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## Perceived barriers to smoking cessation in selected socioeconomically disadvantaged groups: A systematic review of the qualitative and quantitative literature.

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3 **Perceived barriers to smoking cessation in selected socioeconomically disadvantaged**  
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5 **groups: A systematic review of the qualitative and quantitative literature.**  
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## ABSTRACT

**Objectives:** To identify barriers which are common and unique to six selected disadvantaged groups: low income; Indigenous; mental illness and substance abuse; homeless; prisoners and at-risk youth.

**Design:** A systematic review was carried out to identify the perceived barriers to smoking cessation within six disadvantaged groups.

**Data sources:** Medline, EMBASE, CINAHL and PsycInfo were searched using keywords and MeSH terms from each database's inception published prior to March 2014.

**Study selection:** Studies that provided either qualitative or quantitative (i.e. longitudinal, cross-sectional or cohort surveys) descriptions of self-reported perceived barriers to quitting smoking in one of the six aforementioned disadvantaged groups were included.

**Data extraction:** Two authors independently assessed studies for inclusion and extracted data.

**Results:** 63 eligible papers were identified: 24 with low income groups, 16 with Indigenous groups, 17 involving people with a mental illness, three with homeless groups, two involving prisoners and one involving at risk youth. Barriers common to all disadvantaged groups included: smoking for stress management, lack of support from health and other service providers and the high prevalence and acceptability of smoking in disadvantaged communities. Unique barriers were identified for people with a mental illness (e.g. maintenance of mental health), Indigenous groups (e.g., cultural and historical norms), prisoners (e.g., living conditions), people who are homeless (e.g., competing priorities) and at risk youth (e.g., high accessibility of tobacco).

**Conclusions:** Disadvantaged groups experience common barriers to smoking cessation, in addition to barriers that are unique to specific disadvantaged groups. Individual-level and

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3 community and social network-level interventions are priority areas for future smoking  
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5 cessation interventions within disadvantaged groups.  
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7 **Trial registration:** A protocol for this review has been registered with PROSPERO  
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9 International Prospective Register of Systematic Reviews [Identifier: CRD42013005761].  
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14 **281**

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18 Strengths:

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- 21 • This study provides a valuable synthesis of the literature examining the perceived  
22 barriers to smoking cessation common and unique across six disadvantaged groups.  
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25 Limitations:

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- 28 • While the overall quality of the studies included in this review was acceptable, most  
29 studies failed to provide information regarding the trustworthiness (qualitative  
30 studies) or reliability and validity (quantitative studies) of the research  
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## INTRODUCTION

Tobacco use is the leading global cause of avoidable death worldwide (1) and a key modifiable risk factor for the development of a range of diseases, including cardiovascular disease, chronic obstructive pulmonary disease, and some cancers (1).

The prevalence of tobacco smoking is inversely related to socioeconomic position in most high-income countries (1). For example, in 2010 in Australia, the prevalence of smoking was 24.6% in the lowest socioeconomic areas compared to 12.5% in the highest socioeconomic areas (2). The highest rates of smoking are evident amongst the most vulnerable groups, including Indigenous groups (31% - 51.8%) (3-5); people with a mental illness (31.7-32.4%) (6), those with substance abuse disorders (77%) (7); the homeless (73%) (8); and prisoners (78% - 84%) (9, 10).

While rates of *quit attempts* in lower socioeconomic groups are comparable to the general population (11, 12), the *success* rate is much lower (13, 14). There are many reasons quit success may be lower in disadvantaged groups (15). Within the health behaviour literature, factors that prevent an individual from undertaking health behaviour change have been referred to as barriers. Barriers are often conceptualised as either structural or individual psychosocial factors (16). Structural barriers include systems, organisations and the relationship between systems and individuals, for example lack of accessible smoking cessation programs. Individual barriers refer to the subjective experience of the individual, for example physical addiction to nicotine.

Within the general population, cross-sectional studies have found variation in the most commonly reported barriers to cessation. Enjoyment (79%)(17); cravings (75%) (17); and stress management (36% - 63%) (17, 18) are the most frequently reported barriers. Irritability (39% - 42%) (19); habit (39%) (18); withdrawal symptoms (28% - 48%) (17, 18);

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3 fear of failure (17% - 32%) (17, 18) and concern about weight gain (27%-34%) (17-19) are  
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5 also identified as barriers to cessation.  
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8 The effect of socioeconomic position on perceived barriers to quitting was examined  
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10 in a representative sample (n = 2,133) in the United Kingdom (20). Enjoyment (51%) and  
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12 stress relief (47%) were the most frequently endorsed motives for continuing to smoke across  
13  
14 the sample; however stress management and avoiding boredom were associated with  
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16 decreasing socioeconomic position. This suggests that smokers from disadvantaged groups  
17  
18 may experience barriers to smoking cessation differently than those in the general population  
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20 (20).  
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22  
23 Smoking in socioeconomically disadvantaged groups is known to be influenced and  
24  
25 perpetuated by a complex range of social, cultural and environmental factors (21) including  
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27 high acceptability of smoking (22) and higher retailing of tobacco in low socioeconomic  
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29 areas (23). Two previous studies have reviewed the literature to examine barriers to quitting  
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31 smoking amongst disadvantaged groups. One focussed on Aboriginal pregnant women (24),  
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33 and one focussed on the barriers to smoking cessation service utilisation amongst low income  
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35 smokers (25). Both reviews found pro-smoking social norms, inadequate knowledge  
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37 regarding smoking related risks, and lack of access to appropriate cessation services inhibited  
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39 participants' ability to quit.  
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43 As the term disadvantage applies to multiple discrete groups, it is important to  
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45 understand which barriers (if any) are unique for example, cultural factors that inhibit  
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47 smoking cessation may be unique to some Indigenous groups (24). A systematic examination  
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49 of potential unique barriers would be valuable in order to develop and deliver appropriate  
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51 suites of intervention techniques for specific disadvantaged groups.  
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54 Understanding the perceived barriers to quitting is important in order to better  
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56 understand smoking, relapse and quitting related behaviours, to inform appropriate policy,  
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3 and facilitate the development of effective tailored smoking cessation interventions. Given  
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5 the exceptionally high smoking rates and low quit success amongst highly disadvantaged  
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7 groups, there is a critical need for a systematic and comprehensive review of the literature of  
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9 the perceived barriers to quitting smoking amongst socioeconomically disadvantaged  
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11 smokers.  
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### 13 14 15 16 **Aims**

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18 This systematic review aims to provide a comprehensive synthesis of the self-reported  
19  
20 barriers to quitting smoking within six socioeconomically disadvantaged groups by reviewing  
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22 the qualitative and quantitative literature. The review will focus on the perceived, self-  
23  
24 reported barriers to smoking cessation in six selected disadvantaged groups: low income,  
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26 Indigenous, mental illness and substance abuse, homeless, prisoners, and at-risk youth. These  
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28 groups were selected because they represent a large proportion of those classified as  
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30 'socioeconomically disadvantaged' (26); who exhibit smoking rates higher than that of the  
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32 general population (2-10); and who are identified as priority groups targeted for smoking  
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34 cessation programs and policies by peak health authorities (27-29). Specifically, the review  
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36 aims to:  
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42 a) identify barriers which are common across all disadvantaged groups included in the review  
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44 and  
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47 b) identify barriers that may be unique to specific groups.  
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52 The results of the review will be used to develop a practical model to help understand the  
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54 barriers to quitting amongst disadvantaged groups and to aid smoking cessation intervention  
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56 development.  
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## METHOD

### Study design

Guidelines for the reporting of systematic reviews (PRISMA) (30) and qualitative synthesis (ENTREQ) (31) were followed. A protocol for this review was registered with PROSPERO International Prospective Register of Systematic Reviews [Identifier: CRD42013005761].

### Databases and search

Medline, EMBASE, CINAHL and PsycInfo were searched using keywords and MeSH terms from each database's inception published prior to March 2014. The reference lists of key articles and reviews were also manually searched in order to identify any other relevant articles. An extensive list of search terms was used in order to ensure that as many relevant articles as possible were captured (See Table 1).



Table 1. Search strategy

1	1	Tobacco/
2	2	Tobacco use/
3	3	Tobacco use cessation/
4	4	Tobacco smoking/
5	5	Smoking/
6	6	Smoking Cessation/
7	7	Tobacco use cessation/
8	8	Tobacco dependence/
9	9	Cigarette smoking/
10	10	Or/1-9
11	11	Homeless youth/
12	12	Homeless persons/
13	13	Housing/
14	14	Homeless mentally ill/
15	15	Homelessness or homeless/
16	16	Community programs/
17	17	Or/11-16
18	18	Prisoner or Prisons/
19	19	Correctional Health Services/
20	20	Correctional facilities/
21	21	Jail/
22	22	Or/18-21
23	23	Anxiety/
24	24	Depression/
25	25	Schizophrenia/
26	26	Mentally Ill persons/
27	27	Mental health/
28	28	Mental illness/
29	29	Mental disorder/
30	30	Mental disease/
31	31	Mental patient/
32	32	Mental health services/
33	33	Substance-related disorders/
34	34	Drug use/
35	35	Drug abuse/
36	36	Alcohol-related disorders/
37	37	Or/23-36
38	38	Adolescent behaviour/
39	39	Juvenile delinquency/
40	40	Juvenile offenders/
41	41	Disruptive Behaviors or disruptive behaviours/
42	42	At-risk youth/
43	43	At-risk young people/
44	44	Or/38-43
45	45	Indigenous/
46	46	Indigenous health/
47	47	Indigenous peoples/
48	48	Indigenous populations/
49	49	Aboriginal/
50	50	Aboriginal and Torres Strait Islanders/
51	51	Inuits/
52	52	Eskimo/
53	53	Alaska Native/

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54	Indians/
55	Native American/
56	Native Hawaiian/
57	American Indian/
58	Indians, North American/
59	Indians, South American/
60	Indians, Central American/
61	First Nations/
62	Pacific Islander/
63	Maori/
64	Oceanic ancestry group/
65	American Native Continental Ancestry Group/
66	Or/45-65
67	Poverty
68	Social status
69	Social class
70	Low income population
71	Inequalities
72	Socioeconomic status
73	Socioeconomic factors
74	Disadvantaged
75	Underserved
76	Or/67-75
77	Related to smoking cessation/quitting smoking
78	Correlated with smoking cessation/quitting smoking
79	Associated with smoking cessation/quitting smoking
80	That affect smoking cessation/quitting smoking
81	That inhibit smoking cessation/quitting smoking
82	That prevent smoking cessation/quitting smoking
83	Barriers to smoking cessation/quitting smoking
84	Factor\$ or Determinant\$ or Variable\$ or Covariable\$ or Predictor\$ or Barrier\$
85	Or/77-84
86	10 AND 85 AND 17
87	10 AND 85 AND 22
88	10 AND 85 AND 37
89	10 AND 85 AND 44
90	10 AND 85 AND 66
91	10 AND 85 AND 76

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### Inclusion and exclusion criteria

Studies that provided either qualitative or quantitative (i.e. longitudinal, cross-sectional or cohort surveys) descriptions of perceived self-reported barriers to quitting smoking in low income groups, Indigenous groups, people with a mental illness or substance

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3 abuse problems, people who are homeless, prisoners or at-risk youth were included. See  
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5 Table 2 for definitions used as inclusion criteria for each disadvantaged group. Only studies  
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7 carried out in high income countries were included as middle and low income countries may  
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9 present different contextual, political and economic barriers which require separate  
10  
11 consideration. Only studies published in English were included as resources required to  
12  
13 translate articles were beyond the scope of this review. Intervention studies were excluded, as  
14  
15 barriers discussed within these studies related to use of the intervention being tested and not  
16  
17 barriers to smoking cessation per se. Studies examining factors associated with quit attempts  
18  
19 or success were excluded unless they included results on the perceived barriers self-reported  
20  
21 by participants from disadvantaged groups. Studies describing *provider* reports of the barriers  
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23 to the provision of smoking cessation support or treatment, and unpublished grey literature,  
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25 were also excluded. There were no cut offs for sample size.  
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Table 2. Inclusion criteria definitions of each group.

Group	Definition
Low income	Because definitions of low income vary across high income countries this study used an inclusive definition of low income. Studies were included if they described participants as being socioeconomically disadvantaged and gave at least one measure of disadvantage. This measure could be income (above/below poverty level); address in deprived neighbourhood etc.
Indigenous groups	The following definition was used to define potential Indigenous studies in accordance with previous studies (32): “the experiences shared by a group of people who have inhabited a country for thousands of years, which often contrast with those of other groups residing in the same country for a few hundred years” (33).
Mental Illness	People with a mental illness were defined as individuals who had been diagnosed with a mental illness, severe mental illness or were described as inpatients or outpatients in a mental health rehabilitation facility. Substance use disorders were also included. All mental illnesses were included.
At-risk youth	At-risk youth were defined as individuals under the age of 21 who have experienced or are experiencing; problems at school; physical, sexual or psychological abuse; mental or physical health problems; economic disadvantage or who have committed a violent or delinquent act (USA Code).
Prisoners	Prisoners included both those currently incarcerated and those ex-prisoners living in the community.
Homeless	Homeless individuals were defined as those individuals described as meeting national criteria for homelessness or those individuals accessing services provided to homeless persons.
Smoker	Smokers were defined as self-reported daily or occasional cigarette smokers. Studies that also assessed ex-smokers were only included if the majority of participants were current smokers, or if the results were reported by smoking status. Studies were excluded if they focussed solely on ex-smokers or non-smokers.

### **Data extraction**

The titles and abstracts of retrieved publications were assessed by one reviewer (LT) against eligibility criteria and excluded if they did not meet inclusion criteria. A second reviewer (a Research Assistant) independently assessed 20% of the returned abstracts for inclusion with 100% agreement between reviewers. Data from included journal articles was extracted into summary tables independently by one reviewer (LT) and a random 20% checked by a second (Research Assistant). Agreement was again high (97%). Discrepancies were settled by discussion between the reviewers. Data extracted from the articles included: study aims, setting, sample characteristics, response rates, study methodology, data analysis and the barriers identified. Barriers were defined as factors that prevented smoking cessation and/or quit attempts or were reported as primary reasons for continuing to smoke.

### **Risk of bias in individual studies**

Quality assessment was performed independently by all authors, with two reviewers per manuscript. The methodological quality of qualitative studies was assessed using the McMaster Qualitative Criteria Form (34). Quantitative studies were assessed using a tool adapted from the STROBE statement (35). As there is a lack of an agreed, valid and reliable measure to assess the quality of mixed methods studies (36), both the McMaster guidelines and the adapted quantitative framework were applied to the corresponding qualitative and quantitative components of any mixed methods studies identified.

### **Synthesis of results**

Results were synthesised by disadvantaged group using narrative synthesis and inductive data analysis techniques. Narrative synthesis allows the examination of studies that are highly heterogeneous in their research questions, samples and methods (37, 38). In order

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3 to avoid potential biases, care was taken to also identify points of difference between studies  
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5 (39). Where a barrier was reported in more than one study, this was recorded. Barriers were  
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7 combined into categories and then classified using the Social Determinants of Health  
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9 Framework (SDHF) (40). The SDHF holds that an individual's health is influenced by factors  
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11 across many levels, from individual genetic and physical characteristics, to social and  
12  
13 community networks, and broader influences of culture, socioeconomic determinants and the  
14  
15 environment. This framework has been used to examine the determinants of health inequities  
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17 (41). Because the SDHF classifies determinants of health as individual, social and broader  
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19 cultural and environmental factors, it also allows the identification of distinct levels of  
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21 intervention for health policies and programs. For the purposes of this review, individual  
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23 factors were defined as physical or psychological barriers to quitting smoking: for example,  
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25 the individual's level of nicotine dependence or motivation to quit. Lifestyle factors were  
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27 defined as health behaviours (including alcohol and other drug use) that impeded an  
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29 individual's ability to quit. Social and community networks were defined as the impact of an  
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31 individual's family and friend networks, and the wider community. Living and working  
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33 conditions encompassed factors including housing, health care, education and employment.  
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35 The final domain was the broader socioeconomic, cultural and environmental background  
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37 perceived to influence smoking cessation.  
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## 45 RESULTS

### 46 Search results

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48 After duplicates were removed, 21,765 studies were identified from electronic  
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50 searches and a further 27 from manual searches. Of those, 63 studies met inclusion criteria  
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52 and were included in the review (see Figure 1). Supplementary file 1 contains a list of full  
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54 text articles that were retrieved, reviewed and excluded as per the inclusion criteria. Two  
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3 systematic reviews concerning Indigenous Australian pregnant women (24) and pregnant  
4 women (42); and two critical reviews providing summaries of the barriers to quitting (25, 43)  
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6 were also identified from hand searches.  
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### 10 11 12 **Study characteristics**

13  
14 The majority of studies (n = 24) identified barriers to smoking cessation in low  
15 income groups (22, 44-66), Indigenous groups (n = 16) (67-82), and people with a mental  
16 illness (n = 17) (83-99) including two concerning those with substance use disorders (96, 99).  
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18 Three studies reported barriers to quitting within the homeless (100-102) and two reported  
19 barriers within prisoner groups (103, 104). One study with at-risk youth was identified (105).  
20  
21 Two other studies concerning Alaska Native participants (age range from 11 to 18) (81) and  
22 people with a mental illness (age range from 16 to 23) (98) included younger people as  
23 participants. Supplementary files 2, 3 and 4 summarize the included quantitative, qualitative  
24 and mixed methods studies respectively. An overview of the characteristics of included  
25 studies can be found in Supplementary file 5.  
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### 39 **Quality assessment of qualitative studies**

40 The results of the quality assessment of qualitative studies are presented in  
41 Supplementary file 6. Overall, the quality of studies varied widely. The majority of studies  
42 did not explicitly state their study design (n = 38); of those that did, most used Grounded  
43 Theory (52, 54, 56, 88, 93, 94). Most studies provided adequate descriptions of the study  
44 sites; participants; data collection methods and analysis techniques. Studies generally  
45 performed poorly when assessed on four components of trustworthiness, with only fifteen  
46 studies meeting all four criteria (credibility; transferability; dependability and confirmability)  
47 [41,44,48,50,58,60,64,65,68,69,72,73,75,76,84]. It should be noted that none of the mixed  
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3 methods studies explicitly described their methodology as mixed methods nor did they report  
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5 integrating the qualitative and quantitative findings in a systematic way.  
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### 8 9 10 **Quality assessment of quantitative studies**

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12 The results of the quality assessment of quantitative studies are presented in  
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14 Supplementary file 7. Sample sizes in the quantitative studies ranged from 36 to 500  
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16 participants. Response rates ranged from 42% to over 97% (three studies did not provide  
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18 response rates) [70,91,92]. All but one study [81] clearly stated eligibility criteria. All studies  
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20 stated their outcome a priori and no conflicts of interest were identified. The validity and  
21  
22 reliability of survey measures used to assess barriers to cessation were reported in one study  
23  
24 [53]. Three studies employed techniques such as pilot testing and input from key stakeholders  
25  
26 in developing the tools used [53,77,95].  
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### 29 30 31 32 **Perceived barriers to smoking cessation**

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34 The barriers to quitting smoking endorsed over multiple studies included: smoking for  
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36 stress management; enjoyment of smoking; addiction to nicotine; habit; social acceptability  
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38 of smoking; lack of support to quit and access to quit resources; boredom; stressful life  
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40 factors; pro-smoking living environments; smoking cultural norms and socioeconomic  
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42 disadvantage. Figure 2 demonstrates the barriers reported in this review categorised by the  
43  
44 SDHF. For brevity, the current results section will focus on those barriers that were common  
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46 across all groups and unique to certain disadvantaged groups. Supplementary file 8 provides a  
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48 detailed description of all of the barriers identified in this review. Table 3 provides a  
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50 summary of the barriers extracted from the qualitative studies. References of studies that  
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52 report one or more barriers at a given level of the SDHF are included in Table 3. Table 4  
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3 provides a summary of the results of quantitative studies including the proportion of  
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5 participants endorsing the barrier and the study reference.  
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### 9 10 **Barriers common across all groups**

11 Three barriers were present in all six disadvantaged groups included in this review: 1)  
12 stress management, 2) lack of support to quit from health professionals and other service  
13 providers, and 3) high prevalence and acceptability of smoking within disadvantaged  
14 communities.  
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20 Within the SDHF, stress management was categorised as an individual level barrier.  
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22 Thirty eight qualitative studies identified stress management as a significant barrier to  
23 smoking cessation (45-51, 53, 54, 56-58, 60, 62-64, 67, 69, 70, 75, 76, 78, 79, 81, 82, 84, 85,  
24 87, 88, 90-92, 94, 95, 98, 102, 104, 105). Smoking was used as a coping mechanism (47, 53,  
25 57-60, 64, 69, 84, 85, 87, 92, 94) in reaction to daily stressors as well as the stress inherent in  
26 disadvantaged lives. Three quantitative studies reported stress management as a barrier to  
27 quitting with Maori participants (48%) (74), participants with substance use disorders (39%)  
28 (99) and homeless participants (44%) (101). Of note, participants in two studies reported that  
29 smoking also directly contributed to the stress experienced by participants (46, 105).  
30 Participants also reported using smoking to manage their emotions and mood (53, 60, 67, 78,  
31 79, 85, 88, 93, 98, 106). Twenty three percent of participants from a Maori sample indicated  
32 managing emotions was a barrier to quitting (74), 42% of individuals with a substance use  
33 disorder (96).  
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49 High prevalence and acceptability of smoking within disadvantaged communities was  
50 categorised as a community and social network level barrier. Eight qualitative (48, 49, 64, 70,  
51 74, 75, 93, 105) and four quantitative (55, 96, 101, 103) studies found that being around other  
52 smokers was a barrier to quitting. This finding is reinforced by participants describing the  
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3 high prevalence of smoking amongst family and friends in 21 studies (22, 46, 47, 51, 57, 63,  
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5 64, 67, 69, 71, 76, 78, 80-82, 85, 88, 90, 91, 98, 105) and in the wider community in 17  
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7 studies (22, 46, 47, 51, 57, 61, 64, 67, 69, 71, 76, 78, 80-82, 88, 91). Tobacco was readily  
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9 available and easily accessible within disadvantaged communities (46, 57, 61, 71, 78, 85, 86,  
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11 105) and smoking was considered to be a highly acceptable (22, 74, 76-78, 80-82) and  
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13 normalised behaviour (47, 51, 57, 61, 64, 74, 76-78, 80, 82).

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17 Lack of support to quit from health and other service providers to quit was also  
18  
19 categorised as a social and community network barrier. Other service providers include  
20  
21 management and staff in prisons, homeless shelters and organisations, and members of the  
22  
23 community. Twelve qualitative studies (47, 50, 51, 53, 69, 72, 78, 81, 86, 87, 90, 102) and  
24  
25 one quantitative study (103) reported a perceived lack of support from health professionals  
26  
27 regarding smoking cessation. Cases of family members and health professionals actively  
28  
29 discouraging quit attempts and encouraging maintenance of smoking due to concerns about  
30  
31 the individual's mental health (87, 88, 90, 91) or because smoking was perceived to be the  
32  
33 individual's only source of enjoyment (49, 72, 74, 78) were reported. Three studies identified  
34  
35 tobacco use by health professionals and others involved in the participants' care as a barrier  
36  
37 to cessation (72, 90, 103). Over half (55.9%) of prisoners surveyed reported observing  
38  
39 members of staff smoking as a barrier to quitting (103). Studies involving people with a  
40  
41 mental illness and prisoners identified use of cigarettes in order to reward or punish  
42  
43 behaviour by health professionals and other service providers (88, 90, 91, 104) as a barrier to  
44  
45 quitting. Twenty-nine percent of prisoners also indicated that not receiving cessation support  
46  
47 from prison staff prevented them from quitting smoking (103). Twenty-six percent of  
48  
49 substance abusing individuals reported they did not have enough support to quit. One study  
50  
51 involving at risk youth identified smoking being unaddressed by teachers and members of the  
52  
53 police force as a barrier to smoking cessation (105).

Table 3. A summary of the self-reported barriers to smoking cessation – qualitative and mixed methods studies by disadvantaged group.

Barrier	Low income groups (n = 22)	Indigenous groups (n =16 )	People with a mental illness(n=13)	Homeless groups (n = 3)	Prisoner groups (n = 2)	At risk youth (n = 1)
<b>Individual and lifestyle factors</b>						
Stress management	(45-54, 56-58, 60-64)	(67, 69, 70, 74, 76, 78, 79, 81, 82)	(84, 85, 87, 88, 90-94)	(102)	(104)	(105)
Enjoyment	(45, 49-51, 54, 57, 58, 60, 62)	(74, 76-78)	(84, 85, 87-89, 92, 93)			(105)
Addiction	(44, 45, 49, 52, 54, 62-64)	(67, 69, 70, 76, 78, 79, 81)	(85-87, 93)			
Habit	(45, 52, 60, 63)	(70, 74, 78, 79)	(87)			
Mental health benefits	(53, 62)	(69)	(84, 86-94)			
Weight gain	(22, 44, 47-49, 59, 62)	(67, 69, 79)	(86, 93)			
Competing priorities	(51, 58)	(69, 70, 82)	(84, 86, 93, 94)	(102)		
Rationalisations	(49-51, 53, 56, 62)	(69, 73, 77, 82)	(84, 92)			
Other substance use	(44, 51, 54, 57)	(69, 71, 76, 79)	(84)			
Autonomy	(51, 53, 63)	(78)	(88, 92-94)			
Low confidence	(47, 48, 51, 58, 62, 64)	(68, 79)	(87, 91, 93)			
Cognitive benefits	(46)	(78)	(88-90)			
Loneliness	(47, 54, 60)		(88, 92, 93)			
Low risk of harm	(53)	(82)	(90, 92)			
Low motivation			(87, 89, 92, 93)			
Past failed attempts	(56)	(69)				
Positive smoker image	(22, 52)		(92)			
<b>Social and community networks</b>						
Prevalence and acceptability	(22, 46-49, 51, 57, 61, 63, 64)	(67, 69, 71, 74, 78, 80-82)	(85, 86, 88, 90, 91)	(102)	(104)	(105)
Lack of social support	(22, 44, 49-51, 53, 59, 62-64)	(69, 70, 72, 74, 78, 79)	(86, 89, 93)	(102)		

Social activity	(22, 44, 48, 52, 57)	(68-70, 74, 80, 82)	(84, 85, 87, 88, 90, 92, 93)			
Lack of health and other professional support	(47, 49-51, 53)	(69, 72, 74, 78, 81)	(86-88, 90, 91)	(102)	(104)	(105)
<b>Living and working conditions</b>						
Access to quit resources	(47, 50, 51, 56-58)	(67-69, 73, 76, 81, 107)	(88, 91, 93)	(102)	(104)	
Boredom	(45-47, 49-51, 54, 60)	(70, 81)	(85, 89, 90, 92, 94)	(102)	(104)	
Concerns regarding treatment	(45, 47, 51, 53, 56-58, 64)	(67-69, 72, 73, 76, 81)	(86, 88, 91)	(102)		
Stressful factors	(51, 53, 54, 57, 58, 60, 63)	(69, 70, 80)			(104)	
Living and working circumstances	(22, 49, 53)	(69)	(91)			
Social and geographical isolation	(51, 57, 59)	(80)				
<b>Cultural, socioeconomic and environmental factors</b>						
Cultural norms	(51, 57)	(67-70, 73, 76-78, 80-82)	(88, 89, 93)		(104)	
Socioeconomic factors	(60)		(92)			

### Barriers unique to certain disadvantaged groups

Indigenous; prisoner; mentally ill, homeless, and at risk youth reported unique barriers to smoking cessation. Racism, historical factors (69, 70, 80), ceremonial use of tobacco (67, 68, 77, 80, 81), cultural values that promote sharing, kinship, and reciprocity (78), cultural values of pride, independence and self-reliance that affect help seeking behaviour (76, 77), cultural values concerning health and privacy (79), and maintenance of cultural identity (68-70, 77, 78, 80) were identified as barriers within Indigenous groups. Smoking cessation could therefore exclude an individual from fully participating in their culture or potentially challenge family, personal or community relationships.

1  
2  
3 Living environments and the stressful context of prison presented unique barriers for  
4  
5 prisoners, including social isolation, anxiety regarding legal matters, transfers to other  
6  
7 prisons, use of cigarettes as a currency, use of cigarettes as a way to reward or punish  
8  
9 behaviour, bullying, missing family and restricted movement throughout the day (104).  
10

11 Low levels of motivation (87, 89, 92, 93), concerns about ability of cessation services  
12  
13 to handle mental health issues(86, 88, 91), identity and belonging(88, 89, 93) and symptom  
14  
15 management (83-93) were barriers for people with mental illness.  
16  
17

18 Competing needs and prioritising need to find shelter/place to live were unique  
19  
20 barriers for individual who were homeless (102). Very high levels of accessibility of  
21  
22 cigarettes within the community were identified by one study with at risk youth as a unique  
23  
24 barrier (104).  
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Table 4. A summary of the barriers to smoking cessation – reported prevalence of each barrier by disadvantaged group for studies using quantitative and mixed methods<sup>ab</sup>.

Barrier	Reported prevalence of each barrier N/Total N (%)				
	Low income groups (n = 1)	Indigenous groups (n = 1)	People with a mental illness (n = 3)	Homeless groups (n = 2)	Prisoner groups (n = 1)
<b>Individual and lifestyle factors</b>					
Stress management		63/130 (48) <sup>(74)</sup>	30/78 (39) <sup>(99)</sup>	82/186 (44) <sup>(101)</sup>	
Relaxation	261/500 (52) <sup>(55)</sup>	22/130 (17) <sup>(74)</sup>	13/30 (42) <sup>(95)</sup> 7/72 (10) <sup>(83)</sup>		
Enjoyment		33/130 (25) <sup>(74)</sup>	34/72 (47) <sup>(83)</sup> 21/105 (20) <sup>(85)</sup> 30/78 (39) <sup>(99)</sup>		
Addiction	431/500 (86) <sup>(55)</sup>	51/130 (39) <sup>(74)</sup>	56 (53) <sup>(85)</sup> 10/30 (33) <sup>(95)</sup>	93/186 (50) <sup>(101)</sup>	
Cravings			53/78 (68) <sup>(99)</sup> 47/96 (48) <sup>(96)</sup>		
Withdrawal symptoms			85/96 (87) <sup>(96)</sup>		
Habit	411/500 (82) <sup>(55)</sup>	95/130 (73) <sup>(74)</sup>	26/72 (36) <sup>(83)</sup> 20/105 (19) <sup>(85)</sup> 17/30 (58) <sup>(95)</sup>		
Perceived Mental Health Benefits		6 – 30/130 (5-23) <sup>(74)</sup>	21/105 (20) <sup>(85)</sup> 7 – 8/72 (10-11) <sup>(83)</sup> 41/78 (53) <sup>(99)</sup> 41-76/96 (42-78) <sup>(96)</sup>		
Concentration			27-56/96 (28-55) <sup>(96)</sup>		
Low levels of motivation	131/350 (38) <sup>(65)</sup>		46/96 (47) <sup>(96)</sup>		
Weight gain	69/350 (20) <sup>(65)</sup>	6/130 (5) <sup>(74)</sup>	3/72 (4) <sup>(83)</sup> 39/96 (40) <sup>(96)</sup>	38/186 (20) <sup>(101)</sup>	
Other substance use			3/72 (4) <sup>(83)</sup> 2-8/78 (3-10) <sup>(99)</sup> 13-40/96 (13-41) <sup>(96)</sup>		
Problems getting to sleep			23/96 (23) <sup>(96)</sup>		
Low confidence	87 - 202/350		22/78 (24) <sup>(99)</sup>		25/34 (74)

and perceived difficulty	(25 - 58) <sup>(65)</sup>				(103)
<b>Social and community networks</b>					
High prevalence and acceptability I community	332/500 (66) <sub>(55)</sub> 116/350 (33) <sub>(65)</sub>	5/130 (12) <sup>(74)</sup>	13/105 (13) <sub>(85)</sub> 5/72 (7) <sup>(83)</sup> 34/78 (43) <sup>(99)</sup>	78/186 (42) <sub>(101)</sub>	27/34 (79) <sub>(103)</sub>
Lack of social support	90/350 (26) <sub>(65)</sub>			48/186 (26) <sub>(101)</sub> 70-79/98 (71-79) <sup>(100)</sup>	10/34 (29) <sub>(103)</sub>
Lack of health and other professional support			3/72 (4) <sup>(83)</sup>		19/34 (56) <sub>(103)</sub>
Social activity		44/130 (34) <sup>(74)</sup>	17/30 (58) <sub>(95)</sub> 2/72 (3) <sup>(83)</sup>		
Availability of cigarettes		5/130 (4) <sup>(74)</sup>	8/105 (8) <sup>(85)</sup> 5/72 (7) <sup>(83)</sup>		
<b>Living and working conditions</b>					
Access to quit resources	108/350 (31) <sup>(65)</sup>				9/34 (27) <sup>(103)</sup>
Boredom	242/500 (48) <sub>(55)</sub>	38/130 (29) <sup>(74)</sup>	9/72 (13) <sup>(83)</sup> 13/105 (13) <sub>(85)</sub>		
Stressful factors			4/72 (6) <sup>(83)</sup>		
Living environments					20 (59) <sup>(103)</sup>

<sup>a</sup> Decimals rounded to nearest whole number where appropriate.

<sup>b</sup> Numerators/denominators are presented first, followed by proportion (in parentheses), followed by reference.

## DISCUSSION

This is the first systematic review reporting perceived barriers to smoking cessation across a range of disadvantaged groups. The findings from 52 qualitative, eight quantitative and three mixed methods studies demonstrate that barriers to quitting smoking operate at multiple levels including individual and lifestyle factors; social and community networks; living conditions; and cultural and socioeconomic factors. These include: smoking for stress management; enjoyment of smoking; addiction to nicotine; habit; social acceptability of smoking; lack of support to quit and access to quit resources; boredom; stressful life factors; pro-smoking living environments; cultural norms and socioeconomic disadvantage. Stress management, lack of support from health professionals and other service providers and the high prevalence and acceptability of smoking in communities were the three barriers common across all six disadvantaged groups included in this review.

The identified barriers broadly reflect those reported in two systematic reviews limited to pregnant smokers (42) and Indigenous Australian pregnant smokers (24) and two critical reviews providing summaries of the challenges to cessation amongst low income smokers (25) and low income; rural; homeless; hard core; immigrant and HIV positive smokers (43). Addiction to nicotine, habit, stress management, enjoyment and weight gain are typically reported barriers to smoking cessation within the general population (18-20, 108). No studies were found that directly compared barriers experienced by disadvantaged groups and smokers in the general population. To the authors knowledge, only one study has assessed the effect of socioeconomic position on barriers to quitting smoking and identified that decreasing SEP was associated with higher likelihood of reporting stress management and boredom as barriers (20). This review did not aim to provide direct comparisons between disadvantaged groups and the general population due to the heterogeneity of studies. Additionally, comparisons by gender were beyond the scope of this review, but should be



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2  
3 considered for further research, as disadvantage has differential effects on males and females  
4  
5 (15) and preliminary evidence suggests barriers to cessation may differ by gender (65).  
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7  
8 Nevertheless, the results of this review indicate that disadvantaged smokers report a  
9  
10 number of additional barriers to cessation that operate within their social and community  
11  
12 networks; living conditions; and wider cultural and socioeconomic contexts. Social and  
13  
14 community barriers include: lack of support to quit from both peers and health and other  
15  
16 professionals; high prevalence and acceptability of smoking within disadvantaged  
17  
18 communities and smoking as a social activity. Living conditions include: stressful factors;  
19  
20 pro-smoking living and working circumstances; lack of access to quit resources; social and  
21  
22 geographical isolation and boredom. Cultural norms and socioeconomic disadvantage also  
23  
24 presented barriers to quitting.  
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### 29 30 **Main barriers identified across all disadvantaged groups**

#### 31 32 *Stress management*

33  
34 Stress management was a frequently reported individual level barrier. Smokers  
35  
36 typically demonstrate higher levels of stress and low mood than non-smokers and ex-smokers  
37  
38 (109-111). Smoking may provide a coping mechanism for individuals who are prone to  
39  
40 higher levels of stress (112-114) or smoking may act as a stressor due to neurobiological  
41  
42 processes or through the experience of withdrawal symptoms (114). Stressors associated with  
43  
44 disadvantage (for example unemployment, financial stress, and poverty) may compound  
45  
46 stress levels within disadvantaged groups. Given that disadvantaged smokers may be more  
47  
48 likely to report smoking in order to relieve stress (20) incorporating stress management  
49  
50 techniques into interventions targeted at disadvantaged groups may help to increase cessation.  
51  
52

#### 53 54 *Lack of support to quit from health professionals and other service providers*

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2  
3 At the social and community level, a lack of support to quit from health professionals  
4 and other service providers was identified. This reflects research that suggests disadvantaged  
5 smokers are less likely to receive advice to quit from a healthcare provider than their more  
6 advantaged counterparts (115), despite evidence demonstrating brief advice can increase the  
7 likelihood of successful quitting (116, 117). Both organisational and individual factors affect  
8 the provision of quit advice by health and other service providers. These include lack of time,  
9 confidence, knowledge and counselling skills (118). Efforts should be focussed on improving  
10 health professionals' ability to offer quit advice and may benefit from examining how best to  
11 ensure compliance to existing guidelines that provide clear recommendations on identifying  
12 individuals who are at higher risk of smoking and addressing the unique issues that these  
13 individuals face.  
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27 Tailoring interventions to the specific needs of disadvantaged groups may be  
28 effective. Tailored interventions for behaviour change have been found to be effective  
29 compared to no intervention or dissemination of guidelines or educational materials alone  
30 [92]. Given that this review identified three common barriers across the six disadvantaged  
31 groups include in this review, we argue that subsequent smoking cessation interventions in  
32 disadvantaged groups should seek to address these factors. Programs should include specific  
33 modules on stress management techniques and how best to combat stress in disadvantaged  
34 settings as well as educating smokers about how stress relief and relief from nicotine  
35 withdrawal symptoms can be confounded.  
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47 Smoking cessation interventions should be designed to maximise participation by  
48 disadvantaged individuals, addressing the key barriers around acceptability and access to  
49 interventions. Utilising existing services and organisations that are highly accessed by  
50 disadvantaged groups and are a trusted source of help for disadvantaged groups is also  
51 necessary. There is accumulating evidence that social and community service organisations  
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(SCSOs) are well placed to provide brief smoking cessation advice to clients from very disadvantaged backgrounds (119, 120).

### *High prevalence and acceptability of smoking*

The high prevalence and social acceptability of smoking within disadvantaged communities was frequently reported. Considerable measures have been taken to address the denormalisation of smoking in the general population through regulation and legislative changes such as restrictions in advertising, smoke-free environment policies and point of sale restriction (1, 121, 122). Participants who were homeless, experiencing mental illness and prisoners cited a lack of restrictions on smoking within their living environments (or lack of enforcement of existing policies) as a factor that reinforced their smoking. While there are challenges associated with their implementation, smoke free areas can be successfully implemented within mental health treatment centres and prisons (123-125) and there is potential to extend these restrictions to homeless shelters and public housing developments.

Efforts to encourage the denormalisation of smoking in the environments of disadvantaged communities require further exploration. Providing access to acceptable and effective behavioural and pharmacological supports should ensure that denormalisation does not result in compounding stigma and further isolating disadvantaged groups (121, 126).

### **Barriers specific to certain groups**

#### *Indigenous groups*

Indigenous groups identified unique stressors linked to smoking including racism and historical factors; cultural practices including ceremonial use of tobacco and cultural values that promote sharing, kinship and reciprocity and the importance of smoking as a way to maintain cultural identity. Cultural values also had effects on the willingness of Indigenous participants to access smoking support services. Certain Indigenous groups may be less likely to receive advice to quit or engage with services designed to aid in cessation (127). However,

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2  
3 it is important to note that smoking cessation programs have been shown to be effective  
4  
5 within Indigenous groups (106, 128). Culturally appropriate interventions tailored to the  
6  
7 needs of Indigenous smokers should continue to be developed, implemented and evaluated.  
8  
9 These programs should acknowledge the cultural significance of tobacco use and the  
10  
11 important historical and social factors associated with Indigenous groups and smoking (129).

#### 14 *Prisoners*

15  
16 Prisoners identified unique stressors within their living conditions that contributed to  
17  
18 their smoking including social isolation, anxiety regarding legal matters and transfers to other  
19  
20 prisons. A recent multicomponent randomised controlled trial that included improving stress  
21  
22 management skills in prisoners found similar point prevalence abstinence rates as another  
23  
24 trial conducted with prisoners (9) and other community based studies (130, 131). Thus,  
25  
26 smoking cessation programs can be effective even in prison environments that are highly  
27  
28 conducive to smoking and should form a part of routine care within prison systems.  
29  
30

#### 31 *People with a mental illness*

32  
33 Low motivation to quit smoking was only reported in studies involving smokers with  
34  
35 a mental illness. This contradicts research showing no difference in motivation to quit  
36  
37 between those with severe mental illness and the general population (132). A recent review  
38  
39 concluded there is some evidence to suggest that individuals diagnosed with a psychotic  
40  
41 disorder are slightly less motivated to quit than those diagnosed with depression (132).  
42  
43 Possible reasons for this include the symptoms associated with schizophrenia (including  
44  
45 amotivation), management of side effects of medications (including Parkinsonism), limited  
46  
47 support systems, low perceived vulnerability to smoking related disease, lack of alternate  
48  
49 coping mechanisms and poverty (132, 133). Information on the diagnoses of participants was  
50  
51 only reported in one of the studies reporting motivation as a barrier in this review (87) where  
52  
53 the majority of participants were diagnosed with a psychotic disorder. However, other studies  
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2  
3 did not provide information on participants' diagnoses and further exploration is beyond the  
4  
5 scope of this review.  
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7  
8 Symptom management also presented a significant barrier within studies concerning  
9  
10 people with a mental illness. There is evidence to suggest that biochemical processes between  
11  
12 nicotine and other substances in tobacco improve some symptoms of mental illness (133).  
13  
14 Additionally, smokers who are mentally ill may be more likely to misattribute their  
15  
16 withdrawal symptoms as recurring mental illness symptoms. Further investigation and  
17  
18 education regarding cessation and symptom management with people with a mental illness is  
19  
20 warranted. Integrating smoking cessation care with mental health and addiction treatments  
21  
22 can be effective at promoting cessation rates in groups with mental illness (134, 135).  
23  
24 However, future studies need to investigate ways to maintain long term smoking cessation as  
25  
26 well as systems-level changes that may support smoking cessation in people with mental  
27  
28 illness (125, 136).  
29  
30

### 31 32 **Barriers to smoking cessation in disadvantaged groups: a model**

33  
34 Figure 2 visually demonstrates the broad range of barriers to cessation reported by  
35  
36 disadvantaged groups, many of which exist outside of the realm of the individual. This model  
37  
38 demonstrates the interconnectedness of individual and lifestyle factors with the wider social  
39  
40 and community factors, living conditions and cultural, socioeconomic and environmental  
41  
42 factors. The two darker spheres holding social and community networks and individual and  
43  
44 lifestyle factors identify those factors that are potentially modifiable through short term health  
45  
46 behaviour change interventions. This model does not provide an exhaustive list of all of the  
47  
48 factors that prevent disadvantaged individuals from smoking cessation. It does provide a  
49  
50 framework for understanding the perceived self-reported barriers to quitting smoking  
51  
52 identified in this review.  
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### Strengths and limitations

This synthesis of the literature provides evidence of the perceived barriers to smoking cessation by examining the methodological quality of studies and comparing between and within selected disadvantaged groups. However, this review has some limitations. While the overall quality of the studies included in this review was acceptable, most qualitative studies failed to provide information regarding the trustworthiness of the research and most quantitative studies failed to provide information on the validity and reliability of the measures used to assess barriers. Of quantitative studies included, the majority used convenience samples. It is not generally feasible to target disadvantaged and hard to reach populations using random population sampling procedures. This limits the generalizability and transferability of the included studies to wider disadvantaged populations. Nevertheless, the agreement in findings between qualitative studies does suggest that these results are robust.

The nature of the studies included in this review means that no weight is given to the different barriers and the authors cannot provide comment on which, if any, barriers should be made a priority to target in smoking cessation interventions with disadvantaged groups. Given limited resources and funds, addressing all barriers is rarely possible. Future research is needed to identify those barriers which are most important to address first and to prioritise resourcing and intervention development.

The results of this review were broadly categorised according to the SDHF, however these categories are not mutually exclusive and certain barriers were able to be included in multiple categories (for example stress and stressful factors could be categorised as either individual level barriers or barriers within the living conditions level).

Similarly, as this review sought to provide a summary of disadvantaged smokers' perceived self-reported barriers to cessation, other barriers which may be important

1  
2  
3 determinants of quit attempts and success were not considered. Barriers such as the  
4  
5 knowledge and attitudes of staff and health professionals and the capacity of services to offer  
6  
7 smoking cessation programs, which have been identified within the literature (118), should  
8  
9 also be considered when examining the challenges facing disadvantaged groups.  
10

11  
12 This review was only able to identify four studies that examined the barriers to  
13  
14 quitting smoking within prisoner (n=2 studies) and homeless (n=2) groups and one study  
15  
16 focussing on at-risk youth. These results indicate more research is required with these groups  
17  
18 to examine the barriers to smoking cessation. More studies investigating the barriers to  
19  
20 cessation within these groups may lead to identification of additional common and unique  
21  
22 barriers across disadvantaged groups. Additionally, this review was limited to studies  
23  
24 conducted within one of six disadvantaged groups. Other disadvantaged groups that show  
25  
26 high rates of smoking include lesbian, gay, bisexual and transgender groups (137); culturally  
27  
28 and linguistically diverse groups (138); and rural and remote communities (139). The authors  
29  
30 acknowledge the disparity in smoking prevalence in these groups, however their inclusion  
31  
32 was beyond the scope of this review. These groups may experience barriers to cessation  
33  
34 different to those experienced by the groups included in this review. It should also be noted  
35  
36 that individuals within the included groups often experience multiple forms of disadvantage  
37  
38 for example people who are homeless are more likely to experience a mental illness (140)  
39  
40 and Indigenous communities are more likely to be overrepresented in lower socioeconomic  
41  
42 positions (3).  
43  
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46

## 47 **Conclusions**

48  
49 These results support findings that disadvantaged groups experience common barriers  
50  
51 to smoking cessation, and also barriers which are unique to specific disadvantaged groups.  
52  
53 Stress management, high prevalence and acceptability of smoking and lack of support to quit  
54  
55 were identified as priority areas for cessation research, program implementation and policy  
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3 change. Many of the barriers identified within this review are modifiable through short term  
4 health behaviour change strategies. For heterogeneous groups of disadvantaged individuals,  
5 intervention development should seek to address those barriers common to all disadvantaged  
6 groups identified in this review. For relatively homogenous groups of disadvantaged  
7 individuals, interventions should seek to address the unique barriers faced by those groups in  
8 addition to those barriers identified as common to all disadvantaged groups.  
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16 These findings, coupled with lower success rates in quitting within socioeconomically  
17 disadvantaged groups (12, 141), suggest that interventions with disadvantaged groups need to  
18 address wider social, community and cultural factors as well as individualised cessation  
19 support. Addressing the predictors of cessation found within the general population such as  
20 addiction, habit and enjoyment remain important for disadvantaged groups.  
21  
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29

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40 synthesis. All authors have read and met the ICMJE criteria for authorship.  
41  
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52  
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15 **Data sharing:** There are no additional data available.  
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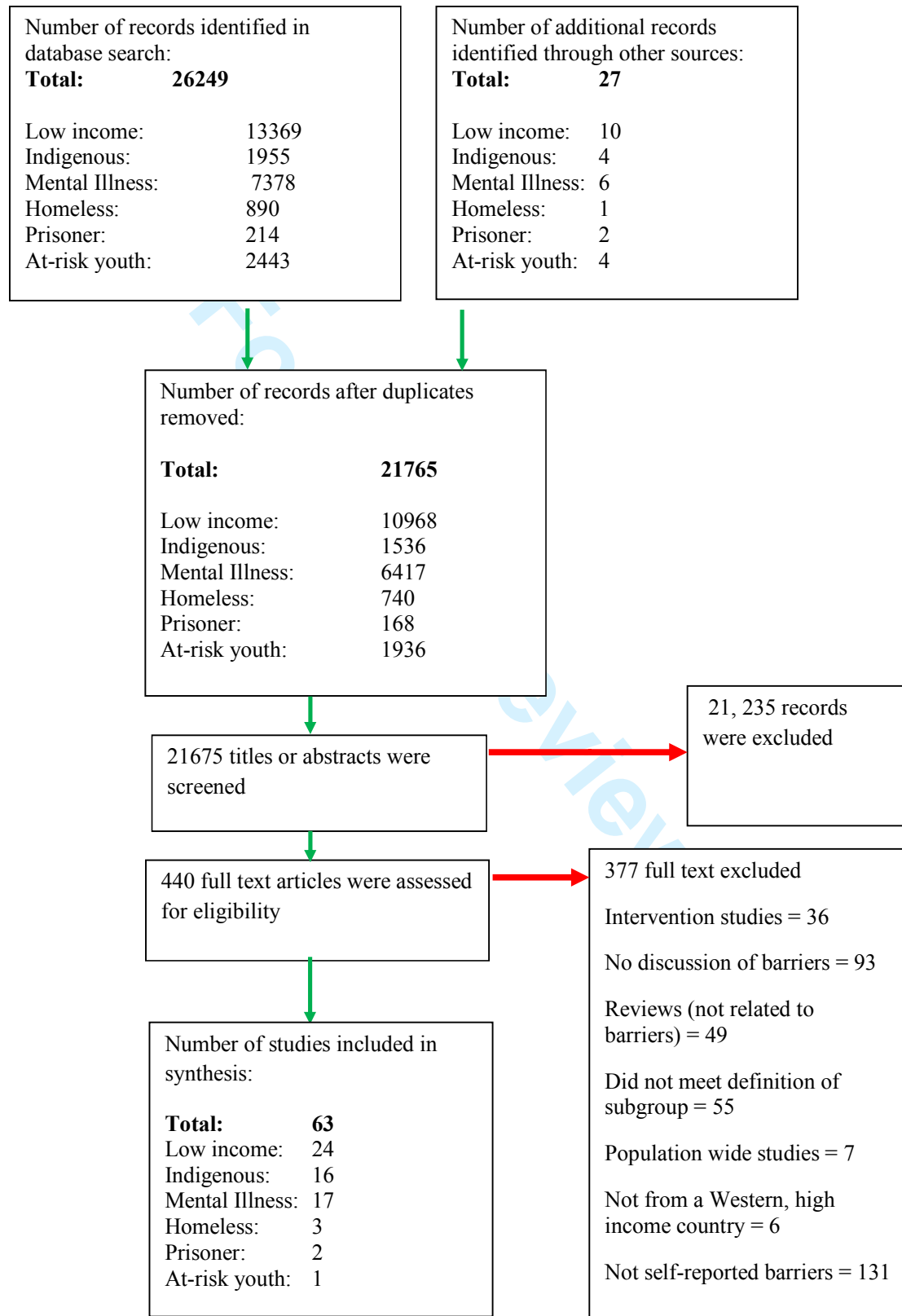


Figure 1. Database search results

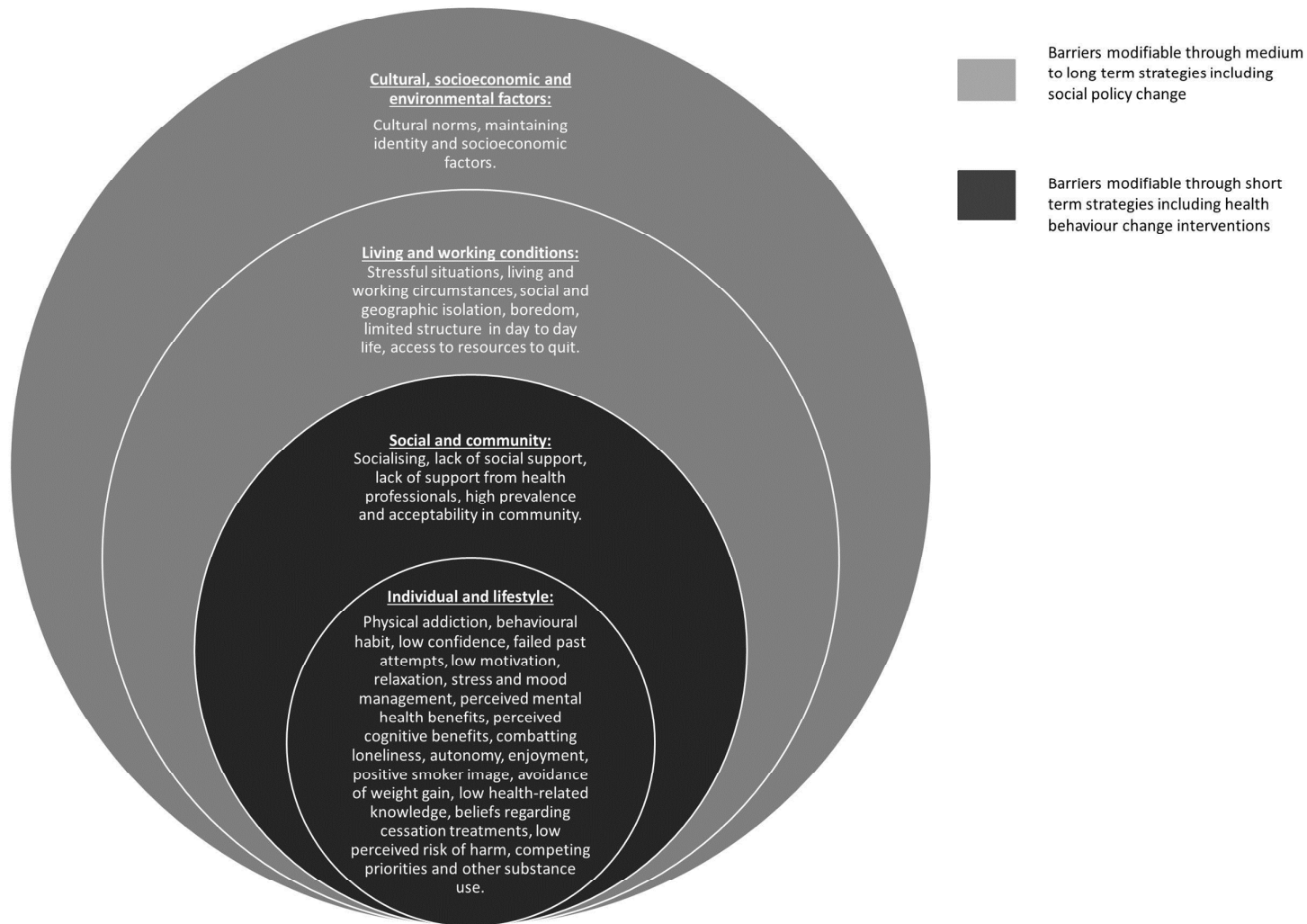


Figure 2. Model of the perceived barriers to smoking cessation identified within six disadvantaged groups.

**Supplementary file 1: References of full text articles that were retrieved, reviewed and excluded for not meeting inclusion criteria. Articles could meet multiple criteria for exclusion.**

**Low income studies excluded (n = )**

*Intervention studies*

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### **Indigenous studies**

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#### *Studies not meeting the subgroup definition*

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### **Mental illness studies**

#### *Intervention studies*

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#### *No discussion of barriers*

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*No discussion of barriers to smoking cessation (e.g might be barriers to accessing health care in general)*

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*Not reporting the perceived self-reported barriers to smoking cessation (e.g. might report results of logistic regressions showing nicotine dependence associated with cessation success)*

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#### **Prisoner studies**

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Supplementary file 2. Summaries of the included quantitative studies by disadvantaged group (n = 8).

Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
<b>Quantitative studies</b>							
<b>Low income population</b>							
Price 1994(54)  USA	Assess the perceptions of lung cancer and smoking in a socioeconomically disadvantaged sample.	Telephone interviews in Ohio, USA.	n = 500 49% female Age: mean = 58, SD = 18.2 Ethnicity: white (83%)	42%	Cross-sectional.	Pre-designed survey instrument based on the Health Belief Model – 45 items.  Barriers: 5 items. .79 reliability coefficient.	Habit: 82% Prevents boredom: 48% Helps to relax: 52% Addiction: 86% Many friends of smokers also smoke: 66%
Rosenthal et al 2013 (64)  USA	Identify the most endorse barriers and motivations to quitting an sociodemographic differences in the barriers to quitting report.	Six low income neighbourhoods in new haven, Connecticut.	n = 350 Ethnicity: 61% Black 20% Latino 12% White Education: 56% High school diploma/ GED or less	73%	Cross-sectional	Gender, race/ethnicity, educational attainment, age, smoking status. Barriers measure based on pre-existing survey (7 items).	<i>Intrapersonal barriers</i> I don't want to quit: 37.4% It is too difficult: 57.7% I don't know how: 24.9% I am afraid of gaining weight : 19.7% <i>Financial barrier</i> I can't afford the medication or nicotine replacement therapy products (such as the patch or gum): 30.9% <i>Support barrier</i> I don't have enough support: 25.7% <i>Social Influence barrier</i> Everyone I know uses tobacco: 33.1%

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Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
<b>People with a mental illness</b>							
Asher et al 2003 (95)  USA	Report the relative frequency of endorsement of the various barriers as a source of guidance for clinicians wanting to motivate alcoholic patients to quit smoking.	Urban inpatient state-subsidized substance abuse facility.	96 alcohol dependent smokers	73%	Cross sectional survey	11 item True/False Barriers to Quitting Smoking in Substance Abuse Treatment (BQS-SAT) questionnaire.	If I quit smoking, I'll feel tense and irritable: 87% If I quit smoking, I would feel anxious: 78% When I don't smoke, I feel restless, and I can't concentrate: 56% If I quit smoking, my urges to smoke will be so strong, I won't be able to stand it: 48% I don't have the willpower to quit smoking: 47% I need smoking to lift me up when I'm feeling down: 42% Quitting smoking during substance abuse treatment would make it harder to stay sober: 41% If I quit smoking, I would gain weight: 40% Smoking gives me a lift when I'm feeling tired: 28% If I quit smoking, I won't be able to sleep: 23% If I quit smoking, my urges to drink or use drugs will be so strong I won't be able to stand it: 13% Negative affect: 32% Habit: 28% Seeing others smoke or peer pressure: 22%. Being addicted to more than one substance: 5% .

Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
							Compulsion and mental urges: 3%
Carosella et al 1999 (82). USA.	Assess the barriers to and facilitators of quitting smoking in long term care inpatients.	Long term psychiatric care units.	n = 92 98% male Age: mean = 47.6 Diagnoses: substance abuse (60.9%); schizophrenia (55.4%); affective disorders (38%).	77.7%	Interviews.	Smoking status and history, demographic information, reasons for not quitting smoking.	Enjoyment: 47.2% Habit : 36.1% Boredom: 12.5% Anxiety, nerves: 11.1% Smoking does me good (e.g., relaxing, stimulating, stifles pain): 9.7% Availability of cigarettes: 6.9% Never had a reason/need to stop: 6.9% I have emotional problems: 6.9% Other stressors: 5.6% Concentrating on other addictions: 4.2% Smoking helps your appetite/digestion: 4.2% I need some help to stop: 4.2% Sociability of smoking: 2.7% Don't know: 2.7%
Orleans et al 1993 USA	Aimed to inform the design of nicotine addiction treatments tailored for patients with chemical dependency	Inpatient substance use treatment centre	n = 78 78% male mean age = 36.6 (SD = 10.1) 78%: alcohol 9% drug problems including cocaine, heroin, marijuana and prescription medication	Not reported	Cross-sectional	Sociodemographic, smoking related characteristics, 9 item barriers survey.	Missing or craving cigarettes: 68.4% Being nervous, anxious or tense: 53.3% Being around other smokers: 43.3% Losing a pleasure: 39.4% Coping with stress: 38.7% Being afraid you'll fail: 27% Gaining weight: 24.3% Maintaining sobriety: 9.9% Increased alcohol/drug use: 2.9%

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Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
			13% alcohol and other drug problems				
<b>Homeless groups</b>							
Arnstet et al 2004 (99).  USA.	Evaluate predictors of readiness to quit and interest in cessation counselling in a homeless sample	Homeless services at urban hospital	n = 98 Age: mean = 44 years. Median number of years homeless = 2.75 Predominantly white, unmarried, unemployed or disabled, males (proportions not provided).	Not reported.	Cross-sectional.	Smoking behaviour, reasons for quitting, readiness to quit, history of homelessness, alcohol and other drug history, psychiatric history, medical history, quit attempts, social support.	21% believe the people closest to them would be very helpful in quitting smoking.  29% endorsed the item "People closest to you want you to quit very much".
Connor et al. 2002 (100).  USA.	Ascertain the prevalence of smoking, smoking cessation and how various factors associated with homelessness impact on readiness to quit smoking.	Emergency homeless services, residential drug treatment services, drop in centres for homeless in the city of Pittsburgh (9 homeless services).	n = 230 Male = 81% Age: mean = 41.8, SD = 10.7. Ethnicity: 54% African Americans; 40% white; 3% Hispanic; 3% other. Homelessness: 46% living in transitional	>97%	Cross-sectional.	Demographics, substance use history, housing status, Fagerstrom Test of Nicotine Dependence, Stage of Change, self-efficacy, barriers to cessation (as 5 potential barriers: cravings, other smokers, weight	Cravings: 50% Stress or mood swings: 44% Being around others who smoke: 42% Not receiving any support during quit attempt: 26% Fear of weight gain: 20% No specific treatments (pharmacological) could help them quit smoking: 31.6%



Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
			housing, 31% in shelter; street 20%; 3% living with family/friends.			gain, habit, stress/mood), social support.	
<b>Prisoner groups</b>							
Dickens et al 2005 (102).  UK.	To explore psychiatric inpatients views of smoking cessation options.	Forensic wards of large independent psychiatric hospital.	n = 34 57.8% male Age: mean = 36.0, SD = 9.7 Ethnicity: not reported. 88.9% legal status of detained.	44.1%	Cross-sectional.	Demographic details, mental health act status, smoking characteristics, views on smoking cessation and rules on smoking in the hospital.	Other patients smoking: 79.4% The “smoky atmosphere” would make it too difficult to stop smoking: 58.8% Seeing members of staff smoking: 55.9% Not enough encouragement from staff: 29.4% Not enough information about giving up smoking: 26.5% “It’s just too difficult” to give up smoking: 73.5% Several smokers commented that boredom was a factor in continuing to smoke.

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Supplementary file 3. Summaries of the included qualitative studies by disadvantaged group (n = 52).

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
<b>Low income</b>							
Ahijevych 2003(42).  USA	Investigate the beliefs and attitudes towards tobacco of current and former Appalachian smokers.	Non metropolitan Appalachian county.	n = 14 64% female Age: mean = 33.7, SD = 8.7 Ethnicity: 100% white, non-Hispanic High school education or less: 40.5%	Focus groups	Roles of tobacco in life and community, factors helped or hindered previous quit attempts, community perceptions of tobacco use, and strategies for successful smoking cessation programs.	Content analysis.	Addiction to nicotine. Cravings. Smoking provides a rush. Alleviating boredom Peers and family members who reinforced smoking. Routine/ritual of smoking. Social activities. Associated behaviours: alcohol, caffeine, Weight gain.
Bancroft et al 2003 (43).  UK	Investigate barriers to quitting and accessing treatment in two disadvantaged areas of Scotland	two disadvantaged geographical areas in Scotland	n = 100 50% female Age: not reported Ethnicity: not reported. Housing tenure: 76% council housing	Interviews	Smoking and quitting; future smoking, intentions to quit; habit and addiction.	Thematic analysis. NUDIST.	Addictive behaviour. Habit. Lack of alternatives. Smoking is the only pleasurable activity to do. Reward. Deal with stress. Alleviate boredom. Alleviate stress from financial pressures.
Beech et al 2003 (44).  USA	Investigate the cultural and social factors associated with African American low income smokers.	High schools, colleges, housing developments and trade schools.	n = 118 45% female Age: between 18 and 35 years old. Ethnicity: 100% African American.	Focus groups.	Smoking initiation, smoking maintenance and cessation.	Content analysis.	Equal numbers of participants reporting smoking managed their stress compared to those who reported smoking contributed to their stress. Anxiety management. Daily hassles and life events.. Energy and alertness. Taking a break. Boredom. Managing certain medical conditions. High levels of accessibility in communities. Willpower and prayer were more highly valued as cessation methods than use of pharmacology or counselling. High prevalence of smoking within social networks and communities: family, peers and the wider community.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
Bryant et al 2010 (45).  AUS	Sought to describe the smoking behaviours and attitudes of disadvantaged Australian smokers attending SCSOs, including past experiences of quitting, preferences for quit support, and perceived barriers to quitting.	Five community welfare organisations located in New South Wales, Australia.	n = 32 69% female Age: all participants aged over 16 years.	Focus groups.	Current smoking behaviour, motivation to quit, past quit attempts, barriers to quitting and preferences for cessation support.	Thematic analysis. Nvivo version 8.	Stress relief. Calming, relaxing. Alleviating boredom. Coping mechanism . A best friend. Low self-efficacy – doubting ability to quit. Viewing quitting as impossible. Feeling ready and having willpower were integral to success. Low knowledge of quit support. Unsure how to correctly use NRT, belief NRT was ineffective, learning from others about the efficacy of NRT. Knowledge of other pharmacotherapies was low. Telephone quit lines usage also low. Weight gain Limited perceived support from GPs and other health professionals. High cost of NRT. Repeated social and environmental exposure to smoking. Norm within the community. High prevalence of friends and family were smokers.
Copeland et al 2003 (46).  UK	To further examine the roles that smoking plays in the lives of the study group	General practice in a deprived area of Edinburgh.	n = 51 100% female	Open ended survey.	Open-ended questions regarding smoking characteristics, feelings and experiences regarding smoking, as well as measures of anxiety, depression and stress.	Content and category analysis.	Lack of willpower. Triggering event such as starting new job, marital problems, bereavement. Nothing else to help cope. Weight gain. Social smoking. Contact with other smokers.
Dunn et al 1998 (47)	Explore attitudes and perceptions of smoking during pregnancy.	Neighbourhood centres and clinics in an urban area. .	n = 57. 100% female Age: 77% aged 25 or younger	Focus groups.	Health concerns, sources of advice regarding pregnancy.	Content analysis.	Internal factors: Stress. Boredom. Addiction to nicotine.

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Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
USA	barriers to quitting, second hand smoke exposure, and preference for cessation programs among women of low SES.		Ethnicity: African Americans 24; Native Americans 23; white 10. High school education or less: 68%		characteristics of useful programs, health effects of smoking, quitting, passive smoking exposure and attempts to avoid exposure.		Withdrawal symptoms. Strong cravings. Weight gain. Belief that smoking was not dangerous enough to warrant quitting. Long term effects which participants do not consider. External factors: Being around friends and family members who smoked, including those who were not supportive of quit attempt. Lack of control over exposure to smoke and influence of others.
Franco et al 2011 (48).  AUS	Increase knowledge on the barriers to smoking cessation and the acceptability of addressing smoking in SCSOs	SCSO Illawarra region, NSW Australia	n = 53 83% female	Focus groups.	Smoking and health, smoking cessation, support preferences, acceptability of addressing smoking in SCSO setting.	Notes based analysis.	Ritual. Structures the day. Reward after daily chores. Something to do. Stress management. Concerns about the effectiveness of NRT. Cost of NRT and other treatments too high. Need more support to quit.
Lacey et al 1993 (87).  USA.	Increase understanding of the role of smoking and the challenges faced when attempting to quit.	Residents of public housing in Chicago, USA.	n = 6 – 8 participants per focus group (8 focus groups in total). 100% female. Ethnicity: 100% African American. 42% not completed high school 100% had average yearly income < \$13,000 USD.	Focus groups.	Day to day activities, life stressors, community and living conditions,	Content analysis.	Social isolation. Lack of support. Racially and economically segregated areas. Fear limited outings to necessary activities. Limited social networks outside of immediate family. Stress management. Substandard, unclean housing. Few opportunities for recreation or employment. Violence and crime. Substance use. Sense of control. One of few attainable pleasures. Legal and harmless for relatively small investment. Perceived alternatives are drugs, alcohol abuse or losing control. Low perceived harm. Fatalistic beliefs/rationalisations/self-exempting beliefs.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							Other physical illness and disease that took priority – COPD, heart disease, kidney disease. Belief that smoking is normal. Belief that most adults smoke. High prevalence in social network. Hard to avoid smoking. Belief that the only way to quit smoking was to do it cold turkey. Low knowledge regarding how to quit and methods/help available. Absence of specific constructive assistance. Being self-reliant preferred over being dependent on help from someone. Smoking cessation support not seen as effective.
Moffatt et al 2004 (50).  AUS	Aim to gain better understanding of the barriers to quitting in blue collar workers	Two antenatal clinics in Brisbane, QLD servicing predominantly low SES participants.	n = 25 100% male Age: between 20 and 53 years old	Semi-structured interviews.	Questions developed from literature review and pilot study.	Constant comparative method – conceptual analysis. NUDIST.	Lack of control over smoking. Long positive association with cigarettes – cool, sophisticated. Lack of support to quit. Withdrawal - negative feelings such as anger/irritability. Peer pressure. Relaxation. Social contexts. Habit – daily routine.
Nichter et al 2007 (51).  USA	To uncover the factors that facilitate smoking during pregnancy and those that facilitate quitting; investigate the use of harm reduction practices used by pregnant women and the effects of social networks on smoking and	Large urban city.	n = 53 100% female Age: mean = 25, ranged from 18 – 43 years. Ethnicity: Anglo-American 62%; Mexican American 21%; African American 11%, multiethnic 6%.	Semi-structured interviews	Interview questions developed from pilot material with key informants.	ATLAS ti 5.0	Low social support Living in more than one residence during pregnancy Not being head of household/able to make decisions regarding smoking policy and house. No stable employment No family/peer support Smoking helped women manage anger, frustration, control and autonomy. Coping strategy History of depression Smoking seen as lesser evil compared to alcohol or other drugs Less clear about direct outcomes for baby Rationalisations “defence mechanisms/downplaying

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
	cessation.		High school education or less: 74% Unemployed: 60%				medical risks/prioritising less stress over smoking damage. No helpful guidance from health professionals
Paul et al 2010 (52).  AUS	Examine the experience of the social context of smoking and whether this experience differed by sociodemographic characteristics	Local community facilities in high and low SEIFA suburbs in Sydney, Aus.	n = 4 – 8 participants per group (8 groups in total).	Focus groups.	Smoking behaviour and history; current and future smoking environments; environmental factors related to smoking.	Thematic analysis.	Nostalgia for smoking that was once cool and sophisticated. Weight control. Not noticing any decrease in the smoking prevalence in their community over time. Social/peer groups predominantly made up of smokers. Social activity. High perceived acceptability of smoking. Work environment being more conducive to smoking. Lack of smoking restriction at workplace. Acceptability of smoking in open air environments in low SEP neighbourhoods.
Peretti-Watel et al 2009 (53).  FRA	To increase understanding of low socioeconomic status and smoking through investigating smoking motives.	South –east of France – social work centres and participants homes.	n = 31	In depth semi-structured interviews	Brief topic guide mentioned but not presented.	Based on principles of grounded theory.	Addiction. Pleasure and happiness. Satisfied essential needs. Relieves stress. Fills void in everyday life – nothing else to do. Only leisure activity they can afford. Combat loneliness. Manage other addictions. Stressful life events such as break up of relationship or loss of job.
Roddy et al 2006 (55).  UK	Determine level of awareness of stop smoking services in deprived area and identify specific barriers and motivators to improve access.	Most deprived districts in Greater Nottingham.	n = 39	Focus groups.	Smoking behaviour, cessation experiences, knowledge and perceptions of existing services.	NUD*IST 6 software.	Lack of knowledge of services Misconceptions about attitudes within services. Being judged by health professionals. Feeling they would need intensive support to quit. NRT was expensive and ineffective (many contraindications). Bupropion was negatively associated with adverse events reported in media. Stress. Rationalisations. Failed quit attempts in the past.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
Stead et al 2001 (56).  UK	To investigate how smoking is fostered in areas that experience multiple forms of deprivation	Housing estates within 8 communities in Glasgow having DEPCAT scores of 7 (highest scores of deprivation).	n = 53 Sample selected according to age, gender and smoking status.	Focus groups	Smoking characteristics, smoking history, leisure activities, work and unemployment, cessation history, experiences of the local community.	Thematic analysis.	<p>Coping mechanism – dealing with stress directly related to living in a deprived community.</p> <p>Stressors include: limited income, caring for children, poor local infrastructure, high levels of crime and drug use, limited opportunities for rest and respite from community.</p> <p>High accessibility of cigarettes (legal, illegal and informal sources).</p> <p>Socialising.</p> <p>Main pleasure (cheap and easily accessible).</p> <p>Smoking alleviated anxiety and nervousness.</p> <p>Coping with frustration and demotivation of widespread unemployment.</p> <p>Normative influence of being surrounded by smoking.</p> <p>Accepted smoking as inevitable and preferable to other drug use.</p> <p>Deprived communities experienced feeling cut off from other communities (that were more advantaged) thus weren't exposed to other norms.</p> <p>Belonging and identity.</p> <p>Smoking compensates exclusion and binds communities together.</p> <p>Deepening financial hardship.</p> <p>Fears of not being able to cope without cigarettes.</p> <p>Limited awareness of help available.</p> <p>Lack of trust regarding efficacy of medications and cynicism about health professionals financially exploiting smokers.</p> <p>Little support from community.</p>
Stewart et al 1996 (57).  CAN	Examine the factors associated with barriers and supports to smoking cessation in disadvantaged women.	Atlantic region, Canada.	n = 386 100% female	Semi-structured interviews	Interview guides were used but not described.	Content analysis.	<p>Linked with poverty, isolation, and caregiving.</p> <p>Coping mechanism.</p> <p>Associated fear, anger and anxiety.</p> <p>Reward.</p> <p>Pleasure.</p> <p>Addiction.</p> <p>Short and long term goals – struggle for 'survival'; therefore long term benefits of quitting had little impact.</p>

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							Not using traditional cessation support services – negative reactions from those that had. Personal determination and willpower were integral to success. Cessation aids viewed as ineffective or harmful. Believed that poverty, abuse and alcoholism more damaging to society – antagonistic towards tobacco control measures.
Stewart et al 1996 (58).  CAN	Identify social-psychological factors associated with smoking cessation among disadvantaged women.	Atlantic region of Canada  Research carried out in sites accessible to participants.	n = 126 100% female	Focus groups and interviews	Reasons for smoking and continuing to smoke, impact of anti-smoking media messages, opinions and experiences regarding smoking cessation, strategies, services and support that would help stop or reduce smoking.	Content analysis.	Weight gain. Low expectation of support from health professionals and health agencies – lack of confidence in GPs and nurses. Rarely contacted national/peak bodies like Lung association or Cancer Society. Geographical isolation, lack of awareness of role and scepticism. Lack of social support – partners, immediate family, friends and acquaintances.
Stewart et al 2011 (59).  Canada.	Identify the needs and preference of female smokers from low socioeconomic background ds.	Three large urban cities in Canada.	n = 64 100%female Age: mean = 37 High school education or less: 68%	Focus groups.	Smoking characteristics, cessation attempts and experiences, preferences for support to quit and resources.	Thematic analysis. QSR N6	Limited employment opportunities. Reliance on welfare and benefit payments. Low socioeconomic status – poverty, low education, unemployment and the stress caused by these factors. Lack of affordable childcare. Management of emotions and stress – anger, upset, anxiety. Coping mechanism. One of few pleasures available. Relaxation. Reward. Boredom, lack of access to recreational activities. Smoking linked to feelings of loneliness and hopelessness regarding poverty. Smoking as habit – linked to other behaviours – drinking coffee etc.
Stillman et	Increase knowledge of	Employment and training and	n = 28	Focus groups	Social norms and smoking, how	Atlas.ti v 3.	Smoking seen as normal, very common and not problematic.



Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
al 2007 (60). USA.	environmental factors that facilitate or prevent young AA from smoking cessation.	education programs – inner city.			tobacco was sourced, socialisation and smoking and smoking restrictions and advertising.		Faced few restrictions regarding smoking. “Loosies” (single cigarettes) were easily accessible.
Tod 2003 (61). UK	Explore the reasons why pregnant women do not quit and are less likely to access smoking cessation services.	South Yorkshire Coalfields (SYC) – deprived area with high prevalence of smoking. Pregnant women known to maternity services within this area. Approached by midwives.	n = 11 100% female Age: ranged from 19 to 38 years old.	Semi-structured interviews via telephone.	Smoking history; obstetric history; factors influencing access to smoking cessation services; knowledge and beliefs; preferences for future services.	Framework analysis.	Addiction. Only cutting down for baby; plan to resume after birth. Enjoyment. Belief that willpower is essential for success. Cutting down but missing that extra strength to finally quit. Pressures and stresses of life. Lack of willpower linked to self-fulfilling prophecy; relapse was viewed as inevitable. Smoking during pregnancy safest, and healthiest, and preferred course of action. Housework; childcare, financial anxieties and relationships. Protecting mental health. Familiar and necessary tool to cope. Smoking controlling appetite for weight concerns and also to control hunger. Food was sacrificed in order to afford cigarettes. Partners’ smoking affected motivation to quit. Being around people who were smoking. Timing of smoking cessation advice coinciding with tests for babies’ health . Judgemental attitudes from service providers. Lack of childcare options. Minimizing risk of smoking. Participants own experience discredited health advice.
Tsourtos et al 2008 (62).	Understand the barriers to quitting smoking, especially in relation to stress, in order to	The most disadvantaged are (local government area) in metropolitan Adelaide.	n = 29 48% female.	Focus groups (2) and in depth telephone interviews	Barriers to quitting smoking (focus on stress), reasons for quitting, stress and quit attempts.	Not reported.	Stressful environments including: financial stress, child rearing, family issues, employment disadvantage, increased morbidity and mortality within community (including smoking related illness), and difficulties in the workplace. NRT too expensive to maintain.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
AUS	understand the differences in cessation rates between the groups.			(11).			Financial stress. Stress that arises from childrearing and women having a smoke to get 'time out'. Partner smoking. Increased morbidity and mortality in community, including due to smoking related illness. Habit of smoking; ritualised behaviour. Lack of control. Addiction. Cravings. Boredom. Smoking to alleviate stress. Some respondents held the belief that it was not tobacco/cigarettes themselves that provided stress relief, but the chance to relax.
White & Baird 2013 (65)  UK	Explore perspectives of former miners in disadvantaged former coal mining communities on smoking and cessation	Former coal mining towns and villages in Bolsover district, North Derbyshire.	n = 16  100% white 100% male 100% British  Aged between 45 and 68  All former miners	Interviews	Perspectives on smoking, stopping smoking and stop smoking services.	Content analysis	Attributing health issues to coal dust exposure rather than smoking Comparing the risks of coal mining to the risks of smoking Participants reported being able to stop smoking at will with minimal difficulty and need for support, despite all previous attempts being unsuccessful.
Wiltshire et al 2003 (63).  UK	Examine participants' views on quitting smoking and smoking and how that may be affected by their lives.	Two health centres in two areas of deprivation in Scotland.	n = 100 50% male Housing: 76% council/housing association	Semi-structured interviews.	Daily consumption patterns, reasons for smoking, wider community environment, experiences of quitting and changes in smoking status, future quit intentions.	Thematic analysis.  NUD*ST.	Stress Management. Coping mechanism. Living, socializing and working with other smokers. Smoking 'deeply embedded' in their lives. Smoking was normalized and routine contact with other smokers made quitting even more difficult. Only way to quit is remove yourself completely from your environment. Addiction to nicotine. Cravings. Withdrawal symptoms and their impact on family/friends.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							<p>Stressful life circumstances.</p> <p>Belief that NRT not up to task of replacing cigarettes.</p> <p>Cost of NRT.</p> <p>Word of mouth regarding bad/unsuccessful attempts with NRT.</p> <p>Boredom and times of inactivity.</p> <p>Characteristics of living in a disadvantaged area - violence, crime.</p> <p>Willpower was essential in order to be able to quit smoking.</p>
<b>Indigenous studies</b>							
Burgess et al 2007 (66).  USA	Explore the cultural factors associated with experience and perceptions regarding tobacco use, cessation and dependence treatments.	Minneapolis/St Paul metropolitan area.	n = 26 American Indian participants 30% female	Focus groups.	Smoking, smoking cessation and tobacco dependence treatments.	Content analysis.	<p>Smoking as highly acceptable and widespread within community.</p> <p>Traditional ceremonial use of tobacco.</p> <p>Addiction.</p> <p>Cravings.</p> <p>Withdrawal symptoms.</p> <p>Stressful circumstances.</p> <p>Suspicion towards pharmacotherapy.</p> <p>Scepticism about benefits of pharmacotherapy and negative views of medical profession in general.</p> <p>For women, smoking was seen as way to care for self in face of multiple responsibilities</p> <p>Women used to manage stress, negative emotions, deal with life demands including children, work and family.</p> <p>Weight control.</p>
Choi et al 2006 (67).  USA.	Assess smoking behaviour, cessation, traditional tobacco use and attitudes towards a smoking cessation program in a sample of American Indian participants.	Health Centre based within an Indian Nations University.	n = 41 American Indian participants 63% female Age: mean = 41 (SD = 12.3) ranged from 21-67 63% some college education	Focus groups.	1. Tobacco use (including ceremonial and non-ceremonial) 2. Smoking and quitting. 3. Smoking cessation program "Second Wind".	Themes identified.	<p>Traditional or ceremonial use of tobacco.</p> <p>Use of tobacco important to maintain an 'Indian' identity.</p> <p>Relapse in social situations.</p> <p>Normative behaviour.</p> <p>Highly prevalent: everyone smokes.</p> <p>Stressful situations.</p> <p>Belief that quitting smoking "takes personal motivation and a person will not be able to quit unless he or she has determination and self-control and really wants to quit".</p> <p>Most had tried NRT – cost was a barrier to getting more</p>

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Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							<p>NRT. Nightmares were attributed to bupropion and NRT. Largest barriers to NRT use were cost and accessibility.</p>
<p>Dawson et al 2012 (68).  AUS</p>	<p>Increase understanding of barriers within Aboriginal Health Worker workforce.</p>	<p>Metropolitan, rural and remote health services.</p>	<p>n = 34 Aboriginal Australian participants 44% female</p>	<p>Semi structured interviews and focus groups.</p>	<p>Factors related to relapse, not wanting to quit, challenges in quitting.</p>	<p>Content analysis. NVivo 8 software.</p>	<p>Stress, grief and loss – due to health concerns, excessive work demands, family issues, inequity in workplace, institutionalised racism and pervasiveness of social disadvantage. Chronic disease, burden of illness, premature deaths in community. Fear – of failure, feeling sick (withdrawal symptoms), weight gain, and losing a coping strategy. Smoking not being a problem – rationalizations as well as just the belief that it’s not a problem. Quitting not the greatest priority in their lives. Lack of knowledge about quit methods – unsure about the benefits of certain pharmacological methods. Lack of access to relevant quit smoking aids – culturally appropriate, cost. Nicotine addiction – biological addiction was rarely referenced. Social pressure to smoke – living and socialising with smokers. Situations where alcohol was consumed or with high number of other smokers. Quitting means exclusion from this network. Offence at not participating – maintaining connectedness. Lack of support/role models – few friends and family/community members who had quit successfully, intolerance of mood changes around when quitting. Pressure to quit from non-smokers – ‘picked on’, line between encouragement and beleaguering. Smoking common in the workplace – acceptable, organisational culture enabled smoking, create bond between clients and workers, challenge in enforcing smoke free policies. Smoking was pervasive and acceptable within community, inability to avoid smoking – high prevalence impacted by historical role of tobacco,</p>

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							culturally and colonial influence. smoking behaviours weren't questioned. Lack of policies to promote smoke free environments, short term funding of tobacco programs, inadequate investment for organisations.
Dawson et al 2012 (69).  AUS	Explore the perceptions of Aboriginal Health Workers in relation to individual and contextual factors relating to smoking	Metropolitan, rural and remote health services.	n = 34 Aboriginal Australian participants 44% male	Semi-structured interviews	Current smoking and smoking history; reasons for continuing to smoke; typical weekday and weekend when smoking occurred; quit history.	Content analysis. NVivo 8.	Stress: relationships and family issues; financial problems; community issues and work challenges. Poor physical and mental health e.g. anxiety, depression, chronic pain. Associative behaviours: getting in the car; drinking alcohol or caffeinated drinks, watching television, going outside. Habit (tactile) – having something in their hands. Boredom – ‘time on one’s hand’. Awareness of ‘nicotine addiction’ only reported by 2 participants. Chronic disease burden – heart disease, emphysema, diabetes, cancer. Grief and loss – reduced life expectancy. Caring for family – health support and advice; financial obligations and housing. Breakdown in family dynamics: single parent families; isolation; stolen generation. Socialisation and connection: social lubricant; belonging. Debriefing opportunity – after stressor. Co-worker, friend, family, client encouragement to smoke. Active and passive encouragement. Demanding work, including out of hours. Job insecurity and financial insecurity. Institutionalised racism. Dispossession of land; collective grief and loss; prevalent racism; social disadvantage; poverty, homelessness; unemployment, chronic disease, drug abuse; gambling, violence, housing issues; imprisonment, lack of education.
Dennis et al	Qualitatively explore tobacco,	Rural reservation in Midwestern	n = 49 American	Focus groups.	Not reported.	Thematic analysis.	Lenient attitudes towards smoking. Generational use (parents and grandparents to children).

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
2012 (70).  USA	alcohol and other drug use in a sample of American Indians living on a rural reservation.	state of USA.	Indian participants 61% female Age: 18 – 54 (57.2%)				Accessibility of cigarettes (easy access through friends and family; cheaper to purchase on reservation). Smoking linked with other behaviours (gambling, alcohol use). High prevalence of smoking in community.
Fernandez et al 2008 (71).  New Zealand	Investigate the perception of smoking cessation in Maori women	One local Maori organisation	n = 5 Maori participants 100% female	Focus group.	Perceptions of smoking and quitting, triggers for smoking, quit smoking policies and initiatives from the government, and mass media campaigns and marketing.	Thematic analysis.	Observing health professionals smoking. Limited support from other smokers (feeling negatively judged by other smokers when trying to quit). Maori women felt more comfortable accessing health care from a Maori provider rather than a mainstream service. All participants stated they would never ring the National Quitline (trust, disclosing information and allowing someone to assist them who is not known were the reasons cited for this). Asking a stranger for help deemed unacceptable.
Fu et al 2007 (72).  USA	Increase understanding of the experiences of smoking cessation in 4 different ethnic groups: American Indians, Hmong, Vietnamese and African Americans.	7 community organizations in Minneapolis/St Paul.	n = 26 American Indian participants (6 focus groups). 44.4% female.	Focus groups conducted separately for each ethnic group.	Discussion guide: smoking, smoking cessation, and help with quitting.	Methods for analysing qualitative data. Atlas.ti, version 5.0 was used in coding themes.	Counselling was associated with an unequal power relationship between a white counsellor who was going to shame the participants about their smoking behaviour. Rationalisations: “it's not like I'm dying today”. Cynicism about the medical profession, including beliefs that doctors are untrustworthy, driven by monetary gain, and hypocritical. Negative experiences with particular doctors including doctors being confrontational, blaming and impersonal. Most had low levels of knowledge about the functional benefits of pharmacotherapy. Participants did not understand that pharmacotherapy could be used to help them with cravings and withdrawal symptoms. Concerns about side effects (e.g., overestimation of risks of side effects compared to risks of smoking). Cost of medications and lack of accessibility perceived as major barriers to their use. Word of mouth was a powerful influence on decisions to use or not use pharmacotherapy.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							American Indian smokers, in particular, associated pills with Western medicine, and viewed them with scepticism.
Gould et al, 2013  AUS	Explore issues for pregnant ATSI women in terms of smoking and smoking in the household	Regional NSW, Australia Aboriginal maternal and infant health service.	18 Aboriginal and/or Torres Strait Islander peoples (83% female) Mean age: 30.3 (SD = 11.70) Age range: 17-53 years	5 focus groups	Experiences of and attitudes towards smoking during pregnancy and cessation	Content analysis	Smoking usual in families Several smokers in one household, difficult to avoid being around smoke Smoking provides sense of social connection Isolation if attempting to quit Shared activity, and an anticipated part of mutual exchange (socialising) Low levels of support from family and friends to quit Pressure to quit from family and friends Pregnancy specific barriers: offset diabetes or keep baby small Babies and individuals turned out “healthy” Not receiving understanding from doctors (judgemental) Stress and anxious situations Cravings and withdrawal symptoms Meal times and work breaks (habit) Yarning and socialising Sporting events, watching TV, boredom, TV ads, drinking alcohol and smelling tobacco smoke Smoking cannabis Being around other smokers, after birth, Quitting “too hard” Negative views of NRT due to adverse effects, preference to quit unaided, didn’t understand how NRT could help. Hopelessness after trying many methods
Gryczynski et al 2010 (75).  USA	Inform the development of a culturally appropriate smoking cessation program for American	Local community-based American Indian health service organization	n = 35 American Indian participants. 51.4% female Age: 45.7% between ages	Focus groups.	Cultural and social factors associated with smoking; smoking cessation experiences; attitudes towards cessation aids and	Variant of the thematic framework approach.	Values of self-reliance and pride that are intertwined with American Indian identity. Enjoyment of smoking. Addiction to nicotine (deeply entrenched learned behaviour). Linked to very heavy smoking behaviours (waking up during the night to smoke).

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
	Indians by looking at their preference for smoking cessation and associated programs.		of 41 – 50.		programs.		Association between other behaviours and smoking (coffee, alcohol, sex, other drug use). Smoking as a form of stress relief (given the highly stressful nature of low socioeconomic status). Ubiquity of cigarette use in life, friends and family. While physicians were seen as a good source of smoking cessation help, it was noted that many AI do not have private health insurance. Also physicians were not seen for non-emergency care. Cost, incorrect use, ineffectiveness and negative side effects prevented use of NRT. High number of family friends also smokers.
Hodge et al 2006 (76). USA.	Investigate tobacco use, attitudes, knowledge and practices in American Indian sample.	Reservation sites.	n = 51 American Indian participants 56.9% female.	Focus groups.	History of tobacco use in tribal context, knowledge and attitudes regarding cigarette smoking.	Krueger's (1998) focus group analysis methodology.	Lenient attitudes towards smoking including: acceptance of smoking as a social norm; belief in autonomy and people's right to experiment with tobacco; and low numbers of household smoking bans. Cultural phenomenon of independence and non-interference. Reluctance to tell others what to do, or to move away from someone who begins to smoke. Low harm value assigned to smoking – in light of other day to day issues faced. Participants were aware of the risks but downplayed the seriousness of those risks. Enjoyment of smoking. Maintaining the ritual of smoking. Brand loyalty (several brands of tobacco that have AI names e.g. Seneca, Mohawk etc) Ceremonial use of tobacco was an important cultural custom. Learning how to use tobacco in ceremonies as a young person was important. The loyalty to the tribe overrides tobacco's ill effects.
Johnston et al 2008 (77). AUS	To gain a better understanding of the reasons why Indigenous Australians	Health professional and community members from a coastal	n = 25 Indigenous Australian community members	Semi-structured interviews.	Flexible interview schedule developed through literature review and discussions with	Thematic analysis. Atlas-ti (Version 5).	Social pressure to smoke – both implicit and explicit. Smoking is everywhere – smokers live or socialise with smokers. Tobacco as a normative substance in this community. Communal and collective activity.



Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
	smoke.	community in Northern Territory.	52% female		service providers – details not given.		<p>Tobacco used for reciprocal social exchange; ceremony and sharing.</p> <p>Sharing was a very important part of Indigenous culture as a way to influence behaviour, relationships and social control.</p> <p>Refusing to share cigarettes may be seen as a betrayal of the kinship they share and as an offensive act.</p> <p>Not sharing cigarettes may lead to isolation, as the sharing of cigarettes contributes to a sense of belonging and social identity.</p> <p>Some participants were derided for their decision to quit (but others were supported).</p> <p>Some state that the only way they could quit smoking is to distance themselves from family and friends, an entirely unfeasible proposition.</p> <p>Sharing a cigarette gives opportunity for a ‘yarn’ – enjoyment.</p> <p>Other positive effects including feeling more alert, happy, good, more able to complete tasks, relief, and allowing a sense of control.</p> <p>Habit, addiction and hooked – nicotine dependence.</p> <p>Overcrowding in homes.</p> <p>Stress was most often mentioned in conjunction with smoking relapse, and more often by women than men.</p> <p>An outlet, a stress management, and to manage grief.</p>
Kaholokula et al, 2007 (78). USA	Identify supports for and barriers to smoking cessation for this ethnic population., and to inform the development of a smoking cessation program for this population.	Northern rural community.	n = 52 Native Hawaiian participants. 48% male Age: mean = 51.8 (SD = 12.4)	Focus groups.	Smoking cessation advice and experience; barriers and facilitators to cessation; preferences in smoking cessation programs; differences between males and females.  Ex-smokers were also asked about	Thematic analysis.	<p>Social factors: presence of friends, family and co-workers who were smokers, nagging to quit smoking.</p> <p>Psychological factors: stress, negative emotions, lack of ‘willpower’, thinking about the need to smoke.</p> <p>Physical factors: physical experience on nicotine addiction and withdrawal, weight gain.</p> <p>Behavioural : habitual nature of smoking, smoking linked to other behaviours (alcohol, reading the paper).</p>

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Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
					aids to quitting and preferences.		
Passey et al 2011 (79).  AUS	Explore the factors contributing to smoking initiation and the social context within which smoking behaviour occurs.	Coastal, river region of NSW – Aboriginal Maternal and Infant Health Strategy antenatal teams.	n = 36 Aboriginal Australian participants. 100% female Age (of women interview n = 22): mean = 24.9, ranged from 17 to 41. Education: Less than ten years of education 68%	3 Focus groups and 22 semi-structured interviews.	Topic areas – social and environmental factors that maintained or encouraged smoking and smoking initiation.	Content analysis.	Colonisation and introduction of tobacco: Disruption to Aboriginal society including dispossession of traditional lands, removal of children, loss of traditional lifestyle and introduction of new substances. The traditional and ceremonial limits that used to apply to smoking are no longer applicable. Social networks and community norms: Aboriginal community remains largely isolated. Many aboriginal people have limited interaction with non-smokers. High prevalence of smoking which allows the normalisation of smoking to occur. Limited interaction with non-smokers also limits exposure to changing attitude towards smoking. Disadvantaged lives: High unemployment, associated poverty, affordable housing, overcrowding, relationship difficulties, loss of family members through death/removal of children, grief and loss, abuse, perceived racism and negative stereotypes –smoking helped manage and navigate their way through these factors. Maintaining relationships and sharing: Relationships may be given higher priority over individual needs. Reciprocity – obligations to share time and resources including cigarettes – to give and to accept those given to you. Sharing and having a yarn was an important social activity.
Patten et al, 2009 (80).  USA	Preferences and acceptability of different tobacco cessation strategies and the barriers and	3 remote villages on the coast of western Alaska (populations ranging from 750	n = 49 Alaskan Native participants 61% female Age: mean = 14.6 (SD =	Focus groups.	Motives for quitting, barriers to quitting, role of family members and others in quitting, preference for	Content analysis.	Cravings. Use as a stress/anger management. Use of traditional forms of tobacco. Manages mood. Relieves boredom. High prevalence and acceptance of tobacco use in

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
	unmet needs of Alaskan Native adolescents who want to quit smoking.	to 1,000) Most residents live subsistence lifestyles.	1.6).		tobacco cessation methods, preference for study recruitment and retention methods.		villages Lack of encouragement by peers and other community members to stop. Lack of effective resources to help quit
Wood et al 2008 (81).  AUS	The aim of this study was to explore the experience of tobacco smoking and cessation within a pregnant Aboriginal and Torres Strait Islander sample.	Perth (State capital), Western Australia.	n = 40 Aboriginal women and 10 Aboriginal Health Workers Age: ranged from 14 to 50 years, with most less than 30 years.	Focus groups and in-depth interviews.	A semi-structured discussion guide with open-ended questions was developed in consultation with the reference group.	Thematic analysis. QSR N6 NUDIST.	Smoking as an accepted behaviour, Stress management Low priority in terms of health Stress Difficult life circumstances Relaxation, chance to catch up with others. Pregnancy acted as a barrier as it increased boredom/stress High levels of smoking amongst friends, family and wider community. To quit you would have to avoid family and friends. Knowledge about the specific risks to the foetus was low. References to babies being healthy despite smoking during pregnancy.
<b>Mental illness</b>							
Clancy et al, 2013 (96)  AUS	Explore experiences of smokers with self-reported depression	Large cluster randomized control study	n = 16	Interviews	Semi-structured interview Attitude towards smoking, relationship between smoking and mental health, quitting process.	Thematic analysis  nVivo 9	Low mood Sense of hopelessness Lack of control over one's life Lack of meaningful activities
Davis et al 2010 (83).  USA	Investigate how people with severe mental illness perceive risks from smoking/risks posed by smoking.	Large urban psychosocial rehabilitation agency.	n = 31 54% female Ethnicity: 54.8% Caucasian; 35% African American	Semi-structured interviews.	General health and healthy lifestyle questions, smoking status, smoking history, quit attempts and barriers to and facilitators of	Inductive data analysis. Atlas-ti.	Enjoyment of smoking – pleasurable activity/coping mechanism. Maintain good mental health. Stress management. Worried that without stress management of smoking: relapse, rehospitalisation, suicidal thoughts or suicide were possible. Allowed people to manage other addictions.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
					cessation.		<p>Not experiencing symptoms of smoking related illness currently.</p> <p>Smoking certain brands, types or flavours of cigarettes because they are less likely to cause cancer.</p> <p>Extreme trauma and negative life experiences act as a protective factor for smoking related illness – “I’ve made it through life this far, I don’t think I’ll get sick from smoking too” belief.</p> <p>Examples of friends and family who are/were smokers and have never been ill.</p> <p>Examples of friends/family who are not smokers who are still unhealthy.</p> <p>Friends and family socialising and smoking at the same time.</p>
Howard et al 2012 (85).  UK	Investigate the specific barriers to smoking cessation faced by pregnant smokers.	Maternity and perinatal psychiatry services.	n = 27 100% female Age: mean = 29 (SD = 1.1), ranged from 17 – 41. Ethnicity: 13 White; 4 Black African; 6 Black Caribbean and 4 Mixed/Other.	Semi-structured interviews.	Not reported.	Framework analysis.	<p>Smoking used as a way of losing weight (for participants diagnosed with SMI and eating disorder). Maintain good mental health. Only occurring during manic/depressive cycles. Fear that attempts to quit would increase symptoms of mental illness. Prioritisation of mental health over smoking cessation by health professionals. Social environment – family, partner and social network of peers – high prevalence of smoking and lack of support. Accessibility of cigarettes. Psychological and physical addiction to cigarettes. Quit smoking services and resources: judgemental, lack of proactive follow up, lack of continuity of care, prioritisation of mental health over smoking.</p>
Kerr et al 2013 (86).  UK	To determine the principle barriers and facilitators to smoking cessation for people with mental health problems	Recruited from three Health Boards in Scotland, UK.	n = 27 participants with mental health problems 41% male Age: median = 49, ranged	Semi-structured interviews.	Smoking history; positive and negative aspects of smoking perceived barriers and facilitators to smoking cessation; times when smoke	Framework analysis. NVivo 8.	<p>Socialising and habits of family and friends Smoking as a calming agent; dealing with general stressors and anxiety linked to mental health problems. Stopping smoking would mean loss of coping mechanism/support. Maintain good mental health. Deterioration in mental health increases need for smoking.</p>

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
			from 30 to 60. Diagnosis: 41% Schizophrenia/ delusional disorder; 30% Affective disorder; 22% Schizoaffective disorder; 4% neurotic disorder and 4% neurotic-affective disorder.		more or less; impact of mental health problem on smoking and cessation		Stimulant effect helped overcome side effects from medications, in particular antipsychotics. Habit and addiction (small numbers). Enjoyment. Lacking motivation and confidence to give up. Lack of support from health professionals – uncommon to raise issue of smoking, offer encouragement support to stop. Some reports of professionals actively discouraging cessation attempts.
Lawn et al 2002 (87).	Describe the experience of mental health clients as they relate to smoking behaviour, the relationship of smoking behaviour to the course of their mental illness and its management and to their attempts to quit smoking.	Mental health services.	n = 24 50% female Age: ranged from 25 – 63 years old. Diagnosis: 6 chronic paranoid schizophrenia; 6 major depressive disorder; 6 bipolar affective disorder; and 6 borderline personality disorder.	Semi-structured interviews.	Cigarette use; quit history, use of NRT and other aids; meanings of smoking, attempts to quit, relationship between smoking and mental illness, experiences in hospital.	Thematic analysis.	Cigarettes as a symbol of control, fulfilling needs of: safety, reassurance, predictability, autonomy. Allowed greater freedom to take part in social activity. Promote more control – over symptoms, mood, and emotions. Cigarettes used by staff as tools to reward, punish or control behaviour. Smoking is the most effective means of avoiding relapse. Smoking as freedom, rebellion and protest. Little hope for recovery. An alternative way out to taking direct action – 'suicide'. Enjoyment. Compensation for losses in other areas of life. Smoking to relieve physical symptoms of mental illness – while many of their symptoms could be described as withdrawal/cravings from cigarette, most attributed these to symptoms of relapse to MI. Tools for decision making, clear thoughts, compartmentalise time, avoidance. Relieve stress, anxiety, to relax. Aid sleep, motivation, stabilise mood swings. Identity as a smoker – companionship of cigarettes.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							Families, friends, peers all smokers. Service providers and family condoning or colluding with their smoking. Few participants thought they could be successful. Few participants had tried NRT, citing cost as the main barrier. Excluded from mainstream quit programmes. Misunderstood and judged, double dose of stigma from smoking policy changes.
Lucksted et al 2000 (88). USA.	Explore pros and cons of smoking and quitting smoking in psychosocial rehabilitation clients.	One urban and one suburban psychosocial rehabilitation groups.	n = 40 70% male Demographic characteristics (including diagnosis) were not assessed.	Focus groups.	Semi-structured discussion guide: Positive and negative things about quitting, barriers and facilitators to quitting, other issues.	Thematic analysis.	The positive anti-depressive, anti-anxiety, calming, and cognitive-focusing effects of tobacco. Symptom management (symptoms of mental illness and also side effects from medications). Boredom. Enjoyment. Others beliefs – friends and family encouraging smoking as it was perceived to be one of few positive things in the individual's life. Ignoring health effects and health campaigns or accepting the risks. Lack of motivation. Smoking offered sense of identity and feeling included.
Morris et al 2009 (89). USA.	To explore the perceptions of clients and staff on how best to quit smoking.	Consumers of mental health services in both rural and urban areas of Colorado.	n = 62	Focus groups.	Preferences for smoking cessation, views on current resources available, health professional practices that aid in cessation, factors that prevent cessation.	Content analysis. NVivo 7.	Lack of resources to aid in cessation. Seeing health professionals smoking had a negative impact on participants' motivation to quit. Earning smoking as a behavioural reward. Negative expectations of the ability of people with a mental illness to quit smoking. Little knowledge of the negative health effects of cigarette smoking. Smoking to manage stress/anxiety/tension, psychiatric symptoms, and to enhance cognitive ability. Boredom. Smoking viewed as a social event, as a way of connecting with others. Peer smoking.
Nawaz et al 2012 (90).	To explore the smoking and quitting beliefs,	Large psychiatric rehabilitation agency in	n = 36 Ethnicity: 17 African	Focus groups.	Not reported.	Qualitative analysis. Atlas.ti.5.7.1.	Tobacco use promoted, normalized and reinforced in mental health treatment community. Smoking ameliorated illness symptoms and memories

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
USA	attitudes and behaviours amongst smokers with severe mental illness from three different race/ethnicity groups.	Chicago, Illinois.	American; 12 Latino; 7 White. Diagnosis: 14.3 – 33.3% Schizophrenia/Schizo-affective; 14.3 – 23.5% bipolar depression; 35.3 – 50% Major depression; 11.8 – 28.6% not specified.				of traumatic experiences. Manage daily stress that might otherwise aggravate mental illness symptoms. Smoking norm amongst peers in treatment settings – highly prevalent. Use of cigarettes to manage/reward behaviour. Policies that prohibited smoking in only parts of treatment centres/halfway houses etc. Difficulty of quitting Lack of access to treatment – directly linked to poor health insurance and poverty. Financial cost of NRT and other pharmacotherapies.
Prochaska et al 2013 (97) USA	Aimed to obtain formative data to guide development of a tobacco cessation smoking program for youth with co-occurring mental health disorders	Outpatient mental health settings in the san Francisco bay area.	Between ages of 16 – 23. 6 girls, 8 boys.	interviews	Semistructured interviews: reasons for smoking, perceived relationship between tobacco use and mental health issues, perceptions of smoking and preferences for program characteristics.	Content analysis ATLAS.ti	Failure to enforce no smoking ban in the home Parental smoking Peers who smoke being a negative influence Difficulty maintaining relationships if quit smoking Stress Affect Other substances Addiction Media images
Snyder et al 2008 (91). USA.	Identify multi-level factors that impact on smoking	Two psychiatric rehabilitation centres within the mid-west of the	n = 25 75% male Aged between 24 and 55.	Focus groups.	Views and perspectives on smoking and cessation, factors	Iterative analysis process. QSR NUDI*ST N4.	Low confidence in quitting. Desire to smoke was stronger than desire to quit. NRT seen as ineffective leading to feelings of hopelessness.

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Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
	cessation with people with mental illness.	USA. One dual diagnosis, one offering rehabilitation services for predominantly African American people with mental illness.	Diagnoses not reported.		that acted as motivators for smoking, factors that motivated cessation.		<p>Sense of autonomy over behaviour; participants felt that making the choice to smoke was empowering. Conversely, a sense of having no control over smoking due to addiction was also a barrier. Smoking as a central part of life. Coping mechanism for stress, anxiety, depression, boredom and loneliness. Cigarettes were an affordable luxury. Being able to purchase cigarettes was a source of self-esteem. Belief that if they quit, they would have nothing else enjoyable to do. Beliefs around the health effects of smoking: Participants reported health benefits from smoking and minimised health risks. Non-smokers are able to refrain from smoking because they are not disadvantaged. Belief that non-smokers don't have as much fun. Feeling judged or nagged by non-smokers. Smoking offering opportunity for connection and social interaction. Boredom; days left relatively unstructured so smoking filled in the time.</p>
Solway et al, 2011 (92).  USA.	Explore the perceptions of people with mental illness on smoking and smoking cessation.	Outpatient mental health services	n = 26 38% female Mean age: 62 (ranged from 41 – 82). Nearly all participants had been diagnosed with severe mental illness.	Focus groups.	Semi-structured interview protocol.	Constructivist grounded theory.	<p>Perceived benefits of smoking outweigh the negative health risks. Enjoyment. Relaxation. Experience cravings when feeling anxious or upset or in the company of other smokers. Sense of control over emotions. Feeling extremely daunted about the quit process and withdrawal symptoms in general. Cost and accessibility of NRT. Lack of willpower, motivation and the right frame of mind. Smoking provides an identity and also acts as a source of connectedness over the sense of exclusion/stigma of having mental illness.</p>



Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							Freedom, exercise their right to choose and maintain independence. Smoking as a 'friend'. Symptom management. Continued smoking eliminates withdrawal symptoms. Other's expectations of their ability to quit smoking. Feeling that smoking and medications to treat mental illness are related. Smoking to relieve side effects of medication. Weight gain.
Tsourtos et al 2008 (93).  AUS	Explore why non-smokers appear to be resilient to smoking in a highly acceptable and prevalent group.	General practice and a range of mental health services	n = 34 58% female All had diagnoses of depression.	Semi-structured interviews.	Smoking and participants' social environment throughout the lifecourse.	Components of Grounded Theory were used with an analytic framework. NVivo 8	Smoking to deal with stress: Stressors included: boredom; physical injury; death of a loved one; stressful occupation; relationship breakdown; one or more medically diagnosed disorders. Coping mechanism. Relaxation. Comfort. Strength. Quitting smoking would exacerbate stress. Depression and anxiety made quitting more difficult.
<b>Homeless</b>							
Okuyemi et al 2006 (101).  USA.	Examine the views of homeless people on smoking practices, knowledge and barriers to and interest in quitting.	Homeless service facilities	n = 62 68% response rate 70% male Ethnicity: 58% black; 37% white and 5% other.  Age: mean = 41.5 (SD = 9.3). Education: 73% high school educated or lower	Focus groups.	Smoking history; quitting experiences; smoking cessation aids (NRT and other medications); preferences for smoking cessation treatment.	Principles outlined by Morgan and Krueger. Atlas-ti v 4.1 used for coding.	Low self-efficacy Limited access to care (cost of cessation aids). Service providers offer limited support to quit. Competing needs e.g. food, shelter. Uncertainty associated with being homeless. Limited structure and routine – keeping busy to avoid boredom. Smoking as a socially acceptable behaviour in homeless settings. Few restrictions in homeless services. Fear that quitting smoking may result in changes in emotion/stress levels that may impact negatively on other areas of life. Concerns about using NRT and cost, taste, proper usage and side effects, interactions with other medications and effect on other health conditions. Concern about becoming addicted to NRT.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
<b>Prisoners</b>							
Richmond et al 2009 (103).  AUS.	Investigate tobacco and its role in prisons.	One maximum security prison and one community justice restorative centre.	n = 40 (9 prisoners and 31 ex-prisoners). 30% female Age: ranged from mid 20s to late 40s. Ethnicity: 4 Aboriginal Australian participants	Focus groups.	Role of tobacco in prisons, reasons for smoking initiation, smoking cessation, methods to quit.	Content analysis.	Poor knowledge of cessation strategies. Some had not heard of bupropion, would not attend a doctor for assistance and would not attend quit smoking programs once in the community. Smoking as a normal practice in prison. Cigarettes as a substitute for money. Boredom, stress, anxiety regarding legal matters, being locked up for large portions of the day and social isolation. Cigarettes/smoking used as a reward. Transfer to another wing or prison. Bullying, missing family, isolation,
<b>At risk youth</b>							
Lewis et al 2013(104)  UK	Aims to contribute to the existing literature on smoking and young people and to clarify how factors related to young people and smoking play out in disadvantaged communities.	Communities in North East of England – deindustrialisation – former coal mining village.	n = 52  30 female  Aged between 1 to 18 years old	Participant observation	NA	Thematic analysis	Surrounded by other smokers makes it too hard to quit. A lot of family and friends smoke Helps with stress – conflicting messages – some participants felt it did and did not relieve stress. For fun and enjoyment. Accessibility and availability: tab (cigarette) houses – private dwellings where people can buy cigarettes – always sell to underage people. Buying a packet from the tab houses and then selling at school. Mixed messages regarding smoking: people in authority not discouraging or addressing smoking (e.g. teachers, police force).

Supplementary file 4. Summaries of the included mixed methods studies by disadvantaged group (n = 3).

Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Qualitative method and type of analysis	Quantitative results (barrier and prevalence)	Qualitative data (barriers identified)
<b>Indigenous studies</b>									
Glover, 2005 (73). NZ.	Increase the understanding of smoking in Maori populations and best ways to affect smoking cessation.	Not reported.	n = 130 self-identified Maori participants. 78% female. Age: mean = 35 (ranged from 16 – 62).	Not reported.	Pre and post interviews after a quit attempt (both open and close ended questions).	Smoking history, Smoking behaviour, Quit history, Fagerstrom NDT, Experience of relapse, Reasons for smoking, Motivation to quit, Self-efficacy, Stage of Change, Methods of quitting, Quit abstinence – not biochemically verified.	Semi-structured interviews General inductive approach. QSR NUD*IST Release V4.0.	Habit: 73% Normal to smoke: 11.5% Coping with stress: 48% Coping with emotions: 23% Addiction: 39% Socialising/drinking: 34% Bored: 29% Enjoyment: 25% Time out/reward: 17%	Relapse was also related to poor self-esteem and a tendency to attribute blame to themselves. Living with other smokers. Family (Whanau) directly or indirectly supporting relapse. Socialising. Others smoking.

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Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Qualitative method and type of analysis	Quantitative results (barrier and prevalence)	Qualitative data (barriers identified)
<b>Mental illness studies</b>									
Goldberg et al 1996 (84).  CAN	Identify what clients identify as barriers and facilitators to cessation .	Community based psychiatric rehabilitation program (mid-sized urban Canadian).	n = 105  68% male Age: mean = 35 (ranged from 20 to 58 years). Diagnoses not reported.	93%	Telephone and face to face interviews.	Reasons for smoking, why it is hard to quit, beliefs about support required to change smoking behaviour.	Focus groups. Type of analysis not specified.	Addiction: 53% Difficulty resisting cravings: 33% Enjoyment: 20% Relieving symptoms: 20% Habit: 19% Boredom: 17% Most or all friends are smokers: 12.5% Low cost of cigarettes: 8% to smoke, lack of support to quit. Smoking as a social activity.	Afraid of giving up old friend. Withdrawal symptoms. Enhanced mood. Cheap thrill. Coping strategy when stressed. Something to do. Apathy and daily drudgery associated with psychiatric disability. Peer pressure to smoke. Lack of support from peers to quit. Smoking as a social activity. Receiving cigarettes from family and friends.
Van Dongen et al 1999 (94).  USA	Examine the experiences of persons with persistent mental illness and smoking.	Outpatient clinic, Midwest, USA.	n = 36 75% male Age: mean ranged from 45 to 49. Diagnosis: Schizophrenia (70% - 90%); schizoaffect	Not reported	Cross-sectional survey.	Not reported.	Interviews. Content analysis.	Habit and routine: 58% Socialization: 58% Relaxation: 42% Addiction to nicotine: 33%	Smoking provided structure and activity. Something to do. Way to deal with stress.

Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross- sectional, etc)	Outcome measure (and info on survey instrument)	Qualitative method and type of analysis	Quantitative results (barrier and prevalence)	Qualitative data (barriers identified)
			tive and mood disorders were the other diagnoses present.						

Supplementary file 5. Overview of study characteristics

### Study characteristics

Almost half (40%) of the studies had been published from 2009 onwards. Apart from three studies (80, 97, 104), all participants were adults aged 18 years and over. Studies were carried out in the USA (n=29) (42, 44, 47, 49, 54, 60, 64, 66, 67, 70, 72, 75, 76, 78, 80, 82, 83, 88-92, 94, 95, 97-101); Australia (n=15) (45, 48, 50, 52, 62, 68, 69, 74, 77, 79, 81, 87, 93, 96, 103); the United Kingdom (n=12) (43, 46, 55, 56, 61, 63, 65, 85, 86, 102, 104); Canada (n=5), New Zealand (n=2) (71, 73) and France (n=1) (53). Qualitative (n=52) (42-53, 55-63, 65-72, 74-81, 83, 85-93, 96, 97, 101, 103, 104); quantitative (n=8) (21, 54, 64, 82, 95, 99, 100, 102) and mixed method studies (n=3) (73, 84, 94) were included. Of the qualitative studies, 26 used focus group methods (42, 44, 45, 47-49, 52, 55, 56, 59, 60, 66, 67, 70-72, 74-76, 78, 80, 88, 90, 91, 101, 103); 17 used interviews (43, 46, 50, 51, 53, 61, 63, 65, 69, 77, 83, 85-87, 93, 96, 97) and eight used a combination of interviews and focus groups (57, 58, 62, 68, 79, 81, 89, 92). One qualitative paper used participant observation methods (104). All eight quantitative studies utilised cross-sectional survey methods (21, 54, 64, 82, 95, 99, 100, 102). Two mixed methods studies used both cross-sectional surveys and interview ((73, 94) and one mixed methods study used cross-sectional surveys and focus groups (84). Twelve studies included only female participants (46, 47, 49, 51, 57-59, 61, 70, 79, 81, 85), five of which were carried out with pregnant women (47, 51, 61, 81, 85). Two studies were carried out with men only; partners of women who were pregnant (50) and disadvantaged former miners (65).

### Quality assessment of qualitative studies

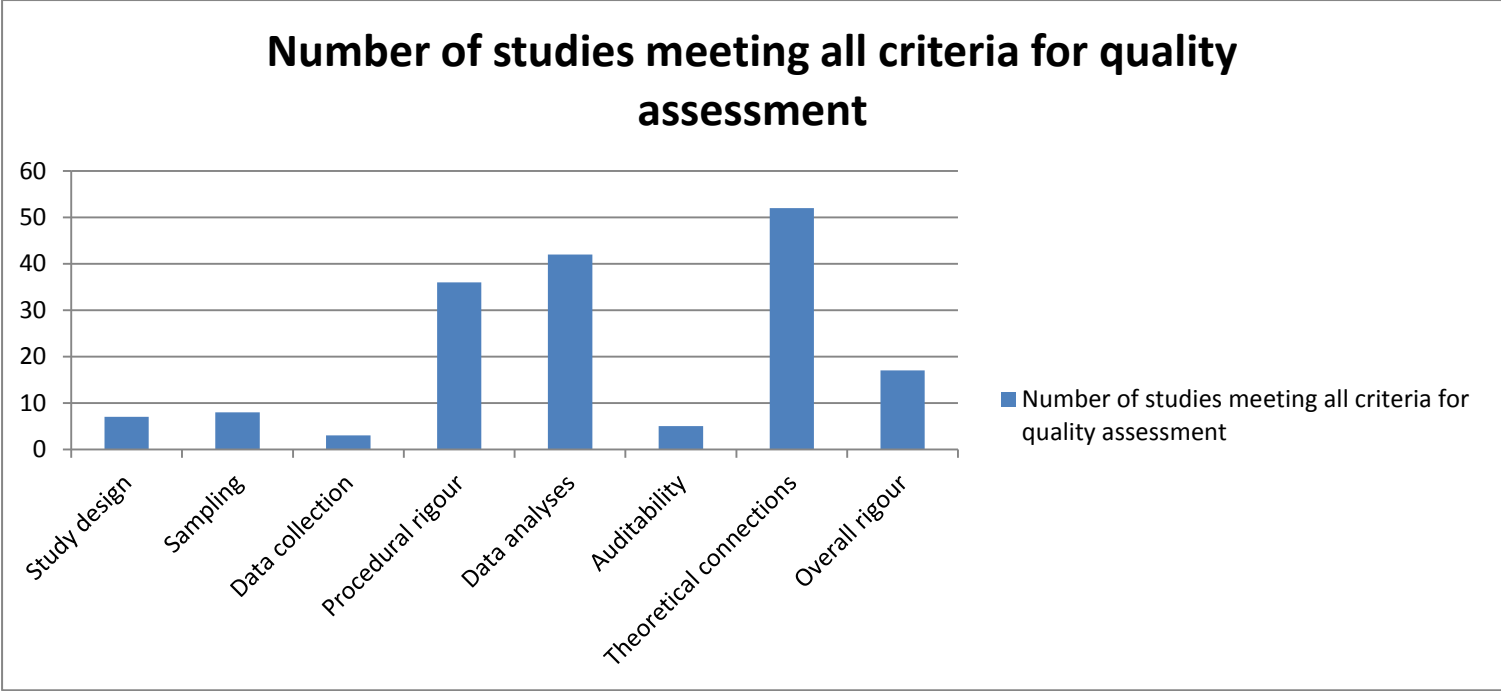
This figure includes assessment of the qualitative components of the mixed methods studies. The majority of studies did not explicitly state their study design (n = 42); of those that did, most used Grounded Theory (50, 53, 55, 87, 92, 93). Most studies provided adequate descriptions of the study sites; participants; data collection methods and analysis techniques. Only a small number of studies (n = 9) (44, 47, 51, 69, 70, 72, 77, 78, 90, 104) addressed the role of the relationship between participants and the researcher and fewer still identified potential assumptions and biases of the researcher (n = 5) (44, 47, 55, 77, 92). Studies generally performed poorly when assessed on four components of

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3 trustworthiness, with only 17 studies meeting all four criteria (credibility; transferability; dependability and confirmability) (42, 45, 49, 51, 59,  
4 61, 65, 67, 68, 71, 72, 74, 76, 77, 79, 80, 87). It should be noted that none of the mixed methods studies explicitly described their methodology  
5 as mixed methods nor did they report integrating the qualitative and quantitative findings in a systematic way.  
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### 8 **Quality assessment of quantitative studies**

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10 The results of the quality assessment of quantitative studies are provided in Supplementary file 6. This table also provides assessment of  
11 the quantitative components of included mixed methods studies. Sample sizes in the quantitative studies ranged from 36 to 500 participants.  
12 Response rates ranged from 42% to over 97% (four studies did not provide response rates) (73, 94, 98, 99). All but one study (84) clearly stated  
13 eligibility criteria. The majority of studies adequately described the research aims (54, 64, 73, 82, 84, 95, 98-100); source of participants(54, 82,  
14 84, 94, 99, 100) and addressed potential sources of bias within their analysis (54, 82, 100, 102). All studies stated their outcome *a priori* and no  
15 conflicts of interest were identified. Eight studies used convenience sampling (82, 84, 94, 95, 98-100, 102). The validity and reliability of survey  
16 measures used to assess barriers to cessation were reported in one study (54). Three studies employed techniques such as pilot testing and input  
17 from key stakeholders in developing the tools used (54, 64, 102).  
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Supplementary figure 6. Quality of included qualitative studies and qualitative components of mixed methods studies (n = 55)

Peer review only



## Supplementary file 7. Results of the quality assessment of quantitative studies and quantitative components of mixed methods studies

Study author and year	Aims	Selection methods			Was the measurement of variables appropriate?			Control of bias			Was the use of statistics appropriate?		Conflict of interest
		Aims clearly stated?	Eligibility criteria stated?	Source of participants described?	Selection method?	Validity of measures?	Reliability of measures?	Other method used?	Potential sources of bias?	Methods to deal with bias?	Response rate (%)?	Sample size?	
Price et al 1994 (54)	✓	✓	✓	Random sampling	✓	✓	✓	✓	✗	42	500	✓	✓
Rosenthal et al 2013 (64)	✓	✗	✓	Random sampling	✗	✗	✓	✓	✗	73	350	✓	✓
Dickens et al 2005 (102)	✗	✓	✓	Convenience sample	✗	✗	✓	✓	✗	44.1	45	✓	✓
Connor et al 2002 (100)	✓	✓	✓	Convenience sample	✗	✗	✗	✓	✓	>97	236	✓	✓
Asher et al 2003 (95)	✓	✓	✓	Convenience sample	✗	✗	✗	✗	✗	73	96	✓	✓
Carosella et al 1999 (82)	✓	✓	✓	Convenience sample	✗	✗	✗	✓	✗	80.9	89	✓	✓
Orleans et al 1993(98)	✓	✗	✓	Convenience sample	✗	✗	✓	✗	✗	✗	✗	✓	✗
Arnsten et al 2004(99)	✓	Y	✗	Convenience sample.	✗	✗	✗	✗	✗	✗	98	✓	✓

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Study author and year	Aims	Selection methods			Was the measurement of variables appropriate?			Control of bias			Was the use of statistics appropriate?		Conflict of interest
		Eligibility criteria stated?	Source of participants described?	Selection method?	Validity of measures?	Reliability of measures?	Other method used?	Potential sources of bias?	Methods to deal with bias?	Response rate (%)?	Sample size?	Primary outcome stated a priori?	
Glover et al 2005 (73)	✓	✓	✗	Not reported	✗	✗	✗	✗	✗	✗	130	✓	✓
Van Dongen et al 1999(94)	✗	✓	✓	Convenience sample	✓	✗	✗	✗	✗	N	36	✓	✓
Goldberg et al 1996(84)	✓	✓	✓	Convenience sample	✗	✗	✗	✗	✗	93	105	✓	✓

Supplementary file 8: Detailed summary of barriers identified

## **Individual & lifestyle factors**

### ***Relaxation, stress and mood management***

Thirty eight qualitative studies identified stress management as a significant barrier to smoking cessation (43-49, 51, 53, 55-57, 59, 61-63, 66, 68, 69, 74, 75, 77, 78, 80, 81, 83, 84, 86, 87, 89-91, 93, 94, 97, 101, 103, 104). Smoking was used as a coping mechanism (45, 51, 56-59, 63, 68, 83, 84, 86, 91, 93) in reaction to daily stressors as well as the stress inherent in disadvantaged lives. Three quantitative studies reported stress management as a barrier to quitting with Maori participants (48%) (73), participants with substance use disorders (39%) (98) and homeless participants (44%) (100). Of note, participants in two studies reported that smoking also directly contributed to the stress experienced by participants (44, 104).

Participants also reported using smoking to manage their emotions and mood (51, 59, 66, 77, 78, 84, 87, 92, 97, 125). Twenty three percent of participants from a Maori sample indicated managing emotions was a barrier to quitting (73), 42% of individuals with a substance use disorder (95).

### ***Enjoyment of smoking***

Across 21 studies, smoking was described as an enjoyable activity (43, 48, 49, 53, 56, 57, 59, 61, 73, 75-77, 82-84, 86-88, 91, 92, 104). In quantitative studies, proportions of participants who said enjoyment prevented them from quitting ranged from 25% (73) to 47.2% (82). Smoking was viewed as an affordable, rewarding luxury (43, 48, 57, 73, 87, 91) and the only pleasurable activity some participants had (43, 49, 53, 56, 59).

### ***Physical addiction to nicotine***

Addiction to nicotine was reported as a barrier in 15 qualitative studies (42, 43, 47, 53, 61-63, 66, 68, 69, 75, 77, 78, 85, 86) (97) and four quantitative studies (54, 73, 84, 94). Proportions of individuals who reported addiction to nicotine as a barrier ranged from 33% (94) to 86% (54). The experience of withdrawal symptoms was a barrier to quitting in nine studies (47, 50, 63, 66, 68, 74, 78, 84, 92). Management of cravings was a barrier in ten qualitative studies (42, 47, 62, 63, 66, 74, 78, 80, 84, 92) and one quantitative study (100) where 50% of homeless participants cited cravings as a barrier to cessation. Withdrawal symptoms were especially a barrier for individuals with substance use disorder, with 87% feeling tense or irritable if they quit smoking, and 48% saying their cravings would be so strong they couldn't stand it (95).

### ***Behavioural habit of smoking***

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Five quantitative studies (54, 73, 82, 84, 94) and nine qualitative studies (43, 50, 59, 62, 69, 74, 77, 78, 86) reported habit as a barrier to smoking. Proportions of participants who endorsed habit as a barrier ranged from 19% to 58% in studies carried out with people with a mental illness (82, 84, 94); 82% in a low income sample (54) and 73% in a study conducted with Maori participants (73).

### ***Perceived mental health benefits of smoking***

Smoking in order to manage the symptoms of mental illness was identified in the majority of studies carried out with participants with a mental illness (82-92, 96) as well as managing the side effects from medications (86, 88, 92). Smoking in order to protect mental health was also found in one study conducted with low income pregnant women (61). In two community surveys a history of depression was reported as a barrier to smoking cessation (51, 68).

Participants with mental illness in two studies perceived that the benefits of continuing to smoke far outweighed the potential risks of stopping, which included relapse, rehospitalisation and suicidal thoughts (83, 92). A large portion (78%) of individual's with substance use disorder would feel anxious if they tried to quit (95).

### ***Avoidance of weight gain***

Fourteen studies reported that smoking was used in weight management, and that potential weight gain was a barrier to quitting (42, 45-47, 52, 58, 61, 66, 68, 78, 85, 92, 95, 100).

Twenty percent of homeless participants endorsed weight gain as a barrier to quitting (100) and in 20% of individual with substance use disorder (95). Smoking was also used to suppress appetite for individuals diagnosed with an eating disorder (85) and for low income pregnant women (61).

### ***Competing priorities and needs***

Competing needs, including finding shelter or food for those who were homeless (101); addressing mental health issues (83, 92); or addressing other physical illnesses (49, 68, 93) often meant that smoking cessation was not a priority for participants or those involved in their care in ten studies (49, 57, 68, 69, 81, 83, 85, 92, 93, 101).

### ***Rationalisations to continue smoking***

Lack of acknowledgement of the health-related harm of tobacco use was reported in eight studies (49, 51, 61, 68, 76, 81, 83, 91). Rationalisations to continue smoking were also reported in ten studies (47, 48, 51, 55, 61, 68, 72, 76, 83, 91) and included the belief that smoking certain brands/strengths of cigarettes meant a lower likelihood of developing cancer (76); not experiencing any signs or symptoms of smoking related illness at the present time (47, 51); fatalistic beliefs (49); providing examples of relatives or other persons who are

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3 smokers and who are healthy (74, 81); and the experience of disadvantage as a protective  
4 factor against developing smoking related illness (83).

### 7 ***Other substance use***

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9 Participants identified associations between smoking and other behaviours in seven studies  
10 including alcohol use (42, 68, 70, 74, 78) cannabis and caffeine (42, 75). Approximately one  
11 third (34%) of Maori participants identified alcohol use as a barrier to quitting smoking(73).  
12 Smoking was used to manage other addictions and prevent relapse (53, 83, 97). Alternatives  
13 to smoking included drug use, relapse to alcohol addiction and losing control; all of which  
14 were unacceptable to participants (49, 56, 83). For 41% of those diagnosed with a substance  
15 use disorder, quitting would make it harder to remain sober and 13% wouldn't be able to  
16 control their cravings for other substances if they quit smoking (95).

### 23 ***Sense of autonomy***

24  
25 Participants across seven studies reported that smoking provided a sense of autonomy,  
26 control (49, 51, 62, 77, 87, 91, 92) and power (93) over lives that were often chaotic and out  
27 of control. On the other hand, participants with mental illness identified the lack of control  
28 they had over smoking as a barrier to quitting (96).

### 32 ***Low confidence and perceived difficulty of quitting***

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34 Low self-efficacy (45, 87, 99, 100) and low confidence (86, 91) was reported in six studies.  
35 The belief that willpower was the single-most important factor needed to successfully quit  
36 was reported in five studies (44, 45, 58, 61, 63). Participants also reported that the process of  
37 quitting smoking was too hard (45, 74, 90, 92), including 73.5% of prisoners and ex-prisoners  
38 surveyed (102) and 58% of individuals with a substance use disorder (95). Smokers with  
39 depression reported it was hopeless to try to quit (96). However, the opposite was reported by  
40 a sample of former miners, who maintained they were able to stop smoking at will, with  
41 minimal difficulty and need for support (65). Twenty five percent of individuals with  
42 substance abuse disorder said they did not know how to quit (95).

### 49 ***Perceived cognitive benefits of smoking***

50  
51 Enhanced concentration and other cognitive benefits associated with smoking were reported  
52 in six studies (44, 77, 84, 87-89), including 56% of individuals with a substance use disorder  
53 (95).

### 56 ***Combating loneliness***

57  
58 Smoking provided a way of reducing loneliness in six studies (45, 53, 59, 87, 91, 92);  
59 providing companionship (87) and was described as a friend (45, 92) by participants.

### 60 ***Perceived low individual risk of harm***

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3 Whilst most of the studies reported that participants had good knowledge of the health risks  
4 associated with smoking, low levels of knowledge about the risks of smoking were identified  
5 as barriers to cessation (51, 81, 89, 91) including one study conducted with pregnant women  
6 (51) and two studies conducted with Indigenous Australian pregnant women (74, 81). Low  
7 knowledge of the risks of smoking whilst pregnant were also identified (51, 81). In a study  
8 conducted with former miners, participants were more likely to attribute their current health  
9 issues to coal dust exposure, rather than smoking. Additionally, participants rationalised  
10 continuing smoking by weighing the risks of smoking in comparison to the risks of coal  
11 mining (65).  
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### 14 ***Low motivation***

15 Low levels of motivation to quit smoking were reported in four studies, all of which were  
16 carried out with participants who were diagnosed with a mental illness (86, 88, 91, 92).  
17 Additionally, 38% of individuals from a low income areas (64) and 47% of individuals  
18 diagnosed with a substance use disorder (95) also reported low levels of motivation to quit.  
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### 21 ***Failed past quit attempts***

22 Past failed attempts to quit smoking were identified as barriers to future attempts in two  
23 qualitative studies (55, 68) as was a sense of hopelessness after trying many methods and  
24 remaining unsuccessful (81).  
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### 27 ***Positive smoker image***

28 Two studies within low income samples reported associations between smoking and  
29 perceptions of being cool and sophisticated (50, 52) and one study with persons with a mental  
30 illness found that participants believed that non-smokers do not have as much fun as smokers  
31 (91). In a sample of young people with mental illness, positive media images were also  
32 reported as barriers to quitting (97).  
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### 35 **Social and community networks**

#### 36 ***High prevalence and acceptability of smoking in community***

37 Eight qualitative (46, 47, 63, 69, 73, 74, 92, 104) and four quantitative (54, 95, 100, 102)  
38 studies found that being around other smokers was a barrier to quitting. This finding is  
39 compounded by participants describing the high prevalence of smoking amongst family and  
40 friends in 21 studies (44, 45, 49, 52, 56, 62, 63, 66, 68, 70, 75, 77, 79-81, 84, 87, 89, 90, 97,  
41 104) and in the wider community in 17 studies (44, 45, 49, 52, 56, 60, 63, 66, 68, 70, 75, 77,  
42 79-81, 87, 90). Tobacco was readily available and easily accessible within disadvantaged  
43 communities (44, 56, 60, 70, 77, 84, 85, 104) and smoking was considered to be a highly  
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3 acceptable (52, 73, 75-77, 79-81) and normalised behaviour (45, 49, 56, 60, 63, 73, 75-77, 79,  
4 81).

### 5 6 7 ***Lack of social support***

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9 A lack of social support to quit smoking was reported in 12 studies (49, 51, 52, 58, 61, 62,  
10 69, 73, 78, 92, 100, 101) and a lack of support from family and friends in particular was a  
11 barrier in 14 qualitative studies (42, 47, 48, 51, 63, 68, 69, 71, 73, 77, 78, 81, 85, 88). In one  
12 quantitative study, only 21% of homeless individuals agreed that close friends or family  
13 would be helpful in quitting smoking and only 29% believed that close friends and family  
14 wanted them to quit very much (99). Similarly, 26% of homeless respondents cited a lack of  
15 support during a quit attempt as a barrier to successfully quit (100).

### 16 17 18 19 20 21 ***Smoking as a social activity***

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23 Tobacco use and socialising were linked in two quantitative studies (82, 94) and 20  
24 qualitative studies (42, 46, 50, 52, 56, 67-69, 73, 74, 79, 81, 83, 84, 86, 87, 89, 91, 92, 97):  
25 where participants reported that using tobacco helped to facilitate social connections amongst  
26 family, friends and strangers.

### 27 28 29 30 ***Lack of health and other professional support to quit***

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32 Twelve qualitative studies (45, 48, 49, 51, 68, 71, 77, 80, 85, 86, 89, 101) and one  
33 quantitative study (102) reported a perceived lack of support from health professionals  
34 regarding smoking cessation. Cases of family members and health professionals actively  
35 discouraging quit attempts and encouraging maintenance of smoking due to concerns about  
36 the individual's mental health (86, 87, 89, 90) or because smoking was perceived to be the  
37 individual's only source of enjoyment (47, 71, 73, 77) were reported. Three studies identified  
38 tobacco use by health professionals and others involved in the participants' care as a barrier  
39 to cessation (71, 89, 102). Over half (55.9%) of prisoners surveyed reported observing  
40 members of staff smoking as a barrier to quitting (102). Participants also reported that  
41 cigarettes were used as a way to reward or punish behaviour by health professionals and other  
42 service providers (87, 89, 90, 103). Twenty-nine percent of prisoners also indicated that not  
43 receiving cessation support from prison staff prevented them from quitting smoking (102).  
44 Twenty-six percent of substance abusing individuals reported they did not have enough  
45 support to quit. The study involving at risk youth identified mixed messages sent by those in  
46 places of authority (for example teachers, members of the police force) also acted as a barrier  
47 for at risk youth (104).  
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## **Living and working conditions**

### ***Access to resources to quit***

Thirteen studies cited the cost of Nicotine Replacement Therapy (NRT) and other pharmacological interventions as a barrier to access that directly prevented cessation (45, 48, 55, 62, 63, 67, 68, 72, 75, 87, 90, 92, 101). Cost was also a barrier for 40% of participants diagnosed with substance abuse disorder (95). There was also poor knowledge and low uptake of programs available to participants (45, 49, 55-57, 66, 68, 72, 80, 90, 101, 103).

### ***Boredom and limited structure in day to day life***

Fourteen qualitative studies (43-45, 47, 48, 59, 69, 80, 88, 89, 91, 93, 101, 103) and four quantitative studies (54, 73, 82, 84) indicated that smoking alleviated boredom. Limited opportunities for leisure and high levels of unemployment often meant that participants had large amounts of free time and smoking was used to mark the transition from one task or part of the day to another (49, 53, 87, 91, 96, 101).

### ***Concerns regarding cessation treatment and services***

Ten qualitative studies reported that participants were reluctant to access psychological or pharmacological resources to quit smoking due to a belief that these treatments were largely ineffective (49, 51, 55-57, 63, 66, 74, 75, 91). In one survey almost a third (31%) of homeless participants reported that no existing pharmacological treatments would be able to help them stop smoking (100).

The possible side effects of pharmacological interventions (43, 67, 72, 75, 101), uncertainty about the correct use of pharmacological interventions (45, 75, 101); or the possible interactions between NRT and other medications (101) presented barriers to cessation. Homeless participants in one study expressed concerns about the possibility of becoming addicted to NRT (101). Concerns about existing treatment services included lack of continuity of care(85); being capable of addressing smoking simultaneously with mental health issues (85, 87, 90); cultural appropriateness (68, 71, 72, 80); feeling judged by programs (55, 61, 85, 87) and a cynicism regarding the medical profession (71). Telephone quitlines were not viewed as culturally appropriate resources (71) and participants were sceptical of the effectiveness of quitline support (45).

### ***Stressful factors***

Participants across ten studies (49, 51, 53, 56, 57, 59, 62, 68, 69, 79) reported that increased stress due to the events and life circumstances intrinsically linked to their socioeconomic position were barriers to quitting smoking. The following situations compounded feelings of stress, hopelessness and meant that cessation was not prioritised: unemployment (49, 51, 53,



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3 56, 57, 59, 62, 79); poverty and financial stress (56, 59, 69, 79); housing issues including  
4 substandard housing, homelessness and overcrowding (49, 51, 69, 79); violence and crime  
5 (49, 56, 62, 69); drug use (49, 56, 69); increased morbidity and mortality (62, 68, 69, 79);  
6 chronic disease (68, 69); low education (59, 69); and limited recreational activities (56, 59).  
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10 Two studies carried out with Indigenous Australians found that additional stressors  
11 experienced by this group included racism, stigma, dispossession of traditional lands, high  
12 burden of illness, premature deaths within the community and collective grief and loss  
13 relating to the Stolen Generation and the removal of children (68, 69, 79). Unique stressors  
14 facing prisoners including; transfers within and across prisons; legal matters; bullying;  
15 missing family; and restricted movement for most of the day were also identified (103).  
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### 21 *Living and working environments*

22 Participants reported lack of control over exposure to smoking due to others smoking in the  
23 home; a lack of smoke free policies or policies that did not cover the whole environment or  
24 were only partially enforced were barriers to quitting smoking (47, 51, 68, 90, 97, 100). In  
25 one study involving prisoners, 59% of participants reported that the ‘smoky atmosphere’  
26 within the prison was a barrier to quitting (102). Work environments that were conducive to  
27 smoking also presented a barrier in one study (52).  
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### 33 *Social and geographical isolation*

34 Social and geographical isolation were reported in four studies as barriers to quitting (49, 56,  
35 58, 79). Geographical isolation referred to the lack of access to cessation services that rural  
36 and remote communities experience. Social isolation referred to the racial and economic  
37 segregation that separates disadvantaged neighbourhoods and individuals from others (49)  
38 further contributing to differences in perceived acceptability and prevalence of tobacco use  
39 (56, 79). Unsafe neighbourhoods also limited unnecessary outings and inhibited accessing  
40 smoking cessation support (49).  
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### 49 **Cultural, socioeconomic and environmental factors**

#### 50 *Cultural norms*

51 The importance of tobacco use in traditional and ceremonial contexts was expressed in three  
52 studies concerning American Indian participants (66, 67, 76) and one study including  
53 Aboriginal and Torres Strait Islander participants (79) and one study including Alaska Native  
54 participants (80). Cultural values of self-reliance, pride and independence prevented  
55 American Indian participants from seeking cessation support in two studies (75, 76) and in  
56 one study with low income African Americans (49). Historical factors including  
57 dispossession of land, colonisation and collective grief and loss of cultural identity were  
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3 reported as barriers to cessation in three studies of Aboriginal and Torres Strait Islanders (68,  
4 69, 79). Studies carried out with American Indian participants (67, 76) and Aboriginal and  
5 Torres Strait Islanders (68, 69, 77, 79) highlighted the function of smoking as a way of  
6 maintaining cultural identity and belonging. Maintenance of identity and belonging were also  
7 reported in three studies concerning people with a mental illness (87, 88, 92) and one study  
8 carried out with low income participants in the UK (56). In prison settings, use of cigarettes  
9 as a substitute currency also provided a barrier to cessation (103).

### 16 *Socioeconomic factors*

17 Two qualitative studies reported participants linking their status as smokers and their inability  
18 to quit smoking with their lower socioeconomic position (59, 91). In a study conducted with  
19 people with a mental illness, participants endorsed the belief that non-smokers were able to  
20 refrain from becoming smokers because they were more advantaged (91) and in a study of  
21 low income women, participants referred to their low socioeconomic position and poverty as  
22 a barrier to quitting smoking (59).  
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Section/topic	#	Checklist item	Reported on page #
<b>TITLE</b>			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3-4
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3-5
<b>METHODS</b>			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	5
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	6
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	5
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	See Table 1
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	6-7
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	7
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	6 -8 (see Table 2)
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	7
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	7
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., $I^2$ for each meta-analysis). <a href="http://bmjopen.bmj.com/site/about/guidelines.xhtml">http://bmjopen.bmj.com/site/about/guidelines.xhtml</a>	7-8



# PRISMA 2009 Checklist

Page 1 of 2

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	7
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	NA
<b>RESULTS</b>			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	8 (See Figure 1)
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	See supplementary files 1, 2 and 3)
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	9 (See supplementary files 4 and 5)
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	See supplementary files 1, 2 and 3)
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	See supplementary files 7 and 8 and tables 3 and 4)
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	9-10
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	NA
<b>DISCUSSION</b>			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	11-19



# PRISMA 2009 Checklist

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Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	16-17
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	11-19
<b>FUNDING</b>			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	1

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: [www.prisma-statement.org](http://www.prisma-statement.org).

Page 2 of 2

# BMJ Open

## Perceived barriers to smoking cessation in selected vulnerable groups: A systematic review of the qualitative and quantitative literature.

Journal:	<i>BMJ Open</i>
Manuscript ID:	bmjopen-2014-006414.R1
Article Type:	Research
Date Submitted by the Author:	11-Nov-2014
Complete List of Authors:	Twyman, Laura; University of Newcastle, School of Medicine and Public Health Bonevski, Billie; University of Newcastle, School of Medicine & Public Health Paul, Chris; University of Newcastle, School of Medicine and Public Health; Hunter Medical Research Institute, Priority Research Centre for Health Behaviour and Health Behaviour Research Group Bryant, Jamie; University of Newcastle, School of Medicine and Public Health; Hunter Medical Research Institute, Priority Research Centre for Health Behaviour and Health Behaviour Research Group
<b>Primary Subject Heading</b>:	Smoking and tobacco
Secondary Subject Heading:	Smoking and tobacco
Keywords:	barriers, vulnerable populations, review, smoking cessation, disadvantage

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Manuscripts

Only

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3 **Perceived barriers to smoking cessation in selected vulnerable groups: A systematic**  
4 **review of the qualitative and quantitative literature.**  
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9 **Twyman, Laura,<sup>1\*</sup> Bonevski, Billie,<sup>1</sup> Paul, Chris,<sup>2</sup> & Bryant, Jamie.<sup>2</sup>**  
10

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22

23 **Keywords:** smoking cessation, vulnerable populations, disadvantage, barriers, systematic  
24 **review**  
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26 **Word count:** 5720  
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## ABSTRACT

**Objectives:** To identify barriers which are common and unique to six selected vulnerable groups: low socioeconomic status; Indigenous; mental illness and substance abuse; homeless; prisoners and at-risk youth.

**Design:** A systematic review was carried out to identify the perceived barriers to smoking cessation within six vulnerable groups.

**Data sources:** Medline, EMBASE, CINAHL and PsycInfo were searched using keywords and MeSH terms from each database's inception published prior to March 2014.

**Study selection:** Studies that provided either qualitative or quantitative (i.e. longitudinal, cross-sectional or cohort surveys) descriptions of self-reported perceived barriers to quitting smoking in one of the six aforementioned vulnerable groups were included.

**Data extraction:** Two authors independently assessed studies for inclusion and extracted data.

**Results:** 65 eligible papers were identified: 24 with low socioeconomic groups, 16 with Indigenous groups, 18 involving people with a mental illness, three with homeless groups, two involving prisoners and one involving at risk youth. One study identified was carried out with participants who were homeless and addicted to alcohol and/or other drugs. Barriers common to all vulnerable groups included: smoking for stress management, lack of support from health and other service providers and the high prevalence and acceptability of smoking in vulnerable communities. Unique barriers were identified for people with a mental illness (e.g. maintenance of mental health), Indigenous groups (e.g. cultural and historical norms), prisoners (e.g. living conditions), people who are homeless (e.g. competing priorities) and at risk youth (e.g. high accessibility of tobacco).

**Conclusions:** Vulnerable groups experience common barriers to smoking cessation, in addition to barriers that are unique to specific vulnerable groups. Individual-level and



1  
2  
3 community and social network-level interventions are priority areas for future smoking  
4  
5 cessation interventions within vulnerable groups.  
6

7 **Trial registration:** A protocol for this review has been registered with PROSPERO  
8  
9 International Prospective Register of Systematic Reviews [Identifier: CRD42013005761].  
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## 12 13 14 298

### 15 16 17 18 Strengths:

- 19  
20 • This study provides a valuable synthesis of the literature examining the perceived  
21  
22 barriers to smoking cessation common and unique across six vulnerable groups.  
23

### 24 25 Limitations:

- 26  
27 • While the overall quality of the studies included in this review was acceptable, most  
28  
29 studies failed to provide information regarding the trustworthiness (qualitative  
30  
31 studies) or reliability and validity (quantitative studies) of the research.  
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## INTRODUCTION

Tobacco use is the leading global cause of avoidable death worldwide (1) and a key modifiable risk factor for the development of a range of diseases, including cardiovascular disease, chronic obstructive pulmonary disease, and some cancers (1).

The prevalence of tobacco smoking is inversely related to socioeconomic position (SEP) in high-income countries (1). For example, in 2010 in Australia, the prevalence of smoking was 24.6% in the lowest socioeconomic areas compared to 12.5% in the highest socioeconomic areas (2). The highest rates of smoking are evident amongst the most vulnerable groups, including Indigenous groups (31% - 51.8%) (3-5); people with a mental illness (31.7-32.4%) (6), those with substance abuse disorders (77%) (7); the homeless (73%) (8); and prisoners (78% - 84%) (9, 10). For the purpose of this review, vulnerable groups are defined as groups that are more likely to experience social disadvantage due to lower income, material or cultural deprivation, and social exclusion (11).

Conflicting evidence exists regarding whether the rates of quit attempts in low SEP are similar to (12, 13) or lower (14-17) than the rates made by smokers in higher SEP. However, the success rate of quit attempts for lower SEP individuals is much lower than the success rate in higher SEP counterparts (13, 18).

There are many reasons quit success may be lower in vulnerable groups (19, 20). Within the health behaviour literature, factors that prevent an individual from undertaking health behaviour change have been referred to as barriers. Barriers are often conceptualised as either structural or individual psychosocial factors (21). Structural barriers include systems, organisations and the relationship between systems and individuals, for example lack of accessible smoking cessation programs. Individual barriers refer to the subjective experience of the individual, for example physical addiction to nicotine.

1  
2  
3 This definition of barriers is congruent with the social determinants of health  
4 framework (SDHF)(22). The SDHF holds that an individual's health is influenced by factors  
5 across many levels, from individual genetic and physical characteristics, social and  
6 community networks, to broader influences of culture, socioeconomic determinants and the  
7 environment. This framework has been used to examine the determinants of health  
8 inequities(23). Because the SDHF classifies determinants of health as individual, social and  
9 broader cultural and environmental factors, it also allows the identification of distinct levels  
10 of intervention for health policies.  
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21 Within the general population, cross-sectional studies have found variation in the  
22 most commonly reported barriers to cessation. Enjoyment (79%)(24); cravings (75%) (24);  
23 and stress management (36% - 63%) (24, 25) are the most frequently reported barriers.  
24 Irritability (39% - 42%) (26); habit (39%) (25); withdrawal symptoms (28% - 48%) (24, 25);  
25 fear of failure (17% - 32%) (24, 25) and concern about weight gain (27%-34%) (24-26) are  
26 also identified as barriers to cessation.  
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34 The effect of socioeconomic position on perceived barriers to quitting was examined  
35 in a representative sample (n = 2,133) in the United Kingdom (27). Enjoyment (51%) and  
36 stress relief (47%) were the most frequently endorsed motives for continuing to smoke across  
37 the sample; however as socioeconomic position decreased, the likelihood of reporting stress  
38 management and avoiding boredom as motives to continue to smoke increased. This  
39 suggests that smokers from vulnerable groups may experience barriers to smoking cessation  
40 differently than those in the general population (27).  
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49 Smoking in vulnerable groups is known to be influenced and perpetuated by a  
50 complex range of social, cultural and environmental factors (28) including high acceptability  
51 of smoking (29) and higher retailing of tobacco in low socioeconomic areas (30). Two  
52 previous studies have reviewed the literature to examine barriers to quitting smoking amongst  
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3 vulnerable groups. One focussed on Aboriginal pregnant women (31), and one focussed on  
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5 the barriers to smoking cessation service utilisation amongst low income smokers (32). Both  
6  
7 reviews found pro-smoking social norms, inadequate knowledge regarding smoking related  
8  
9 risks, and lack of access to appropriate cessation services inhibited participants' ability to  
10  
11 quit.  
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13  
14 As the term vulnerable applies to multiple discrete groups, it is important to  
15  
16 understand which barriers (if any) are unique for example, cultural factors that inhibit  
17  
18 smoking cessation may be unique to some Indigenous groups (31). A systematic examination  
19  
20 of potential unique barriers would be valuable in order to develop and deliver appropriate  
21  
22 suites of intervention techniques for specific vulnerable groups.  
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25 Understanding the perceived barriers to quitting is important in order to better  
26  
27 understand smoking, relapse and quitting related behaviours, to inform appropriate policy,  
28  
29 and facilitate the development of effective tailored smoking cessation interventions. Given  
30  
31 the exceptionally high smoking rates and low quit success amongst vulnerable groups, there  
32  
33 is a critical need for a systematic and comprehensive review of the literature of the perceived  
34  
35 barriers to quitting smoking amongst vulnerable smokers.  
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#### 41 **Aims**

42  
43 This systematic review aims to provide a comprehensive synthesis of the self-reported  
44  
45 barriers to quitting smoking within six vulnerable groups by reviewing the qualitative and  
46  
47 quantitative literature. The review will focus on the perceived, self-reported barriers to  
48  
49 smoking cessation in six selected vulnerable groups: low socioeconomic status (low SES),  
50  
51 Indigenous, mental illness and substance abuse, homeless, prisoners, and at-risk youth. These  
52  
53 groups were selected because they represent a large proportion of those classified as  
54  
55 vulnerable to socioeconomic disadvantage (33); who exhibit smoking rates higher than that of  
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3 the general population (2-10); and who are identified as priority groups targeted for smoking  
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5 cessation programs and policies by peak health authorities (34-36). Specifically, the review  
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7 aims to:

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11 a) identify barriers which are common across all vulnerable groups included in the review  
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13 and  
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15 b) identify barriers that may be unique to specific groups.  
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21 The results of the review will be used to develop a practical model to help understand the  
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23 barriers to quitting amongst vulnerable groups and to aid smoking cessation intervention  
24  
25 development.  
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## 29 **METHOD**

### 30 **Study design**

31  
32 Guidelines for the reporting of systematic reviews (PRISMA) (37) and qualitative  
33  
34 synthesis (ENTREQ) (38) were followed. A protocol for this review was registered with  
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36 PROSPERO International Prospective Register of Systematic Reviews [Identifier:  
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38 CRD42013005761].  
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### 45 **Databases and search**

46  
47 Medline, EMBASE, CINAHL and PsycInfo were searched using keywords and  
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49 MeSH terms from each database's inception published prior to March 2014. The reference  
50  
51 lists of key articles and reviews were also manually searched in order to identify any other  
52  
53 relevant articles. An extensive list of search terms was used in order to ensure that as many  
54  
55 relevant articles as possible were captured (See Table 1).  
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Table 1. Search strategy

1	Tobacco/
2	Tobacco use/
3	Tobacco use cessation/
4	Tobacco smoking/
5	Smoking/
6	Smoking Cessation/
7	Tobacco use cessation/
8	Tobacco dependence/
9	Cigarette smoking/
10	Or/1-9
11	Homeless youth/
12	Homeless persons/
13	Housing/
14	Homeless mentally ill/
15	Homelessness or homeless/
16	Community programs/
17	Or/11-16
18	Prisoner or Prisons/
19	Correctional Health Services/
20	Correctional facilities/
21	Jail/
22	Or/18-21
23	Anxiety/
24	Depression/
25	Schizophrenia/
26	Mentally Ill persons/
27	Mental health/
28	Mental illness/
29	Mental disorder/
30	Mental disease/
31	Mental patient/
32	Mental health services/
33	Substance-related disorders/
34	Drug use/
35	Drug abuse/
36	Alcohol-related disorders/
37	Or/23-36
38	Adolescent behaviour/
39	Juvenile delinquency/
40	Juvenile offenders/
41	Disruptive Behaviors or disruptive behaviours/
42	At-risk youth/
43	At-risk young people/
44	Or/38-43
45	Indigenous/
46	Indigenous health/
47	Indigenous peoples/
48	Indigenous populations/
49	Aboriginal/
50	Aboriginal and Torres Strait Islanders/
51	Inuits/
52	Eskimo/
53	Alaska Native/

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54	Indians/
55	Native American/
56	Native Hawaiian/
57	American Indian/
58	Indians, North American/
59	Indians, South American/
60	Indians, Central American/
61	First Nations/
62	Pacific Islander/
63	Maori/
64	Oceanic ancestry group/
65	American Native Continental Ancestry Group/
66	Or/45-65
67	Poverty
68	Social status
69	Social class
70	Low income population
71	Inequalities
72	Socioeconomic status
73	Socioeconomic factors
74	Disadvantaged
75	Underserved
76	Or/67-75
77	Related to smoking cessation/quitting smoking
78	Correlated with smoking cessation/quitting smoking
79	Associated with smoking cessation/quitting smoking
80	That affect smoking cessation/quitting smoking
81	That inhibit smoking cessation/quitting smoking
82	That prevent smoking cessation/quitting smoking
83	Barriers to smoking cessation/quitting smoking
84	Factor\$ or Determinant\$ or Variable\$ or Covariable\$ or Predictor\$ or Barrier\$
85	Or/77-84
86	10 AND 85 AND 17
87	10 AND 85 AND 22
88	10 AND 85 AND 37
89	10 AND 85 AND 44
90	10 AND 85 AND 66
91	10 AND 85 AND 76

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### Inclusion and exclusion criteria

Studies that provided either qualitative or quantitative (i.e. longitudinal, cross-sectional or cohort surveys) descriptions of perceived self-reported barriers to quitting smoking in low SES groups, Indigenous groups, people with a mental illness or substance

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3 abuse problems, people who are homeless, prisoners or at-risk youth were included. See  
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5 Table 2 for definitions used as inclusion criteria for each vulnerable group. Only studies  
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7 carried out in high income countries were included as middle and low income countries may  
8  
9 present different contextual, political and economic barriers which require separate  
10  
11 consideration. Only studies published in English were included as resources required to  
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13 translate articles were beyond the scope of this review. Intervention studies were excluded, as  
14  
15 barriers discussed within these studies related to use of the intervention being tested and not  
16  
17 barriers to smoking cessation per se. Studies examining factors associated with quit attempts  
18  
19 or success were excluded unless they included results on the perceived barriers self-reported  
20  
21 by participants from vulnerable groups. Studies describing *provider* reports of the barriers to  
22  
23 the provision of smoking cessation support or treatment, and unpublished grey literature,  
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25 were also excluded. There were no cut offs for sample size.  
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Table 2. Inclusion criteria definitions of each group.

Group	Definition
Low socioeconomic status (SES)	Because definitions of low SES vary across high income countries this study used an inclusive definition of low SES. Studies were included if they described participants as being low SES and gave at least one measure of SES. This measure could be income (above/below poverty level); address in deprived neighbourhood etc.
Indigenous groups	The following definition was used to define potential Indigenous studies in accordance with previous studies (39): “the experiences shared by a group of people who have inhabited a country for thousands of years, which often contrast with those of other groups residing in the same country for a few hundred years” (40).
Mental Illness	People with a mental illness were defined as individuals who had been diagnosed with a mental illness, severe mental illness or were described as inpatients or outpatients in a mental health rehabilitation facility. Substance use disorders were also included. All mental illnesses were included.
At-risk youth	At-risk youth were defined as individuals under the age of 21 who have experienced or are experiencing; problems at school; physical, sexual or psychological abuse; mental or physical health problems; economic disadvantage or who have committed a violent or delinquent act (USA Code).
Prisoners	Prisoners included both those currently incarcerated and those ex-prisoners living in the community.
Homeless	Homeless individuals were defined as those individuals described as meeting national criteria for homelessness or those individuals accessing services provided to homeless persons.
Smoker	Smokers were defined as self-reported daily or occasional cigarette smokers. Studies that also assessed ex-smokers were only included if the majority of participants were current smokers, or if the results were reported by smoking status. Studies were excluded if they focussed solely on ex-smokers or non-smokers.

### **Data extraction**

The titles and abstracts of retrieved publications were assessed by one reviewer (LT) against eligibility criteria and excluded if they did not meet inclusion criteria. A second reviewer (a Research Assistant) independently assessed 20% of the returned abstracts for inclusion with 100% agreement between reviewers. Data from included journal articles was extracted into summary tables independently by one reviewer (LT) and a random 20% checked by a second (Research Assistant). Agreement was again high (97%). Discrepancies were settled by discussion between the reviewers. Data extracted from the articles included: study aims, setting, sample characteristics, response rates, study methodology, data analysis and the barriers identified. Barriers were defined as factors that prevented smoking cessation and/or quit attempts or were reported as primary reasons for continuing to smoke.

### **Risk of bias in individual studies**

Quality assessment was performed independently by all authors, with two reviewers per manuscript. The methodological quality of qualitative studies was assessed using the McMaster Qualitative Criteria Form (41). Quantitative studies were assessed using a tool adapted from the STROBE statement (42). As there is a lack of an agreed, valid and reliable measure to assess the quality of mixed methods studies (43), both the McMaster guidelines and the adapted quantitative framework were applied to the corresponding qualitative and quantitative components of any mixed methods studies identified.

### **Synthesis of results**

Results were synthesised by vulnerable group using narrative synthesis and inductive data analysis techniques. Narrative synthesis allows the examination of studies that are highly heterogeneous in their research questions, samples and methods (44, 45). In order to avoid

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2  
3 potential biases, care was taken to also identify points of difference between studies (46).  
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5 Where a barrier was reported in more than one study, this was recorded. In quantitative  
6  
7 studies, the proportion of respondents reporting each barrier was calculated. Barriers were  
8  
9 combined into categories and then classified using the SDHF (22). For the purposes of this  
10  
11 review, individual factors were defined as physical or psychological barriers to quitting  
12  
13 smoking: for example, the individual's level of nicotine dependence or motivation to quit.  
14  
15 Lifestyle factors were defined as health behaviours (including alcohol and other drug use)  
16  
17 that impeded an individual's ability to quit. Social and community networks were defined as  
18  
19 the impact of an individual's family and friend networks, and the wider community. Living  
20  
21 and working conditions encompassed factors including housing, health care, education and  
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23 employment. The final domain was the broader socioeconomic, cultural and environmental  
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25 background perceived to influence smoking cessation.  
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## 32 RESULTS

### 33 Search results

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35 After duplicates were removed, 21,767 studies were identified from electronic  
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37 searches and a further 27 from manual searches. Of those, 65 studies met inclusion criteria  
38  
39 and were included in the review (see Figure 1). Supplementary file 1 contains a list of full  
40  
41 text articles that were retrieved, reviewed and excluded as per the inclusion criteria. Two  
42  
43 systematic reviews concerning Indigenous Australian pregnant women (31) and pregnant  
44  
45 women (47); and two critical reviews providing summaries of the barriers to quitting (32, 48)  
46  
47 were also identified from hand searches.  
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### 52 Study characteristics

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3 The majority of studies (n = 24) identified barriers to smoking cessation in low SES groups  
4 (29, 49-71), Indigenous groups (n = 16) (72-87), and people with a mental illness (n = 18)  
5 (88-105) including two concerning those with substance use disorders (101, 104). Three  
6  
7 studies reported barriers to quitting within the homeless (106-108) and two reported barriers  
8  
9 within prisoner groups (109, 110). One study with at-risk youth was identified (111). Two  
10  
11 other studies concerning Alaska Native participants (age range from 11 to 18) (86) and  
12  
13 people with a mental illness (age range from 16 to 23) (103) included younger people as  
14  
15 participants. One study was identified that was carried out with participants who were both  
16  
17 homeless and addicted to drugs and/or alcohol (112). Since the study comprised participants  
18  
19 that met criteria for inclusion in two of the vulnerable groups included in this review (both  
20  
21 the homeless and mental illness/substance use groups) this study was included in a seventh  
22  
23 category containing “multiple” participant groups. Supplementary files 2, 3 and 4 summarize  
24  
25 the included quantitative, qualitative and mixed methods studies respectively. An overview of  
26  
27 the characteristics of included studies can be found in Supplementary file 5.  
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### 36 **Quality assessment of qualitative studies**

37  
38 The results of the quality assessment of qualitative studies are presented in  
39  
40 Supplementary file 6. Overall, the quality of studies varied widely. The majority of studies  
41  
42 did not explicitly state their study design (n = 38); of those that did, most used Grounded  
43  
44 Theory (57, 59, 61, 93, 98, 99). Most studies provided adequate descriptions of the study  
45  
46 sites; participants; data collection methods and analysis techniques. Studies generally  
47  
48 performed poorly when assessed on four components of trustworthiness, with only fifteen  
49  
50 studies meeting all four criteria (credibility; transferability; dependability and confirmability)  
51  
52 [41,44,48,50,58,60,64,65,68,69,72,73,75,76,84]. It should be noted that none of the mixed  
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3 methods studies explicitly described their methodology as mixed methods nor did they report  
4  
5 integrating the qualitative and quantitative findings in a systematic way.  
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### 8 9 10 **Quality assessment of quantitative studies**

11  
12 The results of the quality assessment of quantitative studies are presented in  
13  
14 Supplementary file 7. Sample sizes in the quantitative studies ranged from 36 to 500  
15  
16 participants. Response rates ranged from 42% to over 97% (three studies did not provide  
17  
18 response rates) [70,91,92]. All but one study [81] clearly stated eligibility criteria. All studies  
19  
20 stated their outcome a priori and no conflicts of interest were identified. The validity and  
21  
22 reliability of survey measures used to assess barriers to cessation were reported in one study  
23  
24 [53]. Three studies employed techniques such as pilot testing and input from key stakeholders  
25  
26 in developing the tools used [53,77,95].  
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### 32 **Perceived barriers to smoking cessation**

33  
34 The barriers to quitting smoking endorsed over multiple studies included: smoking for  
35  
36 stress management; enjoyment of smoking; addiction to nicotine; habit; social acceptability  
37  
38 of smoking; lack of support to quit and access to quit resources; boredom; stressful life  
39  
40 factors; pro-smoking living environments; smoking cultural norms and socioeconomic  
41  
42 disadvantage. Figure 2 demonstrates the barriers reported in this review categorised by the  
43  
44 SDHF. For brevity, the current results section will focus on those barriers that were common  
45  
46 across all groups and unique to certain vulnerable groups. Supplementary file 8 provides a  
47  
48 detailed description of all of the barriers identified in this review. Table 3 provides a  
49  
50 summary of the barriers extracted from the qualitative studies. References of studies that  
51  
52 report one or more barriers at a given level of the SDHF are included in Table 3. Table 4  
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3 provides a summary of the results of quantitative studies including the proportion of  
4  
5 participants endorsing the barrier and the study reference.  
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7

### 8 9 10 **Barriers common across all groups**

11 Three barriers were present in all six vulnerable groups included in this review: 1)  
12 stress management, 2) lack of support to quit from health professionals and other service  
13 providers, and 3) high prevalence and acceptability of smoking within vulnerable  
14 communities.  
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20 Within the SDHF, stress management was categorised as an individual level barrier.  
21 Forty qualitative studies identified stress management as a significant barrier to smoking  
22 cessation (50-56, 58, 59, 61-63, 65, 67-69, 72, 74, 75, 80, 81, 83, 84, 86, 87, 89, 90, 92, 93,  
23 95-97, 99, 100, 103, 105, 108, 110-112). Smoking was used as a coping mechanism (52, 58,  
24 62-65, 69, 74, 89, 90, 92, 97, 99) in reaction to daily stressors as well as the stress inherent in  
25 vulnerable lives. Three quantitative studies reported stress management as a barrier to  
26 quitting with Maori participants (48%) (79), participants with substance use disorders (39%)  
27 (104) and homeless participants (44%) (107). Of note, participants in two studies reported  
28 that smoking also directly contributed to the stress experienced by participants (51, 111).  
29 Participants also reported using smoking to manage their emotions and mood (58, 65, 72, 83,  
30 84, 90, 93, 98, 103, 113). Twenty three percent of participants from a Maori sample indicated  
31 managing emotions was a barrier to quitting (79), 42% of individuals with a substance use  
32 disorder (101).  
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49 High prevalence and acceptability of smoking within vulnerable communities was  
50 categorised as a community and social network level barrier. Eight qualitative (53, 54, 69, 75,  
51 79, 80, 98, 111) and four quantitative (60, 101, 107, 109) studies found that being around  
52 other smokers was a barrier to quitting. This finding is reinforced by participants describing  
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3 the high prevalence of smoking amongst family and friends in 22 studies (29, 51, 52, 56, 62,  
4 68, 69, 72, 74, 76, 81, 83, 85-87, 90, 93, 95, 96, 103, 111, 112) and in the wider community  
5 in 18 studies (29, 51, 52, 56, 62, 66, 69, 72, 74, 76, 81, 83, 85-87, 93, 96, 112). Tobacco was  
6 readily available and easily accessible within vulnerable communities (51, 62, 66, 76, 83, 90,  
7 91, 111) and smoking was considered to be a highly acceptable (29, 79, 81-83, 85-87) and  
8 normalised behaviour (52, 56, 62, 66, 69, 79, 81-83, 85, 87).

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16 Lack of support to quit from health and other service providers to quit was also  
17 categorised as a social and community network barrier. Other service providers include  
18 management and staff in prisons, homeless shelters and organisations, and members of the  
19 community. Thirteen qualitative studies (52, 55, 56, 58, 74, 77, 83, 86, 91, 92, 95, 108, 112)  
20 and one quantitative study (109) reported a perceived lack of support from health  
21 professionals regarding smoking cessation. Cases of family members and health professionals  
22 actively discouraging quit attempts and encouraging maintenance of smoking due to concerns  
23 about the individual's mental health (92, 93, 95, 96, 112) or because smoking was perceived  
24 to be the individual's only source of enjoyment (54, 77, 79, 83) were reported. Three studies  
25 identified tobacco use by health professionals and others involved in the participants' care as  
26 a barrier to cessation (77, 95, 109). Over half (55.9%) of prisoners surveyed reported  
27 observing members of staff smoking as a barrier to quitting (109). Studies involving people  
28 with a mental illness and prisoners identified use of cigarettes in order to reward or punish  
29 behaviour by health professionals and other service providers (93, 95, 96, 110) as a barrier to  
30 quitting. Twenty-nine percent of prisoners also indicated that not receiving cessation support  
31 from prison staff prevented them from quitting smoking (109). Twenty-six percent of  
32 substance abusing individuals reported they did not have enough support to quit. One study  
33 involving at risk youth identified smoking being unaddressed by teachers and members of the  
34 police force as a barrier to smoking cessation (111).

Table 3. A summary of the self-reported barriers to smoking cessation – qualitative and mixed methods studies by vulnerable group.

Barrier	Low SES groups (n = 22)	Indigenous groups (n = 16)	People with a mental illness (n=13)	Homeless groups (n = 3)	Prisoner groups (n = 2)	At risk youth (n = 1)	Multiple groups (n = 1)
<b>Individual and lifestyle factors</b>							
Stress management	(50-59, 61-63, 65-69)	(72, 74, 75, 79, 81, 83, 84, 86, 87)	(89, 90, 92, 93, 95-98, 105)	(108)	(110)	(111)	(112)
Enjoyment	(50, 54-56, 59, 62, 63, 65, 67)	(79, 81-83)	(89, 90, 92-94, 97, 98, 105)			(111)	
Addiction	(49, 50, 54, 57, 59, 67-69)	(72, 74, 75, 81, 83, 84, 86)	(90-92, 98)				
Habit	(50, 57, 65, 68)	(75, 79, 83, 84)	(92, 105)				
Mental health benefits	(58, 67)	(74)	(89, 91-99)				
Weight gain	(29, 49, 52-54, 64, 67)	(72, 74, 84)	(91, 98)				
Competing priorities	(56, 63)	(74, 75, 87)	(89, 91, 98, 99)	(108)			
Rationalisations	(54-56, 58, 61, 67)	(74, 78, 82, 87)	(89, 97)				
Other substance use	(49, 56, 59, 62)	(74, 76, 81, 84)	(89)				(112)
Autonomy	(56, 58, 68)	(83)	(93, 97-99)				
Low confidence	(52, 53, 56, 63, 67, 69)	(73, 84)	(92, 96, 98)				(112)
Cognitive benefits	(51)	(83)	(93-95)				
Loneliness	(52, 59, 65)		(93, 97, 98)				
Low risk of harm	(58)	(87)	(95, 97)				
Low motivation			(92, 94, 97, 98)				
Past failed attempts	(61)	(74)					
Positive smoker image	(29, 57)		(97)				
<b>Social and community networks</b>							
Prevalence and acceptability	(29, 51-54, 56, 62, 66, 68, 69)	(72, 74, 76, 79, 83, 85-87)	(90, 91, 93, 95, 96, 105)	(108)	(110)	(111)	(112)
Lack of social	(29, 49, 54-56, 58, 64,	(74, 75, 77, 79, 83, 84)	(91, 94, 98)	(108)			



support	67-69)						
Social activity	(29, 49, 53, 57, 62)	(73-75, 79, 85, 87)	(89, 90, 92, 93, 95, 97, 98)				
Lack of health and other professional support	(52, 54-56, 58)	(74, 77, 79, 83, 86)	(91-93, 95, 96)	(108)	(110)	(111)	(112)
<b>Living and working conditions</b>							
Access to quit resources	(52, 55, 56, 61-64)	(72-74, 78, 81, 85, 86)	(93, 96, 98)	(108)	(110)		
Boredom	(50-52, 54-56, 59, 65)	(75, 86)	(90, 94, 95, 97, 99)	(108)	(110)		
Concerns regarding treatment	(50, 52, 56, 58, 61-63, 69)	(72-74, 77, 78, 81, 86)	(91, 93, 96, 105)	(108)			
Stressful factors	(56, 58, 59, 62, 63, 65, 68)	(74, 75, 85)			(110)		
Living and working circumstances	(29, 54, 58)	(74)	(96)				
<b>Cultural, socioeconomic and environmental factors</b>							
Cultural norms	(56, 62)	(72-75, 78, 81-83, 85-87)	(93, 94, 98)		(110)		
Socioeconomic factors	(65)		(97)				

### Barriers unique to certain vulnerable groups

Indigenous; prisoner; mentally ill, homeless, and at risk youth reported unique barriers to smoking cessation. Racism, historical factors (74, 75, 85), ceremonial use of tobacco (72, 73, 82, 85, 86), cultural values that promote sharing, kinship, and reciprocity (83), cultural values of pride, independence and self-reliance that affect help seeking behaviour (81, 82), cultural values concerning health and privacy (84), and maintenance of cultural identity (73-75, 82, 83, 85) were identified as barriers within Indigenous groups. Smoking cessation could therefore exclude an individual from fully participating in their culture or potentially challenge family, personal or community relationships.

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2  
3 Living environments and the stressful context of prison presented unique barriers for  
4  
5 prisoners, including social isolation, anxiety regarding legal matters, transfers to other  
6  
7 prisons, use of cigarettes as a currency, use of cigarettes as a way to reward or punish  
8  
9 behaviour, bullying, missing family and restricted movement throughout the day (110).  
10

11 Low levels of motivation (92, 94, 97, 98), concerns about ability of cessation services  
12  
13 to handle mental health issues (91, 93, 96), identity and belonging (93, 94, 98) and symptom  
14  
15 management (88-98) were barriers for people with mental illness.  
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18 Competing needs and prioritising need to find shelter/place to live were unique  
19  
20 barriers for individual who were homeless (108). Very high levels of accessibility of  
21  
22 cigarettes, and the regular practice of selling cigarettes to those under 18 years of age were  
23  
24 identified by one study with at risk youth as a unique barrier (104).  
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Table 4. A summary of the barriers to smoking cessation – reported prevalence of each barrier by vulnerable group for studies using quantitative and mixed methods<sup>ab</sup>.

Barrier	Reported prevalence of each barrier N/Total N (%)				
	Low SES groups (n = 1)	Indigenous groups (n = 1)	People with a mental illness (n = 3)	Homeless groups (n = 2)	Prisoner groups (n = 1)
<b>Individual and lifestyle factors</b>					
Stress management		63/130 (48) <sup>(79)</sup>	30/78 (39) <sup>(104)</sup>	82/186 (44) <sup>(107)</sup>	
Relaxation	261/500 (52) <sup>(60)</sup>	22/130 (17) <sup>(79)</sup>	13/30 (42) <sup>(100)</sup> 7/72 (10) <sup>(88)</sup>		
Enjoyment		33/130 (25) <sup>(79)</sup>	34/72 (47) <sup>(88)</sup> 21/105 (20) <sup>(90)</sup> 30/78 (39) <sup>(104)</sup>		
Addiction	431/500 (86) <sup>(60)</sup>	51/130 (39) <sup>(79)</sup>	56 (53) <sup>(90)</sup> 10/30 (33) <sup>(100)</sup>	93/186 (50) <sup>(107)</sup>	
Cravings			53/78 (68) <sup>(104)</sup> 47/96 (48) <sup>(101)</sup>		
Withdrawal symptoms			85/96 (87) <sup>(101)</sup>		
Habit	411/500 (82) <sup>(60)</sup>	95/130 (73) <sup>(79)</sup>	26/72 (36) <sup>(88)</sup> 20/105 (19) <sup>(90)</sup> 17/30 (58) <sup>(100)</sup>		
Perceived Mental Health Benefits		6 – 30/130 (5-23) <sup>(79)</sup>	21/105 (20) <sup>(90)</sup> 7 – 8/72 (10-11) <sup>(88)</sup> 41/78 (53) <sup>(104)</sup> 41-76/96 (42-78) <sup>(101)</sup>		
Concentration			27-56/96 (28-55) <sup>(101)</sup>		
Low levels of motivation	131/350 (38) <sup>(70)</sup>		46/96 (47) <sup>(101)</sup>		
Weight gain	69/350 (20) <sup>(70)</sup>	6/130 (5) <sup>(79)</sup>	3/72 (4) <sup>(88)</sup> 39/96 (40) <sup>(101)</sup>	38/186 (20) <sup>(107)</sup>	
Other substance use			3/72 (4) <sup>(88)</sup> 2-8/78 (3-10) <sup>(104)</sup>		

			13-40/96 (13-41) <sup>(101)</sup>		
Problems getting to sleep			23/96 (23) (101)		
Low confidence and perceived difficulty	87 - 202/350 (25 - 58) <sup>(70)</sup>		22/78 (24) <sup>(104)</sup>		25/34 (74) (109)
<b>Social and community networks</b>					
High prevalence and acceptability in the community	332/500 (66) (60)	5/130 (12) <sup>(79)</sup>	13/105 (13) (90)	78/186 (42) (107)	27/34 (79) (109)
	116/350 (33) (70)		5/72 (7) <sup>(88)</sup> 34/78 (43) <sup>(104)</sup>		
Lack of social support	90/350 (26) (70)			48/186 (26) (107) 70-79/98 (71-79) <sup>(106)</sup>	10/34 (29) (109)
Lack of health and other professional support			3/72 (4) <sup>(88)</sup>		19/34 (56) (109)
Social activity		44/130 (34) <sup>(79)</sup>	17/30 (58) (100) 2/72 (3) <sup>(88)</sup>		
Availability of cigarettes		5/130 (4) <sup>(79)</sup>	8/105 (8) <sup>(90)</sup> 5/72 (7) <sup>(88)</sup>		
<b>Living and working conditions</b>					
Access to quit resources	108/350 (31) <sup>(70)</sup>				9/34 (27) <sup>(109)</sup>
Boredom	242/500 (48) (60)	38/130 (29) <sup>(79)</sup>	9/72 (13) <sup>(88)</sup> 13/105 (13) (90)		
Stressful factors			4/72 (6) <sup>(88)</sup>		
Living environments					20 (59) <sup>(109)</sup>

<sup>a</sup> Decimals rounded to nearest whole number where appropriate.

<sup>b</sup> Numerators/denominators are presented first, followed by proportion (in parentheses), followed by reference.

## DISCUSSION

This is the first systematic review reporting perceived barriers to smoking cessation across a range of vulnerable groups. The findings from 54 qualitative, eight quantitative and three mixed methods studies demonstrate that barriers to quitting smoking operate at multiple levels including individual and lifestyle factors; social and community networks; living conditions; and cultural and socioeconomic factors. These include: smoking for stress management; enjoyment of smoking; addiction to nicotine; habit; social acceptability of smoking; lack of support to quit and access to quit resources; boredom; stressful life factors; pro-smoking living environments; cultural norms and socioeconomic disadvantage. Stress management, lack of support from health professionals and other service providers and the high prevalence and acceptability of smoking in communities were the three barriers common across all six vulnerable groups included in this review. The identification of perceived barriers common across vulnerable groups is an extension of the previous literature.

The identified barriers broadly reflect those reported in two systematic reviews limited to pregnant smokers (47) and Indigenous Australian pregnant smokers (31) and two critical reviews providing summaries of the challenges to cessation amongst low income smokers (32) and low income; rural; homeless; hard core; immigrant and HIV positive smokers (48). Addiction to nicotine, habit, stress management, enjoyment and weight gain are typically reported barriers to smoking cessation within the general population (25-27, 114). No studies were found that directly compared barriers experienced by vulnerable groups and smokers in the general population. To the authors knowledge, only one study has assessed the effect of socioeconomic position on barriers to quitting smoking and identified that decreasing SEP was associated with higher likelihood of reporting stress management and boredom as barriers (27). This review did not aim to provide direct comparisons between vulnerable groups and the general population due to the heterogeneity of studies.

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3 Additionally, comparisons by gender were beyond the scope of this review, but should be  
4  
5 considered for further research, as socioeconomic disadvantage has differential effects on  
6  
7 males and females (19) and preliminary evidence suggests barriers to cessation may differ by  
8  
9 gender (27, 70).  
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11  
12 Nevertheless, the novel results of this review indicate that vulnerable smokers report a  
13  
14 number of additional barriers to cessation that operate within their social and community  
15  
16 networks; living conditions; and wider cultural and socioeconomic contexts. Social and  
17  
18 community barriers include: lack of support to quit from both peers and health and other  
19  
20 professionals; high prevalence and acceptability of smoking within vulnerable communities  
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22 and smoking as a social activity. Living conditions include: stressful factors; pro-smoking  
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24 living and working circumstances; lack of access to quit resources; social and geographical  
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26 isolation and boredom. Cultural norms and socioeconomic disadvantage also presented  
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28 barriers to quitting.  
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### 34 **Main barriers identified across all vulnerable groups**

#### 35 *Stress management*

36  
37 Stress management was a frequently reported individual level barrier. Smokers  
38  
39 typically demonstrate higher levels of stress and low mood than non-smokers and ex-smokers  
40  
41 (115-117). Smoking may provide a coping mechanism for individuals who are prone to  
42  
43 higher levels of stress (118-120) or smoking may act as a stressor due to neurobiological  
44  
45 processes or through the experience of withdrawal symptoms (120). Stressors associated with  
46  
47 vulnerable groups (for example unemployment, financial stress, and poverty) may compound  
48  
49 stress levels within vulnerable groups. Given that vulnerable smokers may be more likely to  
50  
51 report smoking in order to relieve stress (27) incorporating stress management techniques  
52  
53 into interventions targeted at vulnerable groups may help to increase cessation.  
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3 *Lack of support to quit from health professionals and other service providers*  
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5 At the social and community level, a lack of support to quit from health professionals  
6 and other service providers was identified. This reflects research that suggests smokers from  
7 low SEP are less likely to receive advice to quit from a healthcare provider than their more  
8 higher SEP counterparts (121), despite evidence demonstrating brief advice can increase the  
9 likelihood of successful quitting (122, 123). Both organisational and individual factors affect  
10 the provision of quit advice by health and other service providers. These include lack of time,  
11 confidence, knowledge and counselling skills (124). Efforts should be focussed on improving  
12 health professionals' ability to offer quit advice and may benefit from examining how best to  
13 ensure compliance to existing guidelines that provide clear recommendations on identifying  
14 individuals who are at higher risk of smoking and addressing the unique issues that these  
15 individuals face.  
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29 Tailoring interventions to the specific needs of vulnerable groups may be effective.  
30 Tailored interventions for behaviour change have been found to be effective compared to no  
31 intervention or dissemination of guidelines or educational materials alone [92]. Given that  
32 this review identified three common barriers across the six vulnerable groups include in this  
33 review, we argue that subsequent smoking cessation interventions in vulnerable groups  
34 should seek to address these factors. Programs should include specific modules on stress  
35 management techniques and how best to combat stress in vulnerable groups as well as  
36 educating smokers about how stress relief and relief from nicotine withdrawal symptoms can  
37 be confounded.  
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49 Smoking cessation interventions should be designed to maximise participation by  
50 vulnerable groups, addressing the key barriers around acceptability and access to  
51 interventions. Utilising existing services and organisations that are highly accessed by  
52 vulnerable groups and are a trusted source of help for vulnerable groups is also necessary.  
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3 There is accumulating evidence that social and community service organisations (SCSOs) are  
4 well placed to provide brief smoking cessation advice to highly vulnerable clients (125, 126).  
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### 7 *High prevalence and acceptability of smoking*

8  
9 The high prevalence and social acceptability of smoking within vulnerable  
10 communities was frequently reported. Considerable measures have been taken to address the  
11 denormalisation of smoking in the general population through regulation and legislative  
12 changes such as restrictions in advertising, smoke-free environment policies and point of sale  
13 restriction (1, 127, 128). Participants who were homeless, experiencing mental illness and  
14 prisoners cited a lack of restrictions on smoking within their living environments (or lack of  
15 enforcement of existing policies) as a factor that reinforced their smoking. While there are  
16 challenges associated with their implementation, smoke free areas can be successfully  
17 implemented within mental health treatment centres and prisons (129-131) and there is  
18 potential to extend these restrictions to homeless shelters and public housing developments.  
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32 Efforts to encourage the denormalisation of smoking in the environments of  
33 vulnerable communities require further exploration. Providing access to acceptable and  
34 effective behavioural and pharmacological supports should ensure that denormalisation does  
35 not result in compounding stigma and further isolating vulnerable groups (127, 132).  
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### 40 **Barriers specific to certain groups**

#### 41 *Indigenous groups*

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43 Indigenous groups identified unique stressors linked to smoking including racism and  
44 historical factors; cultural practices including ceremonial use of tobacco and cultural values  
45 that promote sharing, kinship and reciprocity and the importance of smoking as a way to  
46 maintain cultural identity. Cultural values also had effects on the willingness of Indigenous  
47 participants to access smoking support services. Certain Indigenous groups may be less likely  
48 to receive advice to quit or engage with services designed to aid in cessation (133). However,  
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3 it is important to note that smoking cessation programs have been shown to be effective  
4 within Indigenous groups (113, 134). Culturally appropriate interventions tailored to the  
5 needs of Indigenous smokers should continue to be developed, implemented and evaluated.  
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7 These programs should acknowledge the cultural significance of tobacco use and the  
8 important historical and social factors associated with Indigenous groups and smoking (135).

#### 14 *Prisoners*

16 Prisoners identified unique stressors within their living conditions that contributed to  
17 their smoking including social isolation, anxiety regarding legal matters and transfers to other  
18 prisons. A recent multicomponent randomised controlled trial that included improving stress  
19 management skills in prisoners found similar point prevalence abstinence rates as another  
20 trial conducted with prisoners (9) and other community based studies (136, 137). Thus,  
21 smoking cessation programs can be effective even in prison environments that are highly  
22 conducive to smoking and should form a part of routine care within prison systems.  
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#### 31 *People with a mental illness*

34 Low motivation to quit smoking was only reported in studies involving smokers with  
35 a mental illness. This contradicts research showing no difference in motivation to quit  
36 between those with severe mental illness and the general population (138). A recent review  
37 concluded there is some evidence to suggest that individuals diagnosed with a psychotic  
38 disorder are slightly less motivated to quit than those diagnosed with depression (138).  
39 Possible reasons for this include the symptoms associated with schizophrenia (including  
40 amotivation), management of side effects of medications (including Parkinsonism), limited  
41 support systems, low perceived vulnerability to smoking related disease, lack of alternate  
42 coping mechanisms and poverty (138, 139). Information on the diagnoses of participants was  
43 only reported in one of the studies reporting motivation as a barrier in this review (92) where  
44 the majority of participants were diagnosed with a psychotic disorder. However, other studies  
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3 did not provide information on participants' diagnoses and further exploration is beyond the  
4  
5 scope of this review.  
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8 Symptom management also presented a significant barrier within studies concerning  
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10 people with a mental illness. There is evidence to suggest that biochemical processes between  
11  
12 nicotine and other substances in tobacco improve some symptoms of mental illness (139).  
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14 Additionally, smokers with a mental illness may be more likely to misattribute their  
15  
16 withdrawal symptoms as recurring mental illness symptoms. Further investigation and  
17  
18 education regarding cessation and symptom management with people with a mental illness is  
19  
20 warranted. Integrating smoking cessation care with mental health and addiction treatments  
21  
22 can be effective at promoting cessation rates in groups with mental illness (20, 30). However,  
23  
24 future studies need to investigate ways to maintain long term smoking cessation as well as  
25  
26 systems-level changes that may support smoking cessation in people with mental illness (131,  
27  
28 140).  
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### 31 32 **Barriers to smoking cessation in vulnerable groups: a model**

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34 Figure 2 visually demonstrates the broad range of barriers to cessation reported by vulnerable  
35  
36 groups, many of which exist outside of the realm of the individual. This model demonstrates  
37  
38 the interconnectedness of individual and lifestyle factors with the wider social and  
39  
40 community factors, living conditions and cultural, socioeconomic and environmental factors.  
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42 The two darker spheres holding social and community networks and individual and lifestyle  
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44 factors identify those factors that are potentially modifiable through short term health  
45  
46 behaviour change interventions. This model does not provide an exhaustive list of all of the  
47  
48 factors that prevent vulnerable individuals from smoking cessation. It does provide a  
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50 framework for understanding the perceived self-reported barriers to quitting smoking  
51  
52 identified in this review.  
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### Strengths and limitations

This synthesis of the literature provides evidence of the perceived barriers to smoking cessation by examining the methodological quality of studies and comparing between and within selected vulnerable groups. However, this review has some limitations. While the overall quality of the studies included in this review was acceptable, most qualitative studies failed to provide information regarding the trustworthiness of the research and most quantitative studies failed to provide information on the validity and reliability of the measures used to assess barriers. Of quantitative studies included, the majority used convenience samples. It is not generally feasible to target vulnerable and hard to reach populations using random population sampling procedures. This limits the generalizability and transferability of the included studies to wider vulnerable populations. Nevertheless, the agreement in findings between qualitative studies does suggest that these results are robust.

The nature of the studies included in this review means that no weight is given to the different barriers and the authors cannot provide comment on which, if any, barriers should be made a priority to target in smoking cessation interventions with vulnerable groups. Given limited resources and funds, addressing all barriers is rarely possible. Future research is needed to identify those barriers which are most important to address first and to prioritise resourcing and intervention development.

The results of this review were broadly categorised according to the SDHF, however these categories are not mutually exclusive and certain barriers were able to be included in multiple categories (for example stress and stressful factors could be categorised as either individual level barriers or barriers within the living conditions level). The reviewed studies do not directly clarify whether the nature of stress experienced in vulnerable groups is personal or contextual. Constructs such as coping and resilience (140, 141) have been hypothesised as mediators between stress and smoking in low socioeconomic groups (142).

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3 Similarly, as this review sought to provide a summary of vulnerable smokers'  
4  
5 perceived self-reported barriers to cessation, other barriers which may be important  
6  
7 determinants of quit attempts and success were not considered. Barriers such as the  
8  
9 knowledge and attitudes of staff and health professionals and the capacity of services to offer  
10  
11 smoking cessation programs, which have been identified within the literature (124), should  
12  
13 also be considered when examining the challenges facing vulnerable groups.  
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16  
17 This review was only able to identify four studies that examined the barriers to  
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19 quitting smoking within prisoner (n=2 studies) and homeless (n=2) groups and one study  
20  
21 focussing on at-risk youth. These results indicate more research is required with these groups  
22  
23 to examine the barriers to smoking cessation. More studies investigating the barriers to  
24  
25 cessation within these groups may lead to identification of additional common and unique  
26  
27 barriers across vulnerable groups. Additionally, this review was limited to studies conducted  
28  
29 within one of six vulnerable groups. Other groups that show high rates of smoking include  
30  
31 lesbian, gay, bisexual and transgender groups (143); culturally and linguistically diverse  
32  
33 groups (144); and rural and remote communities (145). The authors acknowledge the  
34  
35 disparity in smoking prevalence in these groups, however their inclusion would have  
36  
37 increased the breadth of the review to a level that would be too broad and complex to be  
38  
39 useful. These groups may experience barriers to cessation different to those experienced by  
40  
41 the groups included in this review. It should also be noted that individuals within the included  
42  
43 groups often experience multiple forms of disadvantage for example people who are  
44  
45 homeless are more likely to experience a mental illness (146) and Indigenous communities  
46  
47 are more likely to be overrepresented in lower socioeconomic positions (3).  
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## 51 **Conclusions**

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54 These results support findings that vulnerable groups experience common barriers to  
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56 smoking cessation, and also barriers which are unique to specific vulnerable groups. Stress  
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3 management, high prevalence and acceptability of smoking and lack of support to quit were  
4 identified as priority areas for cessation research, program implementation and policy change.  
5  
6 Many of the barriers identified within this review are modifiable through short term health  
7  
8 behaviour change strategies. For heterogeneous groups of vulnerable individuals, intervention  
9  
10 development should seek to address those barriers common to all vulnerable groups identified  
11  
12 in this review. For relatively homogenous groups of vulnerable individuals, interventions  
13  
14 should seek to address the unique barriers faced by those groups in addition to those barriers  
15  
16 identified as common to all vulnerable groups.  
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20  
21 These findings, coupled with lower success rates in quitting within vulnerable groups  
22  
23 relative to the success rates in more advantaged groups (13, 147), suggest that interventions  
24  
25 with vulnerable groups need to address wider social, community and cultural factors as well  
26  
27 as individualised cessation support. Addressing the predictors of cessation found within the  
28  
29 general population such as nicotine dependence and enjoyment remain important for  
30  
31 vulnerable groups.  
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3 **Perceived barriers to smoking cessation in selected vulnerable groups: A systematic**  
4 **review of the qualitative and quantitative literature.**  
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9 **Twyman, Laura,<sup>1\*</sup> Bonevski, Billie,<sup>1</sup> Paul, Chris,<sup>2</sup> & Bryant, Jamie.<sup>2</sup>**  
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23 **Keywords:** smoking cessation, vulnerable populations, disadvantage, barriers, systematic  
24 **review**  
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26 **Word count: 5720**  
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## ABSTRACT

**Objectives:** To identify barriers which are common and unique to six selected vulnerable groups: low socioeconomic status; Indigenous; mental illness and substance abuse; homeless; prisoners and at-risk youth.

**Design:** A systematic review was carried out to identify the perceived barriers to smoking cessation within six vulnerable groups.

**Data sources:** Medline, EMBASE, CINAHL and PsycInfo were searched using keywords and MeSH terms from each database's inception published prior to March 2014.

**Study selection:** Studies that provided either qualitative or quantitative (i.e. longitudinal, cross-sectional or cohort surveys) descriptions of self-reported perceived barriers to quitting smoking in one of the six aforementioned vulnerable groups were included.

**Data extraction:** Two authors independently assessed studies for inclusion and extracted data.

**Results:** 65 eligible papers were identified: 24 with low socioeconomic groups, 16 with Indigenous groups, 18 involving people with a mental illness, three with homeless groups, two involving prisoners and one involving at risk youth. One study identified was carried out with participants who were homeless and addicted to alcohol and/or other drugs. Barriers common to all vulnerable groups included: smoking for stress management, lack of support from health and other service providers and the high prevalence and acceptability of smoking in vulnerable communities. Unique barriers were identified for people with a mental illness (e.g. maintenance of mental health), Indigenous groups (e.g. cultural and historical norms), prisoners (e.g. living conditions), people who are homeless (e.g. competing priorities) and at risk youth (e.g. high accessibility of tobacco).

**Conclusions:** Vulnerable groups experience common barriers to smoking cessation, in addition to barriers that are unique to specific vulnerable groups. Individual-level and



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2  
3 community and social network-level interventions are priority areas for future smoking  
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5 cessation interventions within vulnerable groups.  
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7 **Trial registration:** A protocol for this review has been registered with PROSPERO  
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9 International Prospective Register of Systematic Reviews [Identifier: CRD42013005761].  
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## 12 13 14 298

### 15 16 17 18 Strengths:

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20 • This study provides a valuable synthesis of the literature examining the perceived  
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22 barriers to smoking cessation common and unique across six vulnerable groups.  
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### 24 25 Limitations:

- 26  
27 • While the overall quality of the studies included in this review was acceptable, most  
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29 studies failed to provide information regarding the trustworthiness (qualitative  
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31 studies) or reliability and validity (quantitative studies) of the research.  
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## INTRODUCTION

Tobacco use is the leading global cause of avoidable death worldwide (1) and a key modifiable risk factor for the development of a range of diseases, including cardiovascular disease, chronic obstructive pulmonary disease, and some cancers (1).

The prevalence of tobacco smoking is inversely related to socioeconomic position (SEP) in high-income countries (1). For example, in 2010 in Australia, the prevalence of smoking was 24.6% in the lowest socioeconomic areas compared to 12.5% in the highest socioeconomic areas (2). The highest rates of smoking are evident amongst the most vulnerable groups, including Indigenous groups (31% - 51.8%) (3-5); people with a mental illness (31.7-32.4%) (6), those with substance abuse disorders (77%) (7); the homeless (73%) (8); and prisoners (78% - 84%) (9, 10). For the purpose of this review, vulnerable groups are defined as groups that are more likely to experience social disadvantage due to lower income, material or cultural deprivation, and social exclusion (11).

Conflicting evidence exists regarding whether the rates of quit attempts in low SEP are similar to (12, 13) or lower (14-17) than the rates made by smokers in higher SEP. However, the success rate of quit attempts for lower SEP individuals is much lower than the success rate in higher SEP counterparts (13, 18).

There are many reasons quit success may be lower in vulnerable groups(19, 20). Within the health behaviour literature, factors that prevent an individual from undertaking health behaviour change have been referred to as barriers. Barriers are often conceptualised as either structural or individual psychosocial factors (21). Structural barriers include systems, organisations and the relationship between systems and individuals, for example lack of accessible smoking cessation programs. Individual barriers refer to the subjective experience of the individual, for example physical addiction to nicotine.

This definition of barriers is congruent with the social determinants of health framework (SDHF)(22). The SDHF holds that an individual's health is influenced by factors across many levels, from individual genetic and physical characteristics, social and community networks, to broader influences of culture, socioeconomic determinants and the environment. This framework has been used to examine the determinants of health inequities(23). Because the SDHF classifies determinants of health as individual, social and broader cultural and environmental factors, it also allows the identification of distinct levels of intervention for health policies.

Within the general population, cross-sectional studies have found variation in the most commonly reported barriers to cessation. Enjoyment (79%)(24); cravings (75%) (24); and stress management (36% - 63%) (24, 25) are the most frequently reported barriers. Irritability (39% - 42%) (26); habit (39%) (25); withdrawal symptoms (28% - 48%) (24, 25); fear of failure (17% - 32%) (24, 25) and concern about weight gain (27%-34%) (24-26) are also identified as barriers to cessation.

The effect of socioeconomic position on perceived barriers to quitting was examined in a representative sample (n = 2,133) in the United Kingdom (27). Enjoyment (51%) and stress relief (47%) were the most frequently endorsed motives for continuing to smoke across the sample; however as socioeconomic position decreased, the likelihood of reporting stress management and avoiding boredom as motives to continue to smoke increased. This suggests that smokers from vulnerable groups may experience barriers to smoking cessation differently than those in the general population (27).

Smoking in vulnerable groups is known to be influenced and perpetuated by a complex range of social, cultural and environmental factors (28) including high acceptability of smoking (29) and higher retailing of tobacco in low socioeconomic areas (30). Two previous studies have reviewed the literature to examine barriers to quitting smoking amongst

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3 vulnerable groups. One focussed on Aboriginal pregnant women (31), and one focussed on  
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5 the barriers to smoking cessation service utilisation amongst low income smokers (32). Both  
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7 reviews found pro-smoking social norms, inadequate knowledge regarding smoking related  
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9 risks, and lack of access to appropriate cessation services inhibited participants' ability to  
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11 quit.  
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14 As the term vulnerable applies to multiple discrete groups, it is important to  
15  
16 understand which barriers (if any) are unique for example, cultural factors that inhibit  
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18 smoking cessation may be unique to some Indigenous groups (31). A systematic examination  
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20 of potential unique barriers would be valuable in order to develop and deliver appropriate  
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22 suites of intervention techniques for specific vulnerable groups.  
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25 Understanding the perceived barriers to quitting is important in order to better  
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27 understand smoking, relapse and quitting related behaviours, to inform appropriate policy,  
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29 and facilitate the development of effective tailored smoking cessation interventions. Given  
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31 the exceptionally high smoking rates and low quit success amongst vulnerable groups, there  
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33 is a critical need for a systematic and comprehensive review of the literature of the perceived  
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35 barriers to quitting smoking amongst vulnerable smokers.  
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#### 41 **Aims**

42  
43 This systematic review aims to provide a comprehensive synthesis of the self-reported  
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45 barriers to quitting smoking within six vulnerable groups by reviewing the qualitative and  
46  
47 quantitative literature. The review will focus on the perceived, self-reported barriers to  
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49 smoking cessation in six selected vulnerable groups: low socioeconomic status (low SES),  
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51 Indigenous, mental illness and substance abuse, homeless, prisoners, and at-risk youth. These  
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53 groups were selected because they represent a large proportion of those classified as  
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55 vulnerable to socioeconomic disadvantage (33); who exhibit smoking rates higher than that of  
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3 the general population (2-10); and who are identified as priority groups targeted for smoking  
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5 cessation programs and policies by peak health authorities (34-36). Specifically, the review  
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7 aims to:  
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11 a) identify barriers which are common across all vulnerable groups included in the review  
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13 and  
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15 b) identify barriers that may be unique to specific groups.  
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21 The results of the review will be used to develop a practical model to help understand the  
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23 barriers to quitting amongst vulnerable groups and to aid smoking cessation intervention  
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25 development.  
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## 29 **METHOD**

### 30 **Study design**

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32 Guidelines for the reporting of systematic reviews (PRISMA) (37) and qualitative  
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34 synthesis (ENTREQ) (38) were followed. A protocol for this review was registered with  
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36 PROSPERO International Prospective Register of Systematic Reviews [Identifier:  
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38 CRD42013005761].  
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### 45 **Databases and search**

46  
47 Medline, EMBASE, CINAHL and PsycInfo were searched using keywords and  
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49 MeSH terms from each database's inception published prior to March 2014. The reference  
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51 lists of key articles and reviews were also manually searched in order to identify any other  
52  
53 relevant articles. An extensive list of search terms was used in order to ensure that as many  
54  
55 relevant articles as possible were captured (See Table 1).  
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Table 1. Search strategy

1	1	Tobacco/
2	2	Tobacco use/
3	3	Tobacco use cessation/
4	4	Tobacco smoking/
5	5	Smoking/
6	6	Smoking Cessation/
7	7	Tobacco use cessation/
8	8	Tobacco dependence/
9	9	Cigarette smoking/
10	10	Or/1-9
11	11	Homeless youth/
12	12	Homeless persons/
13	13	Housing/
14	14	Homeless mentally ill/
15	15	Homelessness or homeless/
16	16	Community programs/
17	17	Or/11-16
18	18	Prisoner or Prisons/
19	19	Correctional Health Services/
20	20	Correctional facilities/
21	21	Jail/
22	22	Or/18-21
23	23	Anxiety/
24	24	Depression/
25	25	Schizophrenia/
26	26	Mentally ill persons/
27	27	Mental health/
28	28	Mental illness/
29	29	Mental disorder/
30	30	Mental disease/
31	31	Mental patient/
32	32	Mental health services/
33	33	Substance-related disorders/
34	34	Drug use/
35	35	Drug abuse/
36	36	Alcohol-related disorders/
37	37	Or/23-36
38	38	Adolescent behaviour/
39	39	Juvenile delinquency/
40	40	Juvenile offenders/
41	41	Disruptive Behaviors or disruptive behaviours/
42	42	At-risk youth/
43	43	At-risk young people/
44	44	Or/38-43
45	45	Indigenous/
46	46	Indigenous health/
47	47	Indigenous peoples/
48	48	Indigenous populations/
49	49	Aboriginal/
50	50	Aboriginal and Torres Strait Islanders/
51	51	Inuits/
52	52	Eskimo/
53	53	Alaska Native/

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54	Indians/
55	Native American/
56	Native Hawaiian/
57	American Indian/
58	Indians, North American/
59	Indians, South American/
60	Indians, Central American/
61	First Nations/
62	Pacific Islander/
63	Maori/
64	Oceanic ancestry group/
65	American Native Continental Ancestry Group/
66	Or/45-65
67	Poverty
68	Social status
69	Social class
70	Low income population
71	Inequalities
72	Socioeconomic status
73	Socioeconomic factors
74	Disadvantaged
75	Underserved
76	Or/67-75
77	Related to smoking cessation/quitting smoking
78	Correlated with smoking cessation/quitting smoking
79	Associated with smoking cessation/quitting smoking
80	That affect smoking cessation/quitting smoking
81	That inhibit smoking cessation/quitting smoking
82	That prevent smoking cessation/quitting smoking
83	Barriers to smoking cessation/quitting smoking
84	Factor\$ or Determinant\$ or Variable\$ or Covariable\$ or Predictor\$ or Barrier\$
85	Or/77-84
86	10 AND 85 AND 17
87	10 AND 85 AND 22
88	10 AND 85 AND 37
89	10 AND 85 AND 44
90	10 AND 85 AND 66
91	10 AND 85 AND 76

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### Inclusion and exclusion criteria

Studies that provided either qualitative or quantitative (i.e. longitudinal, cross-sectional or cohort surveys) descriptions of perceived self-reported barriers to quitting smoking in low SES groups, Indigenous groups, people with a mental illness or substance

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3 abuse problems, people who are homeless, prisoners or at-risk youth were included. See  
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5 Table 2 for definitions used as inclusion criteria for each vulnerable group. Only studies  
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7 carried out in high income countries were included as middle and low income countries may  
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9 present different contextual, political and economic barriers which require separate  
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11 consideration. Only studies published in English were included as resources required to  
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13 translate articles were beyond the scope of this review. Intervention studies were excluded, as  
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15 barriers discussed within these studies related to use of the intervention being tested and not  
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17 barriers to smoking cessation per se. Studies examining factors associated with quit attempts  
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19 or success were excluded unless they included results on the perceived barriers self-reported  
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21 by participants from vulnerable groups. Studies describing *provider* reports of the barriers to  
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23 the provision of smoking cessation support or treatment, and unpublished grey literature,  
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25 were also excluded. There were no cut offs for sample size.  
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Table 2. Inclusion criteria definitions of each group.

Group	Definition
Low socioeconomic status (SES)	Because definitions of low SES vary across high income countries this study used an inclusive definition of low SES. Studies were included if they described participants as being low SES and gave at least one measure of SES. This measure could be income (above/below poverty level); address in deprived neighbourhood etc.
Indigenous groups	The following definition was used to define potential Indigenous studies in accordance with previous studies (39): “the experiences shared by a group of people who have inhabited a country for thousands of years, which often contrast with those of other groups residing in the same country for a few hundred years” (40).
Mental Illness	People with a mental illness were defined as individuals who had been diagnosed with a mental illness, severe mental illness or were described as inpatients or outpatients in a mental health rehabilitation facility. Substance use disorders were also included. All mental illnesses were included.
At-risk youth	At-risk youth were defined as individuals under the age of 21 who have experienced or are experiencing; problems at school; physical, sexual or psychological abuse; mental or physical health problems; economic disadvantage or who have committed a violent or delinquent act (USA Code).
Prisoners	Prisoners included both those currently incarcerated and those ex-prisoners living in the community.
Homeless	Homeless individuals were defined as those individuals described as meeting national criteria for homelessness or those individuals accessing services provided to homeless persons.
Smoker	Smokers were defined as self-reported daily or occasional cigarette smokers. Studies that also assessed ex-smokers were only included if the majority of participants were current smokers, or if the results were reported by smoking status. Studies were excluded if they focussed solely on ex-smokers or non-smokers.

### **Data extraction**

The titles and abstracts of retrieved publications were assessed by one reviewer (LT) against eligibility criteria and excluded if they did not meet inclusion criteria. A second reviewer (a Research Assistant) independently assessed 20% of the returned abstracts for inclusion with 100% agreement between reviewers. Data from included journal articles was extracted into summary tables independently by one reviewer (LT) and a random 20% checked by a second (Research Assistant). Agreement was again high (97%). Discrepancies were settled by discussion between the reviewers. Data extracted from the articles included: study aims, setting, sample characteristics, response rates, study methodology, data analysis and the barriers identified. Barriers were defined as factors that prevented smoking cessation and/or quit attempts or were reported as primary reasons for continuing to smoke.

### **Risk of bias in individual studies**

Quality assessment was performed independently by all authors, with two reviewers per manuscript. The methodological quality of qualitative studies was assessed using the McMaster Qualitative Criteria Form (41). Quantitative studies were assessed using a tool adapted from the STROBE statement (42). As there is a lack of an agreed, valid and reliable measure to assess the quality of mixed methods studies (43), both the McMaster guidelines and the adapted quantitative framework were applied to the corresponding qualitative and quantitative components of any mixed methods studies identified.

### **Synthesis of results**

Results were synthesised by vulnerable group using narrative synthesis and inductive data analysis techniques. Narrative synthesis allows the examination of studies that are highly heterogeneous in their research questions, samples and methods (44, 45). In order to avoid

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2  
3 potential biases, care was taken to also identify points of difference between studies (46).

4  
5 Where a barrier was reported in more than one study, this was recorded. In quantitative  
6  
7 studies, the proportion of respondents reporting each barrier was calculated. Barriers were  
8  
9 combined into categories and then classified using the SDHF (22). For the purposes of this  
10  
11 review, individual factors were defined as physical or psychological barriers to quitting  
12  
13 smoking: for example, the individual's level of nicotine dependence or motivation to quit.  
14  
15 Lifestyle factors were defined as health behaviours (including alcohol and other drug use)  
16  
17 that impeded an individual's ability to quit. Social and community networks were defined as  
18  
19 the impact of an individual's family and friend networks, and the wider community. Living  
20  
21 and working conditions encompassed factors including housing, health care, education and  
22  
23 employment. The final domain was the broader socioeconomic, cultural and environmental  
24  
25 background perceived to influence smoking cessation.  
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## 32 RESULTS

### 33 Search results

34  
35 After duplicates were removed, 21,767 studies were identified from electronic  
36  
37 searches and a further 27 from manual searches. Of those, 65 studies met inclusion criteria  
38  
39 and were included in the review (see Figure 1). Supplementary file 1 contains a list of full  
40  
41 text articles that were retrieved, reviewed and excluded as per the inclusion criteria. Two  
42  
43 systematic reviews concerning Indigenous Australian pregnant women (31) and pregnant  
44  
45 women (47); and two critical reviews providing summaries of the barriers to quitting (32, 48)  
46  
47 were also identified from hand searches.  
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### 54 Study characteristics

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3 The majority of studies (n = 24) identified barriers to smoking cessation in low SES groups  
4 (29, 49-71), Indigenous groups (n = 16) (72-87), and people with a mental illness (n = 18)  
5 (88-105) including two concerning those with substance use disorders (101, 104). Three  
6  
7 studies reported barriers to quitting within the homeless (106-108) and two reported barriers  
8  
9 within prisoner groups (109, 110). One study with at-risk youth was identified (111). Two  
10  
11 other studies concerning Alaska Native participants (age range from 11 to 18) (86) and  
12  
13 people with a mental illness (age range from 16 to 23) (103) included younger people as  
14  
15 participants. One study was identified that was carried out with participants who were both  
16  
17 homeless and addicted to drugs and/or alcohol (112). Since the study comprised participants  
18  
19 that met criteria for inclusion in two of the vulnerable groups included in this review (both  
20  
21 the homeless and mental illness/substance use groups) this study was included in a seventh  
22  
23 category containing “multiple” participant groups. Supplementary files 2, 3 and 4 summarize  
24  
25 the included quantitative, qualitative and mixed methods studies respectively. An overview of  
26  
27 the characteristics of included studies can be found in Supplementary file 5.  
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### 36 **Quality assessment of qualitative studies**

37  
38 The results of the quality assessment of qualitative studies are presented in  
39  
40 Supplementary file 6. Overall, the quality of studies varied widely. The majority of studies  
41  
42 did not explicitly state their study design (n = 38); of those that did, most used Grounded  
43  
44 Theory (57, 59, 61, 93, 98, 99). Most studies provided adequate descriptions of the study  
45  
46 sites; participants; data collection methods and analysis techniques. Studies generally  
47  
48 performed poorly when assessed on four components of trustworthiness, with only fifteen  
49  
50 studies meeting all four criteria (credibility; transferability; dependability and confirmability)  
51  
52 [41,44,48,50,58,60,64,65,68,69,72,73,75,76,84]. It should be noted that none of the mixed  
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3 methods studies explicitly described their methodology as mixed methods nor did they report  
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5 integrating the qualitative and quantitative findings in a systematic way.  
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### 9 10 **Quality assessment of quantitative studies**

11  
12 The results of the quality assessment of quantitative studies are presented in  
13  
14 Supplementary file 7. Sample sizes in the quantitative studies ranged from 36 to 500  
15  
16 participants. Response rates ranged from 42% to over 97% (three studies did not provide  
17  
18 response rates) [70,91,92]. All but one study [81] clearly stated eligibility criteria. All studies  
19  
20 stated their outcome a priori and no conflicts of interest were identified. The validity and  
21  
22 reliability of survey measures used to assess barriers to cessation were reported in one study  
23  
24 [53]. Three studies employed techniques such as pilot testing and input from key stakeholders  
25  
26 in developing the tools used [53,77,95].  
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### 32 **Perceived barriers to smoking cessation**

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34 The barriers to quitting smoking endorsed over multiple studies included: smoking for  
35  
36 stress management; enjoyment of smoking; addiction to nicotine; habit; social acceptability  
37  
38 of smoking; lack of support to quit and access to quit resources; boredom; stressful life  
39  
40 factors; pro-smoking living environments; smoking cultural norms and socioeconomic  
41  
42 disadvantage. Figure 2 demonstrates the barriers reported in this review categorised by the  
43  
44 SDHF. For brevity, the current results section will focus on those barriers that were common  
45  
46 across all groups and unique to certain vulnerable groups. Supplementary file 8 provides a  
47  
48 detailed description of all of the barriers identified in this review. Table 3 provides a  
49  
50 summary of the barriers extracted from the qualitative studies. References of studies that  
51  
52 report one or more barriers at a given level of the SDHF are included in Table 3. Table 4  
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3 provides a summary of the results of quantitative studies including the proportion of  
4  
5 participants endorsing the barrier and the study reference.  
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### 9 10 **Barriers common across all groups**

11 Three barriers were present in all six vulnerable groups included in this review: 1)  
12 stress management, 2) lack of support to quit from health professionals and other service  
13 providers, and 3) high prevalence and acceptability of smoking within vulnerable  
14  
15 communities.  
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20 Within the SDHF, stress management was categorised as an individual level barrier.  
21 Forty qualitative studies identified stress management as a significant barrier to smoking  
22 cessation (50-56, 58, 59, 61-63, 65, 67-69, 72, 74, 75, 80, 81, 83, 84, 86, 87, 89, 90, 92, 93,  
23 95-97, 99, 100, 103, 105, 108, 110-112). Smoking was used as a coping mechanism (52, 58,  
24 62-65, 69, 74, 89, 90, 92, 97, 99) in reaction to daily stressors as well as the stress inherent in  
25 vulnerable lives. Three quantitative studies reported stress management as a barrier to  
26 quitting with Maori participants (48%) (79), participants with substance use disorders (39%)  
27 (104) and homeless participants (44%) (107). Of note, participants in two studies reported  
28 that smoking also directly contributed to the stress experienced by participants (51, 111).  
29 Participants also reported using smoking to manage their emotions and mood (58, 65, 72, 83,  
30 84, 90, 93, 98, 103, 113). Twenty three percent of participants from a Maori sample indicated  
31 managing emotions was a barrier to quitting (79), 42% of individuals with a substance use  
32 disorder (101).  
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49 High prevalence and acceptability of smoking within vulnerable communities was  
50 categorised as a community and social network level barrier. Eight qualitative (53, 54, 69, 75,  
51 79, 80, 98, 111) and four quantitative (60, 101, 107, 109) studies found that being around  
52 other smokers was a barrier to quitting. This finding is reinforced by participants describing  
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3 the high prevalence of smoking amongst family and friends in 22 studies (29, 51, 52, 56, 62,  
4 68, 69, 72, 74, 76, 81, 83, 85-87, 90, 93, 95, 96, 103, 111, 112) and in the wider community  
5 in 18 studies (29, 51, 52, 56, 62, 66, 69, 72, 74, 76, 81, 83, 85-87, 93, 96, 112). Tobacco was  
6 readily available and easily accessible within vulnerable communities (51, 62, 66, 76, 83, 90,  
7 91, 111) and smoking was considered to be a highly acceptable (29, 79, 81-83, 85-87) and  
8 normalised behaviour (52, 56, 62, 66, 69, 79, 81-83, 85, 87).

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16 Lack of support to quit from health and other service providers to quit was also  
17 categorised as a social and community network barrier. Other service providers include  
18 management and staff in prisons, homeless shelters and organisations, and members of the  
19 community. Thirteen qualitative studies (52, 55, 56, 58, 74, 77, 83, 86, 91, 92, 95, 108, 112)  
20 and one quantitative study (109) reported a perceived lack of support from health  
21 professionals regarding smoking cessation. Cases of family members and health professionals  
22 actively discouraging quit attempts and encouraging maintenance of smoking due to concerns  
23 about the individual's mental health (92, 93, 95, 96, 112) or because smoking was perceived  
24 to be the individual's only source of enjoyment (54, 77, 79, 83) were reported. Three studies  
25 identified tobacco use by health professionals and others involved in the participants' care as  
26 a barrier to cessation (77, 95, 109). Over half (55.9%) of prisoners surveyed reported  
27 observing members of staff smoking as a barrier to quitting (109). Studies involving people  
28 with a mental illness and prisoners identified use of cigarettes in order to reward or punish  
29 behaviour by health professionals and other service providers (93, 95, 96, 110) as a barrier to  
30 quitting. Twenty-nine percent of prisoners also indicated that not receiving cessation support  
31 from prison staff prevented them from quitting smoking (109). Twenty-six percent of  
32 substance abusing individuals reported they did not have enough support to quit. One study  
33 involving at risk youth identified smoking being unaddressed by teachers and members of the  
34 police force as a barrier to smoking cessation (111).

Table 3. A summary of the self-reported barriers to smoking cessation – qualitative and mixed methods studies by vulnerable group.

Barrier	Low SES groups (n = 22)	Indigenous groups (n = 16)	People with a mental illness (n=13)	Homeless groups (n = 3)	Prisoner groups (n = 2)	At risk youth (n = 1)	Multiple groups (n = 1)
<b>Individual and lifestyle factors</b>							
Stress management	(50-59, 61-63, 65-69)	(72, 74, 75, 79, 81, 83, 84, 86, 87)	(89, 90, 92, 93, 95-98, 105)	(108)	(110)	(111)	(112)
Enjoyment	(50, 54-56, 59, 62, 63, 65, 67)	(79, 81-83)	(89, 90, 92-94, 97, 98, 105)			(111)	
Addiction	(49, 50, 54, 57, 59, 67-69)	(72, 74, 75, 81, 83, 84, 86)	(90-92, 98)				
Habit	(50, 57, 65, 68)	(75, 79, 83, 84)	(92, 105)				
Mental health benefits	(58, 67)	(74)	(89, 91-99)				
Weight gain	(29, 49, 52-54, 64, 67)	(72, 74, 84)	(91, 98)				
Competing priorities	(56, 63)	(74, 75, 87)	(89, 91, 98, 99)	(108)			
Rationalisations	(54-56, 58, 61, 67)	(74, 78, 82, 87)	(89, 97)				
Other substance use	(49, 56, 59, 62)	(74, 76, 81, 84)	(89)				(112)
Autonomy	(56, 58, 68)	(83)	(93, 97-99)				
Low confidence	(52, 53, 56, 63, 67, 69)	(73, 84)	(92, 96, 98)				(112)
Cognitive benefits	(51)	(83)	(93-95)				
Loneliness	(52, 59, 65)		(93, 97, 98)				
Low risk of harm	(58)	(87)	(95, 97)				
Low motivation			(92, 94, 97, 98)				
Past failed attempts	(61)	(74)					
Positive smoker image	(29, 57)		(97)				
<b>Social and community networks</b>							
Prevalence and acceptability	(29, 51-54, 56, 62, 66, 68, 69)	(72, 74, 76, 79, 83, 85-87)	(90, 91, 93, 95, 96, 105)	(108)	(110)	(111)	(112)
Lack of social	(29, 49, 54-56, 58, 64,	(74, 75, 77, 79, 83, 84)	(91, 94, 98)	(108)			



support	67-69)						
Social activity	(29, 49, 53, 57, 62)	(73-75, 79, 85, 87)	(89, 90, 92, 93, 95, 97, 98)				
Lack of health and other professional support	(52, 54-56, 58)	(74, 77, 79, 83, 86)	(91-93, 95, 96)	(108)	(110)	(111)	(112)
<b>Living and working conditions</b>							
Access to quit resources	(52, 55, 56, 61-64)	(72-74, 78, 81, 85, 86)	(93, 96, 98)	(108)	(110)		
Boredom	(50-52, 54-56, 59, 65)	(75, 86)	(90, 94, 95, 97, 99)	(108)	(110)		
Concerns regarding treatment	(50, 52, 56, 58, 61-63, 69)	(72-74, 77, 78, 81, 86)	(91, 93, 96, 105)	(108)			
Stressful factors	(56, 58, 59, 62, 63, 65, 68)	(74, 75, 85)			(110)		
Living and working circumstances	(29, 54, 58)	(74)	(96)				
<b>Cultural, socioeconomic and environmental factors</b>							
Cultural norms	(56, 62)	(72-75, 78, 81-83, 85-87)	(93, 94, 98)		(110)		
Socioeconomic factors	(65)		(97)				

### Barriers unique to certain vulnerable groups

Indigenous; prisoner; mentally ill, homeless, and at risk youth reported unique barriers to smoking cessation. Racism, historical factors (74, 75, 85), ceremonial use of tobacco (72, 73, 82, 85, 86), cultural values that promote sharing, kinship, and reciprocity (83), cultural values of pride, independence and self-reliance that affect help seeking behaviour (81, 82), cultural values concerning health and privacy (84), and maintenance of cultural identity (73-75, 82, 83, 85) were identified as barriers within Indigenous groups. Smoking cessation could therefore exclude an individual from fully participating in their culture or potentially challenge family, personal or community relationships.

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2  
3 Living environments and the stressful context of prison presented unique barriers for  
4  
5 prisoners, including social isolation, anxiety regarding legal matters, transfers to other  
6  
7 prisons, use of cigarettes as a currency, use of cigarettes as a way to reward or punish  
8  
9 behaviour, bullying, missing family and restricted movement throughout the day (110).  
10

11 Low levels of motivation (92, 94, 97, 98), concerns about ability of cessation services  
12  
13 to handle mental health issues (91, 93, 96), identity and belonging (93, 94, 98) and symptom  
14  
15 management (88-98) were barriers for people with mental illness.  
16  
17

18 Competing needs and prioritising need to find shelter/place to live were unique  
19  
20 barriers for individual who were homeless (108). Very high levels of accessibility of  
21  
22 cigarettes, and the regular practice of selling cigarettes to those under 18 years of age were  
23  
24 identified by one study with at risk youth as a unique barrier (104).  
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Table 4. A summary of the barriers to smoking cessation – reported prevalence of each barrier by vulnerable group for studies using quantitative and mixed methods<sup>ab</sup>.

Barrier	Reported prevalence of each barrier N/Total N (%)				
	Low SES groups (n = 1)	Indigenous groups (n = 1)	People with a mental illness (n = 3)	Homeless groups (n = 2)	Prisoner groups (n = 1)
<b>Individual and lifestyle factors</b>					
Stress management		63/130 (48) <sup>(79)</sup>	30/78 (39) <sup>(104)</sup>	82/186 (44) <sup>(107)</sup>	
Relaxation	261/500 (52) <sup>(60)</sup>	22/130 (17) <sup>(79)</sup>	13/30 (42) <sup>(100)</sup> 7/72 (10) <sup>(88)</sup>		
Enjoyment		33/130 (25) <sup>(79)</sup>	34/72 (47) <sup>(88)</sup> 21/105 (20) <sup>(90)</sup> 30/78 (39) <sup>(104)</sup>		
Addiction	431/500 (86) <sup>(60)</sup>	51/130 (39) <sup>(79)</sup>	56 (53) <sup>(90)</sup> 10/30 (33) <sup>(100)</sup>	93/186 (50) <sup>(107)</sup>	
Cravings			53/78 (68) <sup>(104)</sup> 47/96 (48) <sup>(101)</sup>		
Withdrawal symptoms			85/96 (87) <sup>(101)</sup>		
Habit	411/500 (82) <sup>(60)</sup>	95/130 (73) <sup>(79)</sup>	26/72 (36) <sup>(88)</sup> 20/105 (19) <sup>(90)</sup> 17/30 (58) <sup>(100)</sup>		
Perceived Mental Health Benefits		6 – 30/130 (5-23) <sup>(79)</sup>	21/105 (20) <sup>(90)</sup> 7 – 8/72 (10-11) <sup>(88)</sup> 41/78 (53) <sup>(104)</sup> 41-76/96 (42-78) <sup>(101)</sup>		
Concentration			27-56/96 (28-55) <sup>(101)</sup>		
Low levels of motivation	131/350 (38) <sup>(70)</sup>		46/96 (47) <sup>(101)</sup>		
Weight gain	69/350 (20) <sup>(70)</sup>	6/130 (5) <sup>(79)</sup>	3/72 (4) <sup>(88)</sup> 39/96 (40) <sup>(101)</sup>	38/186 (20) <sup>(107)</sup>	
Other substance use			3/72 (4) <sup>(88)</sup> 2-8/78 (3-10) <sup>(104)</sup>		

			13-40/96 (13-41) <sup>(101)</sup>		
Problems getting to sleep			23/96 (23) (101)		
Low confidence and perceived difficulty	87 - 202/350 (25 - 58) <sup>(70)</sup>		22/78 (24) <sup>(104)</sup>		25/34 (74) (109)
<b>Social and community networks</b>					
High prevalence and acceptability in the community	332/500 (66) (60)	5/130 (12) <sup>(79)</sup>	13/105 (13) (90)	78/186 (42) (107)	27/34 (79) (109)
	116/350 (33) (70)		5/72 (7) <sup>(88)</sup> 34/78 (43) <sup>(104)</sup>		
Lack of social support	90/350 (26) (70)			48/186 (26) (107) 70-79/98 (71-79) <sup>(106)</sup>	10/34 (29) (109)
Lack of health and other professional support			3/72 (4) <sup>(88)</sup>		19/34 (56) (109)
Social activity		44/130 (34) <sup>(79)</sup>	17/30 (58) (100) 2/72 (3) <sup>(88)</sup>		
Availability of cigarettes		5/130 (4) <sup>(79)</sup>	8/105 (8) <sup>(90)</sup> 5/72 (7) <sup>(88)</sup>		
<b>Living and working conditions</b>					
Access to quit resources	108/350 (31) <sup>(70)</sup>				9/34 (27) <sup>(109)</sup>
Boredom	242/500 (48) (60)	38/130 (29) <sup>(79)</sup>	9/72 (13) <sup>(88)</sup> 13/105 (13) (90)		
Stressful factors			4/72 (6) <sup>(88)</sup>		
Living environments					20 (59) <sup>(109)</sup>

<sup>a</sup> Decimals rounded to nearest whole number where appropriate.

<sup>b</sup> Numerators/denominators are presented first, followed by proportion (in parentheses), followed by reference.

## DISCUSSION

This is the first systematic review reporting perceived barriers to smoking cessation across a range of vulnerable groups. The findings from 54 qualitative, eight quantitative and three mixed methods studies demonstrate that barriers to quitting smoking operate at multiple levels including individual and lifestyle factors; social and community networks; living conditions; and cultural and socioeconomic factors. These include: smoking for stress management; enjoyment of smoking; addiction to nicotine; habit; social acceptability of smoking; lack of support to quit and access to quit resources; boredom; stressful life factors; pro-smoking living environments; cultural norms and socioeconomic disadvantage. Stress management, lack of support from health professionals and other service providers and the high prevalence and acceptability of smoking in communities were the three barriers common across all six vulnerable groups included in this review. [The identification of perceived barriers common across vulnerable groups is an extension of the previous literature.](#)

The identified barriers broadly reflect those reported in two systematic reviews limited to pregnant smokers (47) and Indigenous Australian pregnant smokers (31) and two critical reviews providing summaries of the challenges to cessation amongst low income smokers (32) and low income; rural; homeless; hard core; immigrant and HIV positive smokers (48). Addiction to nicotine, habit, stress management, enjoyment and weight gain are typically reported barriers to smoking cessation within the general population (25-27, 114). No studies were found that directly compared barriers experienced by vulnerable groups and smokers in the general population. To the authors knowledge, only one study has assessed the effect of socioeconomic position on barriers to quitting smoking and identified that decreasing SEP was associated with higher likelihood of reporting stress management and boredom as barriers (27). This review did not aim to provide direct comparisons between vulnerable groups and the general population due to the heterogeneity of studies.

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3 Additionally, comparisons by gender were beyond the scope of this review, but should be  
4  
5 considered for further research, as socioeconomic disadvantage has differential effects on  
6  
7 males and females (19) and preliminary evidence suggests barriers to cessation may differ by  
8  
9 gender (27, 70).  
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11  
12 Nevertheless, the novel results of this review indicate that vulnerable smokers report a  
13  
14 number of additional barriers to cessation that operate within their social and community  
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16 networks; living conditions; and wider cultural and socioeconomic contexts. Social and  
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18 community barriers include: lack of support to quit from both peers and health and other  
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20 professionals; high prevalence and acceptability of smoking within vulnerable communities  
21  
22 and smoking as a social activity. Living conditions include: stressful factors; pro-smoking  
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24 living and working circumstances; lack of access to quit resources; social and geographical  
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26 isolation and boredom. Cultural norms and socioeconomic disadvantage also presented  
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28 barriers to quitting.  
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### 34 **Main barriers identified across all vulnerable groups**

#### 35 *Stress management*

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37 Stress management was a frequently reported individual level barrier. Smokers  
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39 typically demonstrate higher levels of stress and low mood than non-smokers and ex-smokers  
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41 (115-117). Smoking may provide a coping mechanism for individuals who are prone to  
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43 higher levels of stress (118-120) or smoking may act as a stressor due to neurobiological  
44  
45 processes or through the experience of withdrawal symptoms (120). Stressors associated with  
46  
47 vulnerable groups (for example unemployment, financial stress, and poverty) may compound  
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49 stress levels within vulnerable groups. Given that vulnerable smokers may be more likely to  
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51 report smoking in order to relieve stress (27) incorporating stress management techniques  
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53 into interventions targeted at vulnerable groups may help to increase cessation.  
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3 *Lack of support to quit from health professionals and other service providers*  
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5 At the social and community level, a lack of support to quit from health professionals  
6 and other service providers was identified. This reflects research that suggests smokers from  
7 low SEP are less likely to receive advice to quit from a healthcare provider than their more  
8 higher SEP counterparts (121), despite evidence demonstrating brief advice can increase the  
9 likelihood of successful quitting (122, 123). Both organisational and individual factors affect  
10 the provision of quit advice by health and other service providers. These include lack of time,  
11 confidence, knowledge and counselling skills (124). Efforts should be focussed on improving  
12 health professionals' ability to offer quit advice and may benefit from examining how best to  
13 ensure compliance to existing guidelines that provide clear recommendations on identifying  
14 individuals who are at higher risk of smoking and addressing the unique issues that these  
15 individuals face.  
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29 Tailoring interventions to the specific needs of vulnerable groups may be effective.  
30 Tailored interventions for behaviour change have been found to be effective compared to no  
31 intervention or dissemination of guidelines or educational materials alone [92]. Given that  
32 this review identified three common barriers across the six vulnerable groups include in this  
33 review, we argue that subsequent smoking cessation interventions in vulnerable groups  
34 should seek to address these factors. Programs should include specific modules on stress  
35 management techniques and how best to combat stress in vulnerable groups as well as  
36 educating smokers about how stress relief and relief from nicotine withdrawal symptoms can  
37 be confounded.  
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49 Smoking cessation interventions should be designed to maximise participation by  
50 vulnerable groups, addressing the key barriers around acceptability and access to  
51 interventions. Utilising existing services and organisations that are highly accessed by  
52 vulnerable groups and are a trusted source of help for vulnerable groups is also necessary.  
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3 There is accumulating evidence that social and community service organisations (SCSOs) are  
4 well placed to provide brief smoking cessation advice to highly vulnerable clients (125, 126).  
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### 7 *High prevalence and acceptability of smoking*

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9  
10 The high prevalence and social acceptability of smoking within vulnerable  
11 communities was frequently reported. Considerable measures have been taken to address the  
12 denormalisation of smoking in the general population through regulation and legislative  
13 changes such as restrictions in advertising, smoke-free environment policies and point of sale  
14 restriction (1, 127, 128). Participants who were homeless, experiencing mental illness and  
15 prisoners cited a lack of restrictions on smoking within their living environments (or lack of  
16 enforcement of existing policies) as a factor that reinforced their smoking. While there are  
17 challenges associated with their implementation, smoke free areas can be successfully  
18 implemented within mental health treatment centres and prisons (129-131) and there is  
19 potential to extend these restrictions to homeless shelters and public housing developments.  
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31  
32 Efforts to encourage the denormalisation of smoking in the environments of  
33 vulnerable communities require further exploration. Providing access to acceptable and  
34 effective behavioural and pharmacological supports should ensure that denormalisation does  
35 not result in compounding stigma and further isolating vulnerable groups (127, 132).  
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### 40 **Barriers specific to certain groups**

#### 41 *Indigenous groups*

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44  
45 Indigenous groups identified unique stressors linked to smoking including racism and  
46 historical factors; cultural practices including ceremonial use of tobacco and cultural values  
47 that promote sharing, kinship and reciprocity and the importance of smoking as a way to  
48 maintain cultural identity. Cultural values also had effects on the willingness of Indigenous  
49 participants to access smoking support services. Certain Indigenous groups may be less likely  
50 to receive advice to quit or engage with services designed to aid in cessation (133). However,  
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3 it is important to note that smoking cessation programs have been shown to be effective  
4  
5 within Indigenous groups (113, 134). Culturally appropriate interventions tailored to the  
6  
7 needs of Indigenous smokers should continue to be developed, implemented and evaluated.  
8  
9 These programs should acknowledge the cultural significance of tobacco use and the  
10  
11 important historical and social factors associated with Indigenous groups and smoking (135).

#### 14 *Prisoners*

15  
16 Prisoners identified unique stressors within their living conditions that contributed to  
17  
18 their smoking including social isolation, anxiety regarding legal matters and transfers to other  
19  
20 prisons. A recent multicomponent randomised controlled trial that included improving stress  
21  
22 management skills in prisoners found similar point prevalence abstinence rates as another  
23  
24 trial conducted with prisoners (9) and other community based studies (136, 137). Thus,  
25  
26 smoking cessation programs can be effective even in prison environments that are highly  
27  
28 conducive to smoking and should form a part of routine care within prison systems.  
29  
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#### 31 *People with a mental illness*

32  
33 Low motivation to quit smoking was only reported in studies involving smokers with  
34  
35 a mental illness. This contradicts research showing no difference in motivation to quit  
36  
37 between those with severe mental illness and the general population (138). A recent review  
38  
39 concluded there is some evidence to suggest that individuals diagnosed with a psychotic  
40  
41 disorder are slightly less motivated to quit than those diagnosed with depression (138).  
42  
43 Possible reasons for this include the symptoms associated with schizophrenia (including  
44  
45 amotivation), management of side effects of medications (including Parkinsonism), limited  
46  
47 support systems, low perceived vulnerability to smoking related disease, lack of alternate  
48  
49 coping mechanisms and poverty (138, 139). Information on the diagnoses of participants was  
50  
51 only reported in one of the studies reporting motivation as a barrier in this review (92) where  
52  
53 the majority of participants were diagnosed with a psychotic disorder. However, other studies  
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3 did not provide information on participants' diagnoses and further exploration is beyond the  
4  
5 scope of this review.  
6

7  
8 Symptom management also presented a significant barrier within studies concerning  
9  
10 people with a mental illness. There is evidence to suggest that biochemical processes between  
11  
12 nicotine and other substances in tobacco improve some symptoms of mental illness (139).  
13  
14 Additionally, smokers with a mental illness may be more likely to misattribute their  
15  
16 withdrawal symptoms as recurring mental illness symptoms. Further investigation and  
17  
18 education regarding cessation and symptom management with people with a mental illness is  
19  
20 warranted. Integrating smoking cessation care with mental health and addiction treatments  
21  
22 can be effective at promoting cessation rates in groups with mental illness (20, 30). However,  
23  
24 future studies need to investigate ways to maintain long term smoking cessation as well as  
25  
26 systems-level changes that may support smoking cessation in people with mental illness (131,  
27  
28 140).  
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### 31 32 **Barriers to smoking cessation in vulnerable groups: a model**

33  
34 Figure 2 visually demonstrates the broad range of barriers to cessation reported by vulnerable  
35  
36 groups, many of which exist outside of the realm of the individual. This model demonstrates  
37  
38 the interconnectedness of individual and lifestyle factors with the wider social and  
39  
40 community factors, living conditions and cultural, socioeconomic and environmental factors.  
41  
42 The two darker spheres holding social and community networks and individual and lifestyle  
43  
44 factors identify those factors that are potentially modifiable through short term health  
45  
46 behaviour change interventions. This model does not provide an exhaustive list of all of the  
47  
48 factors that prevent vulnerable individuals from smoking cessation. It does provide a  
49  
50 framework for understanding the perceived self-reported barriers to quitting smoking  
51  
52 identified in this review.  
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### Strengths and limitations

This synthesis of the literature provides evidence of the perceived barriers to smoking cessation by examining the methodological quality of studies and comparing between and within selected vulnerable groups. However, this review has some limitations. While the overall quality of the studies included in this review was acceptable, most qualitative studies failed to provide information regarding the trustworthiness of the research and most quantitative studies failed to provide information on the validity and reliability of the measures used to assess barriers. Of quantitative studies included, the majority used convenience samples. It is not generally feasible to target vulnerable and hard to reach populations using random population sampling procedures. This limits the generalizability and transferability of the included studies to wider vulnerable populations. Nevertheless, the agreement in findings between qualitative studies does suggest that these results are robust.

The nature of the studies included in this review means that no weight is given to the different barriers and the authors cannot provide comment on which, if any, barriers should be made a priority to target in smoking cessation interventions with vulnerable groups. Given limited resources and funds, addressing all barriers is rarely possible. Future research is needed to identify those barriers which are most important to address first and to prioritise resourcing and intervention development.

The results of this review were broadly categorised according to the SDHF, however these categories are not mutually exclusive and certain barriers were able to be included in multiple categories (for example stress and stressful factors could be categorised as either individual level barriers or barriers within the living conditions level). The reviewed studies do not directly clarify whether the nature of stress experienced in vulnerable groups is personal or contextual. Constructs such as coping and resilience (140, 141) have been hypothesised as mediators between stress and smoking in low socioeconomic groups (142).

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3 Similarly, as this review sought to provide a summary of vulnerable smokers'  
4 perceived self-reported barriers to cessation, other barriers which may be important  
5 determinants of quit attempts and success were not considered. Barriers such as the  
6 knowledge and attitudes of staff and health professionals and the capacity of services to offer  
7 smoking cessation programs, which have been identified within the literature (124), should  
8 also be considered when examining the challenges facing vulnerable groups.  
9

10  
11 This review was only able to identify four studies that examined the barriers to  
12 quitting smoking within prisoner (n=2 studies) and homeless (n=2) groups and one study  
13 focussing on at-risk youth. These results indicate more research is required with these groups  
14 to examine the barriers to smoking cessation. More studies investigating the barriers to  
15 cessation within these groups may lead to identification of additional common and unique  
16 barriers across vulnerable groups. Additionally, this review was limited to studies conducted  
17 within one of six vulnerable groups. Other groups that show high rates of smoking include  
18 lesbian, gay, bisexual and transgender groups (143); culturally and linguistically diverse  
19 groups (144); and rural and remote communities (145). The authors acknowledge the  
20 disparity in smoking prevalence in these groups, however their inclusion would have  
21 increased the breadth of the review to a level that would be too broad and complex to be  
22 useful. These groups may experience barriers to cessation different to those experienced by  
23 the groups included in this review. It should also be noted that individuals within the included  
24 groups often experience multiple forms of disadvantage for example people who are  
25 homeless are more likely to experience a mental illness (146) and Indigenous communities  
26 are more likely to be overrepresented in lower socioeconomic positions (3).  
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## 51 **Conclusions**

52  
53 These results support findings that vulnerable groups experience common barriers to  
54 smoking cessation, and also barriers which are unique to specific vulnerable groups. Stress  
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3 management, high prevalence and acceptability of smoking and lack of support to quit were  
4 identified as priority areas for cessation research, program implementation and policy change.  
5  
6 Many of the barriers identified within this review are modifiable through short term health  
7  
8 behaviour change strategies. For heterogeneous groups of vulnerable individuals, intervention  
9  
10 development should seek to address those barriers common to all vulnerable groups identified  
11  
12 in this review. For relatively homogenous groups of vulnerable individuals, interventions  
13  
14 should seek to address the unique barriers faced by those groups in addition to those barriers  
15  
16 identified as common to all vulnerable groups.  
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20  
21 These findings, coupled with lower success rates in quitting within vulnerable groups  
22 relative to the success rates in more advantaged groups (13, 147), suggest that interventions  
23  
24 with vulnerable groups need to address wider social, community and cultural factors as well  
25  
26 as individualised cessation support. Addressing the predictors of cessation found within the  
27  
28 general population such as nicotine dependence and enjoyment remain important for  
29  
30 vulnerable groups.  
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46  
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48  
49 completed quality assessment of the included papers. BB and LT completed narrative  
50  
51 synthesis. All authors have read and met the ICMJE criteria for authorship.  
52  
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# PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
<b>TITLE</b>			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3-4
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3-5
<b>METHODS</b>			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	5
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	6
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	5
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	See Table 1
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	6-7
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	7
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	6 -8 (see Table 2)
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	7
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	7
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., $I^2$ for each meta-analysis). <a href="http://bmjopen.bmj.com/site/about/guidelines.xhtml">http://bmjopen.bmj.com/site/about/guidelines.xhtml</a>	7-8



# PRISMA 2009 Checklist

Page 1 of 2

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	7
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	NA
<b>RESULTS</b>			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	8 (See Figure 1)
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	See supplementary files 1, 2 and 3)
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	9 (See supplementary files 4 and 5)
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	See supplementary files 1, 2 and 3)
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	See supplementary files 7 and 8 and tables 3 and 4)
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	9-10
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	NA
<b>DISCUSSION</b>			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	11-19





# PRISMA 2009 Checklist

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Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	16-17
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	11-19
<b>FUNDING</b>			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	1

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: [www.prisma-statement.org](http://www.prisma-statement.org).

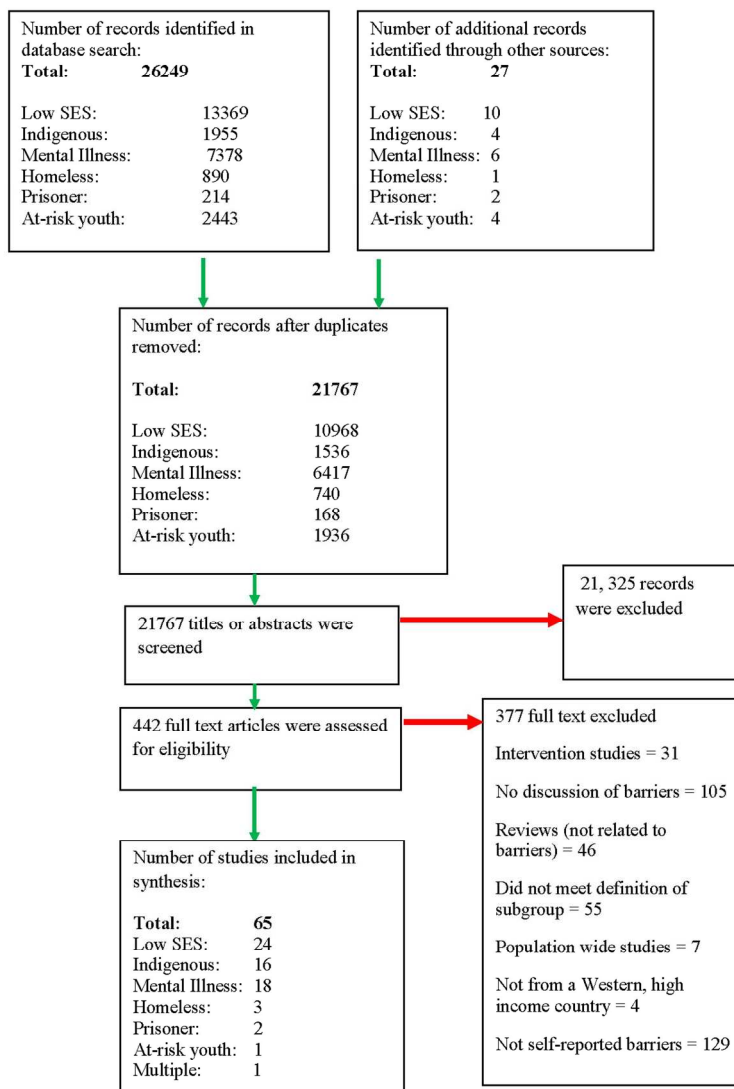
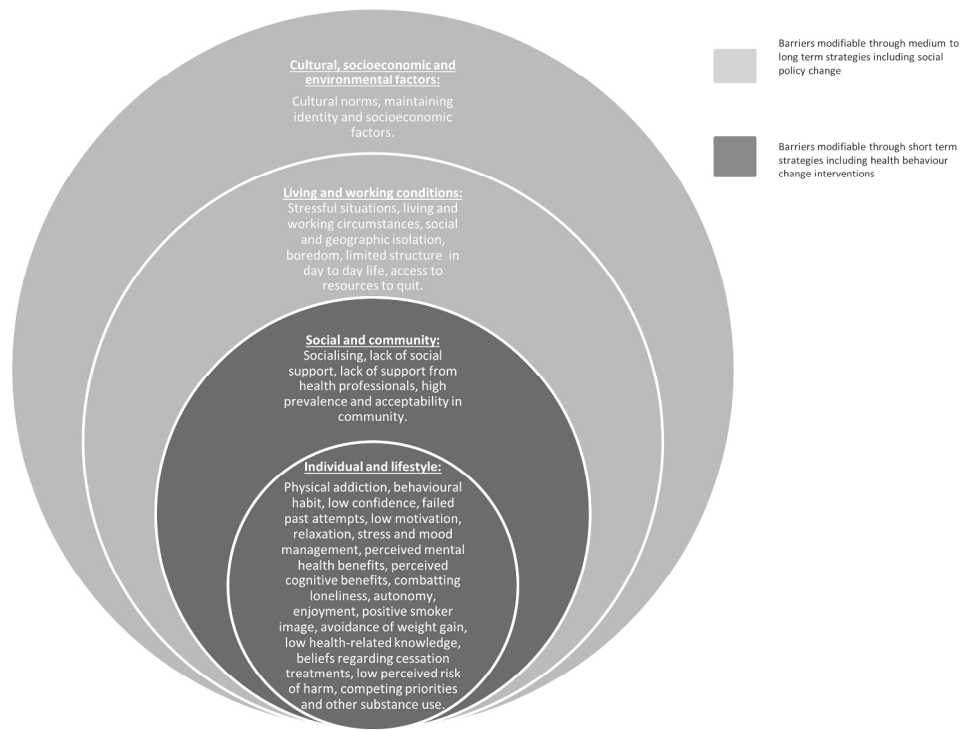


Figure 1. Database search results

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**Supplementary file 1: References of full text articles that were retrieved, reviewed and excluded for not meeting inclusion criteria. Articles could meet multiple criteria for exclusion (total n = 377).**

**Low socioeconomic status studies excluded (n = 111)**

*Intervention studies*

1. Maher JE, Rohde K, Dent CW, Stark MJ, Pizacani B, Boysun MJ, et al. Is a statewide tobacco quitline an appropriate service for specific populations? *Tobacco Control*. 2007;16 Suppl 1:i65-70.
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#### *Reviews (reviews conducted on smoking within the defined disadvantaged group but not reporting on perceived barriers to smoking cessation)*

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### **Homeless studies (n = 38)**

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*Not reporting the perceived self-reported barriers to smoking cessation (e.g. might report results of logistic regressions showing nicotine dependence associated with cessation success)*

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## Prisoner studies (n = 22)

### *Intervention studies*

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#### **At risk youth studies (n = 48)**

*Intervention studies*

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*No discussion of barriers*

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Supplementary file 2. Summaries of the included quantitative studies by disadvantaged group (n = 8).

Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
<b>Quantitative studies</b>							
<b>Low SES groups</b>							
Price 1994(60)  USA	Assess the perceptions of lung cancer and smoking in a socioeconomically disadvantaged sample.	Telephone interviews in Ohio, USA.	n = 500 49% female Age: mean = 58, SD = 18.2 Ethnicity: white (83%)	42%	Cross-sectional.	Pre-designed survey instrument based on the Health Belief Model – 45 items.  Barriers: 5 items. .79 reliability coefficient.	Habit: 82% Prevents boredom: 48% Helps to relax: 52% Addiction: 86% Many friends of smokers also smoke: 66%
Rosenthal et al 2013 (70)  USA	Identify the most endorse barriers and motivations to quitting an sociodemographic differences in the barriers to quitting report.	Six low income neighbourhoods in new haven, Connecticut.	n = 350 Ethnicity: 61% Black 20% Latino 12% White Education: 56% High school diploma/ GED or less	73%	Cross-sectional	Gender, race/ethnicity, educational attainment, age, smoking status. Barriers measure based on pre-existing survey (7 items).	<i>Intrapersonal barriers</i> I don't want to quit: 37.4% It is too difficult: 57.7% I don't know how: 24.9% I am afraid of gaining weight : 19.7% <i>Financial barrier</i> I can't afford the medication or nicotine replacement therapy products (such as the patch or gum): 30.9% <i>Support barrier</i> I don't have enough support: 25.7% <i>Social Influence barrier</i> Everyone I know uses tobacco: 33.1%

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Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
<b>People with a mental illness</b>							
Asher et al 2003 (101)  USA	Report the relative frequency of endorsement of the various barriers as a source of guidance for clinicians wanting to motivate alcoholic patients to quit smoking.	Urban inpatient state-subsidized substance abuse facility.	96 alcohol dependent smokers	73%	Cross sectional survey	11 item True/False Barriers to Quitting Smoking in Substance Abuse Treatment (BQS-SAT) questionnaire.	<p>If I quit smoking, I'll feel tense and irritable: 87%</p> <p>If I quit smoking, I would feel anxious: 78%</p> <p>When I don't smoke, I feel restless, and I can't concentrate: 56%</p> <p>If I quit smoking, my urges to smoke will be so strong, I won't be able to stand it: 48%</p> <p>I don't have the willpower to quit smoking: 47%</p> <p>I need smoking to lift me up when I'm feeling down: 42%</p> <p>Quitting smoking during substance abuse treatment would make it harder to stay sober: 41%</p> <p>If I quit smoking, I would gain weight: 40%</p> <p>Smoking gives me a lift when I'm feeling tired: 28%</p> <p>If I quit smoking, I won't be able to sleep: 23%</p> <p>If I quit smoking, my urges to drink or use drugs will be so strong I won't be able to stand it: 13%</p> <p>Negative affect: 32%</p> <p>Habit: 28%</p> <p>Seeing others smoke or peer pressure: 22%.</p> <p>Being addicted to more than one substance: 5% .</p>

Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
							Compulsion and mental urges: 3%
Carosella et al 1999 (88). USA.	Assess the barriers to and facilitators of quitting smoking in long term care inpatients.	Long term psychiatric care units.	n = 92 98% male Age: mean = 47.6 Diagnoses: substance abuse (60.9%); schizophrenia (55.4%); affective disorders (38%).	77.7%	Interviews.	Smoking status and history, demographic information, reasons for not quitting smoking.	Enjoyment: 47.2% Habit : 36.1% Boredom: 12.5% Anxiety, nerves: 11.1% Smoking does me good (e.g., relaxing, stimulating, stifles pain): 9.7% Availability of cigarettes: 6.9% Never had a reason/need to stop: 6.9% I have emotional problems: 6.9% Other stressors: 5.6% Concentrating on other addictions: 4.2% Smoking helps your appetite/digestion: 4.2% I need some help to stop: 4.2% Sociability of smoking: 2.7% Don't know: 2.7%
Orleans et al 1993 USA	Aimed to inform the design of nicotine addiction treatments tailored for patients with chemical dependency	Inpatient substance use treatment centre	n = 78 78% male mean age = 36.6 (SD = 10.1) 78%: alcohol 9% drug problems including cocaine, heroin, marijuana and prescription medication 13% alcohol and other drug problems	Not reported	Cross-sectional	Sociodemographic, smoking related characteristics, 9 item barriers survey.	Missing or craving cigarettes: 68.4% Being nervous, anxious or tense: 53.3% Being around other smokers: 43.3% Losing a pleasure: 39.4% Coping with stress: 38.7% Being afraid you'll fail: 27% Gaining weight: 24.3% Maintaining sobriety: 9.9% Increased alcohol/drug use: 2.9%

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Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
<b>Homeless groups</b>							
Arnsten et al 2004 (106).  USA.	Evaluate predictors of readiness to quit and interest in cessation counselling in a homeless sample	Homeless services at urban hospital	n = 98 Age: mean = 44 years. Median number of years homeless = 2.75 Predominantly white, unmarried, unemployed or disabled, males (proportions not provided).	Not reported.	Cross-sectional.	Smoking behaviour, reasons for quitting, readiness to quit, history of homelessness, alcohol and other drug history, psychiatric history, medical history, quit attempts, social support.	21% believe the people closest to them would be very helpful in quitting smoking.  29% endorsed the item "People closest to you want you to quit very much".
Connor et al. 2002 (107).  USA.	Ascertain the prevalence of smoking, smoking cessation and how various factors associated with homelessness impact on readiness to quit smoking.	Emergency homeless services, residential drug treatment services, drop in centres for homeless in the city of Pittsburgh (9 homeless services).	n = 230 Male = 81% Age: mean = 41.8, SD = 10.7. Ethnicity: 54% African Americans; 40% white; 3% Hispanic; 3% other. Homelessness: 46% living in transitional housing, 31% in shelter; street 20%; 3% living	>97%	Cross-sectional.	Demographics, substance use history, housing status, Fagerstrom Test of Nicotine Dependence, Stage of Change, self-efficacy, barriers to cessation (as 5 potential barriers: cravings, other smokers, weight gain, habit, stress/mood), social support.	Cravings: 50% Stress or mood swings: 44% Being around others who smoke: 42% Not receiving any support during quit attempt: 26% Fear of weight gain: 20% No specific treatments (pharmacological) could help them quit smoking: 31.6%

Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
			with family/friends.				
<b>Prisoner groups</b>							
Dickens et al 2005 (109).  UK.	To explore psychiatric inpatients views of smoking cessation options.	Forensic wards of large independent psychiatric hospital.	n = 34 57.8% male Age: mean = 36.0, SD = 9.7 Ethnicity: not reported. 88.9% legal status of detained.	44.1%	Cross-sectional.	Demographic details, mental health act status, smoking characteristics, views on smoking cessation and rules on smoking in the hospital.	Other patients smoking: 79.4% The “smoky atmosphere” would make it too difficult to stop smoking: 58.8% Seeing members of staff smoking: 55.9% Not enough encouragement from staff: 29.4% Not enough information about giving up smoking: 26.5% “It’s just too difficult” to give up smoking: 73.5% Several smokers commented that boredom was a factor in continuing to smoke.



Supplementary file 3. Summaries of the included qualitative studies by disadvantaged group (n = 54).

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
<b>Low SES</b>							
Ahijevych 2003(49).  USA	Investigate the beliefs and attitudes towards tobacco of current and former Appalachian smokers.	Non metropolitan Appalachian county.	n = 14 64% female Age: mean = 33.7, SD = 8.7 Ethnicity: 100% white, non-Hispanic High school education or less: 40.5%	Focus groups	Roles of tobacco in life and community, factors helped or hindered previous quit attempts, community perceptions of tobacco use, and strategies for successful smoking cessation programs.	Content analysis.	Addiction to nicotine. Cravings. Smoking provides a rush. Alleviating boredom. Peers and family members who reinforced smoking. Routine/ritual of smoking. Social activities. Associated behaviours: alcohol, caffeine, Weight gain.
Bancroft et al 2003 (50).  UK	Investigate barriers to quitting and accessing treatment in two disadvantaged areas of Scotland	Two disadvantaged geographical areas in Scotland	n = 100 50% female Age: not reported Ethnicity: not reported. Housing tenure: 76% council housing	Interviews	Smoking and quitting; future smoking, intentions to quit; habit and addiction.	Thematic analysis.  NUDIST.	Addictive behaviour. Habit. Lack of alternatives. Smoking is the only pleasurable activity to do. Reward. Deal with stress. Alleviate boredom. Alleviate stress from financial pressures.
Beech et al 2003 (51).  USA	Investigate the cultural and social factors associated with African American low income smokers.	High schools, colleges, housing developments and trade schools.	n = 118 45% female Age: between 18 and 35 years old. Ethnicity: 100% African American.	Focus groups.	Smoking initiation, smoking maintenance and cessation.	Content analysis.	Equal numbers of participants reporting smoking managed their stress compared to those who reported smoking contributed to their stress. Anxiety management. Daily hassles and life events. Energy and alertness. Taking a break. Boredom. Managing certain medical conditions. High levels of accessibility in communities. Willpower and prayer were more highly valued as cessation methods than use of pharmacology or counselling. High prevalence of smoking within social networks and communities: family, peers and the wider community.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
Bryant et al 2010 (52).  AUS	Sought to describe the smoking behaviours and attitudes of disadvantaged Australian smokers attending SCSOs, including past experiences of quitting, preferences for quit support, and perceived barriers to quitting.	Five community welfare organisations located in New South Wales, Australia.	n = 32 69% female Age: all participants aged over 16 years.	Focus groups.	Current smoking behaviour, motivation to quit, past quit attempts, barriers to quitting and preferences for cessation support.	Thematic analysis.  Nvivo version 8.	Stress relief. Calming, relaxing. Alleviating boredom. Coping mechanism. A best friend. Low self-efficacy – doubting ability to quit. Viewing quitting as impossible. Feeling ready and having willpower were integral to success. Low knowledge of quit support. Unsure how to correctly use NRT, belief NRT was ineffective, learning from others about the efficacy of NRT. Knowledge of other pharmacotherapies was low. Telephone quit lines usage also low. Weight gain. Limited perceived support from GPs and other health professionals. High cost of NRT. Repeated social and environmental exposure to smoking. Norm within the community. High prevalence of friends and family were smokers.
Copeland et al 2003 (53).  UK	To further examine the roles that smoking plays in the lives of the study group	General practice in a deprived area of Edinburgh.	n = 51 100% female	Open ended survey.	Open-ended questions regarding smoking characteristics, feelings and experiences regarding smoking, as well as measures of anxiety, depression and stress.	Content and category analysis.	Lack of willpower. Triggering event such as starting new job, marital problems, bereavement. Nothing else to help cope. Weight gain. Social smoking. Contact with other smokers.
Dunn et al 1998 (54)	Explore attitudes and perceptions of smoking during pregnancy.	Neighbourhood centres and clinics in an urban area. .	n = 57. 100% female Age: 77% aged 25 or younger	Focus groups.	Health concerns, sources of advice regarding pregnancy,	Content analysis.	Internal factors: Stress. Boredom. Addiction to nicotine.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
USA	barriers to quitting, second hand smoke exposure, and preference for cessation programs among women of low SES.		Ethnicity: African Americans 24; Native Americans 23; white 10. High school education or less: 68%		characteristics of useful programs, health effects of smoking, quitting, passive smoking exposure and attempts to avoid exposure.		Withdrawal symptoms. Strong cravings. Weight gain. Belief that smoking was not dangerous enough to warrant quitting. Long term effects which participants do not consider. External factors: Being around friends and family members who smoked, including those who were not supportive of quit attempt. Lack of control over exposure to smoke and influence of others.
Franco et al 2011 (55).  AUS	Increase knowledge on the barriers to smoking cessation and the acceptability of addressing smoking in SCSOs	SCSO Illawarra region, NSW Australia	n = 53 83% female	Focus groups.	Smoking and health, smoking cessation, support preferences, acceptability of addressing smoking in SCSO setting.	Notes based analysis.	Ritual. Structures the day. Reward after daily chores. Something to do. Stress management. Concerns about the effectiveness of NRT. Cost of NRT and other treatments too high. Need more support to quit.
Lacey et al 1993 (93).  USA.	Increase understanding of the role of smoking and the challenges faced when attempting to quit.	Residents of public housing in Chicago, USA.	n = 6 – 8 participants per focus group (8 focus groups in total). 100% female. Ethnicity: 100% African American. 42% not completed high school 100% had average yearly income < \$13,000 USD.	Focus groups.	Day to day activities, life stressors, community and living conditions,	Content analysis.	Social isolation. Lack of support. Racially and economically segregated areas. Fear limited outings to necessary activities. Limited social networks outside of immediate family. Stress management. Substandard, unclean housing. Few opportunities for recreation or employment. Violence and crime. Substance use. Sense of control. One of few attainable pleasures. Legal and harmless for relatively small investment. Perceived alternatives are drugs, alcohol abuse or losing control. Low perceived harm. Fatalistic beliefs/rationalisations/self-exempting beliefs.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							Other physical illness and disease that took priority – COPD, heart disease, kidney disease. Belief that smoking is normal. Belief that most adults smoke. High prevalence in social network. Hard to avoid smoking. Belief that the only way to quit smoking was to do it cold turkey. Low knowledge regarding how to quit and methods/help available. Absence of specific constructive assistance. Being self-reliant preferred over being dependent on help from someone. Smoking cessation support not seen as effective.
Moffatt et al 2004 (57).  AUS	Aim to gain better understanding of the barriers to quitting in blue collar workers	Two antenatal clinics in Brisbane, QLD servicing predominantly low SES participants.	n = 25 100% male Age: between 20 and 53 years old	Semi-structured interviews.	Questions developed from literature review and pilot study.	Constant comparative method – conceptual analysis.  NUDIST.	Lack of control over smoking. Long positive association with cigarettes – cool, sophisticated. Lack of support to quit. Withdrawal - negative feelings such as anger/irritability. Peer pressure. Relaxation. Social contexts. Habit – daily routine.
Nichter et al 2007 (58).  USA	To uncover the factors that facilitate smoking during pregnancy and those that facilitate quitting; investigate the use of harm reduction practices used by pregnant women and the effects of social networks on smoking and	Large urban city.	n = 53 100% female Age: mean = 25, ranged from 18 – 43 years. Ethnicity: Anglo-American 62%; Mexican American 21%; African American 11%, multiethnic 6%.	Semi-structured interviews	Interview questions developed from pilot material with key informants.	ATLAS ti 5.0 software.	Low social support. Living in more than one residence during pregnancy. Not being head of household/able to make decisions regarding smoking policy and house. No stable employment. No family/peer support. Smoking helped women manage anger, frustration, control and autonomy. Coping strategy. History of depression. Smoking seen as lesser evil compared to alcohol or other drugs. Less clear about direct outcomes for baby. Rationalisations “defence mechanisms/downplaying

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
	cessation.		High school education or less: 74% Unemployed: 60%				medical risks/prioritising less stress over smoking damage. No helpful guidance from health professionals.
Paul et al 2010 (29).  AUS	Examine the experience of the social context of smoking and whether this experience differed by sociodemographic characteristics	Local community facilities in high and low SEIFA suburbs in Sydney, Aus.	n = 4 – 8 participants per group (8 groups in total).	Focus groups.	Smoking behaviour and history; current and future smoking environments; environmental factors related to smoking.	Thematic analysis.	Nostalgia for smoking that was once cool and sophisticated. Weight control. Not noticing any decrease in the smoking prevalence in their community over time. Social/peer groups predominantly made up of smokers. Social activity. High perceived acceptability of smoking. Work environment being more conducive to smoking. Lack of smoking restriction at workplace. Acceptability of smoking in open air environments in low SEP neighbourhoods.
Peretti-Watel et al 2009 (59).  FRA	To increase understanding of low socioeconomic status and smoking through investigating smoking motives.	South –east of France – social work centres and participants homes.	n = 31	In depth semi-structured interviews	Brief topic guide mentioned but not presented.	Based on principles of grounded theory.	Addiction. Pleasure and happiness. Satisfied essential needs. Relieves stress. Fills void in everyday life – nothing else to do. Only leisure activity they can afford. Combat loneliness. Manage other addictions. Stressful life events such as break up of relationship or loss of job.
Roddy et al 2006 (61).  UK	Determine level of awareness of stop smoking services in deprived area and identify specific barriers and motivators to improve access.	Most deprived districts in Greater Nottingham.	n = 39	Focus groups.	Smoking behaviour, cessation experiences, knowledge and perceptions of existing services.	NUD*IST 6 software.	Lack of knowledge of services. Misconceptions about attitudes within services. Being judged by health professionals. Feeling they would need intensive support to quit. NRT was expensive and ineffective (many contraindications). Bupropion was negatively associated with adverse events reported in media. Stress. Rationalisations. Failed quit attempts in the past.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
Stead et al 2001 (62).  UK	To investigate how smoking is fostered in areas that experience multiple forms of deprivation	Housing estates within 8 communities in Glasgow having DEPCAT scores of 7 (highest scores of deprivation).	n = 53 Sample selected according to age, gender and smoking status.	Focus groups	Smoking characteristics, smoking history, leisure activities, work and unemployment, cessation history, experiences of the local community.	Thematic analysis.	<p>Coping mechanism – dealing with stress directly related to living in a deprived community.</p> <p>Stressors include: limited income, caring for children, poor local infrastructure, high levels of crime and drug use, limited opportunities for rest and respite from community.</p> <p>High accessibility of cigarettes (legal, illegal and informal sources).</p> <p>Socialising.</p> <p>Main pleasure (cheap and easily accessible).</p> <p>Smoking alleviated anxiety and nervousness.</p> <p>Coping with frustration and demotivation of widespread unemployment.</p> <p>Normative influence of being surrounded by smoking.</p> <p>Accepted smoking as inevitable and preferable to other drug use.</p> <p>Deprived communities experienced feeling cut off from other communities (that were more advantaged) thus weren't exposed to other norms.</p> <p>Belonging and identity.</p> <p>Smoking compensates exclusion and binds communities together.</p> <p>Deepening financial hardship.</p> <p>Fears of not being able to cope without cigarettes.</p> <p>Limited awareness of help available.</p> <p>Lack of trust regarding efficacy of medications and cynicism about health professionals financially exploiting smokers.</p> <p>Little support from community.</p>
Stewart et al 1996 (63).  CAN	Examine the factors associated with barriers and supports to smoking cessation in disadvantaged women.	Atlantic region, Canada.	n = 386 100% female	Semi-structured interviews	Interview guides were used but not described.	Content analysis.	<p>Linked with poverty, isolation, and caregiving.</p> <p>Coping mechanism.</p> <p>Associated fear, anger and anxiety.</p> <p>Reward.</p> <p>Pleasure.</p> <p>Addiction.</p> <p>Short and long term goals – struggle for 'survival'; therefore long term benefits of quitting had little impact.</p>

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							Not using traditional cessation support services – negative reactions from those that had. Personal determination and willpower were integral to success. Cessation aids viewed as ineffective or harmful. Believed that poverty, abuse and alcoholism more damaging to society – antagonistic towards tobacco control measures.
Stewart et al 1996 (64).  CAN	Identify social-psychological factors associated with smoking cessation among disadvantaged women.	Atlantic region of Canada  Research carried out in sites accessible to participants.	n = 126 100% female	Focus groups and interviews	Reasons for smoking and continuing to smoke, impact of anti-smoking media messages, opinions and experiences regarding smoking cessation, strategies, services and support that would help stop or reduce smoking.	Content analysis.	Weight gain. Low expectation of support from health professionals and health agencies – lack of confidence in GPs and nurses. Rarely contacted national/peak bodies like Lung association or Cancer Society. Geographical isolation, lack of awareness of role and scepticism. Lack of social support – partners, immediate family, friends and acquaintances.
Stewart et al 2011 (65).  Canada.	Identify the needs and preference of female smokers from low socioeconomic background ds.	Three large urban cities in Canada.	n = 64 100% female Age: mean = 37 High school education or less: 68%	Focus groups.	Smoking characteristics, cessation attempts and experiences, preferences for support to quit and resources.	Thematic analysis. QSR N6.	Limited employment opportunities. Reliance on welfare and benefit payments. Low socioeconomic status – poverty, low education, unemployment and the stress caused by these factors. Lack of affordable childcare. Management of emotions and stress – anger, upset, anxiety. Coping mechanism. One of few pleasures available. Relaxation. Reward. Boredom, lack of access to recreational activities. Smoking linked to feelings of loneliness and hopelessness regarding poverty. Smoking as habit – linked to other behaviours – drinking coffee etc.
Stillman et	Increase knowledge of	Employment and training and	n = 28	Focus groups	Social norms and smoking, how	Atlas.ti v 3. software.	Smoking seen as normal, very common and not problematic.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
al 2007 (66). USA.	environmental factors that facilitate or prevent young AA from smoking cessation.	education programs – inner city.			tobacco was sourced, socialisation and smoking and smoking restrictions and advertising.		Faced few restrictions regarding smoking. “Loosies” (single cigarettes) were easily accessible.
Tod 2003 (67). UK	Explore the reasons why pregnant women do not quit and are less likely to access smoking cessation services.	South Yorkshire Coalfields (SYC) – deprived area with high prevalence of smoking. Pregnant women known to maternity services within this area. Approached by midwives.	n = 11 100% female Age: ranged from 19 to 38 years old.	Semi-structured interviews via telephone.	Smoking history; obstetric history; factors influencing access to smoking cessation services; knowledge and beliefs; preferences for future services.	Framework analysis.	Addiction. Only cutting down for baby; plan to resume after birth. Enjoyment. Belief that willpower is essential for success. Cutting down but missing that extra strength to finally quit. Pressures and stresses of life. Lack of willpower linked to self-fulfilling prophecy; relapse was viewed as inevitable. Smoking during pregnancy safest, and healthiest, and preferred course of action. Housework; childcare, financial anxieties and relationships. Protecting mental health. Familiar and necessary tool to cope. Smoking controlling appetite for weight concerns and also to control hunger. Food was sacrificed in order to afford cigarettes. Partners’ smoking affected motivation to quit. Being around people who were smoking. Timing of smoking cessation advice coinciding with tests for babies’ health. Judgemental attitudes from service providers. Lack of childcare options. Minimizing risk of smoking. Participants own experience discredited health advice.
Tsourtos et al 2008 (68).	Understand the barriers to quitting smoking, especially in relation to stress, in order to	The most disadvantaged are (local government area) in metropolitan Adelaide.	n = 29 48% female.	Focus groups (2) and in depth telephone interviews	Barriers to quitting smoking (focus on stress), reasons for quitting, stress and quit attempts.	Not reported.	Stressful environments including: financial stress, child rearing, family issues, employment disadvantage, increased morbidity and mortality within community (including smoking related illness), and difficulties in the workplace. NRT too expensive to maintain.



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Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
AUS	understand the differences in cessation rates between the groups.			(11).			Financial stress. Stress that arises from childrearing and women having a smoke to get 'time out'. Partner smoking. Increased morbidity and mortality in community, including due to smoking related illness. Habit of smoking; ritualised behaviour. Lack of control. Addiction. Cravings. Boredom. Smoking to alleviate stress. Some respondents held the belief that it was not tobacco/cigarettes themselves that provided stress relief, but the chance to relax.
White & Baird 2013 (71)  UK	Explore perspectives of former miners in disadvantaged former coal mining communities on smoking and cessation	Former coal mining towns and villages in Bolsover district, North Derbyshire.	n = 16 All participants white, male and British. Aged between 45 and 68. All former miners.	Interviews	Perspectives on smoking, stopping smoking and stop smoking services.	Content analysis	Attributing health issues to coal dust exposure rather than smoking. Comparing the risks of coal mining to the risks of smoking. Participants reported being able to stop smoking at will with minimal difficulty and need for support, despite all previous attempts being unsuccessful.
Wiltshire et al 2003 (69).  UK	Examine participants' views on quitting smoking and smoking and how that may be affected by their lives.	Two health centres in two areas of deprivation in Scotland.	n = 100 50% male Housing: 76% council/housing association	Semi-structured interviews.	Daily consumption patterns, reasons for smoking, wider community environment, experiences of quitting and changes in smoking status, future quit intentions.	Thematic analysis.  NUD*ST.	Stress Management. Coping mechanism. Living, socializing and working with other smokers. Smoking 'deeply embedded' in their lives. Smoking was normalized and routine contact with other smokers made quitting even more difficult. Only way to quit is remove yourself completely from your environment. Addiction to nicotine. Cravings. Withdrawal symptoms and their impact on family/friends. Stressful life circumstances. Belief that NRT not up to task of replacing cigarettes.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							<p>Cost of NRT.</p> <p>Word of mouth regarding bad/unsuccessful attempts with NRT.</p> <p>Boredom and times of inactivity.</p> <p>Characteristics of living in a disadvantaged area - violence, crime.</p> <p>Willpower was essential in order to be able to quit smoking.</p>
<b>Indigenous studies</b>							
Burgess et al 2007 (72).  USA	Explore the cultural factors associated with experience and perceptions regarding tobacco use, cessation and dependence treatments.	Minneapolis/St Paul metropolitan area.	n = 26 American Indian participants 30% female	Focus groups.	Smoking, smoking cessation and tobacco dependence treatments.	Content analysis.	<p>Smoking as highly acceptable and widespread within community.</p> <p>Traditional ceremonial use of tobacco.</p> <p>Addiction.</p> <p>Cravings.</p> <p>Withdrawal symptoms.</p> <p>Stressful circumstances.</p> <p>Suspicion towards pharmacotherapy.</p> <p>Scepticism about benefits of pharmacotherapy and negative views of medical profession in general.</p> <p>For women, smoking was seen as way to care for self in face of multiple responsibilities.</p> <p>Women used to manage stress, negative emotions, deal with life demands including children, work and family.</p> <p>Weight control.</p>
Choi et al 2006 (73).  USA.	Assess smoking behaviour, cessation, traditional tobacco use and attitudes towards a smoking cessation program in a sample of American Indian participants.	Health Centre based within an Indian Nations University.	n = 41 American Indian participants 63% female Age: mean = 41 (SD = 12.3) ranged from 21-67 63% some college education	Focus groups.	1. Tobacco use (including ceremonial and non-ceremonial) 2. Smoking and quitting. 3. Smoking cessation program "Second Wind".	Themes identified.	<p>Traditional or ceremonial use of tobacco.</p> <p>Use of tobacco important to maintain an 'Indian' identity.</p> <p>Relapse in social situations.</p> <p>Normative behaviour.</p> <p>Highly prevalent: everyone smokes.</p> <p>Stressful situations.</p> <p>Belief that quitting smoking "takes personal motivation and a person will not be able to quit unless he or she has determination and self-control and really wants to quit".</p> <p>Most had tried NRT – cost was a barrier to getting more NRT.</p> <p>Nightmares were attributed to bupropion and NRT.</p>

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Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
Dawson et al 2012 (74).  AUS	Increase understanding of barriers within Aboriginal Health Worker workforce.	Metropolitan, rural and remote health services.	n = 34 Aboriginal Australian participants 44% female	Semi structured interviews and focus groups.	Factors related to relapse, not wanting to quit, challenges in quitting.	Content analysis.  NVivo 8 software.	<p>Largest barriers to NRT use were cost and accessibility.</p> <p>Stress, grief and loss – due to health concerns, excessive work demands, family issues, inequity in workplace, institutionalised racism and pervasiveness of social disadvantage.</p> <p>Chronic disease, burden of illness, premature deaths in community.</p> <p>Fear – of failure, feeling sick (withdrawal symptoms), weight gain, and losing a coping strategy.</p> <p>Smoking not being a problem – rationalizations as well as just the belief that it’s not a problem.</p> <p>Quitting not the greatest priority in their lives.</p> <p>Lack of knowledge about quit methods – unsure about the benefits of certain pharmacological methods.</p> <p>Lack of access to relevant quit smoking aids – culturally appropriate, cost.</p> <p>Nicotine addiction – biological addiction was rarely referenced.</p> <p>Social pressure to smoke – living and socialising with smokers.</p> <p>Situations where alcohol was consumed or with high number of other smokers.</p> <p>Quitting means exclusion from this network.</p> <p>Offence at not participating – maintaining connectedness.</p> <p>Lack of support/role models – few friends and family/community members who had quit successfully, intolerance of mood changes around when quitting.</p> <p>Pressure to quit from non-smokers – ‘picked on’, line between encouragement and beleaguering.</p> <p>Smoking common in the workplace – acceptable, organisational culture enabled smoking, create bond between clients and workers, challenge sin enforcing smoke free policies.</p> <p>Smoking was pervasive and acceptable within community, inability to avoid smoking – high prevalence impacted by historical role of tobacco, culturally and colonial influence.</p>

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							Smoking behaviours weren't questioned. Lack of policies to promote smoke free environments, short term funding of tobacco programs, inadequate investment for organisations.
Dawson et al 2012 (75).  AUS	Explore the perceptions of Aboriginal Health Workers in relation to individual and contextual factors relating to smoking	Metropolitan, rural and remote health services.	n = 34 Aboriginal Australian participants 44% male	Semi-structured interviews	Current smoking and smoking history; reasons for continuing to smoke; typical weekday and weekend when smoking occurred; quit history.	Content analysis.  NVivo 8.	Stress: relationships and family issues; financial problems; community issues and work challenges. Poor physical and mental health e.g. anxiety, depression, chronic pain. Associative behaviours: getting in the car; drinking alcohol or caffeinated drinks, watching television, going outside. Habit (tactile) – having something in their hands. Boredom – 'time on one's hand'. Awareness of 'nicotine addiction' only reported by 2 participants. Chronic disease burden – heart disease, emphysema, diabetes, cancer. Grief and loss – reduced life expectancy. Caring for family – health support and advice; financial obligations and housing. Breakdown in family dynamics: single parent families; isolation; stolen generation. Socialisation and connection: social lubricant; belonging. Debriefing opportunity – after stressor. Co-worker, friend, family, client encouragement to smoke. Active and passive encouragement. Demanding work, including out of hours. Job insecurity and financial insecurity. Institutionalised racism. Dispossession of land; collective grief and loss; prevalent racism; social disadvantage; poverty, homelessness; unemployment, chronic disease, drug abuse; gambling, violence, housing issues; imprisonment, lack of education.
Dennis et al 2012 (76).	Qualitatively explore tobacco, alcohol and other	Rural reservation in Midwestern state of USA.	n = 49 American Indian	Focus groups.	Not reported.	Thematic analysis.	Lenient attitudes towards smoking. Generational use (parents and grandparents to children). Accessibility of cigarettes (easy access through friends)

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
USA	drug use in a sample of American Indians living on a rural reservation.		participants 61% female Age: 18 – 54 (57.2%)				and family; cheaper to purchase on reservation). Smoking linked with other behaviours (gambling, alcohol use). High prevalence of smoking in community.
Fernandez et al 2008 (77).  New Zealand	Investigate the perception of smoking cessation in Maori women	One local Maori organisation	n = 5 Maori participants 100% female	Focus group.	Perceptions of smoking and quitting, triggers for smoking, quit smoking policies and initiatives from the government, and mass media campaigns and marketing.	Thematic analysis.	Observing health professionals smoking. Limited support from other smokers (feeling negatively judged by other smokers when trying to quit). Maori women felt more comfortable accessing health care from a Maori provider rather than a mainstream service. All participants stated they would never ring the National Quitline (trust, disclosing information and allowing someone to assist them who is not known were the reasons cited for this). Asking a stranger for help deemed unacceptable.
Fu et al 2007 (78).  USA	Increase understanding of the experiences of smoking cessation in 4 different ethnic groups: American Indians, Hmong, Vietnamese and African Americans.	Seven community organizations in Minneapolis/St Paul.	n = 26 American Indian participants (6 focus groups). 44.4% female.	Focus groups conducted separately for each ethnic group.	Discussion guide: smoking, smoking cessation, and help with quitting.	Methods for analysing qualitative data.  Atlas.ti, v 5.0	Counselling was associated with an unequal power relationship between a white counsellor who was going to shame the participants about their smoking behaviour. Rationalisations: “it's not like I'm dying today”. Cynicism about the medical profession, including beliefs that doctors are untrustworthy, driven by monetary gain, and hypocritical. Negative experiences with particular doctors including doctors being confrontational, blaming and impersonal. Most had low levels of knowledge about the functional benefits of pharmacotherapy. Participants did not understand that pharmacotherapy could be used to help them with cravings and withdrawal symptoms. Concerns about side effects (e.g., overestimation of risks of side effects compared to risks of smoking). Cost of medications and lack of accessibility perceived as major barriers to their use. Word of mouth was a powerful influence on decisions to use or not use pharmacotherapy. American Indian smokers, in particular, associated pills

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							with Western medicine, and viewed them with scepticism.
Gould et al, 2013  AUS	Explore issues for pregnant ATSI women in terms of smoking and smoking in the household	Regional NSW, Australia Aboriginal maternal and infant health service.	18 Aboriginal and/or Torres Strait Islander peoples (83% female) Mean age: 30.3 (SD = 11.70) Age range: 17-53 years	5 focus groups	Experiences of and attitudes towards smoking during pregnancy and cessation	Content analysis	Smoking usual in families. Several smokers in one household, difficult to avoid being around smoke. Smoking provides sense of social connection. Isolation if attempting to quit. Shared activity, and an anticipated part of mutual exchange (socialising). Low levels of support from family and friends to quit. Pressure to quit from family and friends. Pregnancy specific barriers: offset diabetes or keep baby small. Babies and individuals turned out "healthy". Not receiving understanding from doctors (judgemental). Stress and anxious situations. Cravings and withdrawal symptoms. Meal times and work breaks (habit). Yarning and socialising. Sporting events, watching TV, boredom, TV ads, drinking alcohol and smelling tobacco smoke. Smoking cannabis. Being around other smokers, after birth. Quitting "too hard". Negative views of NRT due to adverse effects, preference to quit unaided, didn't understand how NRT could help. Hopelessness after trying many methods.
Gryczynski et al 2010 (81).  USA	Inform the development of a culturally appropriate smoking cessation program for American Indians by looking at their	Local community-based American Indian health service organization	n = 35 American Indian participants. 51.4% female Age: 45.7% between ages of 41 – 50.	Focus groups.	Cultural and social factors associated with smoking; smoking cessation experiences; attitudes towards cessation aids and programs.	Variant of the thematic framework approach.	Values of self-reliance and pride that are intertwined with American Indian identity. Enjoyment of smoking. Addiction to nicotine (deeply entrenched learned behaviour). Linked to very heavy smoking behaviours (waking up during the night to smoke). Association between other behaviours and smoking (coffee, alcohol, sex, other drug use).

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	preference for smoking cessation and associated programs.						Smoking as a form of stress relief (given the highly stressful nature of low socioeconomic status). Ubiquity of cigarette use in life, friends and family. While physicians were seen as a good source of smoking cessation help, it was noted that many AI do not have private health insurance. Also physicians were not seen for non-emergency care. Cost, incorrect use, ineffectiveness and negative side effects prevented use of NRT. High number of family friends also smokers.
Hodge et al 2006 (82). USA.	Investigate tobacco use, attitudes, knowledge and practices in American Indian sample.	Reservation sites.	n = 51 American Indian participants 56.9% female.	Focus groups.	History of tobacco use in tribal context, knowledge and attitudes regarding cigarette smoking.	Krueger's (1998) focus group analysis methodology.	Lenient attitudes towards smoking including: acceptance of smoking as a social norm; belief in autonomy and people's right to experiment with tobacco; and low numbers of household smoking bans. Cultural phenomenon of independence and non-interference. Reluctance to tell others what to do, or to move away from someone who begins to smoke. Low harm value assigned to smoking – in light of other day to day issues faced. Participants were aware of the risks but downplayed the seriousness of those risks. Enjoyment of smoking. Maintaining the ritual of smoking. Brand loyalty (several brands of tobacco that have AI names e.g. Seneca, Mohawk etc.). Ceremonial use of tobacco was an important cultural custom. Learning how to use tobacco in ceremonies as a young person was important. The loyalty to the tribe overrides tobacco's ill effects.
Johnston et al 2008 (83). AUS	To gain a better understanding of the reasons why Indigenous Australians smoke.	Health professional and community members from a coastal community in Northern	n = 25 Indigenous Australian community members 52% female	Semi-structured interviews.	Flexible interview schedule developed through literature review and discussions with service providers – details not given.	Thematic analysis.  Atlas-ti (Version 5).	Social pressure to smoke – both implicit and explicit. Smoking is everywhere – smokers live or socialise with smokers. Tobacco as a normative substance in this community. Communal and collective activity. Tobacco used for reciprocal social exchange; ceremony and sharing.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
		Territory.					<p>Sharing was a very important part of Indigenous culture as a way to influence behaviour, relationships and social control.</p> <p>Refusing to share cigarettes may be seen as a betrayal of the kinship they share and as an offensive act.</p> <p>Not sharing cigarettes may lead to isolation, as the sharing of cigarettes contributes to a sense of belonging and social identity.</p> <p>Some participants were derided for their decision to quit (but others were supported).</p> <p>Some state that the only way they could quit smoking is to distance themselves from family and friends, an entirely unfeasible proposition.</p> <p>Sharing a cigarette gives opportunity for a 'yarn' – enjoyment.</p> <p>Other positive effects including feeling more alert, happy, good, more able to complete tasks, relief, and allowing a sense of control.</p> <p>Habit, addiction and hooked – nicotine dependence.</p> <p>Overcrowding in homes.</p> <p>Stress was most often mentioned in conjunction with smoking relapse, and more often by women than men.</p> <p>An outlet, a stress management, and to manage grief.</p>
Kaholokula et al, 2007 (84). USA	Identify supports for and barriers to smoking cessation for this ethnic population., and to inform the development of a smoking cessation program for this population.	Northern rural community.	n = 52 Native Hawaiian participants. 48% male Age: mean = 51.8 (SD = 12.4)	Focus groups.	Smoking cessation advice and experience; barriers and facilitators to cessation; preferences in smoking cessation programs; differences between males and females.  Ex-smokers were also asked about aids to quitting and preferences.	Thematic analysis.	<p>Social factors: presence of friends, family and co-workers who were smokers, nagging to quit smoking.</p> <p>Psychological factors: stress, negative emotions, lack of 'willpower', thinking about the need to smoke.</p> <p>Physical factors: physical experience on nicotine addiction and withdrawal, weight gain.</p> <p>Behavioural : habitual nature of smoking, smoking linked to other behaviours (alcohol, reading the paper).</p>



Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
Passey et al 2011 (85).  AUS	Explore the factors contributing to smoking initiation and the social context within which smoking behaviour occurs.	Coastal, river region of NSW – Aboriginal Maternal and Infant Health Strategy antenatal teams.	n = 36 Aboriginal Australian participants. 100% female Age (of women interview n = 22): mean = 24.9, ranged from 17 to 41. Education: Less than ten years of education 68%	3 Focus groups and 22 semi-structured interviews.	Topic areas – social and environmental factors that maintained or encouraged smoking and smoking initiation.	Content analysis.	Colonisation and introduction of tobacco: Disruption to Aboriginal society including dispossession of traditional lands, removal of children, loss of traditional lifestyle and introduction of new substances. The traditional and ceremonial limits that used to apply to smoking are no longer applicable. Social networks and community norms: Aboriginal community remains largely isolated. Many aboriginal people have limited interaction with non-smokers. High prevalence of smoking which allows the normalisation of smoking to occur. Limited interaction with non-smokers also limits exposure to changing attitude towards smoking. Disadvantaged lives: High unemployment, associated poverty, affordable housing, overcrowding, relationship difficulties, loss of family members through death/removal of children, grief and loss, abuse, perceived racism and negative stereotypes –smoking helped manage and navigate their way through these factors. Maintaining relationships and sharing: Relationships may be given higher priority over individual needs. Reciprocity – obligations to share time and resources including cigarettes – to give and to accept those given to you. Sharing and having a yarn was an important social activity.
Patten et al, 2009 (86).  USA	Preferences and acceptability of different tobacco cessation strategies and the barriers and unmet needs of Alaskan Native	3 remote villages on the coast of western Alaska (populations ranging from 750 to 1,000) Most residents	n = 49 Alaskan Native participants 61% female Age: mean = 14.6 (SD = 1.6).	Focus groups.	Motives for quitting, barriers to quitting, role of family members and others in quitting, preference for tobacco cessation methods, preference	Content analysis.	Cravings. Use as a stress/anger management. Use of traditional forms of tobacco. Manages mood. Relieves boredom. High prevalence and acceptance of tobacco use in villages Lack of encouragement by peers and other community

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
	adolescents who want to quit smoking.	live subsistence lifestyles.			for study recruitment and retention methods.		members to stop. Lack of effective resources to help quit
Wood et al 2008 (87).  AUS	The aim of this study was to explore the experience of tobacco smoking and cessation within a pregnant Aboriginal and Torres Strait Islander sample.	Perth (State capital), Western Australia.	n = 40 Aboriginal women and 10 Aboriginal Health Workers Age: ranged from 14 to 50 years, with most less than 30 years.	Focus groups and in-depth interviews.	A semi-structured discussion guide with open-ended questions was developed in consultation with the reference group.	Thematic analysis.  QSR N6 NUDIST.	Smoking as an accepted behaviour. Stress management. Low priority in terms of health. Stress. Difficult life circumstances. Relaxation, chance to catch up with others. Pregnancy acted as a barrier as it increased boredom/stress. High levels of smoking amongst friends, family and wider community. To quit you would have to avoid family and friends. Knowledge about the specific risks to the foetus was low. References to babies being healthy despite smoking during pregnancy.
<b>Mental illness</b>							
Clancy et al, 2013 (102)  AUS	Explore experiences of smokers with self-reported depression	Large cluster randomized control study	n = 16	Semi-structured interviews.	Semi-structured interview Attitude towards smoking, relationship between smoking and mental health, quitting process.	Thematic analysis.  nVivo 9.	Low mood. Sense of hopelessness. Lack of control over one's life. Lack of meaningful activities.
Davis et al 2010 (89).  USA	Investigate how people with severe mental illness perceive risks from smoking/risks posed by smoking.	Large urban psychosocial rehabilitation agency.	n = 31 54% female Ethnicity: 54.8% Caucasian; 35% African American	Semi-structured interviews.	General health and healthy lifestyle questions, smoking status, smoking history, quit attempts and barriers to and facilitators of cessation.	Inductive data analysis.  Atlas-ti.	Enjoyment of smoking – pleasurable activity/coping mechanism. Maintain good mental health. Stress management. Worried that without stress management of smoking: relapse, rehospitalisation, suicidal thoughts or suicide were possible. Allowed people to manage other addictions. Not experiencing symptoms of smoking related illness currently. Smoking certain brands, types or flavours of cigarettes

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							because they are less likely to cause cancer. Extreme trauma and negative life experiences act as a protective factor for smoking related illness – “I’ve made it through life this far, I don’t think I’ll get sick from smoking too” belief. Examples of friends and family who are/were smokers and have never been ill. Examples of friends/family who are not smokers who are still unhealthy. Friends and family socialising and smoking at the same time.
Howard et al 2012 (91).  UK	Investigate the specific barriers to smoking cessation faced by pregnant smokers.	Maternity and perinatal psychiatry services.	n = 27 100% female Age: mean = 29 (SD = 1.1), ranged from 17 – 41. Ethnicity: 13 White; 4 Black African; 6 Black Caribbean and 4 Mixed/Other.	Semi-structured interviews.	Not reported.	Framework analysis.	Smoking used as a way of losing weight (for participants diagnosed with SMI and eating disorder). Maintain good mental health. Only occurring during manic/depressive cycles. Fear that attempts to quit would increase symptoms of mental illness. Prioritisation of mental health over smoking cessation by health professionals. Social environment – family, partner and social network of peers – high prevalence of smoking and lack of support. Accessibility of cigarettes. Psychological and physical addiction to cigarettes. Quit smoking services and resources: judgemental, lack of proactive follow up, lack of continuity of care, prioritisation of mental health over smoking.
Kerr et al 2013 (92).  UK	To determine the principle barriers and facilitators to smoking cessation for people with mental health problems	Recruited from three Health Boards in Scotland, UK.	n = 27 participants with mental health problems 41% male Age: median = 49, ranged from 30 to 60. Diagnosis: 41% Schizophrenia/	Semi-structured interviews.	Smoking history; positive and negative aspects of smoking perceived barriers and facilitators to smoking cessation; times when smoke more or less; impact of mental health problem on smoking	Framework analysis.  NVivo 8.	Socialising and habits of family and friends Smoking as a calming agent; dealing with general stressors and anxiety linked to mental health problems. Stopping smoking would mean loss of coping mechanism/support. Maintain good mental health. Deterioration in mental health increases need for smoking. Stimulant effect helped overcome side effects from medications, in particular antipsychotics. Habit and addiction (small numbers).

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
			delusional disorder; 30% Affective disorder; 22% Schizoaffective disorder; 4% neurotic disorder and 4% neurotic-affective disorder.		and cessation		Enjoyment. Lacking motivation and confidence to give up. Lack of support from health professionals – uncommon to raise issue of smoking, offer encouragement support to stop. Some reports of professionals actively discouraging cessation attempts.
Lawn et al 2002 (93).	Describe the experience of mental health clients as they relate to smoking behaviour, the relationship of smoking behaviour to the course of their mental illness and its management and to their attempts to quit smoking.	Mental health services.	n = 24 50% female Age: ranged from 25 – 63 years old. Diagnosis: 6 chronic paranoid schizophrenia; 6 major depressive disorder; 6 bipolar affective disorder; and 6 borderline personality disorder.	Semi-structured interviews.	Cigarette use; quit history, use of NRT and other aids; meanings of smoking, attempts to quit, relationship between smoking and mental illness, experiences in hospital.	Thematic analysis.	Cigarettes as a symbol of control, fulfilling needs of: safety, reassurance, predictability, autonomy. Allowed greater freedom to take part in social activity. Promote more control – over symptoms, mood, and emotions. Cigarettes used by staff as tools to reward, punish or control behaviour. Smoking is the most effective means of avoiding relapse. Smoking as freedom, rebellion and protest. Little hope for recovery. An alternative way out to taking direct action – suicide? Enjoyment. Compensation for losses in other areas of life. Smoking to relieve physical symptoms of mental illness – while many of their symptoms could be described as withdrawal/cravings form cigarette, most attributed these to symptoms of relapse to MI. Tools for decision making, clear thoughts, compartmentalise time, avoidance. Relieve stress, anxiety, to relax. Aid sleep, motivation, stabilise mood swings. Identity as a smoker – companionship of cigarettes. Families, friends, peers all smokers. Service providers and family condoning or colluding with their smoking. Few participants thought they could be successful.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							Few participants had tried NRT, citing cost as the main barrier. Excluded from mainstream quit programmes. Misunderstood and judged, double dose of stigma from smoking policy changes.
Lucksted et al 2000 (94). USA.	Explore pros and cons of smoking and quitting smoking in psychosocial rehabilitation clients.	One urban and one suburban psychosocial rehabilitation groups.	n = 40 70% male Demographic characteristics (including diagnosis) were not assessed.	Focus groups.	Semi-structured discussion guide: Positive and negative things about quitting, barriers and facilitators to quitting, other issues.	Thematic analysis.	The positive anti-depressive, anti-anxiety, calming, and cognitive-focusing effects of tobacco. Symptom management (symptoms of mental illness and also side effects from medications). Boredom. Enjoyment Others beliefs – friends and family encouraging smoking as it was perceived to be one of few positive things in the individual's life. Ignoring health effects and health campaigns or accepting the risks. Lack of motivation. Smoking offered sense of identity and feeling included.
Morris et al 2009 (95). USA.	To explore the perceptions of clients and staff on how best to quit smoking.	Consumers of mental health services in both rural and urban areas of Colorado.	n = 62	Focus groups.	Preferences for smoking cessation, views on current resources available, health professional practices that aid in cessation, factors that prevent cessation.	Content analysis. NVivo 7.	Lack of resources to aid in cessation. Seeing health professionals smoking had a negative impact on participants' motivation to quit. Earning smoking as a behavioural reward. Negative expectations of the ability of people with a mental illness to quit smoking. Little knowledge of the negative health effects of cigarette smoking. Smoking to manage stress/anxiety/tension, psychiatric symptoms, and to enhance cognitive ability. Boredom. Smoking viewed as a social event, as a way of connecting with others. Peer smoking.
Nawaz et al 2012 (96).	To explore the smoking and quitting beliefs, attitudes and behaviours amongst smokers	Large psychiatric rehabilitation agency in Chicago, Illinois.	n = 36 Ethnicity: 17 African American; 12 Latino; 7 White.	Focus groups.	Not reported.	Qualitative analysis. Atlas.ti.5.7.1.	Tobacco use promoted, normalized and reinforced in mental health treatment community. Smoking ameliorated illness symptoms and memories of traumatic experiences. Manage daily stress that might otherwise aggravate mental illness symptoms.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
USA	with severe mental illness from three different race/ethnicity groups.		Diagnosis: 14.3 – 33.3% Schizophrenia/ Schizo-affective; 14.3 – 23.5% bipolar depression; 35.3 – 50% Major depression; 11.8 – 28.6% not specified.				Smoking norm amongst peers in treatment settings – highly prevalent. Use of cigarettes to manage/reward behaviour. Policies that prohibited smoking in only parts of treatment centres/halfway houses etc. Difficulty of quitting Lack of access to treatment – directly linked to poor health insurance and poverty. Financial cost of NRT and other pharmacotherapies.
Prochaska et al 2013 (103) USA	Aimed to obtain formative data to guide development of a tobacco cessation smoking program for youth with co-occurring mental health disorders	Outpatient mental health settings in the san Francisco bay area.	n = 14 43% female. Between ages of 16 – 23.	Semi-structured interviews.	Semi-structured interviews: reasons for smoking, perceived relationship between tobacco use and mental health issues, perceptions of smoking and preferences for program characteristics.	Content analysis. ATLAS.ti	Failure to enforce no smoking ban in the home Parental smoking Peers who smoke being a negative influence Difficulty maintaining relationships if quit smoking Stress Affect Other substances Addiction Media images
Ratschen et al 2010 (105) UK	To explore patients' experience, smoking behaviour and symptoms of nicotine withdrawal in the	Two acute mental health wards and one ten bed intensive care unit.	n = 15 60% male Mean age: 42.3 (ranged from 27 – 61). Mental illness diagnoses: Schizophrenia,	Semi-structured interviews.	Current smoking behaviour, their individual experience, knowledge, beliefs, and feelings related to smoking, quitting smoking,	Framework analysis.	Dealing with stress. Dealing with boredom. Habit. Enjoyment. Anxiety. Peer pressure. NRT use: Disliked the taste of nicotine gum, reported allergic

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Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
	context of a comprehensive smokefree policy on mental health acute wards.		schizotypal disorders (n = 5); mood and affective disorders (n = 7); neurotic, stress related and somatoform disorders (n = 1); organic disorder (n = 1).		the smoke-free policy and the environment of the wards; the support offered to them on the wards; and their potential interest in further support.		skin reactions to patches, and, for one participant, a fear of NRT. Negative reactions to taking additional medication on top of that for their mental illness
Snyder et al 2008 (97).  USA.	Identify multi-level factors that impact on smoking cessation with people with mental illness.	Two psychiatric rehabilitation centres within the mid-west of the USA. One dual diagnosis, one offering rehabilitation services for predominantly African American people with mental illness.	n = 25 75% male Aged between 24 and 55. Diagnoses not reported.	Focus groups.	Views and perspectives on smoking and cessation, factors that acted as motivators for smoking, factors that motivated cessation.	Iterative analysis process.  QSR NUDI*ST N4.	Low confidence in quitting. Desire to smoke was stronger than desire to quit. NRT seen as ineffective leading to feelings of hopelessness. Sense of autonomy over behaviour; participants felt that making the choice to smoke was empowering. Conversely, a sense of having no control over smoking due to addiction was also a barrier. Smoking as a central part of life. Coping mechanism for stress, anxiety, depression, boredom and loneliness. Cigarettes were an affordable luxury. Being able to purchase cigarettes was a source of self-esteem. Belief that if they quit, they would have nothing else enjoyable to do. Beliefs around the health effects of smoking: Participants reported health benefits from smoking and minimised health risks. Non-smokers are able to refrain from smoking because they are not disadvantaged. Belief that non-smokers don't have as much fun. Feeling judged or nagged by non-smokers. Smoking offering opportunity for connection and social interaction.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							Boredom; days left relatively unstructured so smoking filled in the time.
Solway et al, 2011 (98). USA.	Explore the perceptions of people with mental illness on smoking and smoking cessation.	Outpatient mental health services	n = 26 38% female Mean age: 62 (ranged from 41 – 82). Nearly all participants had been diagnosed with severe mental illness.	Focus groups.	Semi-structured interview protocol.	Constructivist grounded theory.	Perceived benefits of smoking outweigh the negative health risks. Enjoyment. Relaxation. Experience cravings when feeling anxious or upset or in the company of other smokers. Sense of control over emotions. Feeling extremely daunted about the quit process and withdrawal symptoms in general. Cost and accessibility of NRT. Lack of willpower, motivation and the right frame of mind. Smoking provides an identity and also acts as a source of connectedness over the sense of exclusion/stigma of having mental illness. Freedom, exercise their right to choose and maintain independence. Smoking as a 'friend'. Symptom management. Continued smoking eliminates withdrawal symptoms. Other's expectations of their ability to quit smoking. Feeling that smoking and medications to treat mental illness are related. Smoking to relieve side effects of medication. Weight gain.
Tsourtos et al 2008 (99). AUS	Explore why non-smokers appear to be resilient to smoking in a highly acceptable and prevalent group.	General practice and a range of mental health services	n = 34 58% female All had diagnoses of depression.	Semi-structured interviews.	Smoking and participants' social environment throughout the lifecourse.	Components of Grounded Theory were used with an analytic framework.  NVivo 8.	Smoking to deal with stress: Stressors included: boredom; physical injury; death of a loved one; stressful occupation; relationship breakdown; one or more medically diagnosed disorders. Coping mechanism. Relaxation. Comfort. Strength. Quitting smoking would exacerbate stress. Depression and anxiety made quitting more difficult.



Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
<b>Homeless</b>							
Okuyemi et al 2006 (108).  USA.	Examine the views of homeless people on smoking practices, knowledge and barriers to and interest in quitting.	Homeless service facilities	n = 62 68% response rate 70% male Ethnicity: 58% black; 37% white and 5% other.  Age: mean = 41.5 (SD = 9.3). Education: 73% high school educated or lower.	Focus groups.	Smoking history; quitting experiences; smoking cessation aids (NRT and other medications); preferences for smoking cessation treatment.	Principles outlined by Morgan and Krueger.  Atlas-ti v 4.1 used for coding.	Low self-efficacy. Limited access to care (cost of cessation aids). Service providers offer limited support to quit. Competing needs e.g. food, shelter. Uncertainty associated with being homeless. Limited structure and routine – keeping busy to avoid boredom. Smoking as a socially acceptable behaviour in homeless settings. Few restrictions in homeless services. Fear that quitting smoking may result in changes in emotion/stress levels that may impact negatively on other areas of life. Concerns about using NRT and cost, taste, proper usage and side effects, interactions with other medications and effect on other health conditions. Concern about becoming addicted to NRT.
<b>Prisoners</b>							
Richmond et al 2009 (110).  AUS.	Investigate tobacco and its role in prisons.	One maximum security prison and one community justice restorative centre.	n = 40 (9 prisoners and 31 ex-prisoners). 30% female Age: ranged from mid 20s to late 40s. Ethnicity: 4 Aboriginal Australian participants	Focus groups.	Role of tobacco in prisons, reasons for smoking initiation, smoking cessation, methods to quit.	Content analysis.	Poor knowledge of cessation strategies. Some had not heard of bupropion, would not attend a doctor for assistance and would not attend quit smoking programs once in the community. Smoking as a normal practice in prison. Cigarettes as a substitute for money. Boredom, stress, anxiety regarding legal matters, being locked up for large portions of the day and social isolation. Cigarettes/smoking used as a reward. Transfer to another wing or prison. Bullying, missing family, isolation,
<b>At risk youth</b>							
Lewis et al 2013(111)	Aims to contribute to the existing literature	Communities in North East of England –	n = 52 58% female	Participant observation.	NA	Thematic analysis.	Surrounded by other smokers makes it too hard to quit. A lot of family and friends smoke Helps with stress – conflicting messages – some

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
UK	on smoking and young people and to clarify how factors related to young people and smoking play out in disadvantaged communities.	deindustrialisation – former coal mining village.	Aged between 11 to 18 years.				participants felt it did and did not relieve stress. For fun and enjoyment. Accessibility and availability: tab (cigarette) houses – private dwellings where people can buy cigarettes- always sell to underage people. Buying a packet from the tab houses and then selling at school. Mixed messages regarding smoking: people in authority not discouraging or addressing smoking (e.g. teachers, police force).
<b>Multiple groups</b>							
Garner et al 2013 (112)  UK  UK	Explore homeless smokers' views, attitudes, experiences and knowledge with regard to smoking and quitting in an urban UK setting.	One drug harm reduction and sexual health service commissioned by the NHS in Nottingham city centre.	n = 15 73% male Aged between 18 to 53 years; mean = 33.	Semi-structured interviews.	Demographics, smoking history, nicotine dependence, quitting related behaviours, experiences and attitudes.	Framework analysis.	Low confidence. High prevalence of peer smoking behaviour. Exposure to a social environment where smoking was the norm. Homeless service staff providing cigarettes. Use of cigarettes as a reward for carrying out small jobs around the service. Use of other substances including alcohol and other drugs. Stress management within already stressful life circumstances. Lack of encouragement or active discouragement by health professionals to quit.

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Supplementary file 4. Summaries of the included mixed methods studies by disadvantaged group (n = 3).

Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Qualitative method and type of analysis	Quantitative results (barrier and prevalence)	Qualitative data (barriers identified)
<b>Indigenous studies</b>									
Glover, 2005 (79). NZ.	Increase the understanding of smoking in Maori populations and best ways to affect smoking cessation	Not reported.	n = 130 self-identified Maori participants. 78% female. Age: mean = 35 (ranged from 16 – 62).	Not reported.	Pre and post interviews after a quit attempt (both open and close ended questions).	Smoking history, Smoking behaviour, Quit history, Fagerstrom NDT, Experience of relapse, Reasons for smoking, Motivation to quit, Self-efficacy, Stage of Change, Methods of quitting, Quit abstinence – not biochemically verified.	Semi-structured interviews General inductive approach. QSR NUD*IST Release V4.0.	Habit: 73% Normal to smoke: 11.5% Coping with stress: 48% Coping with emotions: 23% Addiction: 39% Socialising/drinking: 34% Bored: 29% Enjoyment: 25% Time out/reward: 17%	Relapse was also related to poor self-esteem and a tendency to attribute blame to themselves. Living with other smokers. Family (Whanau) directly or indirectly supporting relapse. Socialising. Others smoking.

Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Qualitative method and type of analysis	Quantitative results (barrier and prevalence)	Qualitative data (barriers identified)
<b>Mental illness studies</b>									
Goldberg et al 1996 (90). CAN	Identify what clients identify as barriers and facilitators to cessation.	Community based psychiatric rehabilitation program (mid-sized urban Canadian).	n = 105 68% male Age: mean = 35 (ranged from 20 to 58 years). Diagnoses not reported.	93%	Telephone and face to face interviews.	Reasons for smoking, why it is hard to quit, beliefs about support required to change smoking behaviour.	Focus groups. Type of analysis not specified.	Addiction: 53% Difficulty resisting cravings: 33% Enjoyment: 20% Relieving symptoms: 20% Habit: 19% Boredom: 17% Most or all friends are smokers: 12.5% Low cost of cigarettes: 8% to smoke, lack of support to quit. Smoking as a social activity.	Afraid of giving up old friend. Withdrawal symptoms. Enhanced mood. Cheap thrill. Coping strategy when stressed. Something to do. Apathy and daily drudgery associated with psychiatric disability. Peer pressure to smoke. Lack of support from peers to quit. Smoking as a social activity. Receiving cigarettes from family and friends.
Van Dongen et al 1999 (100). USA	Examine the experiences of persons with persistent mental illness and smoking.	Outpatient clinic, Midwest, USA.	n = 36 75% male Age: mean ranged from 45 to 49. Diagnosis: Schizophrenia (70% - 90%); schizoaffective	Not reported	Cross-sectional survey.	Not reported.	Interviews. Content analysis.	Habit and routine: 58% Socialization: 58% Relaxation: 42% Addiction to nicotine: 33%	Smoking provided structure and activity. Something to do. Way to deal with stress.

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Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Qualitative method and type of analysis	Quantitative results (barrier and prevalence)	Qualitative data (barriers identified)
			tive and mood disorders were the other diagnoses present.						

## Supplementary file 5. Overview of study characteristics

### Study characteristics

Approximately half (52%) of the studies had been published from 2009 onwards. Apart from three studies (86, 103, 111), all participants were adults aged 18 years and over. Studies were carried out in the USA (n=29) (49, 51, 54, 56, 60, 66, 70, 72, 73, 76, 78, 81, 82, 84, 86, 88, 89, 94-98, 100, 101, 103, 104, 106-108); Australia (n=15) (29, 52, 55, 57, 68, 74, 75, 80, 83, 85, 87, 93, 99, 102, 110); the United Kingdom (n=13) (50, 53, 61, 62, 67, 69, 71, 91, 92, 105, 109, 111, 112); Canada (n=5), New Zealand (n=2) (77, 79) and France (n=1) (59). Qualitative (n=54) (29, 49-59, 61-69, 71-78, 80-87, 89, 91-99, 102, 103, 105, 108, 110-112); quantitative (n=8) (26, 60, 70, 88, 101, 106, 107, 109) and mixed method studies (n=3) (79, 90, 100) were included. Of the qualitative studies, 26 used focus group methods (29, 49, 51, 52, 54-56, 61, 62, 65, 66, 72, 73, 76-78, 80-82, 84, 86, 94, 96, 97, 108, 110); 19 used interviews (50, 53, 57-59, 67, 69, 71, 75, 83, 89, 91-93, 99, 102, 103, 105, 112) and eight used a combination of interviews and focus groups (63, 64, 68, 74, 85, 87, 95, 98). One qualitative paper used participant observation methods (111). All eight quantitative studies utilised cross-sectional survey methods (26, 60, 70, 88, 101, 106, 107, 109). Two mixed methods studies used both cross-sectional surveys and interview ((79, 100) and one mixed methods study used cross-sectional surveys and focus groups (90). Twelve studies included only female participants (53, 54, 56, 58, 63-65, 67, 76, 85, 87, 91), five of which were carried out with pregnant women (54, 58, 67, 87, 91). Two studies were carried out with men only; partners of women who were pregnant (57) and disadvantaged former miners (71).

### Quality assessment of qualitative studies

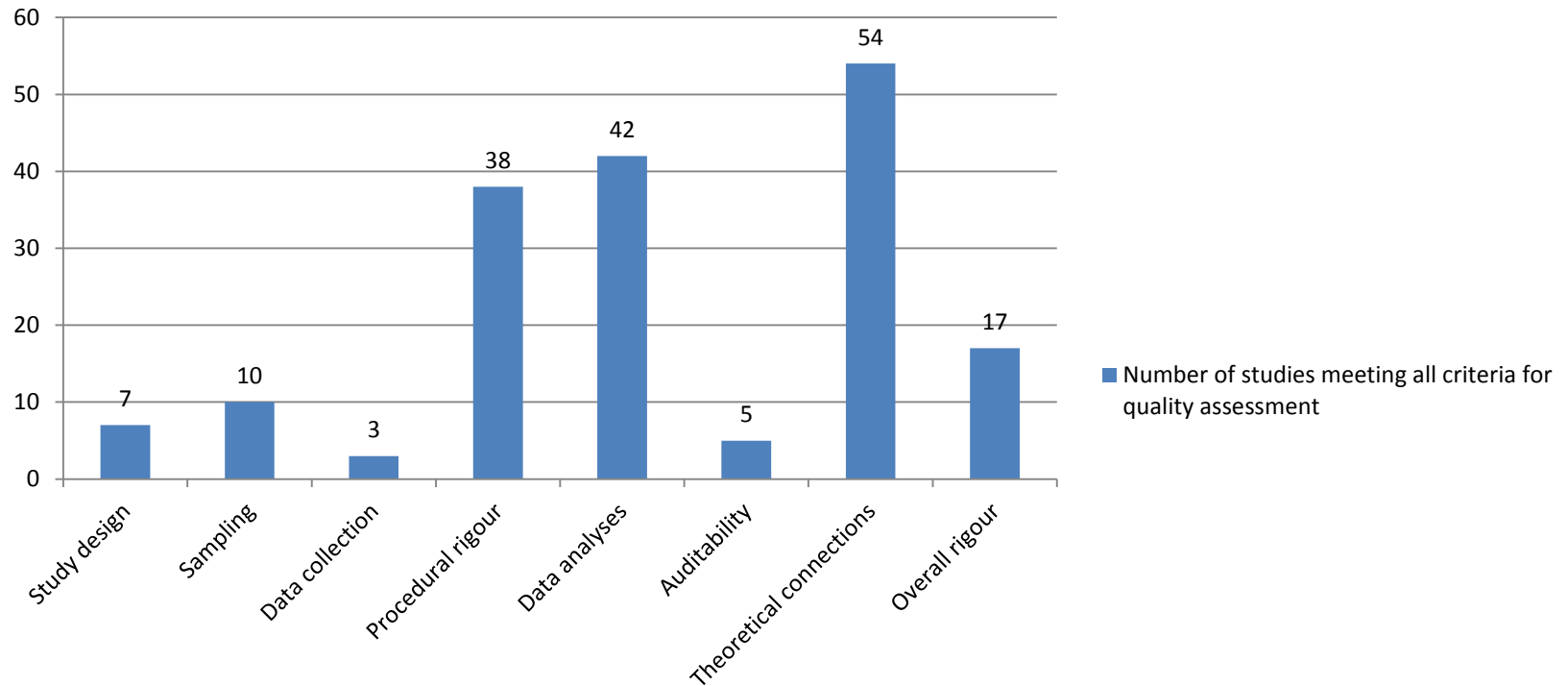
This figure includes assessment of the qualitative components of the mixed methods studies. The majority of studies did not explicitly state their study design (n = 42); of those that did, most used Grounded Theory (57, 59, 61, 93, 98, 99). Most studies provided adequate descriptions of the study sites; participants; data collection methods and analysis techniques. Only a small number of studies (n = 11) (51, 54, 58, 75, 76, 78, 83, 84, 96, 111, 112) addressed the role of the relationship between participants and the researcher and fewer still identified potential assumptions and biases of the researcher (n = 5) (51, 54, 61, 83, 98). Studies generally performed poorly when assessed on four components of trustworthiness, with only 17 studies meeting all four criteria (credibility; transferability; dependability and confirmability) (49, 52, 56, 58, 65, 67, 71, 73, 74, 77, 78, 80, 82, 83, 85, 86, 93). It should be

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3 noted that none of the mixed methods studies explicitly described their methodology as  
4 mixed methods nor did they report integrating the qualitative and quantitative findings in a  
5 systematic way.  
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### 8 **Quality assessment of quantitative studies**

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10 The results of the quality assessment of quantitative studies are provided in  
11 Supplementary file 6. This table also provides assessment of the quantitative components of  
12 included mixed methods studies. Sample sizes in the quantitative studies ranged from 36 to  
13 500 participants. Response rates ranged from 42% to over 97% (four studies did not provide  
14 response rates) (79, 100, 104, 106). All but one study (90) clearly stated eligibility criteria.  
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16 The majority of studies adequately described the research aims (60, 70, 79, 88, 90, 101, 104,  
17 106, 107); source of participants(60, 88, 90, 100, 106, 107) and addressed potential sources of  
18 bias within their analysis (60, 88, 107, 109). All studies stated their outcome *a priori* and no  
19 conflicts of interest were identified. Eight studies used convenience sampling (88, 90, 100,  
20 101, 104, 106, 107, 109). The validity and reliability of survey measures used to assess  
21 barriers to cessation were reported in one study (60). Three studies employed techniques such  
22 as pilot testing and input from key stakeholders in developing the tools used (60, 70, 109).  
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## Number of studies meeting all criteria for quality assessment



Supplementary figure 6. Quality of included qualitative studies and qualitative components of mixed methods studies (n = 57)



## Supplementary file 7. Results of the quality assessment of quantitative studies and quantitative components of mixed methods studies

Study author and year	Aims	Selection methods			Was the measurement of variables appropriate?			Control of bias			Was the use of statistics appropriate?		Conflict of interest
		Aims clearly stated?	Eligibility criteria stated?	Source of participants described?	Selection method?	Validity of measures?	Reliability of measures?	Other method used?	Potential sources of bias?	Methods to deal with bias?	Response rate (%)?	Sample size?	
Price et al 1994 (60)	✓	✓	✓	Random sampling	✓	✓	✓	✓	✗	42	500	✓	✓
Rosenthal et al 2013 (70)	✓	✗	✓	Random sampling	✗	✗	✓	✓	✗	73	350	✓	✓
Dickens et al 2005 (109)	✗	✓	✓	Convenience sample	✗	✗	✓	✓	✗	44.1	45	✓	✓
Connor et al 2002 (107)	✓	✓	✓	Convenience sample	✗	✗	✗	✓	✓	>97	236	✓	✓
Asher et al 2003 (101)	✓	✓	✓	Convenience sample	✗	✗	✗	✗	✗	73	96	✓	✓
Carosella et al 1999 (88)	✓	✓	✓	Convenience sample	✗	✗	✗	✓	✗	80.9	89	✓	✓
Orleans et al 1993(104)	✓	✗	✓	Convenience sample	✗	✗	✓	✗	✗	✗	✗	✓	✗

Study author and year	Aims	Selection methods			Was the measurement of variables appropriate?			Control of bias			Was the use of statistics appropriate?		Conflict of interest
		Eligibility criteria stated?	Source of participants described?	Selection method?	Validity of measures?	Reliability of measures?	Other method used?	Potential sources of bias?	Methods to deal with bias?	Response rate (%)?	Sample size?	Primary outcome stated a priori?	
Arnsten et al 2004(106)	✓	Y	✗	Convenience sample.	✗	✗	✗	✗	✗	✗	98	✓	✓
Glover et al 2005 (79)	✓	✓	✗	Not reported	✗	✗	✗	✗	✗	✗	130	✓	✓
Van Dongen et al 1999(100)	✗	✓	✓	Convenience sample	✓	✗	✗	✗	✗	✗	36	✓	✓
Goldberg et al 1996(90)	✓	✓	✓	Convenience sample	✗	✗	✗	✗	✗	93	105	✓	✓

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Supplementary file 8: Detailed summary of barriers identified

## **Individual & lifestyle factors**

### ***Relaxation, stress and mood management***

Forty qualitative studies identified stress management as a significant barrier to smoking cessation (50-56, 58, 59, 61-63, 65, 67-69, 72, 74, 75, 80, 81, 83, 84, 86, 87, 89, 90, 92, 93, 95-97, 99, 100, 103, 105, 108, 110-112). Smoking was used as a coping mechanism (52, 58, 62-65, 69, 74, 89, 90, 92, 97, 99) in reaction to daily stressors as well as the stress inherent in disadvantaged lives. Three quantitative studies reported stress management as a barrier to quitting with Maori participants (48%) (79), participants with substance use disorders (39%) (104) and homeless participants (44%) (107). Of note, participants in two studies reported that smoking also directly contributed to the stress experienced by participants (51, 111).

Participants also reported using smoking to manage their emotions and mood (58, 65, 72, 83, 84, 90, 93, 98, 103, 113). Twenty three percent of participants from a Maori sample indicated managing emotions was a barrier to quitting (79), 42% of individuals with a substance use disorder (101).

### ***Enjoyment of smoking***

Across 22 studies, smoking was described as an enjoyable activity (50, 55, 56, 59, 62, 63, 65, 67, 79, 81-83, 88-90, 92-94, 97, 98, 105, 111). In quantitative studies, proportions of participants who said enjoyment prevented them from quitting ranged from 25% (79) to 47.2% (88). Smoking was viewed as an affordable, rewarding luxury (50, 55, 63, 79, 93, 97) and the only pleasurable activity some participants had (50, 56, 59, 62, 65).

### ***Physical addiction to nicotine***

Addiction to nicotine was reported as a barrier in 15 qualitative studies (49, 50, 54, 59, 67-69, 72, 74, 75, 81, 83, 84, 91, 92) (103) and four quantitative studies (60, 79, 90, 100).

Proportions of individuals who reported addiction to nicotine as a barrier ranged from 33% (100) to 86% (60). The experience of withdrawal symptoms was a barrier to quitting in nine studies (54, 57, 69, 72, 74, 80, 84, 90, 98). Management of cravings was a barrier in ten qualitative studies (49, 54, 68, 69, 72, 80, 84, 86, 90, 98) and one quantitative study (107) where 50% of homeless participants cited cravings as a barrier to cessation. Withdrawal symptoms were especially a barrier for individuals with substance use disorder, with 87% feeling tense or irritable if they quit smoking, and 48% saying their cravings would be so strong they couldn't stand it (101).

### ***Behavioural habit of smoking***

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Five quantitative studies (60, 79, 88, 90, 100) and ten qualitative studies (50, 57, 65, 68, 75, 80, 83, 84, 92, 105) reported habit as a barrier to smoking. Proportions of participants who endorsed habit as a barrier ranged from 19% to 58% in studies carried out with people with a mental illness (88, 90, 100); 82% in a low income sample (60) and 73% in a study conducted with Maori participants (79).

### ***Perceived mental health benefits of smoking***

Smoking in order to manage the symptoms of mental illness was identified in the majority of studies carried out with participants with a mental illness (88-98, 102) as well as managing the side effects from medications (92, 94, 98). Smoking in order to protect mental health was also found in one study conducted with low income pregnant women (67). In two community surveys a history of depression was reported as a barrier to smoking cessation (58, 74). Participants with mental illness in two studies perceived that the benefits of continuing to smoke far outweighed the potential risks of stopping, which included relapse, rehospitalisation and suicidal thoughts (89, 98). A large portion (78%) of individual's with substance use disorder would feel anxious if they tried to quit (101).

### ***Avoidance of weight gain***

Fourteen studies reported that smoking was used in weight management, and that potential weight gain was a barrier to quitting (29, 49, 52-54, 64, 67, 72, 74, 84, 91, 98, 101, 107). Twenty percent of homeless participants endorsed weight gain as a barrier to quitting (107) and in 20% of individual with substance use disorder (101). Smoking was also used to suppress appetite for individuals diagnosed with an eating disorder (91) and for low income pregnant women (67).

### ***Competing priorities and needs***

Competing needs, including finding shelter or food for those who were homeless (108); addressing mental health issues (89, 98); or addressing other physical illnesses (56, 74, 99) often meant that smoking cessation was not a priority for participants or those involved in their care in ten studies (56, 63, 74, 75, 87, 89, 91, 98, 99, 108).

### ***Rationalisations to continue smoking***

Lack of acknowledgement of the health-related harm of tobacco use was reported in eight studies (56, 58, 67, 74, 82, 87, 89, 97). Rationalisations to continue smoking were also reported in ten studies (54, 55, 58, 61, 67, 74, 78, 82, 89, 97) and included the belief that smoking certain brands/strengths of cigarettes meant a lower likelihood of developing cancer (82); not experiencing any signs or symptoms of smoking related illness at the present time (54, 58); fatalistic beliefs (56); providing examples of relatives or other persons who are

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3 smokers and who are healthy (80, 87); and the experience of disadvantage as a protective  
4 factor against developing smoking related illness (89).

### 7 ***Other substance use***

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9 Participants identified associations between smoking and other behaviours in eight studies  
10 including alcohol use (49, 74, 76, 80, 84, 112) cannabis and caffeine (49, 81, 112).

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12 Approximately one third (34%) of Maori participants identified alcohol use as a barrier to  
13 quitting smoking(79). Smoking was used to manage other addictions and prevent relapse (59,  
14 89, 103). Alternatives to smoking included drug use, relapse to alcohol addiction and losing  
15 control; all of which were unacceptable to participants (56, 62, 89). For 41% of those  
16 diagnosed with a substance use disorder, quitting would make it harder to remain sober and  
17 13% wouldn't be able to control their cravings for other substances if they quit smoking  
18 (101).

### 24 ***Sense of autonomy***

25  
26 Participants across seven studies reported that smoking provided a sense of autonomy,  
27 control (56, 58, 68, 83, 93, 97, 98) and power (99) over lives that were often chaotic and out  
28 of control. On the other hand, participants with mental illness identified the lack of control  
29 they had over smoking as a barrier to quitting (102).

### 33 ***Low confidence and perceived difficulty of quitting***

34  
35 Low self-efficacy (52, 93, 106, 107) and low confidence (92, 97, 112) was reported in seven  
36 studies. The belief that willpower was the single-most important factor needed to successfully  
37 quit was reported in five studies (51, 52, 64, 67, 69). Participants also reported that the  
38 process of quitting smoking was too hard (52, 80, 96, 98), including 73.5% of prisoners and  
39 ex-prisoners surveyed (109) and 58% of individuals with a substance use disorder (101).

40  
41 Smokers with depression reported it was hopeless to try to quit (102). However, the opposite  
42 was reported by a sample of former miners, who maintained they were able to stop smoking  
43 at will, with minimal difficulty and need for support (71). Twenty five percent of individuals  
44 with substance abuse disorder said they did not know how to quit (101).

### 51 ***Perceived cognitive benefits of smoking***

52  
53 Enhanced concentration and other cognitive benefits associated with smoking were reported  
54 in six studies (51, 83, 90, 93-95), including 56% of individuals with a substance use disorder  
55 (101).

### 58 ***Combatting loneliness***

59  
60 Smoking provided a way of reducing loneliness in six studies (52, 59, 65, 93, 97, 98);  
providing companionship (93) and was described as a friend (52, 98) by participants.

### ***Perceived low individual risk of harm***

Whilst most of the studies reported that participants had good knowledge of the health risks associated with smoking, low levels of knowledge about the risks of smoking were identified as barriers to cessation (58, 87, 95, 97) including one study conducted with pregnant women (58) and two studies conducted with Indigenous Australian pregnant women (80, 87). Low knowledge of the risks of smoking whilst pregnant were also identified (58, 87). In a study conducted with former miners, participants were more likely to attribute their current health issues to coal dust exposure, rather than smoking. Additionally, participants rationalised continuing smoking by weighing the risks of smoking in comparison to the risks of coal mining (71).

### ***Low motivation***

Low levels of motivation to quit smoking were reported in four studies, all of which were carried out with participants who were diagnosed with a mental illness (92, 94, 97, 98). Additionally, 38% of individuals from a low income areas (70) and 47% of individuals diagnosed with a substance use disorder (101) also reported low levels of motivation to quit.

### ***Failed past quit attempts***

Past failed attempts to quit smoking were identified as barriers to future attempts in two qualitative studies (61, 74) as was a sense of hopelessness after trying many methods and remaining unsuccessful (87).

### ***Positive smoker image***

Two studies within low income samples reported associations between smoking and perceptions of being cool and sophisticated (29, 57) and one study with persons with a mental illness found that participants believed that non-smokers do not have as much fun as smokers (97). In a sample of young people with mental illness, positive media images were also reported as barriers to quitting (103).

### **Social and community networks**

#### ***High prevalence and acceptability of smoking in community***

Eight qualitative (53, 54, 69, 75, 79, 80, 98, 111) and four quantitative (60, 101, 107, 109) studies found that being around other smokers was a barrier to quitting. This finding is compounded by participants describing the high prevalence of smoking amongst family and friends in 23 studies (29, 51, 52, 56, 62, 68, 69, 72, 74, 76, 81, 83, 85-87, 90, 93, 95, 96, 103, 105, 111, 112) and in the wider community in 18 studies (29, 51, 52, 56, 62, 66, 69, 72, 74, 76, 81, 83, 85-87, 93, 96, 112). Tobacco was readily available and easily accessible within disadvantaged communities (51, 62, 66, 76, 83, 90, 91, 111) and smoking was considered to

1  
2  
3 be a highly acceptable (29, 79, 81-83, 85-87) and normalised behaviour (52, 56, 62, 66, 69,  
4 79, 81-83, 85, 87).

### 7 ***Lack of social support***

8  
9 A lack of social support to quit smoking was reported in 12 studies (29, 56, 58, 64, 67, 68,  
10 75, 79, 84, 98, 107, 108) and a lack of support from family and friends in particular was a  
11 barrier in 14 qualitative studies (49, 54, 55, 58, 69, 74, 75, 77, 79, 83, 84, 87, 91, 94). In one  
12 quantitative study, only 21% of homeless individuals agreed that close friends or family  
13 would be helpful in quitting smoking and only 29% believed that close friends and family  
14 wanted them to quit very much (106). Similarly, 26% of homeless respondents cited a lack of  
15 support during a quit attempt as a barrier to successfully quit (107).

### 21 ***Smoking as a social activity***

22  
23 Tobacco use and socialising were linked in two quantitative studies (88, 100) and 20  
24 qualitative studies (29, 49, 53, 57, 62, 73-75, 79, 80, 85, 87, 89, 90, 92, 93, 95, 97, 98, 103):  
25 where participants reported that using tobacco helped to facilitate social connections amongst  
26 family, friends and strangers.

### 30 ***Lack of health and other professional support to quit***

31  
32 Thirteen qualitative studies (52, 55, 56, 58, 74, 77, 83, 86, 91, 92, 95, 108, 112) and one  
33 quantitative study (109) reported a perceived lack of support from health professionals  
34 regarding smoking cessation. Cases of family members and health professionals actively  
35 discouraging quit attempts and encouraging maintenance of smoking due to concerns about  
36 the individual's mental health (92, 93, 95, 96, 112) or because smoking was perceived to be  
37 the individual's only source of enjoyment (54, 77, 79, 83) were reported. Three studies  
38 identified tobacco use by health professionals and others involved in the participants' care as  
39 a barrier to cessation (77, 95, 109) and one study reported service staff providing cigarettes to  
40 homeless clients as a barrier (112). Over half (55.9%) of prisoners surveyed reported  
41 observing members of staff smoking as a barrier to quitting (109). Participants also reported  
42 that cigarettes were used as a way to reward or punish behaviour by health professionals and  
43 other service providers (93, 95, 96, 110). Twenty-nine percent of prisoners also indicated  
44 that not receiving cessation support from prison staff prevented them from quitting smoking  
45 (109). Twenty-six percent of substance abusing individuals reported they did not have  
46 enough support to quit. The study involving at risk youth identified mixed messages sent by  
47 those in places of authority (for example teachers, members of the police force) also acted as  
48 a barrier for at risk youth (111).

## **Living and working conditions**

### ***Access to resources to quit***

Thirteen studies cited the cost of Nicotine Replacement Therapy (NRT) and other pharmacological interventions as a barrier to access that directly prevented cessation (52, 55, 61, 68, 69, 73, 74, 78, 81, 93, 96, 98, 108). Cost was also a barrier for 40% of participants diagnosed with substance abuse disorder (101). There was also poor knowledge and low uptake of programs available to participants (52, 56, 61-63, 72, 74, 78, 86, 96, 108, 110). Social and geographical isolation were reported in four studies as barriers to quitting (56, 62, 64, 85). Geographical isolation referred to the lack of access to cessation services that rural and remote communities experience. Social isolation referred to the racial and economic segregation that separates disadvantaged neighbourhoods and individuals from others (56) further contributing to differences in perceived acceptability and prevalence of tobacco use (62, 85). Unsafe neighbourhoods also limited unnecessary outings and inhibited accessing smoking cessation support (56).

### ***Boredom and limited structure in day to day life***

Fourteen qualitative studies (50-52, 54, 55, 65, 75, 86, 94, 95, 97, 99, 108, 110) and four quantitative studies (60, 79, 88, 90) indicated that smoking alleviated boredom. Limited opportunities for leisure and high levels of unemployment often meant that participants had large amounts of free time and smoking was used to mark the transition from one task or part of the day to another (56, 59, 93, 97, 102, 108).

### ***Concerns regarding cessation treatment and services***

Ten qualitative studies reported that participants were reluctant to access psychological or pharmacological resources to quit smoking due to a belief that these treatments were largely ineffective (56, 58, 61-63, 69, 72, 80, 81, 97). In one survey almost a third (31%) of homeless participants reported that no existing pharmacological treatments would be able to help them stop smoking (107).

The possible side effects of pharmacological interventions (50, 73, 78, 81, 105, 108), uncertainty about the correct use of pharmacological interventions (52, 81, 108); or the possible interactions between NRT and other medications (108) presented barriers to cessation. Participants in one study reported reluctance to add NRT on top of the medications they were already using (105). Homeless participants in one study expressed concerns about the possibility of becoming addicted to NRT (108). Concerns about existing treatment services included lack of continuity of care(91); being capable of addressing smoking simultaneously with mental health issues (91, 93, 96); cultural appropriateness (74, 77, 78,



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3 86); feeling judged by programs (61, 67, 91, 93) and a cynicism regarding the medical  
4 profession (77). Telephone quitlines were not viewed as culturally appropriate resources (77)  
5 and participants were sceptical of the effectiveness of quitline support (52).  
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### 8 *Stressful factors*

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10 Participants across ten studies (56, 58, 59, 62, 63, 65, 68, 74, 75, 85) reported that increased  
11 stress due to the events and life circumstances intrinsically linked to their socioeconomic  
12 position were barriers to quitting smoking. The following situations compounded feelings of  
13 stress, hopelessness and meant that cessation was not prioritised: unemployment (56, 58, 59,  
14 62, 63, 65, 68, 85); poverty and financial stress (62, 65, 75, 85); housing issues including  
15 substandard housing, homelessness and overcrowding (56, 58, 75, 85); violence and crime  
16 (56, 62, 68, 75); drug use (56, 62, 75); increased morbidity and mortality (68, 74, 75, 85);  
17 chronic disease (74, 75); low education (65, 75); and limited recreational activities (62, 65).  
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21 Two studies carried out with Indigenous Australians found that additional stressors  
22 experienced by this group included racism, stigma, dispossession of traditional lands, high  
23 burden of illness, premature deaths within the community and collective grief and loss  
24 relating to the Stolen Generation and the removal of children (74, 75, 85). Unique stressors  
25 facing prisoners including; transfers within and across prisons; legal matters; bullying;  
26 missing family; and restricted movement for most of the day were also identified (110).  
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### 29 *Living and working environments*

30  
31 Participants reported lack of control over exposure to smoking due to others smoking in the  
32 home; a lack of smoke free policies or policies that did not cover the whole environment or  
33 were only partially enforced were barriers to quitting smoking (54, 58, 74, 96, 103, 107). In  
34 one study involving prisoners, 59% of participants reported that the 'smoky atmosphere'  
35 within the prison was a barrier to quitting (109). Work environments that were conducive to  
36 smoking also presented a barrier in one study (29).  
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### 39 **Cultural, socioeconomic and environmental factors**

#### 40 *Cultural norms*

41  
42 The importance of tobacco use in traditional and ceremonial contexts was expressed in three  
43 studies concerning American Indian participants (72, 73, 82) and one study including  
44 Aboriginal and Torres Strait Islander participants (85) and one study including Alaska Native  
45 participants (86). Cultural values of self-reliance, pride and independence prevented  
46 American Indian participants from seeking cessation support in two studies (81, 82) and in  
47 one study with low income African Americans (56). Historical factors including  
48 dispossession of land, colonisation and collective grief and loss of cultural identity were  
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3 reported as barriers to cessation in three studies of Aboriginal and Torres Strait Islanders (74,  
4 75, 85). Studies carried out with American Indian participants (73, 82) and Aboriginal and  
5 Torres Strait Islanders (74, 75, 83, 85) highlighted the function of smoking as a way of  
6 maintaining cultural identity and belonging. Maintenance of identity and belonging were also  
7 reported in three studies concerning people with a mental illness (93, 94, 98) and one study  
8 carried out with low income participants in the UK (62). In prison settings, use of cigarettes  
9 as a substitute currency also provided a barrier to cessation (110).

### 16 *Socioeconomic factors*

17 Two qualitative studies reported participants linking their status as smokers and their inability  
18 to quit smoking with their lower socioeconomic position (65, 97). In a study conducted with  
19 people with a mental illness, participants endorsed the belief that non-smokers were able to  
20 refrain from becoming smokers because they were more advantaged (97) and in a study of  
21 low income women, participants referred to their low socioeconomic position and poverty as  
22 a barrier to quitting smoking (65).  
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# BMJ Open

## Perceived barriers to smoking cessation in selected vulnerable groups: A systematic review of the qualitative and quantitative literature.

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3 **Perceived barriers to smoking cessation in selected vulnerable groups: A systematic**  
4  
5 **review of the qualitative and quantitative literature.**  
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8  
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27 **Keywords:** smoking cessation, vulnerable populations, disadvantage, barriers, systematic  
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29 review  
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## ABSTRACT

**Objectives:** To identify barriers which are common and unique to six selected vulnerable groups: low socioeconomic status; Indigenous; mental illness and substance abuse; homeless; prisoners and at-risk youth.

**Design:** A systematic review was carried out to identify the perceived barriers to smoking cessation within six vulnerable groups.

**Data sources:** Medline, EMBASE, CINAHL and PsycInfo were searched using keywords and MeSH terms from each database's inception published prior to March 2014.

**Study selection:** Studies that provided either qualitative or quantitative (i.e. longitudinal, cross-sectional or cohort surveys) descriptions of self-reported perceived barriers to quitting smoking in one of the six aforementioned vulnerable groups were included.

**Data extraction:** Two authors independently assessed studies for inclusion and extracted data.

**Results:** 65 eligible papers were identified: 24 with low socioeconomic groups, 16 with Indigenous groups, 18 involving people with a mental illness, three with homeless groups, two involving prisoners and one involving at risk youth. One study identified was carried out with participants who were homeless and addicted to alcohol and/or other drugs. Barriers common to all vulnerable groups included: smoking for stress management, lack of support from health and other service providers and the high prevalence and acceptability of smoking in vulnerable communities. Unique barriers were identified for people with a mental illness (e.g. maintenance of mental health), Indigenous groups (e.g. cultural and historical norms), prisoners (e.g. living conditions), people who are homeless (e.g. competing priorities) and at risk youth (e.g. high accessibility of tobacco).

**Conclusions:** Vulnerable groups experience common barriers to smoking cessation, in addition to barriers that are unique to specific vulnerable groups. Individual-level and

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3 community and social network-level interventions are priority areas for future smoking  
4  
5 cessation interventions within vulnerable groups.  
6

7 **Trial registration:** A protocol for this review has been registered with PROSPERO  
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9 International Prospective Register of Systematic Reviews [Identifier: CRD42013005761].  
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14 **298**

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18 Strengths:

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- 21 • This study provides a valuable synthesis of the literature examining the perceived  
22 barriers to smoking cessation common and unique across six vulnerable groups.  
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25 Limitations:

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- 28 • While the overall quality of the studies included in this review was acceptable, most  
29 studies failed to provide information regarding the trustworthiness (qualitative  
30 studies) or reliability and validity (quantitative studies) of the research.  
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## INTRODUCTION

Tobacco use is the leading global cause of avoidable death worldwide (1) and a key modifiable risk factor for the development of a range of diseases, including cardiovascular disease, chronic obstructive pulmonary disease, and some cancers (1).

The prevalence of tobacco smoking is inversely related to socioeconomic position (SEP) in high-income countries (1). For example, in 2010 in Australia, the prevalence of smoking was 24.6% in the lowest socioeconomic areas compared to 12.5% in the highest socioeconomic areas (2). The highest rates of smoking are evident among those who, in addition to low socioeconomic status, have other characteristics that distinguish them from the general population such as Indigenous groups (31% - 51.8%) (3-5); people with a mental illness (31.7-32.4%) (6), those with substance abuse disorders (77%) (7); the homeless (73%) (8); and prisoners (78% - 84%) (9, 10). These groups were selected because they represent a large proportion of those classified as vulnerable to socioeconomic disadvantage (11). It should be noted that although members of vulnerable groups are more likely to be socioeconomically disadvantaged, not all members are. For the purposes of this review, vulnerable groups are defined as groups that are more likely to experience social and material disadvantage due to lower income, cultural differences, and social exclusion (12).

Conflicting evidence exists regarding whether the rates of quit attempts in low SEP are similar to (13, 14) or lower (15-18) than the rates made by smokers in higher SEP. However, the success rate of quit attempts for lower SEP individuals is much lower than the success rate in higher SEP counterparts (14, 19).

There are many reasons quit success may be lower in vulnerable groups(20, 21). Within the health behaviour literature, factors that prevent an individual from undertaking health behaviour change have been referred to as barriers. Barriers are often conceptualised as either structural or individual psychosocial factors (22). Structural barriers include

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2  
3 systems, organisations and the relationship between systems and individuals, for example  
4  
5 lack of accessible smoking cessation programs. Individual barriers refer to the subjective  
6  
7 experience of the individual, for example physical addiction to nicotine.  
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10 This definition of barriers is congruent with the social determinants of health  
11  
12 framework (SDHF)(23). The SDHF holds that an individual's health is influenced by factors  
13  
14 across many levels, from individual genetic and physical characteristics, social and  
15  
16 community networks, to broader influences of culture, socioeconomic determinants and the  
17  
18 environment. This framework has been used to examine the determinants of health  
19  
20 inequities(24). Because the SDHF classifies determinants of health as individual, social and  
21  
22 broader cultural and environmental factors, it also allows the identification of distinct levels  
23  
24 of intervention for health policies.  
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26

27  
28 Within the general population, cross-sectional studies have found variation in the  
29  
30 most commonly reported barriers to cessation. Enjoyment (79%)(25); cravings (75%) (25);  
31  
32 and stress management (36% - 63%) (25, 26) are the most frequently reported barriers.  
33  
34 Irritability (39% - 42%) (27); habit (39%) (26); withdrawal symptoms (28% - 48%) (25, 26);  
35  
36 fear of failure (17% - 32%) (25, 26) and concern about weight gain (27%-34%) (25-27) are  
37  
38 also identified as barriers to cessation.  
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41 The effect of socioeconomic position on perceived barriers to quitting was examined  
42  
43 in a representative sample (n = 2,133) in the United Kingdom (28). Enjoyment (51%) and  
44  
45 stress relief (47%) were the most frequently endorsed motives for continuing to smoke across  
46  
47 the sample; however as socioeconomic position decreased, the likelihood of reporting stress  
48  
49 management and avoiding boredom as motives to continue to smoke increased. This  
50  
51 suggests that smokers from vulnerable groups may experience barriers to smoking cessation  
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53 differently than those in the general population (28).  
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3 Smoking in vulnerable groups is known to be influenced and perpetuated by a  
4 complex range of social, cultural and environmental factors (29) including high acceptability  
5 of smoking (30) and more tobacco retail outlets in low socioeconomic areas (31). Two  
6 previous studies have reviewed the literature to examine barriers to quitting smoking amongst  
7 vulnerable groups. One focussed on Aboriginal pregnant women (32), and one focussed on  
8 the barriers to smoking cessation service utilisation amongst low income smokers (33). Both  
9 reviews found pro-smoking social norms, inadequate knowledge regarding smoking related  
10 risks, and lack of access to appropriate cessation services inhibited participants' ability to  
11 quit.  
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15 As the term vulnerable applies to multiple discrete groups, it is important to  
16 understand which barriers (if any) are unique for example, cultural factors that inhibit  
17 smoking cessation may be unique to some Indigenous groups (32). A systematic examination  
18 of potential unique barriers would be valuable in order to develop and deliver appropriate  
19 suites of intervention techniques for specific vulnerable groups.  
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23 Understanding the perceived barriers to quitting is important in order to better  
24 understand smoking, relapse and quitting related behaviours, to inform appropriate policy,  
25 and facilitate the development of effective tailored smoking cessation interventions. Given  
26 the exceptionally high smoking rates and low quit success amongst vulnerable groups, there  
27 is a critical need for a systematic and comprehensive review of the literature of the perceived  
28 barriers to quitting smoking amongst vulnerable smokers.  
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### 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 **Aims**

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51 This systematic review aims to provide a comprehensive synthesis of the self-reported  
52 barriers to quitting smoking within six vulnerable groups by reviewing the qualitative and  
53 quantitative literature. The review will focus on the perceived, self-reported barriers to  
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3 smoking cessation in six selected vulnerable groups: low socioeconomic status (low SES),  
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5 Indigenous, mental illness and substance abuse, homeless, prisoners, and at-risk youth. These  
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7 groups were selected because they represent a large proportion of those classified as  
8  
9 vulnerable to socioeconomic disadvantage (11); who exhibit smoking rates higher than that of  
10  
11 the general population (2-10); and who are identified as priority groups targeted for smoking  
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13 cessation programs and policies by peak health authorities (34-36). Specifically, the review  
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15 aims to:  
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20 a) identify barriers which are common across all vulnerable groups included in the review  
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22 and  
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24 b) identify barriers that may be unique to specific groups.  
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30 The results of the review will be used to develop a practical model to help understand the  
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32 barriers to quitting amongst vulnerable groups and to aid smoking cessation intervention  
33  
34 development.  
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## 38 **METHOD**

### 39 **Study design**

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42 Guidelines for the reporting of systematic reviews (PRISMA) (37) and qualitative  
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44 synthesis (ENTREQ) (38) were followed. A protocol for this review was registered with  
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46 PROSPERO International Prospective Register of Systematic Reviews [Identifier:  
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48 CRD42013005761].  
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## Databases and search

Medline, EMBASE, CINAHL and PsycInfo were searched using keywords and MeSH terms from each database's inception published prior to March 2014. The reference lists of key articles and reviews were also manually searched in order to identify any other relevant articles. An extensive list of search terms was used in order to ensure that as many relevant articles as possible were captured (See Table 1).

Table 1. Search strategy

1	Tobacco/
2	Tobacco use/
3	Tobacco use cessation/
4	Tobacco smoking/
5	Smoking/
6	Smoking Cessation/
7	Tobacco use cessation/
8	Tobacco dependence/
9	Cigarette smoking/
10	Or/1-9
11	Homeless youth/
12	Homeless persons/
13	Housing/
14	Homeless mentally ill/
15	Homelessness or homeless/
16	Community programs/
17	Or/11-16
18	Prisoner or Prisons/
19	Correctional Health Services/
20	Correctional facilities/
21	Jail/
22	Or/18-21
23	Anxiety/
24	Depression/
25	Schizophrenia/
26	Mentally Ill persons/
27	Mental health/
28	Mental illness/
29	Mental disorder/
30	Mental disease/
31	Mental patient/
32	Mental health services/
33	Substance-related disorders/
34	Drug use/
35	Drug abuse/
36	Alcohol-related disorders/
37	Or/23-36

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38	Adolescent behaviour/
39	Juvenile delinquency/
40	Juvenile offenders/
41	Disruptive Behaviors or disruptive behaviours/
42	At-risk youth/
43	At-risk young people/
44	Or/38-43
45	Indigenous/
46	Indigenous health/
47	Indigenous peoples/
48	Indigenous populations/
49	Aboriginal/
50	Aboriginal and Torres Strait Islanders/
51	Inuits/
52	Eskimo/
53	Alaska Native/
54	Indians/
55	Native American/
56	Native Hawaiian/
57	American Indian/
58	Indians, North American/
59	Indians, South American/
60	Indians, Central American/
61	First Nations/
62	Pacific Islander/
63	Maori/
64	Oceanic ancestry group/
65	American Native Continental Ancestry Group/
66	Or/45-65
67	Poverty
68	Social status
69	Social class
70	Low income population
71	Inequalities
72	Socioeconomic status
73	Socioeconomic factors
74	Disadvantaged
75	Underserved
76	Or/67-75
77	Related to smoking cessation/quitting smoking
78	Correlated with smoking cessation/quitting smoking
79	Associated with smoking cessation/quitting smoking
80	That affect smoking cessation/quitting smoking
81	That inhibit smoking cessation/quitting smoking
82	That prevent smoking cessation/quitting smoking
83	Barriers to smoking cessation/quitting smoking
84	Factor\$ or Determinant\$ or Variable\$ or Covariable\$ or Predictor\$ or Barrier\$
85	Or/77-84
86	10 AND 85 AND 17
87	10 AND 85 AND 22
88	10 AND 85 AND 37
89	10 AND 85 AND 44

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90	10 AND 85 AND 66
91	10 AND 85 AND 76

### Inclusion and exclusion criteria

Studies that provided either qualitative or quantitative (i.e. longitudinal, cross-sectional or cohort surveys) descriptions of perceived self-reported barriers to quitting smoking in low SES groups, Indigenous groups, people with a mental illness or substance abuse problems, people who are homeless, prisoners or at-risk youth were included. See Table 2 for definitions used as inclusion criteria for each vulnerable group. Only studies carried out in high income countries were included as middle and low income countries may present different contextual, political and economic barriers which require separate consideration. Only studies published in English were included as resources required to translate articles were beyond the scope of this review. Intervention studies were excluded, as barriers discussed within these studies related to use of the intervention being tested and not barriers to smoking cessation per se. Studies examining factors associated with quit attempts or success were excluded unless they included results on the perceived barriers self-reported by participants from vulnerable groups. Studies describing *provider* reports of the barriers to the provision of smoking cessation support or treatment, and unpublished grey literature, were also excluded. There were no cut offs for sample size.

Table 2. Inclusion criteria definitions of each group.

Group	Definition
Low socioeconomic status (SES)	Because definitions of low SES vary across high income countries this study used an inclusive definition of low SES. Studies were included if they described participants as being low SES and gave at least one measure of SES. This measure could be income (above/below poverty level); address in deprived neighbourhood etc.
Indigenous groups	The following definition was used to define potential Indigenous studies in accordance with previous studies (39): “the experiences shared by a group of people who have inhabited a country for thousands of years, which often contrast with those of other groups residing in the same country for a few hundred years” (40).
Mental Illness	People with a mental illness were defined as individuals who had been diagnosed with a mental illness, severe mental illness or were described as inpatients or outpatients in a mental health rehabilitation facility. Substance use disorders were also included. All mental illnesses were included.
At-risk youth	At-risk youth were defined as individuals under the age of 21 who have experienced or are experiencing; problems at school; physical, sexual or psychological abuse; mental or physical health problems; economic disadvantage or who have committed a violent or delinquent act (USA Code).
Prisoners	Prisoners included both those currently incarcerated and those ex-prisoners living in the community.
Homeless	Homeless individuals were defined as those individuals described as meeting national criteria for homelessness or those individuals accessing services provided to homeless persons.
Smoker	Smokers were defined as self-reported daily or occasional cigarette smokers. Studies that also assessed ex-smokers were only included if the majority of participants were current smokers, or if the results were reported by smoking status. Studies were excluded if they focussed solely on ex-smokers or non-smokers.

### Data extraction

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3 The titles and abstracts of retrieved publications were assessed by one reviewer (LT)  
4 against eligibility criteria and excluded if they did not meet inclusion criteria. A second  
5 reviewer (a Research Assistant) independently assessed 20% of the returned abstracts for  
6 inclusion with 100% agreement between reviewers. Data from included journal articles was  
7 extracted into summary tables independently by one reviewer (LT) and a random 20%  
8 checked by a second (Research Assistant). Agreement was again high (97%). Discrepancies  
9 were settled by discussion between the reviewers. Data extracted from the articles included:  
10 study aims, setting, sample characteristics, response rates, study methodology, data analysis  
11 and the barriers identified. Barriers were defined as factors that prevented smoking cessation  
12 and/or quit attempts or were reported as primary reasons for continuing to smoke.  
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### 27 **Risk of bias in individual studies**

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29 Quality assessment was performed independently by all authors, with two reviewers  
30 per manuscript. The methodological quality of qualitative studies was assessed using the  
31 McMaster Qualitative Criteria Form (41). Quantitative studies were assessed using a tool  
32 adapted from the STROBE statement (42). As there is a lack of an agreed, valid and reliable  
33 measure to assess the quality of mixed methods studies (43), both the McMaster guidelines  
34 and the adapted quantitative framework were applied to the corresponding qualitative and  
35 quantitative components of any mixed methods studies identified.  
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### 47 **Synthesis of results**

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49 Results were synthesised by vulnerable group using narrative synthesis and inductive  
50 data analysis techniques. Narrative synthesis allows the examination of studies that are highly  
51 heterogeneous in their research questions, samples and methods (44, 45). In order to avoid  
52 potential biases, care was taken to also identify points of difference between studies (46).  
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3 Where a barrier was reported in more than one study, this was recorded. In quantitative  
4 studies, the proportion of respondents reporting each barrier was calculated. Barriers were  
5 combined into categories and then classified using the SDHF (23). For the purposes of this  
6 review, individual factors were defined as physical or psychological barriers to quitting  
7 smoking: for example, the individual's level of nicotine dependence or motivation to quit.  
8 Lifestyle factors were defined as health behaviours (including alcohol and other drug use)  
9 that impeded an individual's ability to quit. Social and community networks were defined as  
10 the impact of an individual's family and friend networks, and the wider community. Living  
11 and working conditions encompassed factors including housing, health care, education and  
12 employment. The final domain was the broader socioeconomic, cultural and environmental  
13 background perceived to influence smoking cessation.  
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## 30 RESULTS

### 31 Search results

32 After duplicates were removed, 21,767 studies were identified from electronic  
33 searches and a further 27 from manual searches. Of those, 65 studies met inclusion criteria  
34 and were included in the review (see Figure 1). Supplementary file 1 contains a list of full  
35 text articles that were retrieved, reviewed and excluded as per the inclusion criteria. Two  
36 systematic reviews concerning Indigenous Australian pregnant women (32) and pregnant  
37 women (47); and two critical reviews providing summaries of the barriers to quitting (33, 48)  
38 were also identified from hand searches.  
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### 52 Study characteristics

53 The majority of studies (n = 24) identified barriers to smoking cessation in low SES groups  
54 (30, 49-71), Indigenous groups (n = 16) (72-87), and people with a mental illness (n = 18)  
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3 (88-105) including two concerning those with substance use disorders (101, 104). Three  
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5 studies reported barriers to quitting within the homeless (106-108) and two reported barriers  
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7 within prisoner groups (109, 110). One study with at-risk youth was identified (111). Two  
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9 other studies concerning Alaska Native participants (age range from 11 to 18) (86) and  
10  
11 people with a mental illness (age range from 16 to 23) (103) included younger people as  
12  
13 participants. One study was identified that was carried out with participants who were both  
14  
15 homeless and addicted to drugs and/or alcohol (112). Since the study comprised participants  
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17 that met criteria for inclusion in two of the vulnerable groups included in this review (both  
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19 the homeless and mental illness/substance use groups) this study was included in a seventh  
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21 category containing “multiple” participant groups. Supplementary files 2, 3 and 4 summarize  
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23 the included quantitative, qualitative and mixed methods studies respectively. An overview of  
24  
25 the characteristics of included studies can be found in Supplementary file 5.  
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### 32 **Quality assessment of qualitative studies**

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34 The results of the quality assessment of qualitative studies are presented in  
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36 Supplementary file 6. Overall, the quality of studies varied widely. The majority of studies  
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38 did not explicitly state their study design (n = 38); of those that did, most used Grounded  
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40 Theory (57, 59, 61, 93, 98, 99). Most studies provided adequate descriptions of the study  
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42 sites; participants; data collection methods and analysis techniques. Studies generally  
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44 performed poorly when assessed on four components of trustworthiness, with only fifteen  
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46 studies meeting all four criteria (credibility; transferability; dependability and confirmability)  
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48 [41,44,48,50,58,60,64,65,68,69,72,73,75,76,84]. It should be noted that none of the mixed  
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50 methods studies explicitly described their methodology as mixed methods nor did they report  
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52 integrating the qualitative and quantitative findings in a systematic way.  
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### Quality assessment of quantitative studies

The results of the quality assessment of quantitative studies are presented in Supplementary file 7. Sample sizes in the quantitative studies ranged from 36 to 500 participants. Response rates ranged from 42% to over 97% (three studies did not provide response rates) [70,91,92]. All but one study [81] clearly stated eligibility criteria. All studies stated their outcome a priori and no conflicts of interest were identified. The validity and reliability of survey measures used to assess barriers to cessation were reported in one study [53]. Three studies employed techniques such as pilot testing and input from key stakeholders in developing the tools used [53,77,95].

### Perceived barriers to smoking cessation

The barriers to quitting smoking endorsed over multiple studies included: smoking for stress management; enjoyment of smoking; addiction to nicotine; habit; social acceptability of smoking; lack of support to quit and access to quit resources; boredom; stressful life factors; pro-smoking living environments; smoking cultural norms and socioeconomic disadvantage. Figure 2 demonstrates the barriers reported in this review categorised by the SDHF. For brevity, the current results section will focus on those barriers that were common across all groups and unique to certain vulnerable groups. Supplementary file 8 provides a detailed description of all of the barriers identified in this review. Table 3 provides a summary of the barriers extracted from the qualitative studies. References of studies that report one or more barriers at a given level of the SDHF are included in Table 3. Table 4 provides a summary of the results of quantitative studies including the proportion of participants endorsing the barrier and the study reference.

### Barriers common across all groups

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3 Three barriers were present in all six vulnerable groups included in this review: 1)  
4 stress management, 2) lack of support to quit from health professionals and other service  
5 providers, and 3) high prevalence and acceptability of smoking within vulnerable  
6 communities.  
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11 Within the SDHF, stress management was categorised as an individual level barrier.  
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13 Forty qualitative studies identified stress management as a significant barrier to smoking  
14 cessation (50-56, 58, 59, 61-63, 65, 67-69, 72, 74, 75, 80, 81, 83, 84, 86, 87, 89, 90, 92, 93,  
15 95-97, 99, 100, 103, 105, 108, 110-112). Smoking was used as a coping mechanism (52, 58,  
16 62-65, 69, 74, 89, 90, 92, 97, 99) in reaction to daily stressors as well as the stress inherent in  
17 vulnerable lives. Three quantitative studies reported stress management as a barrier to  
18 quitting with Maori participants (48%) (79), participants with substance use disorders (39%)  
19 (104) and homeless participants (44%) (107). Of note, participants in two studies reported  
20 that smoking also directly contributed to the stress experienced by participants (51, 111).  
21 Participants also reported using smoking to manage their emotions and mood (58, 65, 72, 83,  
22 84, 90, 93, 98, 103, 113). Twenty three percent of participants from a Maori sample indicated  
23 managing emotions was a barrier to quitting (79), 42% of individuals with a substance use  
24 disorder (101).  
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41 High prevalence and acceptability of smoking within vulnerable communities was  
42 categorised as a community and social network level barrier. Eight qualitative (53, 54, 69, 75,  
43 79, 80, 98, 111) and four quantitative (60, 101, 107, 109) studies found that being around  
44 other smokers was a barrier to quitting. This finding is reinforced by participants describing  
45 the high prevalence of smoking amongst family and friends in 22 studies (30, 51, 52, 56, 62,  
46 68, 69, 72, 74, 76, 81, 83, 85-87, 90, 93, 95, 96, 103, 111, 112) and in the wider community  
47 in 18 studies (30, 51, 52, 56, 62, 66, 69, 72, 74, 76, 81, 83, 85-87, 93, 96, 112). Tobacco was  
48 readily available and easily accessible within vulnerable communities (51, 62, 66, 76, 83, 90,  
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91, 111) and smoking was considered to be a highly acceptable (30, 79, 81-83, 85-87) and normalised behaviour (52, 56, 62, 66, 69, 79, 81-83, 85, 87).

Lack of support to quit from health and other service providers to quit was also categorised as a social and community network barrier. Other service providers include management and staff in prisons, homeless shelters and organisations, and members of the community. Thirteen qualitative studies (52, 55, 56, 58, 74, 77, 83, 86, 91, 92, 95, 108, 112) and one quantitative study (109) reported a perceived lack of support from health professionals regarding smoking cessation. Cases of family members and health professionals actively discouraging quit attempts and encouraging maintenance of smoking due to concerns about the individual's mental health (92, 93, 95, 96, 112) or because smoking was perceived to be the individual's only source of enjoyment (54, 77, 79, 83) were reported. Three studies identified tobacco use by health professionals and others involved in the participants' care as a barrier to cessation (77, 95, 109). Over half (55.9%) of prisoners surveyed reported observing members of staff smoking as a barrier to quitting (109). Studies involving people with a mental illness and prisoners identified use of cigarettes in order to reward or punish behaviour by health professionals and other service providers (93, 95, 96, 110) as a barrier to quitting. Twenty-nine percent of prisoners also indicated that not receiving cessation support from prison staff prevented them from quitting smoking (109). Twenty-six percent of substance abusing individuals reported they did not have enough support to quit. One study involving at risk youth identified smoking being unaddressed by teachers and members of the police force as a barrier to smoking cessation (111).

Table 3. A summary of the self-reported barriers to smoking cessation – qualitative and mixed methods studies by vulnerable group.

Barrier	Low SES groups (n = 22)	Indigenous groups (n = 16)	People with a mental illness (n=13)	Homeless groups (n = 3)	Prisoner groups (n = 2)	At risk youth (n = 1)	Multiple groups (n = 1)
<b>Individual and lifestyle factors</b>							

Stress management	(50-59, 61-63, 65-69)	(72, 74, 75, 79, 81, 83, 84, 86, 87)	(89, 90, 92, 93, 95-98, 105)	(108)	(110)	(111)	(112)
Enjoyment	(50, 54-56, 59, 62, 63, 65, 67)	(79, 81-83)	(89, 90, 92-94, 97, 98, 105)			(111)	
Addiction	(49, 50, 54, 57, 59, 67-69)	(72, 74, 75, 81, 83, 84, 86)	(90-92, 98)				
Habit	(50, 57, 65, 68)	(75, 79, 83, 84)	(92, 105)				
Mental health benefits	(58, 67)	(74)	(89, 91-99)				
Weight gain	(30, 49, 52-54, 64, 67)	(72, 74, 84)	(91, 98)				
Competing priorities	(56, 63)	(74, 75, 87)	(89, 91, 98, 99)	(108)			
Rationalisations	(54-56, 58, 61, 67)	(74, 78, 82, 87)	(89, 97)				
Other substance use	(49, 56, 59, 62)	(74, 76, 81, 84)	(89)				(112)
Autonomy	(56, 58, 68)	(83)	(93, 97-99)				
Low confidence	(52, 53, 56, 63, 67, 69)	(73, 84)	(92, 96, 98)				(112)
Cognitive benefits	(51)	(83)	(93-95)				
Loneliness	(52, 59, 65)		(93, 97, 98)				
Low risk of harm	(58)	(87)	(95, 97)				
Low motivation			(92, 94, 97, 98)				
Past failed attempts	(61)	(74)					
Positive smoker image	(30, 57)		(97)				
<b>Social and community networks</b>							
Prevalence and acceptability	(30, 51-54, 56, 62, 66, 68, 69)	(72, 74, 76, 79, 83, 85-87)	(90, 91, 93, 95, 96, 105)	(108)	(110)	(111)	(112)
Lack of social support	(30, 49, 54-56, 58, 64, 67-69)	(74, 75, 77, 79, 83, 84)	(91, 94, 98)	(108)			
Social activity	(30, 49, 53, 57, 62)	(73-75, 79, 85, 87)	(89, 90, 92, 93, 95, 97, 98)				
Lack of health and other professional support	(52, 54-56, 58)	(74, 77, 79, 83, 86)	(91-93, 95, 96)	(108)	(110)	(111)	(112)

<b>Living and working conditions</b>					
Access to quit resources	(52, 55, 56, 61-64)	(72-74, 78, 81, 85, 86)	(93, 96, 98)	(108)	(110)
Boredom	(50-52, 54-56, 59, 65)	(75, 86)	(90, 94, 95, 97, 99)	(108)	(110)
Concerns regarding treatment	(50, 52, 56, 58, 61-63, 69)	(72-74, 77, 78, 81, 86)	(91, 93, 96, 105)	(108)	
Stressful factors	(56, 58, 59, 62, 63, 65, 68)	(74, 75, 85)			(110)
Living and working circumstances	(30, 54, 58)	(74)	(96)		
<b>Cultural, socioeconomic and environmental factors</b>					
Cultural norms	(56, 62)	(72-75, 78, 81-83, 85-87)	(93, 94, 98)		(110)
Socioeconomic factors	(65)		(97)		

### **Barriers unique to certain vulnerable groups**

Indigenous; prisoner; mentally ill, homeless, and at risk youth reported unique barriers to smoking cessation. Racism, historical factors (74, 75, 85), ceremonial use of tobacco (72, 73, 82, 85, 86), cultural values that promote sharing, kinship, and reciprocity (83), cultural values of pride, independence and self-reliance that affect help seeking behaviour (81, 82), cultural values concerning health and privacy (84), and maintenance of cultural identity (73-75, 82, 83, 85) were identified as barriers within Indigenous groups. Smoking cessation could therefore exclude an individual from fully participating in their culture or potentially challenge family, personal or community relationships.

Living environments and the stressful context of prison presented unique barriers for prisoners, including social isolation, anxiety regarding legal matters, transfers to other prisons, use of cigarettes as a currency, use of cigarettes as a way to reward or punish behaviour, bullying, missing family and restricted movement throughout the day (110).

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3 Low levels of motivation (92, 94, 97, 98), concerns about ability of cessation services  
4 to handle mental health issues (91, 93, 96), identity and belonging (93, 94, 98) and symptom  
5 management (88-98) were barriers for people with mental illness.  
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10 Competing needs and prioritising need to find shelter/place to live were unique  
11 barriers for individual who were homeless (108). Very high levels of accessibility of  
12 cigarettes, and the regular practice of selling cigarettes to those under 18 years of age were  
13 identified by one study with at risk youth as a unique barrier (104).  
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50 Table 4. A summary of the barriers to smoking cessation – reported prevalence of each barrier by  
51 vulnerable group for studies using quantitative and mixed methods<sup>ab</sup>.  
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Barrier	Reported prevalence of each barrier N/Total N (%)				
	Low SES groups (n = 1)	Indigenous groups (n = 1)	People with a mental illness (n = 3)	Homeless groups (n = 2)	Prisoner groups (n = 1)

<b>Individual and lifestyle factors</b>					
Stress management		63/130 (48) <sup>(79)</sup>	30/78 (39) <sup>(104)</sup>	82/186 (44) (107)	
Relaxation	261/500 (52) (60)	22/130 (17) <sup>(79)</sup>	13/30 (42) (100) 7/72 (10) <sup>(88)</sup>		
Enjoyment		33/130 (25) <sup>(79)</sup>	34/72 (47) (88) 21/105 (20) (90) 30/78 (39) <sup>(104)</sup>		
Addiction	431/500 (86) (60)	51/130 (39) <sup>(79)</sup>	56 (53) <sup>(90)</sup> 10/30 (33) (100)	93/186 (50) (107)	
Cravings			53/78 (68) <sup>(104)</sup> 47/96 (48) <sup>(101)</sup>		
Withdrawal symptoms			85/96 (87) <sup>(101)</sup>		
Habit	411/500 (82) (60)	95/130 (73) <sup>(79)</sup>	26/72 (36) (88) 20/105 (19) (90) 17/30 (58) (100)		
Perceived Mental Health Benefits		6 – 30/130 (5-23) <sup>(79)</sup>	21/105 (20) (90) 7 – 8/72 (10-11) (88) 41/78 (53) <sup>(104)</sup> 41-76/96 (42-78) <sup>(101)</sup>		
Concentration			27-56/96 (28-55) <sup>(101)</sup>		
Low levels of motivation	131/350 (38) (70)		46/96 (47) <sup>(101)</sup>		
Weight gain	69/350 (20) (70)	6/130 (5) <sup>(79)</sup>	3/72 (4) <sup>(88)</sup> 39/96 (40) <sup>(101)</sup>	38/186 (20) (107)	
Other substance use			3/72 (4) <sup>(88)</sup> 2-8/78 (3-10) <sup>(104)</sup> 13-40/96 (13-41) <sup>(101)</sup>		
Problems getting to sleep			23/96 (23) (101)		
Low confidence and perceived difficulty	87 - 202/350 (25 - 58) <sup>(70)</sup>		22/78 (24) <sup>(104)</sup>		25/34 (74) (109)
<b>Social and community networks</b>					



High prevalence and acceptability in the community	332/500 (66) (60) 116/350 (33) (70)	5/130 (12) <sup>(79)</sup>	13/105 (13) (90) 5/72 (7) <sup>(88)</sup> 34/78 (43) <sup>(104)</sup>	78/186 (42) (107)	27/34 (79) (109)
Lack of social support	90/350 (26) (70)			48/186 (26) (107) 70-79/98 (71-79) <sup>(106)</sup>	10/34 (29) (109)
Lack of health and other professional support			3/72 (4) <sup>(88)</sup>		19/34 (56) (109)
Social activity		44/130 (34) <sup>(79)</sup>	17/30 (58) (100) 2/72 (3) <sup>(88)</sup>		
Availability of cigarettes		5/130 (4) <sup>(79)</sup>	8/105 (8) <sup>(90)</sup> 5/72 (7) <sup>(88)</sup>		
<b>Living and working conditions</b>					
Access to quit resources	108/350 (31) <sup>(70)</sup>				9/34 (27) <sup>(109)</sup>
Boredom	242/500 (48) (60)	38/130 (29) <sup>(79)</sup>	9/72 (13) <sup>(88)</sup> 13/105 (13) (90)		
Stressful factors			4/72 (6) <sup>(88)</sup>		
Living environments					20 (59) <sup>(109)</sup>

<sup>a</sup> Decimals rounded to nearest whole number where appropriate.

<sup>b</sup> Numerators/denominators are presented first, followed by proportion (in parentheses), followed by reference.

## DISCUSSION

This is the first systematic review reporting perceived barriers to smoking cessation across a range of vulnerable groups. The findings from 54 qualitative, eight quantitative and three mixed methods studies demonstrate that barriers to quitting smoking operate at multiple levels including individual and lifestyle factors; social and community networks; living conditions; and cultural and socioeconomic factors. These include: smoking for stress management; enjoyment of smoking; addiction to nicotine; habit; social acceptability of smoking; lack of support to quit and access to quit resources; boredom; stressful life factors; pro-smoking living environments; cultural norms and socioeconomic disadvantage. Stress management, lack of support from health professionals and other service providers and the high prevalence and acceptability of smoking in communities were the three barriers common across all six vulnerable groups included in this review. The identification of perceived barriers common across vulnerable groups is an extension of the previous literature.

The identified barriers broadly reflect those reported in two systematic reviews limited to pregnant smokers (47) and Indigenous Australian pregnant smokers (32) and two critical reviews providing summaries of the challenges to cessation amongst low income smokers (33) and low income; rural; homeless; hard core; immigrant and HIV positive smokers (48). Addiction to nicotine, habit, stress management, enjoyment and weight gain are typically reported barriers to smoking cessation within the general population (26-28, 114). No studies were found that directly compared barriers experienced by vulnerable groups and smokers in the general population. To the authors knowledge, only one study has assessed the effect of socioeconomic position on barriers to quitting smoking and identified that decreasing SEP was associated with higher likelihood of reporting stress management and boredom as barriers (28). This review did not aim to provide direct comparisons between vulnerable groups and the general population due to the heterogeneity of studies.

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3 Additionally, comparisons by gender were beyond the scope of this review, but should be  
4 considered for further research, as socioeconomic disadvantage has differential effects on  
5 males and females (20) and preliminary evidence suggests barriers to cessation may differ by  
6 gender (28, 70).  
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12 Nevertheless, the novel results of this review indicate that vulnerable smokers report a  
13 number of additional barriers to cessation that operate within their social and community  
14 networks; living conditions; and wider cultural and socioeconomic contexts. Social and  
15 community barriers include: lack of support to quit from both peers and health and other  
16 professionals; high prevalence and acceptability of smoking within vulnerable communities  
17 and smoking as a social activity. Living conditions include: stressful factors; pro-smoking  
18 living and working circumstances; lack of access to quit resources; social and geographical  
19 isolation and boredom. Cultural norms and socioeconomic disadvantage also presented  
20 barriers to quitting.  
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#### 34 **Main barriers identified across all vulnerable groups**

##### 35 *Stress management*

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37 Stress management was a frequently reported individual level barrier. Smokers  
38 typically demonstrate higher levels of stress and low mood than non-smokers and ex-smokers  
39 (115-117). Smoking may provide a coping mechanism for individuals who are prone to  
40 higher levels of stress (118-120) or smoking may act as a stressor due to neurobiological  
41 processes or through the experience of withdrawal symptoms (120). Stressors associated with  
42 vulnerable groups (for example unemployment, financial stress, and poverty) may compound  
43 stress levels within vulnerable groups. Given that vulnerable smokers may be more likely to  
44 report smoking in order to relieve stress (28) incorporating stress management techniques  
45 into interventions targeted at vulnerable groups may help to increase cessation.  
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3 *Lack of support to quit from health professionals and other service providers*  
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5 At the social and community level, a lack of support to quit from health professionals  
6 and other service providers was identified. This reflects research that suggests smokers from  
7 low SEP are less likely to receive advice to quit from a healthcare provider than their more  
8 higher SEP counterparts (121), despite evidence demonstrating brief advice can increase the  
9 likelihood of successful quitting (122, 123). Both organisational and individual factors affect  
10 the provision of quit advice by health and other service providers. These include lack of time,  
11 confidence, knowledge and counselling skills (124). Efforts should be focussed on improving  
12 health professionals' ability to offer quit advice and may benefit from examining how best to  
13 ensure compliance to existing guidelines that provide clear recommendations on identifying  
14 individuals who are at higher risk of smoking and addressing the unique issues that these  
15 individuals face.  
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29 Tailoring interventions to the specific needs of vulnerable groups may be effective.  
30 Tailored interventions for behaviour change have been found to be effective compared to no  
31 intervention or dissemination of guidelines or educational materials alone [92]. Given that  
32 this review identified three common barriers across the six vulnerable groups include in this  
33 review, we argue that subsequent smoking cessation interventions in vulnerable groups  
34 should seek to address these factors. Programs should include specific modules on stress  
35 management techniques and how best to combat stress in vulnerable groups as well as  
36 educating smokers about how stress relief and relief from nicotine withdrawal symptoms can  
37 be confounded.  
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49 Smoking cessation interventions should be designed to maximise participation by  
50 vulnerable groups, addressing the key barriers around acceptability and access to  
51 interventions. Utilising existing services and organisations that are highly accessed by  
52 vulnerable groups and are a trusted source of help for vulnerable groups is also necessary.  
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3 There is accumulating evidence that social and community service organisations (SCSOs) are  
4 well placed to provide brief smoking cessation advice to highly vulnerable clients (125, 126).  
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### 7 *High prevalence and acceptability of smoking*

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10 The high prevalence and social acceptability of smoking within vulnerable  
11 communities was frequently reported. Considerable measures have been taken to address the  
12 denormalisation of smoking in the general population through regulation and legislative  
13 changes such as restrictions in advertising, smoke-free environment policies and point of sale  
14 restriction (1, 127, 128). Participants who were homeless, experiencing mental illness and  
15 prisoners cited a lack of restrictions on smoking within their living environments (or lack of  
16 enforcement of existing policies) as a factor that reinforced their smoking. While there are  
17 challenges associated with their implementation, smoke free areas can be successfully  
18 implemented within mental health treatment centres and prisons (129-131) and there is  
19 potential to extend these restrictions to homeless shelters and public housing developments.  
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32 Efforts to encourage the denormalisation of smoking in the environments of  
33 vulnerable communities require further exploration. Providing access to acceptable and  
34 effective behavioural and pharmacological supports should ensure that denormalisation does  
35 not result in compounding stigma and further isolating vulnerable groups (127, 132).  
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### 40 **Barriers specific to certain groups**

#### 41 *Indigenous groups*

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45 Indigenous groups identified unique stressors linked to smoking including racism and  
46 historical factors; cultural practices including ceremonial use of tobacco and cultural values  
47 that promote sharing, kinship and reciprocity and the importance of smoking as a way to  
48 maintain cultural identity. Cultural values also had effects on the willingness of Indigenous  
49 participants to access smoking support services. Certain Indigenous groups may be less likely  
50 to receive advice to quit or engage with services designed to aid in cessation (133). However,  
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3 it is important to note that smoking cessation programs have been shown to be effective  
4 within Indigenous groups (113, 134). Culturally appropriate interventions tailored to the  
5 needs of Indigenous smokers should continue to be developed, implemented and evaluated.  
6  
7 These programs should acknowledge the cultural significance of tobacco use and the  
8 important historical and social factors associated with Indigenous groups and smoking (135).

#### 14 *Prisoners*

16 Prisoners identified unique stressors within their living conditions that contributed to  
17 their smoking including social isolation, anxiety regarding legal matters and transfers to other  
18 prisons. A recent multicomponent randomised controlled trial that included improving stress  
19 management skills in prisoners found similar point prevalence abstinence rates as another  
20 trial conducted with prisoners (9) and other community based studies (136, 137). Thus,  
21 smoking cessation programs can be effective even in prison environments that are highly  
22 conducive to smoking and should form a part of routine care within prison systems.

#### 31 *People with a mental illness*

34 Low motivation to quit smoking was only reported in studies involving smokers with  
35 a mental illness. This contradicts research showing no difference in motivation to quit  
36 between those with severe mental illness and the general population (138). A recent review  
37 concluded there is some evidence to suggest that individuals diagnosed with a psychotic  
38 disorder are slightly less motivated to quit than those diagnosed with depression (138).  
39 Possible reasons for this include the symptoms associated with schizophrenia (including  
40 amotivation), management of side effects of medications (including Parkinsonism), limited  
41 support systems, low perceived vulnerability to smoking related disease, lack of alternate  
42 coping mechanisms and poverty (138, 139). Information on the diagnoses of participants was  
43 only reported in one of the studies reporting motivation as a barrier in this review (92) where  
44 the majority of participants were diagnosed with a psychotic disorder. However, other studies  
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3 did not provide information on participants' diagnoses and further exploration is beyond the  
4  
5 scope of this review.  
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8 Symptom management also presented a significant barrier within studies concerning  
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10 people with a mental illness. There is evidence to suggest that biochemical processes between  
11  
12 nicotine and other substances in tobacco improve some symptoms of mental illness (139).  
13  
14 Additionally, smokers with a mental illness may be more likely to misattribute their  
15  
16 withdrawal symptoms as recurring mental illness symptoms. Further investigation and  
17  
18 education regarding cessation and symptom management with people with a mental illness is  
19  
20 warranted. Integrating smoking cessation care with mental health and addiction treatments  
21  
22 can be effective at promoting cessation rates in groups with mental illness (21, 31). However,  
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24 future studies need to investigate ways to maintain long term smoking cessation as well as  
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26 systems-level changes that may support smoking cessation in people with mental illness (131,  
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28 140).  
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### 31 32 **Barriers to smoking cessation in vulnerable groups: a model**

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34 Figure 2 visually demonstrates the broad range of barriers to cessation reported by vulnerable  
35  
36 groups, many of which exist outside of the realm of the individual. This model demonstrates  
37  
38 the interconnectedness of individual and lifestyle factors with the wider social and  
39  
40 community factors, living conditions and cultural, socioeconomic and environmental factors.  
41  
42 The two darker spheres holding social and community networks and individual and lifestyle  
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44 factors identify those factors that are potentially modifiable through short term health  
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46 behaviour change interventions. This model does not provide an exhaustive list of all of the  
47  
48 factors that prevent vulnerable individuals from smoking cessation. It does provide a  
49  
50 framework for understanding the perceived self-reported barriers to quitting smoking  
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52 identified in this review.  
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### Strengths and limitations

This synthesis of the literature provides evidence of the perceived barriers to smoking cessation by examining the methodological quality of studies and comparing between and within selected vulnerable groups. However, this review has some limitations. While the overall quality of the studies included in this review was acceptable, most qualitative studies failed to provide information regarding the trustworthiness of the research and most quantitative studies failed to provide information on the validity and reliability of the survey measures used to assess barriers. Strategies for enhancing the trustworthiness of qualitative research have been concisely summarised (141) and future qualitative studies should seek to employ these strategies where possible. Future quantitative studies should seek to report at least brief psychometric properties of survey measures used to assess barrier to smoking cessation, including reliability and validity.

Of quantitative studies included, the majority used convenience samples. It is not generally feasible to target vulnerable and hard to reach populations using random population sampling procedures. This limits the generalizability and transferability of the included studies to wider vulnerable populations. Nevertheless, the agreement in findings between qualitative studies does suggest that these results are robust.

The nature of the studies included in this review means that no weight is given to the different barriers and the authors cannot provide comment on which, if any, barriers should be made a priority to target in smoking cessation interventions with vulnerable groups. Given limited resources and funds, addressing all barriers is rarely possible. Future research is needed to identify those barriers which are most important to address first and to prioritise resourcing and intervention development.

The results of this review were broadly categorised according to the SDHF, however these categories are not mutually exclusive and certain barriers were able to be included in



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2  
3 multiple categories (for example stress and stressful factors could be categorised as either  
4 individual level barriers or barriers within the living conditions level). The reviewed studies  
5 do not directly clarify whether the nature of stress experienced in vulnerable groups is  
6 personal or contextual. Constructs such as coping and resilience (140, 142) have been  
7 hypothesised as mediators between stress and smoking in low socioeconomic groups (143).  
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11 Similarly, as this review sought to provide a summary of vulnerable smokers'  
12 perceived self-reported barriers to cessation, other barriers which may be important  
13 determinants of quit attempts and success were not considered. Barriers such as the  
14 knowledge and attitudes of staff and health professionals and the capacity of services to offer  
15 smoking cessation programs, which have been identified within the literature (124), should  
16 also be considered when examining the challenges facing vulnerable groups.  
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28 This review was only able to identify four studies that examined the barriers to  
29 quitting smoking within prisoner (n=2 studies) and homeless (n=2) groups and one study  
30 focussing on at-risk youth. These results indicate more research is required with these groups  
31 to examine the barriers to smoking cessation. More studies investigating the barriers to  
32 cessation within these groups may lead to identification of additional common and unique  
33 barriers across vulnerable groups. Additionally, this review was limited to studies conducted  
34 within one of six vulnerable groups. Other groups that show high rates of smoking include  
35 lesbian, gay, bisexual and transgender groups (144); culturally and linguistically diverse  
36 groups (145); and rural and remote communities (146). The authors acknowledge the  
37 disparity in smoking prevalence in these groups, however their inclusion would have  
38 increased the breadth of the review to a level that would be too broad and complex to be  
39 useful. These groups may experience barriers to cessation different to those experienced by  
40 the groups included in this review. It should also be noted that individuals within the included  
41 groups often experience multiple forms of disadvantage for example people who are  
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3 homeless are more likely to experience a mental illness (147) and Indigenous communities  
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5 are more likely to be overrepresented in lower socioeconomic positions (3).  
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## 7 8 **Conclusions**

9  
10 These results support findings that vulnerable groups experience common barriers to  
11 smoking cessation, and also barriers which are unique to specific vulnerable groups. Stress  
12 management, high prevalence and acceptability of smoking and lack of support to quit were  
13 identified as priority areas for cessation research, program implementation and policy change.  
14 Many of the barriers identified within this review are modifiable through short term health  
15 behaviour change strategies. For heterogeneous groups of vulnerable individuals, intervention  
16 development should seek to address those barriers common to all vulnerable groups identified  
17 in this review. For relatively homogenous groups of vulnerable individuals, interventions  
18 should seek to address the unique barriers faced by those groups in addition to those barriers  
19 identified as common to all vulnerable groups.  
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32 These findings, coupled with lower success rates in quitting within vulnerable groups  
33 relative to the success rates in more advantaged groups (14, 148), suggest that interventions  
34 with vulnerable groups need to address wider social, community and cultural factors as well  
35 as individualised cessation support. Addressing the predictors of cessation found within the  
36 general population such as nicotine dependence and enjoyment remain important for  
37 vulnerable groups.  
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## Figure legends

Figure 1 – Database search results

Figure 2 - Model of the barriers to smoking cessation

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**Competing interests:** All authors have completed the Unified Competing Interest Form at [www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf) (available on request from the corresponding author) and declare that: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years; no other relationships or activities that could appear to have influenced the submitted work.

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3 **Perceived barriers to smoking cessation in selected vulnerable groups: A systematic**  
4 **review of the qualitative and quantitative literature.**  
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9 **Twyman, Laura,<sup>1\*</sup> Bonevski, Billie,<sup>1</sup> Paul, Chris,<sup>2</sup> & Bryant, Jamie.<sup>2</sup>**  
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23 **Keywords:** smoking cessation, vulnerable populations, disadvantage, barriers, systematic  
24 **review**  
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26 **Word count:** 5720  
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## ABSTRACT

**Objectives:** To identify barriers which are common and unique to six selected vulnerable groups: low socioeconomic status; Indigenous; mental illness and substance abuse; homeless; prisoners and at-risk youth.

**Design:** A systematic review was carried out to identify the perceived barriers to smoking cessation within six vulnerable groups.

**Data sources:** Medline, EMBASE, CINAHL and PsycInfo were searched using keywords and MeSH terms from each database's inception published prior to March 2014.

**Study selection:** Studies that provided either qualitative or quantitative (i.e. longitudinal, cross-sectional or cohort surveys) descriptions of self-reported perceived barriers to quitting smoking in one of the six aforementioned vulnerable groups were included.

**Data extraction:** Two authors independently assessed studies for inclusion and extracted data.

**Results:** 65 eligible papers were identified: 24 with low socioeconomic groups, 16 with Indigenous groups, 18 involving people with a mental illness, three with homeless groups, two involving prisoners and one involving at risk youth. One study identified was carried out with participants who were homeless and addicted to alcohol and/or other drugs. Barriers common to all vulnerable groups included: smoking for stress management, lack of support from health and other service providers and the high prevalence and acceptability of smoking in vulnerable communities. Unique barriers were identified for people with a mental illness (e.g. maintenance of mental health), Indigenous groups (e.g. cultural and historical norms), prisoners (e.g. living conditions), people who are homeless (e.g. competing priorities) and at risk youth (e.g. high accessibility of tobacco).

**Conclusions:** Vulnerable groups experience common barriers to smoking cessation, in addition to barriers that are unique to specific vulnerable groups. Individual-level and

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3 community and social network-level interventions are priority areas for future smoking  
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5 cessation interventions within vulnerable groups.  
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7 **Trial registration:** A protocol for this review has been registered with PROSPERO  
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9 International Prospective Register of Systematic Reviews [Identifier: CRD42013005761].  
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## 12 13 14 298

### 15 16 17 18 Strengths:

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20 • This study provides a valuable synthesis of the literature examining the perceived  
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22 barriers to smoking cessation common and unique across six vulnerable groups.  
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### 24 25 Limitations:

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27 • While the overall quality of the studies included in this review was acceptable, most  
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29 studies failed to provide information regarding the trustworthiness (qualitative  
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31 studies) or reliability and validity (quantitative studies) of the research.  
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## INTRODUCTION

Tobacco use is the leading global cause of avoidable death worldwide (1) and a key modifiable risk factor for the development of a range of diseases, including cardiovascular disease, chronic obstructive pulmonary disease, and some cancers (1).

The prevalence of tobacco smoking is inversely related to socioeconomic position (SEP) in high-income countries (1). For example, in 2010 in Australia, the prevalence of smoking was 24.6% in the lowest socioeconomic areas compared to 12.5% in the highest socioeconomic areas (2). The highest rates of smoking are evident among those who, in addition to low socioeconomic status, have other characteristics that distinguish them from the general population such as Indigenous groups (31% - 51.8%) (3-5); people with a mental illness (31.7-32.4%) (6), those with substance abuse disorders (77%) (7); the homeless (73%) (8); and prisoners (78% - 84%) (9, 10). These groups were selected because they represent a large proportion of those classified as vulnerable to socioeconomic disadvantage (11). It should be noted that although members of vulnerable groups are more likely to be socioeconomically disadvantaged, not all members are. For the purposes of this review, vulnerable groups are defined as groups that are more likely to experience social and material disadvantage due to lower income, cultural differences, and social exclusion (12).

Conflicting evidence exists regarding whether the rates of quit attempts in low SEP are similar to (13, 14) or lower (15-18) than the rates made by smokers in higher SEP. However, the success rate of quit attempts for lower SEP individuals is much lower than the success rate in higher SEP counterparts (14, 19).

There are many reasons quit success may be lower in vulnerable groups(20, 21). Within the health behaviour literature, factors that prevent an individual from undertaking health behaviour change have been referred to as barriers. Barriers are often conceptualised as either structural or individual psychosocial factors (22). Structural barriers include

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3 systems, organisations and the relationship between systems and individuals, for example  
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5 lack of accessible smoking cessation programs. Individual barriers refer to the subjective  
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7 experience of the individual, for example physical addiction to nicotine.  
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10 This definition of barriers is congruent with the social determinants of health  
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12 framework (SDHF)(23). The SDHF holds that an individual's health is influenced by factors  
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14 across many levels, from individual genetic and physical characteristics, social and  
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16 community networks, to broader influences of culture, socioeconomic determinants and the  
17  
18 environment. This framework has been used to examine the determinants of health  
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20 inequities(24). Because the SDHF classifies determinants of health as individual, social and  
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22 broader cultural and environmental factors, it also allows the identification of distinct levels  
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24 of intervention for health policies.  
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28 Within the general population, cross-sectional studies have found variation in the  
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30 most commonly reported barriers to cessation. Enjoyment (79%)(25); cravings (75%) (25);  
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32 and stress management (36% - 63%) (25, 26) are the most frequently reported barriers.  
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34 Irritability (39% - 42%) (27); habit (39%) (26); withdrawal symptoms (28% - 48%) (25, 26);  
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36 fear of failure (17% - 32%) (25, 26) and concern about weight gain (27%-34%) (25-27) are  
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38 also identified as barriers to cessation.  
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41 The effect of socioeconomic position on perceived barriers to quitting was examined  
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43 in a representative sample (n = 2,133) in the United Kingdom (28). Enjoyment (51%) and  
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45 stress relief (47%) were the most frequently endorsed motives for continuing to smoke across  
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47 the sample; however as socioeconomic position decreased, the likelihood of reporting stress  
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49 management and avoiding boredom as motives to continue to smoke increased. This  
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51 suggests that smokers from vulnerable groups may experience barriers to smoking cessation  
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53 differently than those in the general population (28).  
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3 Smoking in vulnerable groups is known to be influenced and perpetuated by a  
4 complex range of social, cultural and environmental factors (29) including high acceptability  
5 of smoking (30) and more tobacco retail outlets in low socioeconomic areas (31). Two  
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9  
10 previous studies have reviewed the literature to examine barriers to quitting smoking amongst  
11 vulnerable groups. One focussed on Aboriginal pregnant women (32), and one focussed on  
12 the barriers to smoking cessation service utilisation amongst low income smokers (33). Both  
13 reviews found pro-smoking social norms, inadequate knowledge regarding smoking related  
14 risks, and lack of access to appropriate cessation services inhibited participants' ability to  
15 quit.  
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23 As the term vulnerable applies to multiple discrete groups, it is important to  
24 understand which barriers (if any) are unique for example, cultural factors that inhibit  
25 smoking cessation may be unique to some Indigenous groups (32). A systematic examination  
26 of potential unique barriers would be valuable in order to develop and deliver appropriate  
27 suites of intervention techniques for specific vulnerable groups.  
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34 Understanding the perceived barriers to quitting is important in order to better  
35 understand smoking, relapse and quitting related behaviours, to inform appropriate policy,  
36 and facilitate the development of effective tailored smoking cessation interventions. Given  
37 the exceptionally high smoking rates and low quit success amongst vulnerable groups, there  
38 is a critical need for a systematic and comprehensive review of the literature of the perceived  
39 barriers to quitting smoking amongst vulnerable smokers.  
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## 49 Aims

50 This systematic review aims to provide a comprehensive synthesis of the self-reported  
51 barriers to quitting smoking within six vulnerable groups by reviewing the qualitative and  
52 quantitative literature. The review will focus on the perceived, self-reported barriers to  
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3 smoking cessation in six selected vulnerable groups: low socioeconomic status (low SES),  
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5 Indigenous, mental illness and substance abuse, homeless, prisoners, and at-risk youth. These  
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7 groups were selected because they represent a large proportion of those classified as  
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9 vulnerable to socioeconomic disadvantage (11); who exhibit smoking rates higher than that of  
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11 the general population (2-10); and who are identified as priority groups targeted for smoking  
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13 cessation programs and policies by peak health authorities (34-36). Specifically, the review  
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15 aims to:  
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20 a) identify barriers which are common across all vulnerable groups included in the review  
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22 and  
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24 b) identify barriers that may be unique to specific groups.  
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29 The results of the review will be used to develop a practical model to help understand the  
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31 barriers to quitting amongst vulnerable groups and to aid smoking cessation intervention  
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33 development.  
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## 36 37 38 **METHOD**

### 39 40 **Study design**

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42 Guidelines for the reporting of systematic reviews (PRISMA) (37) and qualitative  
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44 synthesis (ENTREQ) (38) were followed. A protocol for this review was registered with  
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46 PROSPERO International Prospective Register of Systematic Reviews [Identifier:  
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48 CRD42013005761].  
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## Databases and search

Medline, EMBASE, CINAHL and PsycInfo were searched using keywords and MeSH terms from each database's inception published prior to March 2014. The reference lists of key articles and reviews were also manually searched in order to identify any other relevant articles. An extensive list of search terms was used in order to ensure that as many relevant articles as possible were captured (See Table 1).

Table 1. Search strategy

1	Tobacco/
2	Tobacco use/
3	Tobacco use cessation/
4	Tobacco smoking/
5	Smoking/
6	Smoking Cessation/
7	Tobacco use cessation/
8	Tobacco dependence/
9	Cigarette smoking/
10	Or/1-9
11	Homeless youth/
12	Homeless persons/
13	Housing/
14	Homeless mentally ill/
15	Homelessness or homeless/
16	Community programs/
17	Or/11-16
18	Prisoner or Prisons/
19	Correctional Health Services/
20	Correctional facilities/
21	Jail/
22	Or/18-21
23	Anxiety/
24	Depression/
25	Schizophrenia/
26	Mentally Ill persons/
27	Mental health/
28	Mental illness/
29	Mental disorder/
30	Mental disease/
31	Mental patient/
32	Mental health services/
33	Substance-related disorders/
34	Drug use/
35	Drug abuse/
36	Alcohol-related disorders/
37	Or/23-36

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38	Adolescent behaviour/
39	Juvenile delinquency/
40	Juvenile offenders/
41	Disruptive Behaviors or disruptive behaviours/
42	At-risk youth/
43	At-risk young people/
44	Or/38-43
45	Indigenous/
46	Indigenous health/
47	Indigenous peoples/
48	Indigenous populations/
49	Aboriginal/
50	Aboriginal and Torres Strait Islanders/
51	Inuits/
52	Eskimo/
53	Alaska Native/
54	Indians/
55	Native American/
56	Native Hawaiian/
57	American Indian/
58	Indians, North American/
59	Indians, South American/
60	Indians, Central American/
61	First Nations/
62	Pacific Islander/
63	Maori/
64	Oceanic ancestry group/
65	American Native Continental Ancestry Group/
66	Or/45-65
67	Poverty
68	Social status
69	Social class
70	Low income population
71	Inequalities
72	Socioeconomic status
73	Socioeconomic factors
74	Disadvantaged
75	Underserved
76	Or/67-75
77	Related to smoking cessation/quitting smoking
78	Correlated with smoking cessation/quitting smoking
79	Associated with smoking cessation/quitting smoking
80	That affect smoking cessation/quitting smoking
81	That inhibit smoking cessation/quitting smoking
82	That prevent smoking cessation/quitting smoking
83	Barriers to smoking cessation/quitting smoking
84	Factor\$ or Determinant\$ or Variable\$ or Covariable\$ or Predictor\$ or Barrier\$
85	Or/77-84
86	10 AND 85 AND 17
87	10 AND 85 AND 22
88	10 AND 85 AND 37
89	10 AND 85 AND 44

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90	10 AND 85 AND 66
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### **Inclusion and exclusion criteria**

Studies that provided either qualitative or quantitative (i.e. longitudinal, cross-sectional or cohort surveys) descriptions of perceived self-reported barriers to quitting smoking in low SES groups, Indigenous groups, people with a mental illness or substance abuse problems, people who are homeless, prisoners or at-risk youth were included. See Table 2 for definitions used as inclusion criteria for each vulnerable group. Only studies carried out in high income countries were included as middle and low income countries may present different contextual, political and economic barriers which require separate consideration. Only studies published in English were included as resources required to translate articles were beyond the scope of this review. Intervention studies were excluded, as barriers discussed within these studies related to use of the intervention being tested and not barriers to smoking cessation per se. Studies examining factors associated with quit attempts or success were excluded unless they included results on the perceived barriers self-reported by participants from vulnerable groups. Studies describing *provider* reports of the barriers to the provision of smoking cessation support or treatment, and unpublished grey literature, were also excluded. There were no cut offs for sample size.

Table 2. Inclusion criteria definitions of each group.

Group	Definition
Low socioeconomic status (SES)	Because definitions of low SES vary across high income countries this study used an inclusive definition of low SES. Studies were included if they described participants as being low SES and gave at least one measure of SES. This measure could be income (above/below poverty level); address in deprived neighbourhood etc.
Indigenous groups	The following definition was used to define potential Indigenous studies in accordance with previous studies (39): “the experiences shared by a group of people who have inhabited a country for thousands of years, which often contrast with those of other groups residing in the same country for a few hundred years” (40).
Mental Illness	People with a mental illness were defined as individuals who had been diagnosed with a mental illness, severe mental illness or were described as inpatients or outpatients in a mental health rehabilitation facility. Substance use disorders were also included. All mental illnesses were included.
At-risk youth	At-risk youth were defined as individuals under the age of 21 who have experienced or are experiencing; problems at school; physical, sexual or psychological abuse; mental or physical health problems; economic disadvantage or who have committed a violent or delinquent act (USA Code).
Prisoners	Prisoners included both those currently incarcerated and those ex-prisoners living in the community.
Homeless	Homeless individuals were defined as those individuals described as meeting national criteria for homelessness or those individuals accessing services provided to homeless persons.
Smoker	Smokers were defined as self-reported daily or occasional cigarette smokers. Studies that also assessed ex-smokers were only included if the majority of participants were current smokers, or if the results were reported by smoking status. Studies were excluded if they focussed solely on ex-smokers or non-smokers.

### Data extraction

The titles and abstracts of retrieved publications were assessed by one reviewer (LT) against eligibility criteria and excluded if they did not meet inclusion criteria. A second reviewer (a Research Assistant) independently assessed 20% of the returned abstracts for inclusion with 100% agreement between reviewers. Data from included journal articles was extracted into summary tables independently by one reviewer (LT) and a random 20% checked by a second (Research Assistant). Agreement was again high (97%). Discrepancies were settled by discussion between the reviewers. Data extracted from the articles included: study aims, setting, sample characteristics, response rates, study methodology, data analysis and the barriers identified. Barriers were defined as factors that prevented smoking cessation and/or quit attempts or were reported as primary reasons for continuing to smoke.

### Risk of bias in individual studies

Quality assessment was performed independently by all authors, with two reviewers per manuscript. The methodological quality of qualitative studies was assessed using the McMaster Qualitative Criteria Form (41). Quantitative studies were assessed using a tool adapted from the STROBE statement (42). As there is a lack of an agreed, valid and reliable measure to assess the quality of mixed methods studies (43), both the McMaster guidelines and the adapted quantitative framework were applied to the corresponding qualitative and quantitative components of any mixed methods studies identified.

### Synthesis of results

Results were synthesised by vulnerable group using narrative synthesis and inductive data analysis techniques. Narrative synthesis allows the examination of studies that are highly heterogeneous in their research questions, samples and methods (44, 45). In order to avoid

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3 potential biases, care was taken to also identify points of difference between studies (46).  
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5 Where a barrier was reported in more than one study, this was recorded. In quantitative  
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7 studies, the proportion of respondents reporting each barrier was calculated. Barriers were  
8  
9 combined into categories and then classified using the SDHF (23). For the purposes of this  
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11 review, individual factors were defined as physical or psychological barriers to quitting  
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13 smoking: for example, the individual's level of nicotine dependence or motivation to quit.  
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15 Lifestyle factors were defined as health behaviours (including alcohol and other drug use)  
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17 that impeded an individual's ability to quit. Social and community networks were defined as  
18  
19 the impact of an individual's family and friend networks, and the wider community. Living  
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21 and working conditions encompassed factors including housing, health care, education and  
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23 employment. The final domain was the broader socioeconomic, cultural and environmental  
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25 background perceived to influence smoking cessation.  
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## 32 RESULTS

### 33 Search results

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35 After duplicates were removed, 21,767 studies were identified from electronic  
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37 searches and a further 27 from manual searches. Of those, 65 studies met inclusion criteria  
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39 and were included in the review (see Figure 1). Supplementary file 1 contains a list of full  
40  
41 text articles that were retrieved, reviewed and excluded as per the inclusion criteria. Two  
42  
43 systematic reviews concerning Indigenous Australian pregnant women (32) and pregnant  
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45 women (47); and two critical reviews providing summaries of the barriers to quitting (33, 48)  
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47 were also identified from hand searches.  
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### 52 Study characteristics

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3 The majority of studies (n = 24) identified barriers to smoking cessation in low SES groups  
4 (30, 49-71), Indigenous groups (n = 16) (72-87), and people with a mental illness (n = 18)  
5 (88-105) including two concerning those with substance use disorders (101, 104). Three  
6 studies reported barriers to quitting within the homeless (106-108) and two reported barriers  
7 within prisoner groups (109, 110). One study with at-risk youth was identified (111). Two  
8 other studies concerning Alaska Native participants (age range from 11 to 18) (86) and  
9 people with a mental illness (age range from 16 to 23) (103) included younger people as  
10 participants. One study was identified that was carried out with participants who were both  
11 homeless and addicted to drugs and/or alcohol (112). Since the study comprised participants  
12 that met criteria for inclusion in two of the vulnerable groups included in this review (both  
13 the homeless and mental illness/substance use groups) this study was included in a seventh  
14 category containing “multiple” participant groups. Supplementary files 2, 3 and 4 summarize  
15 the included quantitative, qualitative and mixed methods studies respectively. An overview of  
16 the characteristics of included studies can be found in Supplementary file 5.

### 36 **Quality assessment of qualitative studies**

37  
38 The results of the quality assessment of qualitative studies are presented in  
39 Supplementary file 6. Overall, the quality of studies varied widely. The majority of studies  
40 did not explicitly state their study design (n = 38); of those that did, most used Grounded  
41 Theory (57, 59, 61, 93, 98, 99). Most studies provided adequate descriptions of the study  
42 sites; participants; data collection methods and analysis techniques. Studies generally  
43 performed poorly when assessed on four components of trustworthiness, with only fifteen  
44 studies meeting all four criteria (credibility; transferability; dependability and confirmability)  
45 [41,44,48,50,58,60,64,65,68,69,72,73,75,76,84]. It should be noted that none of the mixed  
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3 methods studies explicitly described their methodology as mixed methods nor did they report  
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5 integrating the qualitative and quantitative findings in a systematic way.  
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### 8 9 10 **Quality assessment of quantitative studies**

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12 The results of the quality assessment of quantitative studies are presented in  
13  
14 Supplementary file 7. Sample sizes in the quantitative studies ranged from 36 to 500  
15  
16 participants. Response rates ranged from 42% to over 97% (three studies did not provide  
17  
18 response rates) [70,91,92]. All but one study [81] clearly stated eligibility criteria. All studies  
19  
20 stated their outcome a priori and no conflicts of interest were identified. The validity and  
21  
22 reliability of survey measures used to assess barriers to cessation were reported in one study  
23  
24 [53]. Three studies employed techniques such as pilot testing and input from key stakeholders  
25  
26 in developing the tools used [53,77,95].  
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### 30 31 32 **Perceived barriers to smoking cessation**

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34 The barriers to quitting smoking endorsed over multiple studies included: smoking for  
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36 stress management; enjoyment of smoking; addiction to nicotine; habit; social acceptability  
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38 of smoking; lack of support to quit and access to quit resources; boredom; stressful life  
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40 factors; pro-smoking living environments; smoking cultural norms and socioeconomic  
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42 disadvantage. Figure 2 demonstrates the barriers reported in this review categorised by the  
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44 SDHF. For brevity, the current results section will focus on those barriers that were common  
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46 across all groups and unique to certain vulnerable groups. Supplementary file 8 provides a  
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48 detailed description of all of the barriers identified in this review. Table 3 provides a  
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50 summary of the barriers extracted from the qualitative studies. References of studies that  
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52 report one or more barriers at a given level of the SDHF are included in Table 3. Table 4  
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3 provides a summary of the results of quantitative studies including the proportion of  
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5 participants endorsing the barrier and the study reference.  
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### 8 9 10 **Barriers common across all groups**

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12 Three barriers were present in all six vulnerable groups included in this review: 1)  
13 stress management, 2) lack of support to quit from health professionals and other service  
14 providers, and 3) high prevalence and acceptability of smoking within vulnerable  
15 communities.  
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20 Within the SDHF, stress management was categorised as an individual level barrier.  
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22 Forty qualitative studies identified stress management as a significant barrier to smoking  
23 cessation (50-56, 58, 59, 61-63, 65, 67-69, 72, 74, 75, 80, 81, 83, 84, 86, 87, 89, 90, 92, 93,  
24 95-97, 99, 100, 103, 105, 108, 110-112). Smoking was used as a coping mechanism (52, 58,  
25 62-65, 69, 74, 89, 90, 92, 97, 99) in reaction to daily stressors as well as the stress inherent in  
26 vulnerable lives. Three quantitative studies reported stress management as a barrier to  
27 quitting with Maori participants (48%) (79), participants with substance use disorders (39%)  
28 (104) and homeless participants (44%) (107). Of note, participants in two studies reported  
29 that smoking also directly contributed to the stress experienced by participants (51, 111).  
30 Participants also reported using smoking to manage their emotions and mood (58, 65, 72, 83,  
31 84, 90, 93, 98, 103, 113). Twenty three percent of participants from a Maori sample indicated  
32 managing emotions was a barrier to quitting (79), 42% of individuals with a substance use  
33 disorder (101).  
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50 High prevalence and acceptability of smoking within vulnerable communities was  
51 categorised as a community and social network level barrier. Eight qualitative (53, 54, 69, 75,  
52 79, 80, 98, 111) and four quantitative (60, 101, 107, 109) studies found that being around  
53 other smokers was a barrier to quitting. This finding is reinforced by participants describing  
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3 the high prevalence of smoking amongst family and friends in 22 studies (30, 51, 52, 56, 62,  
4 68, 69, 72, 74, 76, 81, 83, 85-87, 90, 93, 95, 96, 103, 111, 112) and in the wider community  
5 in 18 studies (30, 51, 52, 56, 62, 66, 69, 72, 74, 76, 81, 83, 85-87, 93, 96, 112). Tobacco was  
6 readily available and easily accessible within vulnerable communities (51, 62, 66, 76, 83, 90,  
7 91, 111) and smoking was considered to be a highly acceptable (30, 79, 81-83, 85-87) and  
8 normalised behaviour (52, 56, 62, 66, 69, 79, 81-83, 85, 87).

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16 Lack of support to quit from health and other service providers to quit was also  
17 categorised as a social and community network barrier. Other service providers include  
18 management and staff in prisons, homeless shelters and organisations, and members of the  
19 community. Thirteen qualitative studies (52, 55, 56, 58, 74, 77, 83, 86, 91, 92, 95, 108, 112)  
20 and one quantitative study (109) reported a perceived lack of support from health  
21 professionals regarding smoking cessation. Cases of family members and health professionals  
22 actively discouraging quit attempts and encouraging maintenance of smoking due to concerns  
23 about the individual's mental health (92, 93, 95, 96, 112) or because smoking was perceived  
24 to be the individual's only source of enjoyment (54, 77, 79, 83) were reported. Three studies  
25 identified tobacco use by health professionals and others involved in the participants' care as  
26 a barrier to cessation (77, 95, 109). Over half (55.9%) of prisoners surveyed reported  
27 observing members of staff smoking as a barrier to quitting (109). Studies involving people  
28 with a mental illness and prisoners identified use of cigarettes in order to reward or punish  
29 behaviour by health professionals and other service providers (93, 95, 96, 110) as a barrier to  
30 quitting. Twenty-nine percent of prisoners also indicated that not receiving cessation support  
31 from prison staff prevented them from quitting smoking (109). Twenty-six percent of  
32 substance abusing individuals reported they did not have enough support to quit. One study  
33 involving at risk youth identified smoking being unaddressed by teachers and members of the  
34 police force as a barrier to smoking cessation (111).

Table 3. A summary of the self-reported barriers to smoking cessation – qualitative and mixed methods studies by vulnerable group.

Barrier	Low SES groups (n = 22)	Indigenous groups (n = 16)	People with a mental illness (n=13)	Homeless groups (n = 3)	Prisoner groups (n = 2)	At risk youth (n = 1)	Multiple groups (n = 1)
<b>Individual and lifestyle factors</b>							
Stress management	(50-59, 61-63, 65-69)	(72, 74, 75, 79, 81, 83, 84, 86, 87)	(89, 90, 92, 93, 95-98, 105)	(108)	(110)	(111)	(112)
Enjoyment	(50, 54-56, 59, 62, 63, 65, 67)	(79, 81-83)	(89, 90, 92-94, 97, 98, 105)			(111)	
Addiction	(49, 50, 54, 57, 59, 67-69)	(72, 74, 75, 81, 83, 84, 86)	(90-92, 98)				
Habit	(50, 57, 65, 68)	(75, 79, 83, 84)	(92, 105)				
Mental health benefits	(58, 67)	(74)	(89, 91-99)				
Weight gain	(30, 49, 52-54, 64, 67)	(72, 74, 84)	(91, 98)				
Competing priorities	(56, 63)	(74, 75, 87)	(89, 91, 98, 99)	(108)			
Rationalisations	(54-56, 58, 61, 67)	(74, 78, 82, 87)	(89, 97)				
Other substance use	(49, 56, 59, 62)	(74, 76, 81, 84)	(89)				(112)
Autonomy	(56, 58, 68)	(83)	(93, 97-99)				
Low confidence	(52, 53, 56, 63, 67, 69)	(73, 84)	(92, 96, 98)				(112)
Cognitive benefits	(51)	(83)	(93-95)				
Loneliness	(52, 59, 65)		(93, 97, 98)				
Low risk of harm	(58)	(87)	(95, 97)				
Low motivation			(92, 94, 97, 98)				
Past failed attempts	(61)	(74)					
Positive smoker image	(30, 57)		(97)				
<b>Social and community networks</b>							
Prevalence and acceptability	(30, 51-54, 56, 62, 66, 68, 69)	(72, 74, 76, 79, 83, 85-87)	(90, 91, 93, 95, 96, 105)	(108)	(110)	(111)	(112)
Lack of social	(30, 49, 54-56, 58, 64,	(74, 75, 77, 79, 83, 84)	(91, 94, 98)	(108)			

support	67-69)						
Social activity	(30, 49, 53, 57, 62)	(73-75, 79, 85, 87)	(89, 90, 92, 93, 95, 97, 98)				
Lack of health and other professional support	(52, 54-56, 58)	(74, 77, 79, 83, 86)	(91-93, 95, 96)	(108)	(110)	(111)	(112)
<b>Living and working conditions</b>							
Access to quit resources	(52, 55, 56, 61-64)	(72-74, 78, 81, 85, 86)	(93, 96, 98)	(108)	(110)		
Boredom	(50-52, 54-56, 59, 65)	(75, 86)	(90, 94, 95, 97, 99)	(108)	(110)		
Concerns regarding treatment	(50, 52, 56, 58, 61-63, 69)	(72-74, 77, 78, 81, 86)	(91, 93, 96, 105)	(108)			
Stressful factors	(56, 58, 59, 62, 63, 65, 68)	(74, 75, 85)			(110)		
Living and working circumstances	(30, 54, 58)	(74)	(96)				
<b>Cultural, socioeconomic and environmental factors</b>							
Cultural norms	(56, 62)	(72-75, 78, 81-83, 85-87)	(93, 94, 98)		(110)		
Socioeconomic factors	(65)		(97)				

### Barriers unique to certain vulnerable groups

Indigenous; prisoner; mentally ill, homeless, and at risk youth reported unique barriers to smoking cessation. Racism, historical factors (74, 75, 85), ceremonial use of tobacco (72, 73, 82, 85, 86), cultural values that promote sharing, kinship, and reciprocity (83), cultural values of pride, independence and self-reliance that affect help seeking behaviour (81, 82), cultural values concerning health and privacy (84), and maintenance of cultural identity (73-75, 82, 83, 85) were identified as barriers within Indigenous groups. Smoking cessation could therefore exclude an individual from fully participating in their culture or potentially challenge family, personal or community relationships.

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3 Living environments and the stressful context of prison presented unique barriers for  
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5 prisoners, including social isolation, anxiety regarding legal matters, transfers to other  
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7 prisons, use of cigarettes as a currency, use of cigarettes as a way to reward or punish  
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9 behaviour, bullying, missing family and restricted movement throughout the day (110).  
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11 Low levels of motivation (92, 94, 97, 98), concerns about ability of cessation services  
12  
13 to handle mental health issues (91, 93, 96), identity and belonging (93, 94, 98) and symptom  
14  
15 management (88-98) were barriers for people with mental illness.  
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18 Competing needs and prioritising need to find shelter/place to live were unique  
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20 barriers for individual who were homeless (108). Very high levels of accessibility of  
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22 cigarettes, and the regular practice of selling cigarettes to those under 18 years of age were  
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24 identified by one study with at risk youth as a unique barrier (104).  
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Table 4. A summary of the barriers to smoking cessation – reported prevalence of each barrier by vulnerable group for studies using quantitative and mixed methods<sup>ab</sup>.

Barrier	Reported prevalence of each barrier N/Total N (%)				
	Low SES groups (n = 1)	Indigenous groups (n = 1)	People with a mental illness (n = 3)	Homeless groups (n = 2)	Prisoner groups (n = 1)
<b>Individual and lifestyle factors</b>					
Stress management		63/130 (48) <sup>(79)</sup>	30/78 (39) <sup>(104)</sup>	82/186 (44) <sup>(107)</sup>	
Relaxation	261/500 (52) <sup>(60)</sup>	22/130 (17) <sup>(79)</sup>	13/30 (42) <sup>(100)</sup> 7/72 (10) <sup>(88)</sup>		
Enjoyment		33/130 (25) <sup>(79)</sup>	34/72 (47) <sup>(88)</sup> 21/105 (20) <sup>(90)</sup> 30/78 (39) <sup>(104)</sup>		
Addiction	431/500 (86) <sup>(60)</sup>	51/130 (39) <sup>(79)</sup>	56 (53) <sup>(90)</sup> 10/30 (33) <sup>(100)</sup>	93/186 (50) <sup>(107)</sup>	
Cravings			53/78 (68) <sup>(104)</sup> 47/96 (48) <sup>(101)</sup>		
Withdrawal symptoms			85/96 (87) <sup>(101)</sup>		
Habit	411/500 (82) <sup>(60)</sup>	95/130 (73) <sup>(79)</sup>	26/72 (36) <sup>(88)</sup> 20/105 (19) <sup>(90)</sup> 17/30 (58) <sup>(100)</sup>		
Perceived Mental Health Benefits		6 – 30/130 (5-23) <sup>(79)</sup>	21/105 (20) <sup>(90)</sup> 7 – 8/72 (10-11) <sup>(88)</sup> 41/78 (53) <sup>(104)</sup> 41-76/96 (42-78) <sup>(101)</sup>		
Concentration			27-56/96 (28-55) <sup>(101)</sup>		
Low levels of motivation	131/350 (38) <sup>(70)</sup>		46/96 (47) <sup>(101)</sup>		
Weight gain	69/350 (20) <sup>(70)</sup>	6/130 (5) <sup>(79)</sup>	3/72 (4) <sup>(88)</sup> 39/96 (40) <sup>(101)</sup>	38/186 (20) <sup>(107)</sup>	
Other substance use			3/72 (4) <sup>(88)</sup> 2-8/78 (3-10) <sup>(104)</sup>		



			13-40/96 (13-41) <sup>(101)</sup>		
Problems getting to sleep			23/96 (23) (101)		
Low confidence and perceived difficulty	87 - 202/350 (25 - 58) <sup>(70)</sup>		22/78 (24) <sup>(104)</sup>		25/34 (74) (109)
<b>Social and community networks</b>					
High prevalence and acceptability in the community	332/500 (66) (60)	5/130 (12) <sup>(79)</sup>	13/105 (13) (90)	78/186 (42) (107)	27/34 (79) (109)
	116/350 (33) (70)		5/72 (7) <sup>(88)</sup> 34/78 (43) <sup>(104)</sup>		
Lack of social support	90/350 (26) (70)			48/186 (26) (107) 70-79/98 (71-79) <sup>(106)</sup>	10/34 (29) (109)
Lack of health and other professional support			3/72 (4) <sup>(88)</sup>		19/34 (56) (109)
Social activity		44/130 (34) <sup>(79)</sup>	17/30 (58) (100) 2/72 (3) <sup>(88)</sup>		
Availability of cigarettes		5/130 (4) <sup>(79)</sup>	8/105 (8) <sup>(90)</sup> 5/72 (7) <sup>(88)</sup>		
<b>Living and working conditions</b>					
Access to quit resources	108/350 (31) <sup>(70)</sup>				9/34 (27) <sup>(109)</sup>
Boredom	242/500 (48) (60)	38/130 (29) <sup>(79)</sup>	9/72 (13) <sup>(88)</sup> 13/105 (13) (90)		
Stressful factors			4/72 (6) <sup>(88)</sup>		
Living environments					20 (59) <sup>(109)</sup>

<sup>a</sup> Decimals rounded to nearest whole number where appropriate.

<sup>b</sup> Numerators/denominators are presented first, followed by proportion (in parentheses), followed by reference.

## DISCUSSION

This is the first systematic review reporting perceived barriers to smoking cessation across a range of vulnerable groups. The findings from 54 qualitative, eight quantitative and three mixed methods studies demonstrate that barriers to quitting smoking operate at multiple levels including individual and lifestyle factors; social and community networks; living conditions; and cultural and socioeconomic factors. These include: smoking for stress management; enjoyment of smoking; addiction to nicotine; habit; social acceptability of smoking; lack of support to quit and access to quit resources; boredom; stressful life factors; pro-smoking living environments; cultural norms and socioeconomic disadvantage. Stress management, lack of support from health professionals and other service providers and the high prevalence and acceptability of smoking in communities were the three barriers common across all six vulnerable groups included in this review. The identification of perceived barriers common across vulnerable groups is an extension of the previous literature.

The identified barriers broadly reflect those reported in two systematic reviews limited to pregnant smokers (47) and Indigenous Australian pregnant smokers (32) and two critical reviews providing summaries of the challenges to cessation amongst low income smokers (33) and low income; rural; homeless; hard core; immigrant and HIV positive smokers (48). Addiction to nicotine, habit, stress management, enjoyment and weight gain are typically reported barriers to smoking cessation within the general population (26-28, 114). No studies were found that directly compared barriers experienced by vulnerable groups and smokers in the general population. To the authors knowledge, only one study has assessed the effect of socioeconomic position on barriers to quitting smoking and identified that decreasing SEP was associated with higher likelihood of reporting stress management and boredom as barriers (28). This review did not aim to provide direct comparisons between vulnerable groups and the general population due to the heterogeneity of studies.

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3 Additionally, comparisons by gender were beyond the scope of this review, but should be  
4 considered for further research, as socioeconomic disadvantage has differential effects on  
5 males and females (20) and preliminary evidence suggests barriers to cessation may differ by  
6 gender (28, 70).  
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12 Nevertheless, the novel results of this review indicate that vulnerable smokers report a  
13 number of additional barriers to cessation that operate within their social and community  
14 networks; living conditions; and wider cultural and socioeconomic contexts. Social and  
15 community barriers include: lack of support to quit from both peers and health and other  
16 professionals; high prevalence and acceptability of smoking within vulnerable communities  
17 and smoking as a social activity. Living conditions include: stressful factors; pro-smoking  
18 living and working circumstances; lack of access to quit resources; social and geographical  
19 isolation and boredom. Cultural norms and socioeconomic disadvantage also presented  
20 barriers to quitting.  
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### 34 **Main barriers identified across all vulnerable groups**

#### 35 *Stress management*

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37 Stress management was a frequently reported individual level barrier. Smokers  
38 typically demonstrate higher levels of stress and low mood than non-smokers and ex-smokers  
39 (115-117). Smoking may provide a coping mechanism for individuals who are prone to  
40 higher levels of stress (118-120) or smoking may act as a stressor due to neurobiological  
41 processes or through the experience of withdrawal symptoms (120). Stressors associated with  
42 vulnerable groups (for example unemployment, financial stress, and poverty) may compound  
43 stress levels within vulnerable groups. Given that vulnerable smokers may be more likely to  
44 report smoking in order to relieve stress (28) incorporating stress management techniques  
45 into interventions targeted at vulnerable groups may help to increase cessation.  
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3 *Lack of support to quit from health professionals and other service providers*  
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5 At the social and community level, a lack of support to quit from health professionals  
6 and other service providers was identified. This reflects research that suggests smokers from  
7 low SEP are less likely to receive advice to quit from a healthcare provider than their more  
8 higher SEP counterparts (121), despite evidence demonstrating brief advice can increase the  
9 likelihood of successful quitting (122, 123). Both organisational and individual factors affect  
10 the provision of quit advice by health and other service providers. These include lack of time,  
11 confidence, knowledge and counselling skills (124). Efforts should be focussed on improving  
12 health professionals' ability to offer quit advice and may benefit from examining how best to  
13 ensure compliance to existing guidelines that provide clear recommendations on identifying  
14 individuals who are at higher risk of smoking and addressing the unique issues that these  
15 individuals face.  
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29 Tailoring interventions to the specific needs of vulnerable groups may be effective.  
30 Tailored interventions for behaviour change have been found to be effective compared to no  
31 intervention or dissemination of guidelines or educational materials alone [92]. Given that  
32 this review identified three common barriers across the six vulnerable groups include in this  
33 review, we argue that subsequent smoking cessation interventions in vulnerable groups  
34 should seek to address these factors. Programs should include specific modules on stress  
35 management techniques and how best to combat stress in vulnerable groups as well as  
36 educating smokers about how stress relief and relief from nicotine withdrawal symptoms can  
37 be confounded.  
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49 Smoking cessation interventions should be designed to maximise participation by  
50 vulnerable groups, addressing the key barriers around acceptability and access to  
51 interventions. Utilising existing services and organisations that are highly accessed by  
52 vulnerable groups and are a trusted source of help for vulnerable groups is also necessary.  
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3 There is accumulating evidence that social and community service organisations (SCSOs) are  
4 well placed to provide brief smoking cessation advice to highly vulnerable clients (125, 126).  
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### 7 *High prevalence and acceptability of smoking*

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10 The high prevalence and social acceptability of smoking within vulnerable  
11 communities was frequently reported. Considerable measures have been taken to address the  
12 denormalisation of smoking in the general population through regulation and legislative  
13 changes such as restrictions in advertising, smoke-free environment policies and point of sale  
14 restriction (1, 127, 128). Participants who were homeless, experiencing mental illness and  
15 prisoners cited a lack of restrictions on smoking within their living environments (or lack of  
16 enforcement of existing policies) as a factor that reinforced their smoking. While there are  
17 challenges associated with their implementation, smoke free areas can be successfully  
18 implemented within mental health treatment centres and prisons (129-131) and there is  
19 potential to extend these restrictions to homeless shelters and public housing developments.  
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32 Efforts to encourage the denormalisation of smoking in the environments of  
33 vulnerable communities require further exploration. Providing access to acceptable and  
34 effective behavioural and pharmacological supports should ensure that denormalisation does  
35 not result in compounding stigma and further isolating vulnerable groups (127, 132).  
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### 40 **Barriers specific to certain groups**

#### 41 *Indigenous groups*

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45 Indigenous groups identified unique stressors linked to smoking including racism and  
46 historical factors; cultural practices including ceremonial use of tobacco and cultural values  
47 that promote sharing, kinship and reciprocity and the importance of smoking as a way to  
48 maintain cultural identity. Cultural values also had effects on the willingness of Indigenous  
49 participants to access smoking support services. Certain Indigenous groups may be less likely  
50 to receive advice to quit or engage with services designed to aid in cessation (133). However,  
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3 it is important to note that smoking cessation programs have been shown to be effective  
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5 within Indigenous groups (113, 134). Culturally appropriate interventions tailored to the  
6  
7 needs of Indigenous smokers should continue to be developed, implemented and evaluated.  
8  
9 These programs should acknowledge the cultural significance of tobacco use and the  
10  
11 important historical and social factors associated with Indigenous groups and smoking (135).

#### 14 *Prisoners*

15  
16 Prisoners identified unique stressors within their living conditions that contributed to  
17  
18 their smoking including social isolation, anxiety regarding legal matters and transfers to other  
19  
20 prisons. A recent multicomponent randomised controlled trial that included improving stress  
21  
22 management skills in prisoners found similar point prevalence abstinence rates as another  
23  
24 trial conducted with prisoners (9) and other community based studies (136, 137). Thus,  
25  
26 smoking cessation programs can be effective even in prison environments that are highly  
27  
28 conducive to smoking and should form a part of routine care within prison systems.  
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#### 31 *People with a mental illness*

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33 Low motivation to quit smoking was only reported in studies involving smokers with  
34  
35 a mental illness. This contradicts research showing no difference in motivation to quit  
36  
37 between those with severe mental illness and the general population (138). A recent review  
38  
39 concluded there is some evidence to suggest that individuals diagnosed with a psychotic  
40  
41 disorder are slightly less motivated to quit than those diagnosed with depression (138).  
42  
43 Possible reasons for this include the symptoms associated with schizophrenia (including  
44  
45 amotivation), management of side effects of medications (including Parkinsonism), limited  
46  
47 support systems, low perceived vulnerability to smoking related disease, lack of alternate  
48  
49 coping mechanisms and poverty (138, 139). Information on the diagnoses of participants was  
50  
51 only reported in one of the studies reporting motivation as a barrier in this review (92) where  
52  
53 the majority of participants were diagnosed with a psychotic disorder. However, other studies  
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3 did not provide information on participants' diagnoses and further exploration is beyond the  
4  
5 scope of this review.  
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8 Symptom management also presented a significant barrier within studies concerning  
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10 people with a mental illness. There is evidence to suggest that biochemical processes between  
11  
12 nicotine and other substances in tobacco improve some symptoms of mental illness (139).  
13  
14 Additionally, smokers with a mental illness may be more likely to misattribute their  
15  
16 withdrawal symptoms as recurring mental illness symptoms. Further investigation and  
17  
18 education regarding cessation and symptom management with people with a mental illness is  
19  
20 warranted. Integrating smoking cessation care with mental health and addiction treatments  
21  
22 can be effective at promoting cessation rates in groups with mental illness (21, 31). However,  
23  
24 future studies need to investigate ways to maintain long term smoking cessation as well as  
25  
26 systems-level changes that may support smoking cessation in people with mental illness (131,  
27  
28 140).  
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### 31 32 **Barriers to smoking cessation in vulnerable groups: a model**

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34 Figure 2 visually demonstrates the broad range of barriers to cessation reported by vulnerable  
35  
36 groups, many of which exist outside of the realm of the individual. This model demonstrates  
37  
38 the interconnectedness of individual and lifestyle factors with the wider social and  
39  
40 community factors, living conditions and cultural, socioeconomic and environmental factors.  
41  
42 The two darker spheres holding social and community networks and individual and lifestyle  
43  
44 factors identify those factors that are potentially modifiable through short term health  
45  
46 behaviour change interventions. This model does not provide an exhaustive list of all of the  
47  
48 factors that prevent vulnerable individuals from smoking cessation. It does provide a  
49  
50 framework for understanding the perceived self-reported barriers to quitting smoking  
51  
52 identified in this review.  
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### Strengths and limitations

This synthesis of the literature provides evidence of the perceived barriers to smoking cessation by examining the methodological quality of studies and comparing between and within selected vulnerable groups. However, this review has some limitations. While the overall quality of the studies included in this review was acceptable, most qualitative studies failed to provide information regarding the trustworthiness of the research and most quantitative studies failed to provide information on the validity and reliability of the [survey measures used to assess barriers. Strategies for enhancing the trustworthiness of qualitative research have been concisely summarised \(141\) and future qualitative studies should seek to employ these strategies where possible. Future quantitative studies should seek to report at least brief psychometric properties of survey measures used to assess barrier to smoking cessation, including reliability and validity.](#)

Of quantitative studies included, the majority used convenience samples. It is not generally feasible to target vulnerable and hard to reach populations using random population sampling procedures. This limits the generalizability and transferability of the included studies to wider vulnerable populations. Nevertheless, the agreement in findings between qualitative studies does suggest that these results are robust.

The nature of the studies included in this review means that no weight is given to the different barriers and the authors cannot provide comment on which, if any, barriers should be made a priority to target in smoking cessation interventions with vulnerable groups. Given limited resources and funds, addressing all barriers is rarely possible. Future research is needed to identify those barriers which are most important to address first and to prioritise resourcing and intervention development.

The results of this review were broadly categorised according to the SDHF, however these categories are not mutually exclusive and certain barriers were able to be included in



1  
2  
3 multiple categories (for example stress and stressful factors could be categorised as either  
4 individual level barriers or barriers within the living conditions level). The reviewed studies  
5 do not directly clarify whether the nature of stress experienced in vulnerable groups is  
6 personal or contextual. Constructs such as coping and resilience (140, 142) have been  
7 hypothesised as mediators between stress and smoking in low socioeconomic groups (143).  
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14 Similarly, as this review sought to provide a summary of vulnerable smokers'  
15 perceived self-reported barriers to cessation, other barriers which may be important  
16 determinants of quit attempts and success were not considered. Barriers such as the  
17 knowledge and attitudes of staff and health professionals and the capacity of services to offer  
18 smoking cessation programs, which have been identified within the literature (124), should  
19 also be considered when examining the challenges facing vulnerable groups.  
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27 This review was only able to identify four studies that examined the barriers to  
28 quitting smoking within prisoner (n=2 studies) and homeless (n=2) groups and one study  
29 focussing on at-risk youth. These results indicate more research is required with these groups  
30 to examine the barriers to smoking cessation. More studies investigating the barriers to  
31 cessation within these groups may lead to identification of additional common and unique  
32 barriers across vulnerable groups. Additionally, this review was limited to studies conducted  
33 within one of six vulnerable groups. Other groups that show high rates of smoking include  
34 lesbian, gay, bisexual and transgender groups (144); culturally and linguistically diverse  
35 groups (145); and rural and remote communities (146). The authors acknowledge the  
36 disparity in smoking prevalence in these groups, however their inclusion would have  
37 increased the breadth of the review to a level that would be too broad and complex to be  
38 useful. These groups may experience barriers to cessation different to those experienced by  
39 the groups included in this review. It should also be noted that individuals within the included  
40 groups often experience multiple forms of disadvantage for example people who are  
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3 homeless are more likely to experience a mental illness (147) and Indigenous communities  
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5 are more likely to be overrepresented in lower socioeconomic positions (3).  
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## 7 **Conclusions**

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10 These results support findings that vulnerable groups experience common barriers to  
11  
12 smoking cessation, and also barriers which are unique to specific vulnerable groups. Stress  
13  
14 management, high prevalence and acceptability of smoking and lack of support to quit were  
15  
16 identified as priority areas for cessation research, program implementation and policy change.  
17  
18 Many of the barriers identified within this review are modifiable through short term health  
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20 behaviour change strategies. For heterogeneous groups of vulnerable individuals, intervention  
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22 development should seek to address those barriers common to all vulnerable groups identified  
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24 in this review. For relatively homogenous groups of vulnerable individuals, interventions  
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26 should seek to address the unique barriers faced by those groups in addition to those barriers  
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28 identified as common to all vulnerable groups.  
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32 These findings, coupled with lower success rates in quitting within vulnerable groups  
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34 relative to the success rates in more advantaged groups (14, 148), suggest that interventions  
35  
36 with vulnerable groups need to address wider social, community and cultural factors as well  
37  
38 as individualised cessation support. Addressing the predictors of cessation found within the  
39  
40 general population such as nicotine dependence and enjoyment remain important for  
41  
42 vulnerable groups.  
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55  
56 review. LT carried out all searches, wrote up drafts and performed quality assessment. BB,  
57  
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1  
2  
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4  
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6  
7 synthesis. All authors have read and met the ICMJE criteria for authorship.  
8

9  
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31

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# PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
<b>TITLE</b>			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3-4
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3-5
<b>METHODS</b>			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	5
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	6
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	5
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	See Table 1
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	6-7
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	7
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	6 -8 (see Table 2)
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	7
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	7
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., $I^2$ for each meta-analysis). <a href="http://bmjopen.bmj.com/site/about/guidelines.xhtml">http://bmjopen.bmj.com/site/about/guidelines.xhtml</a>	7-8



# PRISMA 2009 Checklist

Page 1 of 2

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	7
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	NA
<b>RESULTS</b>			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	8 (See Figure 1)
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	See supplementary files 1, 2 and 3)
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	9 (See supplementary files 4 and 5)
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	See supplementary files 1, 2 and 3)
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	See supplementary files 7 and 8 and tables 3 and 4)
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	9-10
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	NA
<b>DISCUSSION</b>			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	11-19



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Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	16-17
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	11-19
<b>FUNDING</b>			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	1

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: [www.prisma-statement.org](http://www.prisma-statement.org).

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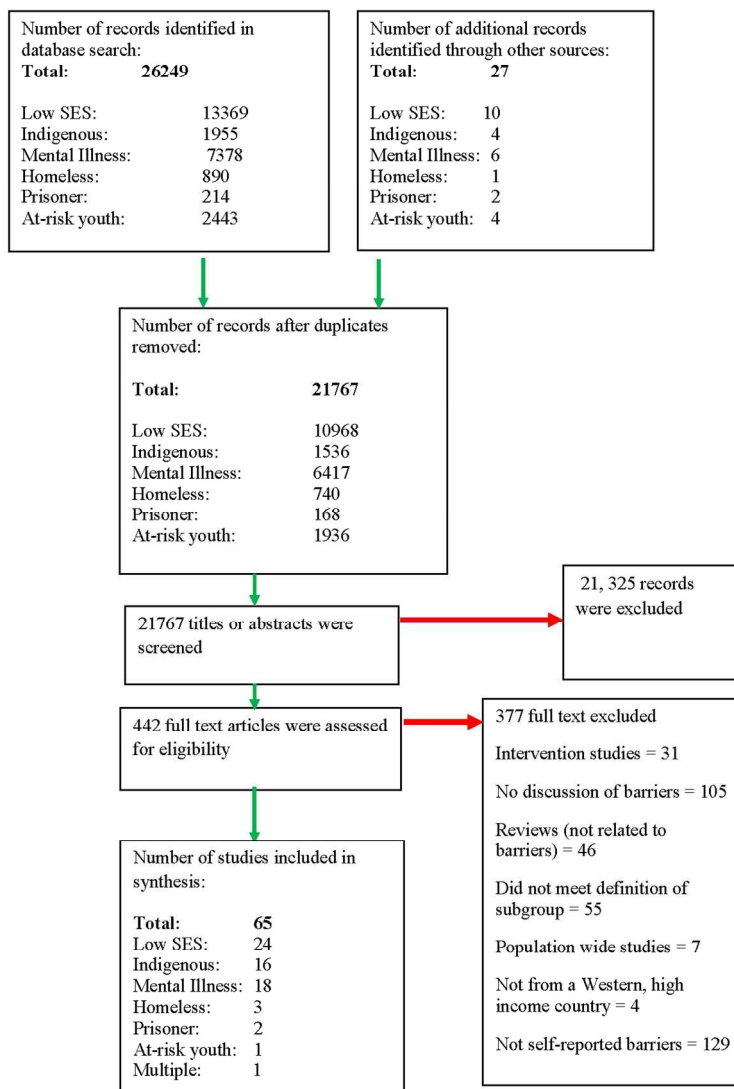
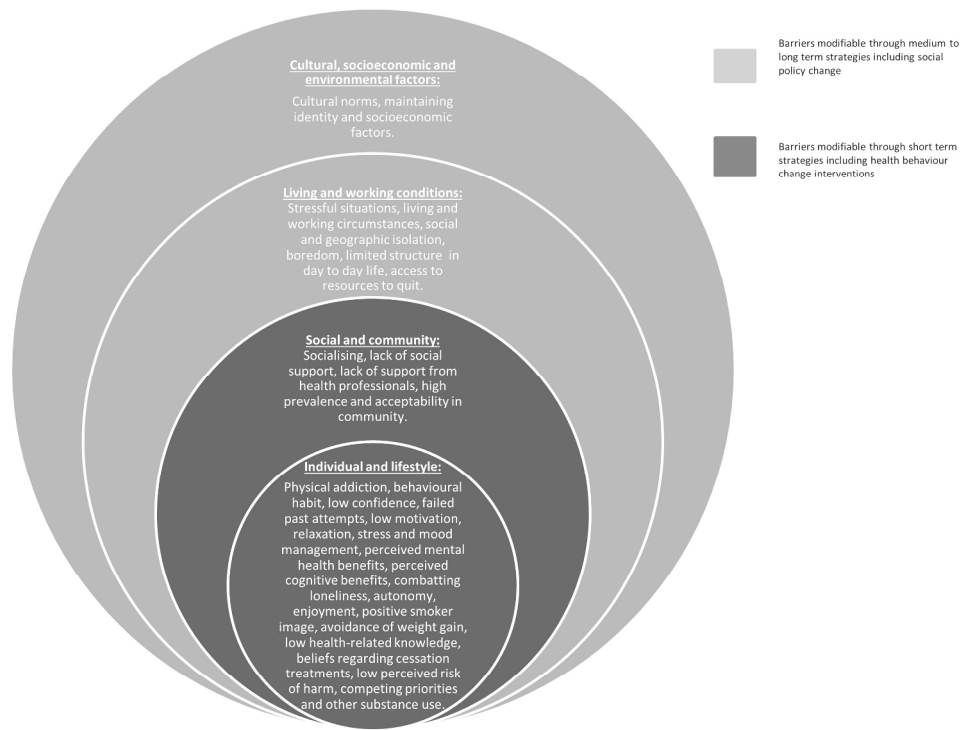


Figure 1. Database search results

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**Supplementary file 1: References of full text articles that were retrieved, reviewed and excluded for not meeting inclusion criteria. Articles could meet multiple criteria for exclusion (total n = 377).**

**Low socioeconomic status studies excluded (n = 111)**

*Intervention studies*

1. Maher JE, Rohde K, Dent CW, Stark MJ, Pizacani B, Boysun MJ, et al. Is a statewide tobacco quitline an appropriate service for specific populations? *Tobacco Control*. 2007;16 Suppl 1:i65-70.
2. Miller CL, Sedivy V. Using a quitline plus low-cost nicotine replacement therapy to help disadvantaged smokers to quit. *Tobacco Control*. 2009;18(2):144-9.
3. Moffatt J, Stanton WR. Smoking and parenting among males in low socio-economic occupations. *International Journal of Health Promotion and Education*. 2005;43(3):81-6.
4. O'Brien J, Salmon A, Geikie A, Jardine A, Oakes W. Integrating smoking care in community welfare agencies to reach disadvantaged people: Findings from the Smoking Matters Project. *Health Promotion Journal of Australia*. 2010;21(3):176-82.
5. O'Loughlin J, Paradis G, Renaud L, Meshefedjian G, Barnett T. The "Yes, I Quit" smoking cessation course: does it help women in a low income community quit? *Journal of community health*. 1997;22(6):451-68.
6. Sias JJ, Urquidi UJ, Bristow ZM, Rodriguez JC, Ortiz M. Evaluation of smoking cessation behaviors and interventions among Latino smokers at low-income clinics in a US-Mexico border county. *Addictive behaviors*. 2008;33(2):373-80. Epub 2007/11/17.

*No discussion of barriers*

1. Ackerson LK, Viswanath K. Communication inequalities, social determinants, and intermittent smoking in the 2003 Health Information National Trends Survey. *Preventing chronic disease*. 2009;6(2):A40.
2. Amos A, Wiltshire S, Bostock Y, Haw S, McNeill A. 'You can't go without a fag...you need it for your hash'--a qualitative exploration of smoking, cannabis and young people. *Addiction (Abingdon, England)*. 2004;99(1):77-81. Epub 2003/12/18.
3. Arnold CL, Davis TC, Berkel HJ, Jackson RH, Nandy I, London S. Smoking status, reading level, and knowledge of tobacco effects among low-income pregnant women. *Preventive medicine*. 2001;32(4):313-20. Epub 2001/04/17.
4. Bonevski B, Bryant J, Paul C. Encouraging smoking cessation among disadvantaged groups: a qualitative study of the financial aspects of cessation. *Drug and alcohol review*. 2011;30(4):411-8. Epub 2011/03/02.
5. Donaghy E, Bauld L, Eadie D, McKell J, Pringle B, Amos A. A qualitative study of how young Scottish smokers living in disadvantaged communities get their cigarettes. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco*. 2013;15(12):2053-9. Epub 2013/08/06.
6. Eadie D, MacAskill S, McKell J, Baybutt M. Barriers and facilitators to a criminal justice tobacco control coordinator: an innovative approach to supporting smoking cessation among offenders. *Addiction (Abingdon, England)*. 2012;107 Suppl 2:26-38. Epub 2012/11/21.
7. Gillies V, Willig C. 'You get the nicotine and that in your blood'—constructions of addiction and control in women's accounts of cigarette smoking. *Journal of Community & Applied Social Psychology*. 1997;7(4):285-301.
8. Macleod J, Smith GD, Metcalfe C, Hart C. Is subjective social status a more important determinant of health than objective social status? Evidence from a prospective observational study of Scottish men. *Social Science & Medicine*. 2005;61(9):1916-29.
9. Manfredi C, Cho YI, Crittenden KS, Dolecek TA. A path model of smoking cessation in women smokers of low socio-economic status. *Health education research*. 2007;22(5):747-56.

10. Manfredi C, Lacey L, Warnecke R, Balch G. Method effects in survey and focus group findings: understanding smoking cessation in low-SES African American women. *Health education & behavior : the official publication of the Society for Public Health Education*. 1997;24(6):786-800. Epub 1997/12/31.
11. Moore RS, McLellan DL, Tauras JA, Fagan P. Securing the health of disadvantaged women: a critical investigation of tobacco-control policy effects on women worldwide. *American Journal of Preventive Medicine*. 2009;37(2 Suppl):S117-20.
12. Pickett KE, Luo Y, Lauderdale DS. Widening social inequalities in risk for sudden infant death syndrome. *American journal of public health*. 2005;95(11):1976-81.
13. Pollak KI, Arredondo EM, Yarnall KSH, Lipkus I, Myers E, McNeilly M, et al. Influence of stereotyping in smoking cessation counselling by primary care residents. *Ethnicity and Disease*. 2002;12(4):578-84.
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15. Wiltshire S, Bancroft A, Amos A, Parry O. "They're doing people a service"-qualitative study of smoking, smuggling, and social deprivation. *BMJ (Clinical research ed)*. 2001;323(7306):203-7. Epub 2001/07/28.

*No discussion of barriers to smoking cessation (e.g. might be barriers to accessing health care in general)*

1. Ackerson LK, Viswanath K. Communication inequalities, social determinants, and intermittent smoking in the 2003 Health Information National Trends Survey. *Preventing chronic disease*. 2009;6(2):A40.
2. Amos A, Wiltshire S, Bostock Y, Haw S, McNeill A. 'You can't go without a fag...you need it for your hash'--a qualitative exploration of smoking, cannabis and young people. *Addiction (Abingdon, England)*. 2004;99(1):77-81. Epub 2003/12/18.
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5. Donaghy E, Bauld L, Eadie D, McKell J, Pringle B, Amos A. A qualitative study of how young Scottish smokers living in disadvantaged communities get their cigarettes. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco*. 2013;15(12):2053-9. Epub 2013/08/06.
6. Eadie D, MacAskill S, McKell J, Baybutt M. Barriers and facilitators to a criminal justice tobacco control coordinator: an innovative approach to supporting smoking cessation among offenders. *Addiction (Abingdon, England)*. 2012;107 Suppl 2:26-38. Epub 2012/11/21.
7. Gillies V, Willig C. 'You get the nicotine and that in your blood'—constructions of addiction and control in women's accounts of cigarette smoking. *Journal of Community & Applied Social Psychology*. 1997;7(4):285-301.
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10. Manfredi C, Lacey L, Warnecke R, Balch G. Method effects in survey and focus group findings: understanding smoking cessation in low-SES African American women. *Health education &*

behavior : the official publication of the Society for Public Health Education. 1997;24(6):786-800. Epub 1997/12/31.

11. Moore RS, McLellan DL, Tauras JA, Fagan P. Securing the health of disadvantaged women: a critical investigation of tobacco-control policy effects on women worldwide. *American Journal of Preventive Medicine*. 2009;37(2 Suppl):S117-20.
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13. Pollak KI, Arredondo EM, Yarnall KSH, Lipkus I, Myers E, McNeilly M, et al. Influence of stereotyping in smoking cessation counselling by primary care residents. *Ethnicity and Disease*. 2002;12(4):578-84.
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15. Wiltshire S, Bancroft A, Amos A, Parry O. "They're doing people a service"-qualitative study of smoking, smuggling, and social deprivation. *BMJ (Clinical research ed)*. 2001;323(7306):203-7. Epub 2001/07/28.
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*Not carried out in high income country/not published in English*

1. Ossip-Klein DJ, Fisher S, Diaz S, Quiñones Z, Sierra E, Dozier A, et al. Tobacco use in six economically disadvantaged communities in the Dominican Republic. *Nicotine & Tobacco Research*. 2008;10(5):851-60.

*Not reporting the perceived self-reported barriers to smoking cessation (e.g. might report results of logistic regressions showing nicotine dependence associated with cessation success)*

1. Bhandari S, Levitch AH, Ellis KK, Ball K, Everett K, Geden E, et al. Comparative analyses of stressors experienced by rural low-income pregnant women experiencing intimate partner violence and those who are not. *Journal of obstetric, gynecologic, and neonatal nursing : JOGNN / NAACOG*. 2008;37(4):492-501. Epub 2008/08/30.
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7. De Silva V, Samarasinghe D, Hanwella R. Association between concurrent alcohol and tobacco use and poverty. *Drug & Alcohol Review*. 2011;30(1):69-73.
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10. Graham H, Der G. Patterns and predictors of smoking cessation among British women. *Health promotion international*. 1999;14(3):231-9.
11. Graham H, Der G. Patterns and predictors of tobacco consumption among women. *Health education research*. 1999;14(5):611-8.
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#### *Population level study*

1. Adams RJ, Howard N, Tucker G, Appleton S, Taylor AW, Chittleborough C, et al. Effects of area deprivation on health risks and outcomes: A multilevel, cross-sectional, Australian population study. *International journal of public health*. 2009;54(3):183-92.
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*Reviews (reviews conducted on smoking within the defined disadvantaged group but not reporting on perceived barriers to smoking cessation)*

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### Mental illness studies (n = 90)

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### **Homeless studies (n = 38)**

#### *Intervention studies*

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#### *No discussion of barriers*

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*No discussion of barriers to smoking cessation (e.g. might be barriers to accessing health care in general)*

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*Not reporting the perceived self-reported barriers to smoking cessation (e.g. might report results of logistic regressions showing nicotine dependence associated with cessation success)*

1. Baggett TP, Anderson R, Freyder PJ, Jarvie JA, Maryman K, Porter J, et al. Addressing tobacco use in homeless populations: a survey of health care professionals. *Journal of health care for the poor and underserved*. 2012;23(4):1650-9. Epub 2012/01/01.
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*Reviews (reviews conducted on smoking within the defined disadvantaged group but not reporting on perceived barriers to smoking cessation)*

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*Studies not meeting the subgroup definition*

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## Prisoner studies (n = 22)

### *Intervention studies*

1. Berg CJ, Ahluwalia JS, Cropsey K. Predictors of adherence to behavioral counseling and medication among female prisoners enrolled in a smoking cessation trial. *Journal of correctional health care : the official journal of the National Commission on Correctional Health Care.* 2013;19(4):236-47. Epub 2013/08/21.
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*No discussion of barriers*

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Supplementary file 2. Summaries of the included quantitative studies by disadvantaged group (n = 8).

Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
<b>Quantitative studies</b>							
<b>Low SES groups</b>							
Price 1994(60)  USA	Assess the perceptions of lung cancer and smoking in a socioeconomically disadvantaged sample.	Telephone interviews in Ohio, USA.	n = 500 49% female Age: mean = 58, SD = 18.2 Ethnicity: white (83%)	42%	Cross-sectional.	Pre-designed survey instrument based on the Health Belief Model – 45 items.  Barriers: 5 items. .79 reliability coefficient.	Habit: 82% Prevents boredom: 48% Helps to relax: 52% Addiction: 86% Many friends of smokers also smoke: 66%
Rosenthal et al 2013 (70)  USA	Identify the most endorse barriers and motivations to quitting an sociodemographic differences in the barriers to quitting report.	Six low income neighbourhoods in new haven, Connecticut.	n = 350 Ethnicity: 61% Black 20% Latino 12% White Education: 56% High school diploma/ GED or less	73%	Cross-sectional	Gender, race/ethnicity, educational attainment, age, smoking status. Barriers measure based on pre-existing survey (7 items).	<i>Intrapersonal barriers</i> I don't want to quit: 37.4% It is too difficult: 57.7% I don't know how: 24.9% I am afraid of gaining weight : 19.7% <i>Financial barrier</i> I can't afford the medication or nicotine replacement therapy products (such as the patch or gum): 30.9% <i>Support barrier</i> I don't have enough support: 25.7% <i>Social Influence barrier</i> Everyone I know uses tobacco: 33.1%

Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
<b>People with a mental illness</b>							
Asher et al 2003 (101)  USA	Report the relative frequency of endorsement of the various barriers as a source of guidance for clinicians wanting to motivate alcoholic patients to quit smoking.	Urban inpatient state-subsidized substance abuse facility.	96 alcohol dependent smokers	73%	Cross sectional survey	11 item True/False Barriers to Quitting Smoking in Substance Abuse Treatment (BQS-SAT) questionnaire.	If I quit smoking, I'll feel tense and irritable: 87% If I quit smoking, I would feel anxious: 78% When I don't smoke, I feel restless, and I can't concentrate: 56% If I quit smoking, my urges to smoke will be so strong, I won't be able to stand it: 48% I don't have the willpower to quit smoking: 47% I need smoking to lift me up when I'm feeling down: 42% Quitting smoking during substance abuse treatment would make it harder to stay sober: 41% If I quit smoking, I would gain weight: 40% Smoking gives me a lift when I'm feeling tired: 28% If I quit smoking, I won't be able to sleep: 23% If I quit smoking, my urges to drink or use drugs will be so strong I won't be able to stand it: 13% Negative affect: 32% Habit: 28% Seeing others smoke or peer pressure: 22%. Being addicted to more than one substance: 5% .

Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
							Compulsion and mental urges: 3%
Carosella et al 1999 (88). USA.	Assess the barriers to and facilitators of quitting smoking in long term care inpatients.	Long term psychiatric care units.	n = 92 98% male Age: mean = 47.6 Diagnoses: substance abuse (60.9%); schizophrenia (55.4%); affective disorders (38%).	77.7%	Interviews.	Smoking status and history, demographic information, reasons for not quitting smoking.	Enjoyment: 47.2% Habit : 36.1% Boredom: 12.5% Anxiety, nerves: 11.1% Smoking does me good (e.g., relaxing, stimulating, stifles pain): 9.7% Availability of cigarettes: 6.9% Never had a reason/need to stop: 6.9% I have emotional problems: 6.9% Other stressors: 5.6% Concentrating on other addictions: 4.2% Smoking helps your appetite/digestion: 4.2% I need some help to stop: 4.2% Sociability of smoking: 2.7% Don't know: 2.7%
Orleans et al 1993 USA	Aimed to inform the design of nicotine addiction treatments tailored for patients with chemical dependency	Inpatient substance use treatment centre	n = 78 78% male mean age = 36.6 (SD = 10.1) 78%: alcohol 9% drug problems including cocaine, heroin, marijuana and prescription medication 13% alcohol and other drug problems	Not reported	Cross-sectional	Sociodemographic, smoking related characteristics, 9 item barriers survey.	Missing or craving cigarettes: 68.4% Being nervous, anxious or tense: 53.3% Being around other smokers: 43.3% Losing a pleasure: 39.4% Coping with stress: 38.7% Being afraid you'll fail: 27% Gaining weight: 24.3% Maintaining sobriety: 9.9% Increased alcohol/drug use: 2.9%

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Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
<b>Homeless groups</b>							
Arnsten et al 2004 (106).  USA.	Evaluate predictors of readiness to quit and interest in cessation counselling in a homeless sample	Homeless services at urban hospital	n = 98 Age: mean = 44 years. Median number of years homeless = 2.75 Predominantly white, unmarried, unemployed or disabled, males (proportions not provided).	Not reported.	Cross-sectional.	Smoking behaviour, reasons for quitting, readiness to quit, history of homelessness, alcohol and other drug history, psychiatric history, medical history, quit attempts, social support.	21% believe the people closest to them would be very helpful in quitting smoking.  29% endorsed the item "People closest to you want you to quit very much".
Connor et al. 2002 (107).  USA.	Ascertain the prevalence of smoking, smoking cessation and how various factors associated with homelessness impact on readiness to quit smoking.	Emergency homeless services, residential drug treatment services, drop in centres for homeless in the city of Pittsburgh (9 homeless services).	n = 230 Male = 81% Age: mean = 41.8, SD = 10.7. Ethnicity: 54% African Americans; 40% white; 3% Hispanic; 3% other. Homelessness: 46% living in transitional housing, 31% in shelter; street 20%; 3% living	>97%	Cross-sectional.	Demographics, substance use history, housing status, Fagerstrom Test of Nicotine Dependence, Stage of Change, self-efficacy, barriers to cessation (as 5 potential barriers: cravings, other smokers, weight gain, habit, stress/mood), social support.	Cravings: 50% Stress or mood swings: 44% Being around others who smoke: 42% Not receiving any support during quit attempt: 26% Fear of weight gain: 20% No specific treatments (pharmacological) could help them quit smoking: 31.6%

Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Barriers to quitting (type and prevalence)
			with family/friends.				
<b>Prisoner groups</b>							
Dickens et al 2005 (109).  UK.	To explore psychiatric inpatients views of smoking cessation options.	Forensic wards of large independent psychiatric hospital.	n = 34 57.8% male Age: mean = 36.0, SD = 9.7 Ethnicity: not reported. 88.9% legal status of detained.	44.1%	Cross-sectional.	Demographic details, mental health act status, smoking characteristics, views on smoking cessation and rules on smoking in the hospital.	Other patients smoking: 79.4% The “smoky atmosphere” would make it too difficult to stop smoking: 58.8% Seeing members of staff smoking: 55.9% Not enough encouragement from staff: 29.4% Not enough information about giving up smoking: 26.5% “It’s just too difficult” to give up smoking: 73.5% Several smokers commented that boredom was a factor in continuing to smoke.

Supplementary file 3. Summaries of the included qualitative studies by disadvantaged group (n = 54).

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
<b>Low SES</b>							
Ahijevych 2003(49).  USA	Investigate the beliefs and attitudes towards tobacco of current and former Appalachian smokers.	Non metropolitan Appalachian county.	n = 14 64% female Age: mean = 33.7, SD = 8.7 Ethnicity: 100% white, non-Hispanic High school education or less: 40.5%	Focus groups	Roles of tobacco in life and community, factors helped or hindered previous quit attempts, community perceptions of tobacco use, and strategies for successful smoking cessation programs.	Content analysis.	Addiction to nicotine. Cravings. Smoking provides a rush. Alleviating boredom. Peers and family members who reinforced smoking. Routine/ritual of smoking. Social activities. Associated behaviours: alcohol, caffeine, Weight gain.
Bancroft et al 2003 (50).  UK	Investigate barriers to quitting and accessing treatment in two disadvantaged areas of Scotland	Two disadvantaged geographical areas in Scotland	n = 100 50% female Age: not reported Ethnicity: not reported. Housing tenure: 76% council housing	Interviews	Smoking and quitting; future smoking, intentions to quit; habit and addiction.	Thematic analysis.  NUDIST.	Addictive behaviour. Habit. Lack of alternatives. Smoking is the only pleasurable activity to do. Reward. Deal with stress. Alleviate boredom. Alleviate stress from financial pressures.
Beech et al 2003 (51).  USA	Investigate the cultural and social factors associated with African American low income smokers.	High schools, colleges, housing developments and trade schools.	n = 118 45% female Age: between 18 and 35 years old. Ethnicity: 100% African American.	Focus groups.	Smoking initiation, smoking maintenance and cessation.	Content analysis.	Equal numbers of participants reporting smoking managed their stress compared to those who reported smoking contributed to their stress. Anxiety management. Daily hassles and life events. Energy and alertness. Taking a break. Boredom. Managing certain medical conditions. High levels of accessibility in communities. Willpower and prayer were more highly valued as cessation methods than use of pharmacology or counselling. High prevalence of smoking within social networks and communities: family, peers and the wider community.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
Bryant et al 2010 (52).  AUS	Sought to describe the smoking behaviours and attitudes of disadvantaged Australian smokers attending SCSOs, including past experiences of quitting, preferences for quit support, and perceived barriers to quitting.	Five community welfare organisations located in New South Wales, Australia.	n = 32 69% female Age: all participants aged over 16 years.	Focus groups.	Current smoking behaviour, motivation to quit, past quit attempts, barriers to quitting and preferences for cessation support.	Thematic analysis.  Nvivo version 8.	Stress relief. Calming, relaxing. Alleviating boredom. Coping mechanism. A best friend. Low self-efficacy – doubting ability to quit. Viewing quitting as impossible. Feeling ready and having willpower were integral to success. Low knowledge of quit support. Unsure how to correctly use NRT, belief NRT was ineffective, learning from others about the efficacy of NRT. Knowledge of other pharmacotherapies was low. Telephone quit lines usage also low. Weight gain. Limited perceived support from GPs and other health professionals. High cost of NRT. Repeated social and environmental exposure to smoking. Norm within the community. High prevalence of friends and family were smokers.
Copeland et al 2003 (53).  UK	To further examine the roles that smoking plays in the lives of the study group	General practice in a deprived area of Edinburgh.	n = 51 100% female	Open ended survey.	Open-ended questions regarding smoking characteristics, feelings and experiences regarding smoking, as well as measures of anxiety, depression and stress.	Content and category analysis.	Lack of willpower. Triggering event such as starting new job, marital problems, bereavement. Nothing else to help cope. Weight gain. Social smoking. Contact with other smokers.
Dunn et al 1998 (54)	Explore attitudes and perceptions of smoking during pregnancy.	Neighbourhood centres and clinics in an urban area. .	n = 57. 100% female Age: 77% aged 25 or younger	Focus groups.	Health concerns, sources of advice regarding pregnancy,	Content analysis.	Internal factors: Stress. Boredom. Addiction to nicotine.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
USA	barriers to quitting, second hand smoke exposure, and preference for cessation programs among women of low SES.		Ethnicity: African Americans 24; Native Americans 23; white 10. High school education or less: 68%		characteristics of useful programs, health effects of smoking, quitting, passive smoking exposure and attempts to avoid exposure.		Withdrawal symptoms. Strong cravings. Weight gain. Belief that smoking was not dangerous enough to warrant quitting. Long term effects which participants do not consider. External factors: Being around friends and family members who smoked, including those who were not supportive of quit attempt. Lack of control over exposure to smoke and influence of others.
Franco et al 2011 (55).  AUS	Increase knowledge on the barriers to smoking cessation and the acceptability of addressing smoking in SCSOs	SCSO Illawarra region, NSW Australia	n = 53 83% female	Focus groups.	Smoking and health, smoking cessation, support preferences, acceptability of addressing smoking in SCSO setting.	Notes based analysis.	Ritual. Structures the day. Reward after daily chores. Something to do. Stress management. Concerns about the effectiveness of NRT. Cost of NRT and other treatments too high. Need more support to quit.
Lacey et al 1993 (93).  USA.	Increase understanding of the role of smoking and the challenges faced when attempting to quit.	Residents of public housing in Chicago, USA.	n = 6 – 8 participants per focus group (8 focus groups in total). 100% female. Ethnicity: 100% African American. 42% not completed high school 100% had average yearly income < \$13,000 USD.	Focus groups.	Day to day activities, life stressors, community and living conditions,	Content analysis.	Social isolation. Lack of support. Racially and economically segregated areas. Fear limited outings to necessary activities. Limited social networks outside of immediate family. Stress management. Substandard, unclean housing. Few opportunities for recreation or employment. Violence and crime. Substance use. Sense of control. One of few attainable pleasures. Legal and harmless for relatively small investment. Perceived alternatives are drugs, alcohol abuse or losing control. Low perceived harm. Fatalistic beliefs/rationalisations/self-exempting beliefs.



Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							Other physical illness and disease that took priority – COPD, heart disease, kidney disease. Belief that smoking is normal. Belief that most adults smoke. High prevalence in social network. Hard to avoid smoking. Belief that the only way to quit smoking was to do it cold turkey. Low knowledge regarding how to quit and methods/help available. Absence of specific constructive assistance. Being self-reliant preferred over being dependent on help from someone. Smoking cessation support not seen as effective.
Moffatt et al 2004 (57).  AUS	Aim to gain better understanding of the barriers to quitting in blue collar workers	Two antenatal clinics in Brisbane, QLD servicing predominantly low SES participants.	n = 25 100% male Age: between 20 and 53 years old	Semi-structured interviews.	Questions developed from literature review and pilot study.	Constant comparative method – conceptual analysis.  NUDIST.	Lack of control over smoking. Long positive association with cigarettes – cool, sophisticated. Lack of support to quit. Withdrawal - negative feelings such as anger/irritability. Peer pressure. Relaxation. Social contexts. Habit – daily routine.
Nichter et al 2007 (58).  USA	To uncover the factors that facilitate smoking during pregnancy and those that facilitate quitting; investigate the use of harm reduction practices used by pregnant women and the effects of social networks on smoking and	Large urban city.	n = 53 100% female Age: mean = 25, ranged from 18 – 43 years. Ethnicity: Anglo-American 62%; Mexican American 21%; African American 11%, multiethnic 6%.	Semi-structured interviews	Interview questions developed from pilot material with key informants.	ATLAS ti 5.0 software.	Low social support. Living in more than one residence during pregnancy. Not being head of household/able to make decisions regarding smoking policy and house. No stable employment. No family/peer support. Smoking helped women manage anger, frustration, control and autonomy. Coping strategy. History of depression. Smoking seen as lesser evil compared to alcohol or other drugs. Less clear about direct outcomes for baby. Rationalisations “defence mechanisms/downplaying

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
	cessation.		High school education or less: 74% Unemployed: 60%				medical risks/prioritising less stress over smoking damage. No helpful guidance from health professionals.
Paul et al 2010 (29).  AUS	Examine the experience of the social context of smoking and whether this experience differed by sociodemographic characteristics	Local community facilities in high and low SEIFA suburbs in Sydney, Aus.	n = 4 – 8 participants per group (8 groups in total).	Focus groups.	Smoking behaviour and history; current and future smoking environments; environmental factors related to smoking.	Thematic analysis.	Nostalgia for smoking that was once cool and sophisticated. Weight control. Not noticing any decrease in the smoking prevalence in their community over time. Social/peer groups predominantly made up of smokers. Social activity. High perceived acceptability of smoking. Work environment being more conducive to smoking. Lack of smoking restriction at workplace. Acceptability of smoking in open air environments in low SEP neighbourhoods.
Peretti-Watel et al 2009 (59).  FRA	To increase understanding of low socioeconomic status and smoking through investigating smoking motives.	South –east of France – social work centres and participants homes.	n = 31	In depth semi-structured interviews	Brief topic guide mentioned but not presented.	Based on principles of grounded theory.	Addiction. Pleasure and happiness. Satisfied essential needs. Relieves stress. Fills void in everyday life – nothing else to do. Only leisure activity they can afford. Combat loneliness. Manage other addictions. Stressful life events such as break up of relationship or loss of job.
Roddy et al 2006 (61).  UK	Determine level of awareness of stop smoking services in deprived area and identify specific barriers and motivators to improve access.	Most deprived districts in Greater Nottingham.	n = 39	Focus groups.	Smoking behaviour, cessation experiences, knowledge and perceptions of existing services.	NUD*IST 6 software.	Lack of knowledge of services. Misconceptions about attitudes within services. Being judged by health professionals. Feeling they would need intensive support to quit. NRT was expensive and ineffective (many contraindications). Bupropion was negatively associated with adverse events reported in media. Stress. Rationalisations. Failed quit attempts in the past.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
Stead et al 2001 (62).  UK	To investigate how smoking is fostered in areas that experience multiple forms of deprivation	Housing estates within 8 communities in Glasgow having DEPCAT scores of 7 (highest scores of deprivation).	n = 53 Sample selected according to age, gender and smoking status.	Focus groups	Smoking characteristics, smoking history, leisure activities, work and unemployment, cessation history, experiences of the local community.	Thematic analysis.	<p>Coping mechanism – dealing with stress directly related to living in a deprived community.</p> <p>Stressors include: limited income, caring for children, poor local infrastructure, high levels of crime and drug use, limited opportunities for rest and respite from community.</p> <p>High accessibility of cigarettes (legal, illegal and informal sources).</p> <p>Socialising.</p> <p>Main pleasure (cheap and easily accessible).</p> <p>Smoking alleviated anxiety and nervousness.</p> <p>Coping with frustration and demotivation of widespread unemployment.</p> <p>Normative influence of being surrounded by smoking.</p> <p>Accepted smoking as inevitable and preferable to other drug use.</p> <p>Deprived communities experienced feeling cut off from other communities (that were more advantaged) thus weren't exposed to other norms.</p> <p>Belonging and identity.</p> <p>Smoking compensates exclusion and binds communities together.</p> <p>Deepening financial hardship.</p> <p>Fears of not being able to cope without cigarettes.</p> <p>Limited awareness of help available.</p> <p>Lack of trust regarding efficacy of medications and cynicism about health professionals financially exploiting smokers.</p> <p>Little support from community.</p>
Stewart et al 1996 (63).  CAN	Examine the factors associated with barriers and supports to smoking cessation in disadvantaged women.	Atlantic region, Canada.	n = 386 100% female	Semi-structured interviews	Interview guides were used but not described.	Content analysis.	<p>Linked with poverty, isolation, and caregiving.</p> <p>Coping mechanism.</p> <p>Associated fear, anger and anxiety.</p> <p>Reward.</p> <p>Pleasure.</p> <p>Addiction.</p> <p>Short and long term goals – struggle for 'survival'; therefore long term benefits of quitting had little impact.</p>

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							Not using traditional cessation support services – negative reactions from those that had. Personal determination and willpower were integral to success. Cessation aids viewed as ineffective or harmful. Believed that poverty, abuse and alcoholism more damaging to society – antagonistic towards tobacco control measures.
Stewart et al 1996 (64).  CAN	Identify social-psychological factors associated with smoking cessation among disadvantaged women.	Atlantic region of Canada  Research carried out in sites accessible to participants.	n = 126 100% female	Focus groups and interviews	Reasons for smoking and continuing to smoke, impact of anti-smoking media messages, opinions and experiences regarding smoking cessation, strategies, services and support that would help stop or reduce smoking.	Content analysis.	Weight gain. Low expectation of support from health professionals and health agencies – lack of confidence in GPs and nurses. Rarely contacted national/peak bodies like Lung association or Cancer Society. Geographical isolation, lack of awareness of role and scepticism. Lack of social support – partners, immediate family, friends and acquaintances.
Stewart et al 2011 (65).  Canada.	Identify the needs and preference of female smokers from low socioeconomic background ds.	Three large urban cities in Canada.	n = 64 100% female Age: mean = 37 High school education or less: 68%	Focus groups.	Smoking characteristics, cessation attempts and experiences, preferences for support to quit and resources.	Thematic analysis.  QSR N6.	Limited employment opportunities. Reliance on welfare and benefit payments. Low socioeconomic status – poverty, low education, unemployment and the stress caused by these factors. Lack of affordable childcare. Management of emotions and stress – anger, upset, anxiety. Coping mechanism. One of few pleasures available. Relaxation. Reward. Boredom, lack of access to recreational activities. Smoking linked to feelings of loneliness and hopelessness regarding poverty. Smoking as habit – linked to other behaviours – drinking coffee etc.
Stillman et	Increase knowledge of	Employment and training and	n = 28	Focus groups	Social norms and smoking, how	Atlas.ti v 3. software.	Smoking seen as normal, very common and not problematic.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
al 2007 (66). USA.	environmental factors that facilitate or prevent young AA from smoking cessation.	education programs – inner city.			tobacco was sourced, socialisation and smoking and smoking restrictions and advertising.		Faced few restrictions regarding smoking. “Loosies” (single cigarettes) were easily accessible.
Tod 2003 (67). UK	Explore the reasons why pregnant women do not quit and are less likely to access smoking cessation services.	South Yorkshire Coalfields (SYC) – deprived area with high prevalence of smoking. Pregnant women known to maternity services within this area. Approached by midwives.	n = 11 100% female Age: ranged from 19 to 38 years old.	Semi-structured interviews via telephone.	Smoking history; obstetric history; factors influencing access to smoking cessation services; knowledge and beliefs; preferences for future services.	Framework analysis.	Addiction. Only cutting down for baby; plan to resume after birth. Enjoyment. Belief that willpower is essential for success. Cutting down but missing that extra strength to finally quit. Pressures and stresses of life. Lack of willpower linked to self-fulfilling prophecy; relapse was viewed as inevitable. Smoking during pregnancy safest, and healthiest, and preferred course of action. Housework; childcare, financial anxieties and relationships. Protecting mental health. Familiar and necessary tool to cope. Smoking controlling appetite for weight concerns and also to control hunger. Food was sacrificed in order to afford cigarettes. Partners’ smoking affected motivation to quit. Being around people who were smoking. Timing of smoking cessation advice coinciding with tests for babies’ health. Judgemental attitudes from service providers. Lack of childcare options. Minimizing risk of smoking. Participants own experience discredited health advice.
Tsourtos et al 2008 (68).	Understand the barriers to quitting smoking, especially in relation to stress, in order to	The most disadvantaged are (local government area) in metropolitan Adelaide.	n = 29 48% female.	Focus groups (2) and in depth telephone interviews	Barriers to quitting smoking (focus on stress), reasons for quitting, stress and quit attempts.	Not reported.	Stressful environments including: financial stress, child rearing, family issues, employment disadvantage, increased morbidity and mortality within community (including smoking related illness), and difficulties in the workplace. NRT too expensive to maintain.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
AUS	understand the differences in cessation rates between the groups.			(11).			Financial stress. Stress that arises from childrearing and women having a smoke to get 'time out'. Partner smoking. Increased morbidity and mortality in community, including due to smoking related illness. Habit of smoking; ritualised behaviour. Lack of control. Addiction. Cravings. Boredom. Smoking to alleviate stress. Some respondents held the belief that it was not tobacco/cigarettes themselves that provided stress relief, but the chance to relax.
White & Baird 2013 (71) UK	Explore perspectives of former miners in disadvantaged former coal mining communities on smoking and cessation	Former coal mining towns and villages in Bolsover district, North Derbyshire.	n = 16 All participants white, male and British. Aged between 45 and 68. All former miners.	Interviews	Perspectives on smoking, stopping smoking and stop smoking services.	Content analysis	Attributing health issues to coal dust exposure rather than smoking. Comparing the risks of coal mining to the risks of smoking. Participants reported being able to stop smoking at will with minimal difficulty and need for support, despite all previous attempts being unsuccessful.
Wiltshire et al 2003 (69). UK	Examine participants' views on quitting smoking and smoking and how that may be affected by their lives.	Two health centres in two areas of deprivation in Scotland.	n = 100 50% male Housing: 76% council/housing association	Semi-structured interviews.	Daily consumption patterns, reasons for smoking, wider community environment, experiences of quitting and changes in smoking status, future quit intentions.	Thematic analysis. NUD*ST.	Stress Management. Coping mechanism. Living, socializing and working with other smokers. Smoking 'deeply embedded' in their lives. Smoking was normalized and routine contact with other smokers made quitting even more difficult. Only way to quit is remove yourself completely from your environment. Addiction to nicotine. Cravings. Withdrawal symptoms and their impact on family/friends. Stressful life circumstances. Belief that NRT not up to task of replacing cigarettes.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							<p>Cost of NRT.</p> <p>Word of mouth regarding bad/unsuccessful attempts with NRT.</p> <p>Boredom and times of inactivity.</p> <p>Characteristics of living in a disadvantaged area - violence, crime.</p> <p>Willpower was essential in order to be able to quit smoking.</p>
<b>Indigenous studies</b>							
Burgess et al 2007 (72).  USA	Explore the cultural factors associated with experience and perceptions regarding tobacco use, cessation and dependence treatments.	Minneapolis/St Paul metropolitan area.	n = 26 American Indian participants 30% female	Focus groups.	Smoking, smoking cessation and tobacco dependence treatments.	Content analysis.	<p>Smoking as highly acceptable and widespread within community.</p> <p>Traditional ceremonial use of tobacco.</p> <p>Addiction.</p> <p>Cravings.</p> <p>Withdrawal symptoms.</p> <p>Stressful circumstances.</p> <p>Suspicion towards pharmacotherapy.</p> <p>Scepticism about benefits of pharmacotherapy and negative views of medical profession in general.</p> <p>For women, smoking was seen as way to care for self in face of multiple responsibilities.</p> <p>Women used to manage stress, negative emotions, deal with life demands including children, work and family.</p> <p>Weight control.</p>
Choi et al 2006 (73).  USA.	Assess smoking behaviour, cessation, traditional tobacco use and attitudes towards a smoking cessation program in a sample of American Indian participants.	Health Centre based within an Indian Nations University.	n = 41 American Indian participants 63% female Age: mean = 41 (SD = 12.3) ranged from 21-67 63% some college education	Focus groups.	1. Tobacco use (including ceremonial and non-ceremonial) 2. Smoking and quitting. 3. Smoking cessation program "Second Wind".	Themes identified.	<p>Traditional or ceremonial use of tobacco.</p> <p>Use of tobacco important to maintain an 'Indian' identity.</p> <p>Relapse in social situations.</p> <p>Normative behaviour.</p> <p>Highly prevalent: everyone smokes.</p> <p>Stressful situations.</p> <p>Belief that quitting smoking "takes personal motivation and a person will not be able to quit unless he or she has determination and self-control and really wants to quit".</p> <p>Most had tried NRT – cost was a barrier to getting more NRT.</p> <p>Nightmares were attributed to bupropion and NRT.</p>

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Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
Dawson et al 2012 (74).  AUS	Increase understanding of barriers within Aboriginal Health Worker workforce.	Metropolitan, rural and remote health services.	n = 34 Aboriginal Australian participants 44% female	Semi structured interviews and focus groups.	Factors related to relapse, not wanting to quit, challenges in quitting.	Content analysis.  NVivo 8 software.	<p>Largest barriers to NRT use were cost and accessibility.</p> <p>Stress, grief and loss – due to health concerns, excessive work demands, family issues, inequity in workplace, institutionalised racism and pervasiveness of social disadvantage.</p> <p>Chronic disease, burden of illness, premature deaths in community.</p> <p>Fear – of failure, feeling sick (withdrawal symptoms), weight gain, and losing a coping strategy.</p> <p>Smoking not being a problem – rationalizations as well as just the belief that it’s not a problem.</p> <p>Quitting not the greatest priority in their lives.</p> <p>Lack of knowledge about quit methods – unsure about the benefits of certain pharmacological methods.</p> <p>Lack of access to relevant quit smoking aids – culturally appropriate, cost.</p> <p>Nicotine addiction – biological addiction was rarely referenced.</p> <p>Social pressure to smoke – living and socialising with smokers.</p> <p>Situations where alcohol was consumed or with high number of other smokers.</p> <p>Quitting means exclusion from this network.</p> <p>Offence at not participating – maintaining connectedness.</p> <p>Lack of support/role models – few friends and family/community members who had quit successfully, intolerance of mood changes around when quitting.</p> <p>Pressure to quit from non-smokers – ‘picked on’, line between encouragement and beleaguering.</p> <p>Smoking common in the workplace – acceptable, organisational culture enabled smoking, create bond between clients and workers, challenge sin enforcing smoke free policies.</p> <p>Smoking was pervasive and acceptable within community, inability to avoid smoking – high prevalence impacted by historical role of tobacco, culturally and colonial influence.</p>



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							Smoking behaviours weren't questioned. Lack of policies to promote smoke free environments, short term funding of tobacco programs, inadequate investment for organisations.
Dawson et al 2012 (75).  AUS	Explore the perceptions of Aboriginal Health Workers in relation to individual and contextual factors relating to smoking	Metropolitan, rural and remote health services.	n = 34 Aboriginal Australian participants 44% male	Semi-structured interviews	Current smoking and smoking history; reasons for continuing to smoke; typical weekday and weekend when smoking occurred; quit history.	Content analysis.  NVivo 8.	Stress: relationships and family issues; financial problems; community issues and work challenges. Poor physical and mental health e.g. anxiety, depression, chronic pain. Associative behaviours: getting in the car; drinking alcohol or caffeinated drinks, watching television, going outside. Habit (tactile) – having something in their hands. Boredom – 'time on one's hand'. Awareness of 'nicotine addiction' only reported by 2 participants. Chronic disease burden – heart disease, emphysema, diabetes, cancer. Grief and loss – reduced life expectancy. Caring for family – health support and advice; financial obligations and housing. Breakdown in family dynamics: single parent families; isolation; stolen generation. Socialisation and connection: social lubricant; belonging. Debriefing opportunity – after stressor. Co-worker, friend, family, client encouragement to smoke. Active and passive encouragement. Demanding work, including out of hours. Job insecurity and financial insecurity. Institutionalised racism. Dispossession of land; collective grief and loss; prevalent racism; social disadvantage; poverty, homelessness; unemployment, chronic disease, drug abuse; gambling, violence, housing issues; imprisonment, lack of education.
Dennis et al 2012 (76).	Qualitatively explore tobacco, alcohol and other	Rural reservation in Midwestern state of USA.	n = 49 American Indian	Focus groups.	Not reported.	Thematic analysis.	Lenient attitudes towards smoking. Generational use (parents and grandparents to children). Accessibility of cigarettes (easy access through friends)

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USA	drug use in a sample of American Indians living on a rural reservation.		participants 61% female Age: 18 – 54 (57.2%)				and family; cheaper to purchase on reservation). Smoking linked with other behaviours (gambling, alcohol use). High prevalence of smoking in community.
Fernandez et al 2008 (77).  New Zealand	Investigate the perception of smoking cessation in Maori women	One local Maori organisation	n = 5 Maori participants 100% female	Focus group.	Perceptions of smoking and quitting, triggers for smoking, quit smoking policies and initiatives from the government, and mass media campaigns and marketing.	Thematic analysis.	Observing health professionals smoking. Limited support from other smokers (feeling negatively judged by other smokers when trying to quit). Maori women felt more comfortable accessing health care from a Maori provider rather than a mainstream service. All participants stated they would never ring the National Quitline (trust, disclosing information and allowing someone to assist them who is not known were the reasons cited for this). Asking a stranger for help deemed unacceptable.
Fu et al 2007 (78).  USA	Increase understanding of the experiences of smoking cessation in 4 different ethnic groups: American Indians, Hmong, Vietnamese and African Americans.	Seven community organizations in Minneapolis/St Paul.	n = 26 American Indian participants (6 focus groups). 44.4% female.	Focus groups conducted separately for each ethnic group.	Discussion guide: smoking, smoking cessation, and help with quitting.	Methods for analysing qualitative data.  Atlas.ti, v 5.0	Counselling was associated with an unequal power relationship between a white counsellor who was going to shame the participants about their smoking behaviour. Rationalisations: “it's not like I'm dying today”. Cynicism about the medical profession, including beliefs that doctors are untrustworthy, driven by monetary gain, and hypocritical. Negative experiences with particular doctors including doctors being confrontational, blaming and impersonal. Most had low levels of knowledge about the functional benefits of pharmacotherapy. Participants did not understand that pharmacotherapy could be used to help them with cravings and withdrawal symptoms. Concerns about side effects (e.g., overestimation of risks of side effects compared to risks of smoking). Cost of medications and lack of accessibility perceived as major barriers to their use. Word of mouth was a powerful influence on decisions to use or not use pharmacotherapy. American Indian smokers, in particular, associated pills

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							with Western medicine, and viewed them with scepticism.
Gould et al, 2013  AUS	Explore issues for pregnant ATSI women in terms of smoking and smoking in the household	Regional NSW, Australia Aboriginal maternal and infant health service.	18 Aboriginal and/or Torres Strait Islander peoples (83% female) Mean age: 30.3 (SD = 11.70) Age range: 17-53 years	5 focus groups	Experiences of and attitudes towards smoking during pregnancy and cessation	Content analysis	Smoking usual in families. Several smokers in one household, difficult to avoid being around smoke. Smoking provides sense of social connection. Isolation if attempting to quit. Shared activity, and an anticipated part of mutual exchange (socialising). Low levels of support from family and friends to quit. Pressure to quit from family and friends. Pregnancy specific barriers: offset diabetes or keep baby small. Babies and individuals turned out "healthy". Not receiving understanding from doctors (judgemental). Stress and anxious situations. Cravings and withdrawal symptoms. Meal times and work breaks (habit). Yarning and socialising. Sporting events, watching TV, boredom, TV ads, drinking alcohol and smelling tobacco smoke. Smoking cannabis. Being around other smokers, after birth. Quitting "too hard". Negative views of NRT due to adverse effects, preference to quit unaided, didn't understand how NRT could help. Hopelessness after trying many methods.
Gryczynski et al 2010 (81).  USA	Inform the development of a culturally appropriate smoking cessation program for American Indians by looking at their	Local community-based American Indian health service organization	n = 35 American Indian participants. 51.4% female Age: 45.7% between ages of 41 – 50.	Focus groups.	Cultural and social factors associated with smoking; smoking cessation experiences; attitudes towards cessation aids and programs.	Variant of the thematic framework approach.	Values of self-reliance and pride that are intertwined with American Indian identity. Enjoyment of smoking. Addiction to nicotine (deeply entrenched learned behaviour). Linked to very heavy smoking behaviours (waking up during the night to smoke). Association between other behaviours and smoking (coffee, alcohol, sex, other drug use).

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Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
	preference for smoking cessation and associated programs.						Smoking as a form of stress relief (given the highly stressful nature of low socioeconomic status). Ubiquity of cigarette use in life, friends and family. While physicians were seen as a good source of smoking cessation help, it was noted that many AI do not have private health insurance. Also physicians were not seen for non-emergency care. Cost, incorrect use, ineffectiveness and negative side effects prevented use of NRT. High number of family friends also smokers.
Hodge et al 2006 (82).  USA.	Investigate tobacco use, attitudes, knowledge and practices in American Indian sample.	Reservation sites.	n = 51 American Indian participants 56.9% female.	Focus groups.	History of tobacco use in tribal context, knowledge and attitudes regarding cigarette smoking.	Krueger's (1998) focus group analysis methodology.	Lenient attitudes towards smoking including: acceptance of smoking as a social norm; belief in autonomy and people's right to experiment with tobacco; and low numbers of household smoking bans. Cultural phenomenon of independence and non-interference. Reluctance to tell others what to do, or to move away from someone who begins to smoke. Low harm value assigned to smoking – in light of other day to day issues faced. Participants were aware of the risks but downplayed the seriousness of those risks. Enjoyment of smoking. Maintaining the ritual of smoking. Brand loyalty (several brands of tobacco that have AI names e.g. Seneca, Mohawk etc.). Ceremonial use of tobacco was an important cultural custom. Learning how to use tobacco in ceremonies as a young person was important. The loyalty to the tribe overrides tobacco's ill effects.
Johnston et al 2008 (83).  AUS	To gain a better understanding of the reasons why Indigenous Australians smoke.	Health professional and community members from a coastal community in Northern	n = 25 Indigenous Australian community members 52% female	Semi-structured interviews.	Flexible interview schedule developed through literature review and discussions with service providers – details not given.	Thematic analysis.  Atlas-ti (Version 5).	Social pressure to smoke – both implicit and explicit. Smoking is everywhere – smokers live or socialise with smokers. Tobacco as a normative substance in this community. Communal and collective activity. Tobacco used for reciprocal social exchange; ceremony and sharing.

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		Territory.					<p>Sharing was a very important part of Indigenous culture as a way to influence behaviour, relationships and social control.</p> <p>Refusing to share cigarettes may be seen as a betrayal of the kinship they share and as an offensive act.</p> <p>Not sharing cigarettes may lead to isolation, as the sharing of cigarettes contributes to a sense of belonging and social identity.</p> <p>Some participants were derided for their decision to quit (but others were supported).</p> <p>Some state that the only way they could quit smoking is to distance themselves from family and friends, an entirely unfeasible proposition.</p> <p>Sharing a cigarette gives opportunity for a 'yarn' – enjoyment.</p> <p>Other positive effects including feeling more alert, happy, good, more able to complete tasks, relief, and allowing a sense of control.</p> <p>Habit, addiction and hooked – nicotine dependence.</p> <p>Overcrowding in homes.</p> <p>Stress was most often mentioned in conjunction with smoking relapse, and more often by women than men.</p> <p>An outlet, a stress management, and to manage grief.</p>
Kaholokula et al, 2007 (84). USA	Identify supports for and barriers to smoking cessation for this ethnic population., and to inform the development of a smoking cessation program for this population.	Northern rural community.	n = 52 Native Hawaiian participants. 48% male Age: mean = 51.8 (SD = 12.4)	Focus groups.	Smoking cessation advice and experience; barriers and facilitators to cessation; preferences in smoking cessation programs; differences between males and females.  Ex-smokers were also asked about aids to quitting and preferences.	Thematic analysis.	<p>Social factors: presence of friends, family and co-workers who were smokers, nagging to quit smoking.</p> <p>Psychological factors: stress, negative emotions, lack of 'willpower', thinking about the need to smoke.</p> <p>Physical factors: physical experience on nicotine addiction and withdrawal, weight gain.</p> <p>Behavioural : habitual nature of smoking, smoking linked to other behaviours (alcohol, reading the paper).</p>

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
Passey et al 2011 (85).  AUS	Explore the factors contributing to smoking initiation and the social context within which smoking behaviour occurs.	Coastal, river region of NSW – Aboriginal Maternal and Infant Health Strategy antenatal teams.	n = 36 Aboriginal Australian participants. 100% female Age (of women interview n = 22): mean = 24.9, ranged from 17 to 41. Education: Less than ten years of education 68%	3 Focus groups and 22 semi-structured interviews.	Topic areas – social and environmental factors that maintained or encouraged smoking and smoking initiation.	Content analysis.	Colonisation and introduction of tobacco: Disruption to Aboriginal society including dispossession of traditional lands, removal of children, loss of traditional lifestyle and introduction of new substances. The traditional and ceremonial limits that used to apply to smoking are no longer applicable. Social networks and community norms: Aboriginal community remains largely isolated. Many aboriginal people have limited interaction with non-smokers. High prevalence of smoking which allows the normalisation of smoking to occur. Limited interaction with non-smokers also limits exposure to changing attitude towards smoking. Disadvantaged lives: High unemployment, associated poverty, affordable housing, overcrowding, relationship difficulties, loss of family members through death/removal of children, grief and loss, abuse, perceived racism and negative stereotypes –smoking helped manage and navigate their way through these factors. Maintaining relationships and sharing: Relationships may be given higher priority over individual needs. Reciprocity – obligations to share time and resources including cigarettes – to give and to accept those given to you. Sharing and having a yarn was an important social activity.
Patten et al, 2009 (86).  USA	Preferences and acceptability of different tobacco cessation strategies and the barriers and unmet needs of Alaskan Native	3 remote villages on the coast of western Alaska (populations ranging from 750 to 1,000) Most residents	n = 49 Alaskan Native participants 61% female Age: mean = 14.6 (SD = 1.6).	Focus groups.	Motives for quitting, barriers to quitting, role of family members and others in quitting, preference for tobacco cessation methods, preference	Content analysis.	Cravings. Use as a stress/anger management. Use of traditional forms of tobacco. Manages mood. Relieves boredom. High prevalence and acceptance of tobacco use in villages Lack of encouragement by peers and other community

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
	adolescents who want to quit smoking.	live subsistence lifestyles.			for study recruitment and retention methods.		members to stop. Lack of effective resources to help quit
Wood et al 2008 (87).  AUS	The aim of this study was to explore the experience of tobacco smoking and cessation within a pregnant Aboriginal and Torres Strait Islander sample.	Perth (State capital), Western Australia.	n = 40 Aboriginal women and 10 Aboriginal Health Workers Age: ranged from 14 to 50 years, with most less than 30 years.	Focus groups and in-depth interviews.	A semi-structured discussion guide with open-ended questions was developed in consultation with the reference group.	Thematic analysis.  QSR N6 NUDIST.	Smoking as an accepted behaviour. Stress management. Low priority in terms of health. Stress. Difficult life circumstances. Relaxation, chance to catch up with others. Pregnancy acted as a barrier as it increased boredom/stress. High levels of smoking amongst friends, family and wider community. To quit you would have to avoid family and friends. Knowledge about the specific risks to the foetus was low. References to babies being healthy despite smoking during pregnancy.
<b>Mental illness</b>							
Clancy et al, 2013 (102)  AUS	Explore experiences of smokers with self-reported depression	Large cluster randomized control study	n = 16	Semi-structured interviews.	Semi-structured interview Attitude towards smoking, relationship between smoking and mental health, quitting process.	Thematic analysis.  nVivo 9.	Low mood. Sense of hopelessness. Lack of control over one's life. Lack of meaningful activities.
Davis et al 2010 (89).  USA	Investigate how people with severe mental illness perceive risks from smoking/risks posed by smoking.	Large urban psychosocial rehabilitation agency.	n = 31 54% female Ethnicity: 54.8% Caucasian; 35% African American	Semi-structured interviews.	General health and healthy lifestyle questions, smoking status, smoking history, quit attempts and barriers to and facilitators of cessation.	Inductive data analysis.  Atlas-ti.	Enjoyment of smoking – pleasurable activity/coping mechanism. Maintain good mental health. Stress management. Worried that without stress management of smoking: relapse, rehospitalisation, suicidal thoughts or suicide were possible. Allowed people to manage other addictions. Not experiencing symptoms of smoking related illness currently. Smoking certain brands, types or flavours of cigarettes

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							because they are less likely to cause cancer. Extreme trauma and negative life experiences act as a protective factor for smoking related illness – “I’ve made it through life this far, I don’t think I’ll get sick from smoking too” belief. Examples of friends and family who are/were smokers and have never been ill. Examples of friends/family who are not smokers who are still unhealthy. Friends and family socialising and smoking at the same time.
Howard et al 2012 (91).  UK	Investigate the specific barriers to smoking cessation faced by pregnant smokers.	Maternity and perinatal psychiatry services.	n = 27 100% female Age: mean = 29 (SD = 1.1), ranged from 17 – 41. Ethnicity: 13 White; 4 Black African; 6 Black Caribbean and 4 Mixed/Other.	Semi-structured interviews.	Not reported.	Framework analysis.	Smoking used as a way of losing weight (for participants diagnosed with SMI and eating disorder). Maintain good mental health. Only occurring during manic/depressive cycles. Fear that attempts to quit would increase symptoms of mental illness. Prioritisation of mental health over smoking cessation by health professionals. Social environment – family, partner and social network of peers – high prevalence of smoking and lack of support. Accessibility of cigarettes. Psychological and physical addiction to cigarettes. Quit smoking services and resources: judgemental, lack of proactive follow up, lack of continuity of care, prioritisation of mental health over smoking.
Kerr et al 2013 (92).  UK	To determine the principle barriers and facilitators to smoking cessation for people with mental health problems	Recruited from three Health Boards in Scotland, UK.	n = 27 participants with mental health problems 41% male Age: median = 49, ranged from 30 to 60. Diagnosis: 41% Schizophrenia/	Semi-structured interviews.	Smoking history; positive and negative aspects of smoking perceived barriers and facilitators to smoking cessation; times when smoke more or less; impact of mental health problem on smoking	Framework analysis.  NVivo 8.	Socialising and habits of family and friends Smoking as a calming agent; dealing with general stressors and anxiety linked to mental health problems. Stopping smoking would mean loss of coping mechanism/support. Maintain good mental health. Deterioration in mental health increases need for smoking. Stimulant effect helped overcome side effects from medications, in particular antipsychotics. Habit and addiction (small numbers).



Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
			delusional disorder; 30% Affective disorder; 22% Schizoaffective disorder; 4% neurotic disorder and 4% neurotic-affective disorder.		and cessation		Enjoyment. Lacking motivation and confidence to give up. Lack of support from health professionals – uncommon to raise issue of smoking, offer encouragement support to stop. Some reports of professionals actively discouraging cessation attempts.
Lawn et al 2002 (93).	Describe the experience of mental health clients as they relate to smoking behaviour, the relationship of smoking behaviour to the course of their mental illness and its management and to their attempts to quit smoking.	Mental health services.	n = 24 50% female Age: ranged from 25 – 63 years old. Diagnosis: 6 chronic paranoid schizophrenia; 6 major depressive disorder; 6 bipolar affective disorder; and 6 borderline personality disorder.	Semi-structured interviews.	Cigarette use; quit history, use of NRT and other aids; meanings of smoking, attempts to quit, relationship between smoking and mental illness, experiences in hospital.	Thematic analysis.	Cigarettes as a symbol of control, fulfilling needs of: safety, reassurance, predictability, autonomy. Allowed greater freedom to take part in social activity. Promote more control – over symptoms, mood, and emotions. Cigarettes used by staff as tools to reward, punish or control behaviour. Smoking is the most effective means of avoiding relapse. Smoking as freedom, rebellion and protest. Little hope for recovery. An alternative way out to taking direct action – suicide? Enjoyment. Compensation for losses in other areas of life. Smoking to relieve physical symptoms of mental illness – while many of their symptoms could be described as withdrawal/cravings form cigarette, most attributed these to symptoms of relapse to MI. Tools for decision making, clear thoughts, compartmentalise time, avoidance. Relieve stress, anxiety, to relax. Aid sleep, motivation, stabilise mood swings. Identity as a smoker – companionship of cigarettes. Families, friends, peers all smokers. Service providers and family condoning or colluding with their smoking. Few participants thought they could be successful.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							Few participants had tried NRT, citing cost as the main barrier. Excluded from mainstream quit programmes. Misunderstood and judged, double dose of stigma from smoking policy changes.
Lucksted et al 2000 (94). USA.	Explore pros and cons of smoking and quitting smoking in psychosocial rehabilitation clients.	One urban and one suburban psychosocial rehabilitation groups.	n = 40 70% male Demographic characteristics (including diagnosis) were not assessed.	Focus groups.	Semi-structured discussion guide: Positive and negative things about quitting, barriers and facilitators to quitting, other issues.	Thematic analysis.	The positive anti-depressive, anti-anxiety, calming, and cognitive-focusing effects of tobacco. Symptom management (symptoms of mental illness and also side effects from medications). Boredom. Enjoyment Others beliefs – friends and family encouraging smoking as it was perceived to be one of few positive things in the individual's life. Ignoring health effects and health campaigns or accepting the risks. Lack of motivation. Smoking offered sense of identity and feeling included.
Morris et al 2009 (95). USA.	To explore the perceptions of clients and staff on how best to quit smoking.	Consumers of mental health services in both rural and urban areas of Colorado.	n = 62	Focus groups.	Preferences for smoking cessation, views on current resources available, health professional practices that aid in cessation, factors that prevent cessation.	Content analysis. NVivo 7.	Lack of resources to aid in cessation. Seeing health professionals smoking had a negative impact on participants' motivation to quit. Earning smoking as a behavioural reward. Negative expectations of the ability of people with a mental illness to quit smoking. Little knowledge of the negative health effects of cigarette smoking. Smoking to manage stress/anxiety/tension, psychiatric symptoms, and to enhance cognitive ability. Boredom. Smoking viewed as a social event, as a way of connecting with others. Peer smoking.
Nawaz et al 2012 (96).	To explore the smoking and quitting beliefs, attitudes and behaviours amongst smokers	Large psychiatric rehabilitation agency in Chicago, Illinois.	n = 36 Ethnicity: 17 African American; 12 Latino; 7 White.	Focus groups.	Not reported.	Qualitative analysis. Atlas.ti.5.7.1.	Tobacco use promoted, normalized and reinforced in mental health treatment community. Smoking ameliorated illness symptoms and memories of traumatic experiences. Manage daily stress that might otherwise aggravate mental illness symptoms.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
USA	with severe mental illness from three different race/ethnicity groups.		Diagnosis: 14.3 – 33.3% Schizophrenia/ Schizo-affective; 14.3 – 23.5% bipolar depression; 35.3 – 50% Major depression; 11.8 – 28.6% not specified.				Smoking norm amongst peers in treatment settings – highly prevalent. Use of cigarettes to manage/reward behaviour. Policies that prohibited smoking in only parts of treatment centres/halfway houses etc. Difficulty of quitting Lack of access to treatment – directly linked to poor health insurance and poverty. Financial cost of NRT and other pharmacotherapies.
Prochaska et al 2013 (103) USA	Aimed to obtain formative data to guide development of a tobacco cessation smoking program for youth with co-occurring mental health disorders	Outpatient mental health settings in the san Francisco bay area.	n = 14 43% female. Between ages of 16 – 23.	Semi-structured interviews.	Semi-structured interviews: reasons for smoking, perceived relationship between tobacco use and mental health issues, perceptions of smoking and preferences for program characteristics.	Content analysis. ATLAS.ti	Failure to enforce no smoking ban in the home Parental smoking Peers who smoke being a negative influence Difficulty maintaining relationships if quit smoking Stress Affect Other substances Addiction Media images
Ratschen et al 2010 (105) UK	To explore patients' experience, smoking behaviour and symptoms of nicotine withdrawal in the	Two acute mental health wards and one ten bed intensive care unit.	n = 15 60% male Mean age: 42.3 (ranged from 27 – 61). Mental illness diagnoses: Schizophrenia,	Semi-structured interviews.	Current smoking behaviour, their individual experience, knowledge, beliefs, and feelings related to smoking, quitting smoking,	Framework analysis.	Dealing with stress. Dealing with boredom. Habit. Enjoyment. Anxiety. Peer pressure. NRT use: Disliked the taste of nicotine gum, reported allergic

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Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
	context of a comprehensive smokefree policy on mental health acute wards.		schizotypal disorders (n = 5); mood and affective disorders (n = 7); neurotic, stress related and somatoform disorders (n = 1); organic disorder (n = 1).		the smoke-free policy and the environment of the wards; the support offered to them on the wards; and their potential interest in further support.		skin reactions to patches, and, for one participant, a fear of NRT. Negative reactions to taking additional medication on top of that for their mental illness
Snyder et al 2008 (97).  USA.	Identify multi-level factors that impact on smoking cessation with people with mental illness.	Two psychiatric rehabilitation centres within the mid-west of the USA. One dual diagnosis, one offering rehabilitation services for predominantly African American people with mental illness.	n = 25 75% male Aged between 24 and 55. Diagnoses not reported.	Focus groups.	Views and perspectives on smoking and cessation, factors that acted as motivators for smoking, factors that motivated cessation.	Iterative analysis process.  QSR NUDI*ST N4.	Low confidence in quitting. Desire to smoke was stronger than desire to quit. NRT seen as ineffective leading to feelings of hopelessness. Sense of autonomy over behaviour; participants felt that making the choice to smoke was empowering. Conversely, a sense of having no control over smoking due to addiction was also a barrier. Smoking as a central part of life. Coping mechanism for stress, anxiety, depression, boredom and loneliness. Cigarettes were an affordable luxury. Being able to purchase cigarettes was a source of self-esteem. Belief that if they quit, they would have nothing else enjoyable to do. Beliefs around the health effects of smoking: Participants reported health benefits from smoking and minimised health risks. Non-smokers are able to refrain from smoking because they are not disadvantaged. Belief that non-smokers don't have as much fun. Feeling judged or nagged by non-smokers. Smoking offering opportunity for connection and social interaction.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
							Boredom; days left relatively unstructured so smoking filled in the time.
Solway et al, 2011 (98). USA.	Explore the perceptions of people with mental illness on smoking and smoking cessation.	Outpatient mental health services	n = 26 38% female Mean age: 62 (ranged from 41 – 82). Nearly all participants had been diagnosed with severe mental illness.	Focus groups.	Semi-structured interview protocol.	Constructivist grounded theory.	Perceived benefits of smoking outweigh the negative health risks. Enjoyment. Relaxation. Experience cravings when feeling anxious or upset or in the company of other smokers. Sense of control over emotions. Feeling extremely daunted about the quit process and withdrawal symptoms in general. Cost and accessibility of NRT. Lack of willpower, motivation and the right frame of mind. Smoking provides an identity and also acts as a source of connectedness over the sense of exclusion/stigma of having mental illness. Freedom, exercise their right to choose and maintain independence. Smoking as a 'friend'. Symptom management. Continued smoking eliminates withdrawal symptoms. Other's expectations of their ability to quit smoking. Feeling that smoking and medications to treat mental illness are related. Smoking to relieve side effects of medication. Weight gain.
Tsourtos et al 2008 (99). AUS	Explore why non-smokers appear to be resilient to smoking in a highly acceptable and prevalent group.	General practice and a range of mental health services	n = 34 58% female All had diagnoses of depression.	Semi-structured interviews.	Smoking and participants' social environment throughout the lifecourse.	Components of Grounded Theory were used with an analytic framework.  NVivo 8.	Smoking to deal with stress: Stressors included: boredom; physical injury; death of a loved one; stressful occupation; relationship breakdown; one or more medically diagnosed disorders. Coping mechanism. Relaxation. Comfort. Strength. Quitting smoking would exacerbate stress. Depression and anxiety made quitting more difficult.

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
<b>Homeless</b>							
Okuyemi et al 2006 (108).  USA.	Examine the views of homeless people on smoking practices, knowledge and barriers to and interest in quitting.	Homeless service facilities	n = 62 68% response rate 70% male Ethnicity: 58% black; 37% white and 5% other.  Age: mean = 41.5 (SD = 9.3). Education: 73% high school educated or lower.	Focus groups.	Smoking history; quitting experiences; smoking cessation aids (NRT and other medications); preferences for smoking cessation treatment.	Principles outlined by Morgan and Krueger.  Atlas-ti v 4.1 used for coding.	Low self-efficacy. Limited access to care (cost of cessation aids). Service providers offer limited support to quit. Competing needs e.g. food, shelter. Uncertainty associated with being homeless. Limited structure and routine – keeping busy to avoid boredom. Smoking as a socially acceptable behaviour in homeless settings. Few restrictions in homeless services. Fear that quitting smoking may result in changes in emotion/stress levels that may impact negatively on other areas of life. Concerns about using NRT and cost, taste, proper usage and side effects, interactions with other medications and effect on other health conditions. Concern about becoming addicted to NRT.
<b>Prisoners</b>							
Richmond et al 2009 (110).  AUS.	Investigate tobacco and its role in prisons.	One maximum security prison and one community justice restorative centre.	n = 40 (9 prisoners and 31 ex-prisoners). 30% female Age: ranged from mid 20s to late 40s. Ethnicity: 4 Aboriginal Australian participants	Focus groups.	Role of tobacco in prisons, reasons for smoking initiation, smoking cessation, methods to quit.	Content analysis.	Poor knowledge of cessation strategies. Some had not heard of bupropion, would not attend a doctor for assistance and would not attend quit smoking programs once in the community. Smoking as a normal practice in prison. Cigarettes as a substitute for money. Boredom, stress, anxiety regarding legal matters, being locked up for large portions of the day and social isolation. Cigarettes/smoking used as a reward. Transfer to another wing or prison. Bullying, missing family, isolation,
<b>At risk youth</b>							
Lewis et al 2013(111)	Aims to contribute to the existing literature	Communities in North East of England –	n = 52 58% female	Participant observation.	NA	Thematic analysis.	Surrounded by other smokers makes it too hard to quit. A lot of family and friends smoke Helps with stress – conflicting messages – some

Author, Year, Country	Study aims	Setting	Sample	Method	Interview schedule/discussion guide	Type of analysis	Barriers to quitting
UK	on smoking and young people and to clarify how factors related to young people and smoking play out in disadvantaged communities.	deindustrialisation – former coal mining village.	Aged between 11 to 18 years.				participants felt it did and did not relieve stress. For fun and enjoyment. Accessibility and availability: tab (cigarette) houses – private dwellings where people can buy cigarettes- always sell to underage people. Buying a packet from the tab houses and then selling at school. Mixed messages regarding smoking: people in authority not discouraging or addressing smoking (e.g. teachers, police force).
<b>Multiple groups</b>							
Garner et al 2013 (112)  UK  UK	Explore homeless smokers' views, attitudes, experiences and knowledge with regard to smoking and quitting in an urban UK setting.	One drug harm reduction and sexual health service commissioned by the NHS in Nottingham city centre.	n = 15 73% male Aged between 18 to 53 years; mean = 33.	Semi-structured interviews.	Demographics, smoking history, nicotine dependence, quitting related behaviours, experiences and attitudes.	Framework analysis.	Low confidence. High prevalence of peer smoking behaviour. Exposure to a social environment where smoking was the norm. Homeless service staff providing cigarettes. Use of cigarettes as a reward for carrying out small jobs around the service. Use of other substances including alcohol and other drugs. Stress management within already stressful life circumstances. Lack of encouragement or active discouragement by health professionals to quit.

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Supplementary file 4. Summaries of the included mixed methods studies by disadvantaged group (n = 3).

Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Qualitative method and type of analysis	Quantitative results (barrier and prevalence)	Qualitative data (barriers identified)
<b>Indigenous studies</b>									
Glover, 2005 (79). NZ.	Increase the understanding of smoking in Maori populations and best ways to affect smoking cessation	Not reported.	n = 130 self-identified Maori participants. 78% female. Age: mean = 35 (ranged from 16 – 62).	Not reported.	Pre and post interviews after a quit attempt (both open and close ended questions).	Smoking history, Smoking behaviour, Quit history, Fagerstrom NDT, Experience of relapse, Reasons for smoking, Motivation to quit, Self-efficacy, Stage of Change, Methods of quitting, Quit abstinence – not biochemically verified.	Semi-structured interviews General inductive approach. QSR NUD*IST Release V4.0.	Habit: 73% Normal to smoke: 11.5% Coping with stress: 48% Coping with emotions: 23% Addiction: 39% Socialising/drinking: 34% Bored: 29% Enjoyment: 25% Time out/reward: 17%	Relapse was also related to poor self-esteem and a tendency to attribute blame to themselves. Living with other smokers. Family (Whanau) directly or indirectly supporting relapse. Socialising. Others smoking.



Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Qualitative method and type of analysis	Quantitative results (barrier and prevalence)	Qualitative data (barriers identified)
<b>Mental illness studies</b>									
Goldberg et al 1996 (90). CAN	Identify what clients identify as barriers and facilitators to cessation.	Community based psychiatric rehabilitation program (mid-sized urban Canadian).	n = 105 68% male Age: mean = 35 (ranged from 20 to 58 years). Diagnoses not reported.	93%	Telephone and face to face interviews.	Reasons for smoking, why it is hard to quit, beliefs about support required to change smoking behaviour.	Focus groups. Type of analysis not specified.	Addiction: 53% Difficulty resisting cravings: 33% Enjoyment: 20% Relieving symptoms: 20% Habit: 19% Boredom: 17% Most or all friends are smokers: 12.5% Low cost of cigarettes: 8% to smoke, lack of support to quit. Smoking as a social activity.	Afraid of giving up old friend. Withdrawal symptoms. Enhanced mood. Cheap thrill. Coping strategy when stressed. Something to do. Apathy and daily drudgery associated with psychiatric disability. Peer pressure to smoke. Lack of support from peers to quit. Smoking as a social activity. Receiving cigarettes from family and friends.
Van Dongen et al 1999 (100). USA	Examine the experiences of persons with persistent mental illness and smoking.	Outpatient clinic, Midwest, USA.	n = 36 75% male Age: mean ranged from 45 to 49. Diagnosis: Schizophrenia (70% - 90%); schizoaffective	Not reported	Cross-sectional survey.	Not reported.	Interviews. Content analysis.	Habit and routine: 58% Socialization: 58% Relaxation: 42% Addiction to nicotine: 33%	Smoking provided structure and activity. Something to do. Way to deal with stress.

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Author, Year, Country	Study aims	Setting	Sample	Response rate	Type of survey (cross-sectional, etc)	Outcome measure (and info on survey instrument)	Qualitative method and type of analysis	Quantitative results (barrier and prevalence)	Qualitative data (barriers identified)
			tive and mood disorders were the other diagnoses present.						

## Supplementary file 5. Overview of study characteristics

### Study characteristics

Approximately half (52%) of the studies had been published from 2009 onwards. Apart from three studies (86, 103, 111), all participants were adults aged 18 years and over. Studies were carried out in the USA (n=29) (49, 51, 54, 56, 60, 66, 70, 72, 73, 76, 78, 81, 82, 84, 86, 88, 89, 94-98, 100, 101, 103, 104, 106-108); Australia (n=15) (29, 52, 55, 57, 68, 74, 75, 80, 83, 85, 87, 93, 99, 102, 110); the United Kingdom (n=13) (50, 53, 61, 62, 67, 69, 71, 91, 92, 105, 109, 111, 112); Canada (n=5), New Zealand (n=2) (77, 79) and France (n=1) (59). Qualitative (n=54) (29, 49-59, 61-69, 71-78, 80-87, 89, 91-99, 102, 103, 105, 108, 110-112); quantitative (n=8) (26, 60, 70, 88, 101, 106, 107, 109) and mixed method studies (n=3) (79, 90, 100) were included. Of the qualitative studies, 26 used focus group methods (29, 49, 51, 52, 54-56, 61, 62, 65, 66, 72, 73, 76-78, 80-82, 84, 86, 94, 96, 97, 108, 110); 19 used interviews (50, 53, 57-59, 67, 69, 71, 75, 83, 89, 91-93, 99, 102, 103, 105, 112) and eight used a combination of interviews and focus groups (63, 64, 68, 74, 85, 87, 95, 98). One qualitative paper used participant observation methods (111). All eight quantitative studies utilised cross-sectional survey methods (26, 60, 70, 88, 101, 106, 107, 109). Two mixed methods studies used both cross-sectional surveys and interview ((79, 100) and one mixed methods study used cross-sectional surveys and focus groups (90). Twelve studies included only female participants (53, 54, 56, 58, 63-65, 67, 76, 85, 87, 91), five of which were carried out with pregnant women (54, 58, 67, 87, 91). Two studies were carried out with men only; partners of women who were pregnant (57) and disadvantaged former miners (71).

### Quality assessment of qualitative studies

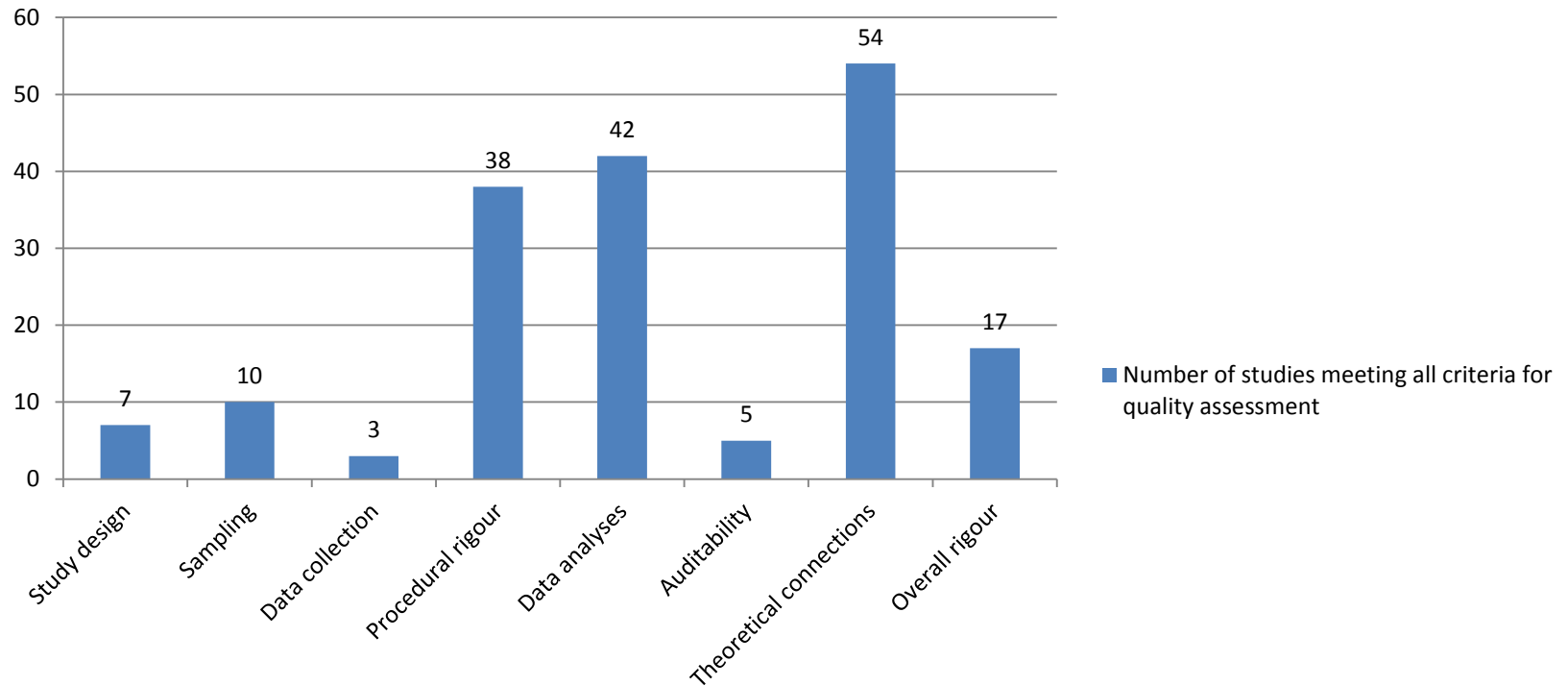
This figure includes assessment of the qualitative components of the mixed methods studies. The majority of studies did not explicitly state their study design (n = 42); of those that did, most used Grounded Theory (57, 59, 61, 93, 98, 99). Most studies provided adequate descriptions of the study sites; participants; data collection methods and analysis techniques. Only a small number of studies (n = 11) (51, 54, 58, 75, 76, 78, 83, 84, 96, 111, 112) addressed the role of the relationship between participants and the researcher and fewer still identified potential assumptions and biases of the researcher (n = 5) (51, 54, 61, 83, 98). Studies generally performed poorly when assessed on four components of trustworthiness, with only 17 studies meeting all four criteria (credibility; transferability; dependability and confirmability) (49, 52, 56, 58, 65, 67, 71, 73, 74, 77, 78, 80, 82, 83, 85, 86, 93). It should be

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3 noted that none of the mixed methods studies explicitly described their methodology as  
4 mixed methods nor did they report integrating the qualitative and quantitative findings in a  
5 systematic way.  
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### 8 **Quality assessment of quantitative studies**

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10 The results of the quality assessment of quantitative studies are provided in  
11 Supplementary file 6. This table also provides assessment of the quantitative components of  
12 included mixed methods studies. Sample sizes in the quantitative studies ranged from 36 to  
13 500 participants. Response rates ranged from 42% to over 97% (four studies did not provide  
14 response rates) (79, 100, 104, 106). All but one study (90) clearly stated eligibility criteria.  
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16 The majority of studies adequately described the research aims (60, 70, 79, 88, 90, 101, 104,  
17 106, 107); source of participants(60, 88, 90, 100, 106, 107) and addressed potential sources of  
18 bias within their analysis (60, 88, 107, 109). All studies stated their outcome *a priori* and no  
19 conflicts of interest were identified. Eight studies used convenience sampling (88, 90, 100,  
20 101, 104, 106, 107, 109). The validity and reliability of survey measures used to assess  
21 barriers to cessation were reported in one study (60). Three studies employed techniques such  
22 as pilot testing and input from key stakeholders in developing the tools used (60, 70, 109).  
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## Number of studies meeting all criteria for quality assessment



Supplementary figure 6. Quality of included qualitative studies and qualitative components of mixed methods studies (n = 57)

## Supplementary file 7. Results of the quality assessment of quantitative studies and quantitative components of mixed methods studies

Study author and year	Aims	Selection methods			Was the measurement of variables appropriate?			Control of bias			Was the use of statistics appropriate?		Conflict of interest
		Aims clearly stated?	Eligibility criteria stated?	Source of participants described?	Selection method?	Validity of measures?	Reliability of measures?	Other method used?	Potential sources of bias?	Methods to deal with bias?	Response rate (%)?	Sample size?	
Price et al 1994 (60)	✓	✓	✓	Random sampling	✓	✓	✓	✓	✗	42	500	✓	✓
Rosenthal et al 2013 (70)	✓	✗	✓	Random sampling	✗	✗	✓	✓	✗	73	350	✓	✓
Dickens et al 2005 (109)	✗	✓	✓	Convenience sample	✗	✗	✓	✓	✗	44.1	45	✓	✓
Connor et al 2002 (107)	✓	✓	✓	Convenience sample	✗	✗	✗	✓	✓	>97	236	✓	✓
Asher et al 2003 (101)	✓	✓	✓	Convenience sample	✗	✗	✗	✗	✗	73	96	✓	✓
Carosella et al 1999 (88)	✓	✓	✓	Convenience sample	✗	✗	✗	✓	✗	80.9	89	✓	✓
Orleans et al 1993(104)	✓	✗	✓	Convenience sample	✗	✗	✓	✗	✗	✗	✗	✓	✗

Study author and year	Aims	Selection methods			Was the measurement of variables appropriate?			Control of bias			Was the use of statistics appropriate?		Conflict of interest
		Eligibility criteria stated?	Source of participants described?	Selection method?	Validity of measures?	Reliability of measures?	Other method used?	Potential sources of bias?	Methods to deal with bias?	Response rate (%)?	Sample size?	Primary outcome stated a priori?	
Arnsten et al 2004(106)	✓	Y	✗	Convenience sample.	✗	✗	✗	✗	✗	✗	98	✓	✓
Glover et al 2005 (79)	✓	✓	✗	Not reported	✗	✗	✗	✗	✗	✗	130	✓	✓
Van Dongen et al 1999(100)	✗	✓	✓	Convenience sample	✓	✗	✗	✗	✗	✗	36	✓	✓
Goldberg et al 1996(90)	✓	✓	✓	Convenience sample	✗	✗	✗	✗	✗	93	105	✓	✓

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Supplementary file 8: Detailed summary of barriers identified

## **Individual & lifestyle factors**

### ***Relaxation, stress and mood management***

Forty qualitative studies identified stress management as a significant barrier to smoking cessation (50-56, 58, 59, 61-63, 65, 67-69, 72, 74, 75, 80, 81, 83, 84, 86, 87, 89, 90, 92, 93, 95-97, 99, 100, 103, 105, 108, 110-112). Smoking was used as a coping mechanism (52, 58, 62-65, 69, 74, 89, 90, 92, 97, 99) in reaction to daily stressors as well as the stress inherent in disadvantaged lives. Three quantitative studies reported stress management as a barrier to quitting with Maori participants (48%) (79), participants with substance use disorders (39%) (104) and homeless participants (44%) (107). Of note, participants in two studies reported that smoking also directly contributed to the stress experienced by participants (51, 111).

Participants also reported using smoking to manage their emotions and mood (58, 65, 72, 83, 84, 90, 93, 98, 103, 113). Twenty three percent of participants from a Maori sample indicated managing emotions was a barrier to quitting (79), 42% of individuals with a substance use disorder (101).

### ***Enjoyment of smoking***

Across 22 studies, smoking was described as an enjoyable activity (50, 55, 56, 59, 62, 63, 65, 67, 79, 81-83, 88-90, 92-94, 97, 98, 105, 111). In quantitative studies, proportions of participants who said enjoyment prevented them from quitting ranged from 25% (79) to 47.2% (88). Smoking was viewed as an affordable, rewarding luxury (50, 55, 63, 79, 93, 97) and the only pleasurable activity some participants had (50, 56, 59, 62, 65).

### ***Physical addiction to nicotine***

Addiction to nicotine was reported as a barrier in 15 qualitative studies (49, 50, 54, 59, 67-69, 72, 74, 75, 81, 83, 84, 91, 92) (103) and four quantitative studies (60, 79, 90, 100).

Proportions of individuals who reported addiction to nicotine as a barrier ranged from 33% (100) to 86% (60). The experience of withdrawal symptoms was a barrier to quitting in nine studies (54, 57, 69, 72, 74, 80, 84, 90, 98). Management of cravings was a barrier in ten qualitative studies (49, 54, 68, 69, 72, 80, 84, 86, 90, 98) and one quantitative study (107) where 50% of homeless participants cited cravings as a barrier to cessation. Withdrawal symptoms were especially a barrier for individuals with substance use disorder, with 87% feeling tense or irritable if they quit smoking, and 48% saying their cravings would be so strong they couldn't stand it (101).

### ***Behavioural habit of smoking***



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Five quantitative studies (60, 79, 88, 90, 100) and ten qualitative studies (50, 57, 65, 68, 75, 80, 83, 84, 92, 105) reported habit as a barrier to smoking. Proportions of participants who endorsed habit as a barrier ranged from 19% to 58% in studies carried out with people with a mental illness (88, 90, 100); 82% in a low income sample (60) and 73% in a study conducted with Maori participants (79).

### ***Perceived mental health benefits of smoking***

Smoking in order to manage the symptoms of mental illness was identified in the majority of studies carried out with participants with a mental illness (88-98, 102) as well as managing the side effects from medications (92, 94, 98). Smoking in order to protect mental health was also found in one study conducted with low income pregnant women (67). In two community surveys a history of depression was reported as a barrier to smoking cessation (58, 74). Participants with mental illness in two studies perceived that the benefits of continuing to smoke far outweighed the potential risks of stopping, which included relapse, rehospitalisation and suicidal thoughts (89, 98). A large portion (78%) of individual's with substance use disorder would feel anxious if they tried to quit (101).

### ***Avoidance of weight gain***

Fourteen studies reported that smoking was used in weight management, and that potential weight gain was a barrier to quitting (29, 49, 52-54, 64, 67, 72, 74, 84, 91, 98, 101, 107). Twenty percent of homeless participants endorsed weight gain as a barrier to quitting (107) and in 20% of individual with substance use disorder (101). Smoking was also used to suppress appetite for individuals diagnosed with an eating disorder (91) and for low income pregnant women (67).

### ***Competing priorities and needs***

Competing needs, including finding shelter or food for those who were homeless (108); addressing mental health issues (89, 98); or addressing other physical illnesses (56, 74, 99) often meant that smoking cessation was not a priority for participants or those involved in their care in ten studies (56, 63, 74, 75, 87, 89, 91, 98, 99, 108).

### ***Rationalisations to continue smoking***

Lack of acknowledgement of the health-related harm of tobacco use was reported in eight studies (56, 58, 67, 74, 82, 87, 89, 97). Rationalisations to continue smoking were also reported in ten studies (54, 55, 58, 61, 67, 74, 78, 82, 89, 97) and included the belief that smoking certain brands/strengths of cigarettes meant a lower likelihood of developing cancer (82); not experiencing any signs or symptoms of smoking related illness at the present time (54, 58); fatalistic beliefs (56); providing examples of relatives or other persons who are

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3 smokers and who are healthy (80, 87); and the experience of disadvantage as a protective  
4 factor against developing smoking related illness (89).

### 7 ***Other substance use***

8  
9 Participants identified associations between smoking and other behaviours in eight studies  
10 including alcohol use (49, 74, 76, 80, 84, 112) cannabis and caffeine (49, 81, 112).

11  
12 Approximately one third (34%) of Maori participants identified alcohol use as a barrier to  
13 quitting smoking(79). Smoking was used to manage other addictions and prevent relapse (59,  
14 89, 103). Alternatives to smoking included drug use, relapse to alcohol addiction and losing  
15 control; all of which were unacceptable to participants (56, 62, 89). For 41% of those  
16 diagnosed with a substance use disorder, quitting would make it harder to remain sober and  
17 13% wouldn't be able to control their cravings for other substances if they quit smoking  
18 (101).

### 24 ***Sense of autonomy***

25  
26 Participants across seven studies reported that smoking provided a sense of autonomy,  
27 control (56, 58, 68, 83, 93, 97, 98) and power (99) over lives that were often chaotic and out  
28 of control. On the other hand, participants with mental illness identified the lack of control  
29 they had over smoking as a barrier to quitting (102).

### 33 ***Low confidence and perceived difficulty of quitting***

34  
35 Low self-efficacy (52, 93, 106, 107) and low confidence (92, 97, 112) was reported in seven  
36 studies. The belief that willpower was the single-most important factor needed to successfully  
37 quit was reported in five studies (51, 52, 64, 67, 69). Participants also reported that the  
38 process of quitting smoking was too hard (52, 80, 96, 98), including 73.5% of prisoners and  
39 ex-prisoners surveyed (109) and 58% of individuals with a substance use disorder (101).

40  
41 Smokers with depression reported it was hopeless to try to quit (102). However, the opposite  
42 was reported by a sample of former miners, who maintained they were able to stop smoking  
43 at will, with minimal difficulty and need for support (71). Twenty five percent of individuals  
44 with substance abuse disorder said they did not know how to quit (101).

### 51 ***Perceived cognitive benefits of smoking***

52  
53 Enhanced concentration and other cognitive benefits associated with smoking were reported  
54 in six studies (51, 83, 90, 93-95), including 56% of individuals with a substance use disorder  
55 (101).

### 58 ***Combatting loneliness***

59  
60 Smoking provided a way of reducing loneliness in six studies (52, 59, 65, 93, 97, 98);  
providing companionship (93) and was described as a friend (52, 98) by participants.

### ***Perceived low individual risk of harm***

Whilst most of the studies reported that participants had good knowledge of the health risks associated with smoking, low levels of knowledge about the risks of smoking were identified as barriers to cessation (58, 87, 95, 97) including one study conducted with pregnant women (58) and two studies conducted with Indigenous Australian pregnant women (80, 87). Low knowledge of the risks of smoking whilst pregnant were also identified (58, 87). In a study conducted with former miners, participants were more likely to attribute their current health issues to coal dust exposure, rather than smoking. Additionally, participants rationalised continuing smoking by weighing the risks of smoking in comparison to the risks of coal mining (71).

### ***Low motivation***

Low levels of motivation to quit smoking were reported in four studies, all of which were carried out with participants who were diagnosed with a mental illness (92, 94, 97, 98). Additionally, 38% of individuals from a low income areas (70) and 47% of individuals diagnosed with a substance use disorder (101) also reported low levels of motivation to quit.

### ***Failed past quit attempts***

Past failed attempts to quit smoking were identified as barriers to future attempts in two qualitative studies (61, 74) as was a sense of hopelessness after trying many methods and remaining unsuccessful (87).

### ***Positive smoker image***

Two studies within low income samples reported associations between smoking and perceptions of being cool and sophisticated (29, 57) and one study with persons with a mental illness found that participants believed that non-smokers do not have as much fun as smokers (97). In a sample of young people with mental illness, positive media images were also reported as barriers to quitting (103).

### **Social and community networks**

#### ***High prevalence and acceptability of smoking in community***

Eight qualitative (53, 54, 69, 75, 79, 80, 98, 111) and four quantitative (60, 101, 107, 109) studies found that being around other smokers was a barrier to quitting. This finding is compounded by participants describing the high prevalence of smoking amongst family and friends in 23 studies (29, 51, 52, 56, 62, 68, 69, 72, 74, 76, 81, 83, 85-87, 90, 93, 95, 96, 103, 105, 111, 112) and in the wider community in 18 studies (29, 51, 52, 56, 62, 66, 69, 72, 74, 76, 81, 83, 85-87, 93, 96, 112). Tobacco was readily available and easily accessible within disadvantaged communities (51, 62, 66, 76, 83, 90, 91, 111) and smoking was considered to

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3 be a highly acceptable (29, 79, 81-83, 85-87) and normalised behaviour (52, 56, 62, 66, 69,  
4 79, 81-83, 85, 87).

### 7 ***Lack of social support***

8  
9 A lack of social support to quit smoking was reported in 12 studies (29, 56, 58, 64, 67, 68,  
10 75, 79, 84, 98, 107, 108) and a lack of support from family and friends in particular was a  
11 barrier in 14 qualitative studies (49, 54, 55, 58, 69, 74, 75, 77, 79, 83, 84, 87, 91, 94). In one  
12 quantitative study, only 21% of homeless individuals agreed that close friends or family  
13 would be helpful in quitting smoking and only 29% believed that close friends and family  
14 wanted them to quit very much (106). Similarly, 26% of homeless respondents cited a lack of  
15 support during a quit attempt as a barrier to successfully quit (107).

### 21 ***Smoking as a social activity***

22  
23 Tobacco use and socialising were linked in two quantitative studies (88, 100) and 20  
24 qualitative studies (29, 49, 53, 57, 62, 73-75, 79, 80, 85, 87, 89, 90, 92, 93, 95, 97, 98, 103):  
25 where participants reported that using tobacco helped to facilitate social connections amongst  
26 family, friends and strangers.

### 30 ***Lack of health and other professional support to quit***

31  
32 Thirteen qualitative studies (52, 55, 56, 58, 74, 77, 83, 86, 91, 92, 95, 108, 112) and one  
33 quantitative study (109) reported a perceived lack of support from health professionals  
34 regarding smoking cessation. Cases of family members and health professionals actively  
35 discouraging quit attempts and encouraging maintenance of smoking due to concerns about  
36 the individual's mental health (92, 93, 95, 96, 112) or because smoking was perceived to be  
37 the individual's only source of enjoyment (54, 77, 79, 83) were reported. Three studies  
38 identified tobacco use by health professionals and others involved in the participants' care as  
39 a barrier to cessation (77, 95, 109) and one study reported service staff providing cigarettes to  
40 homeless clients as a barrier (112). Over half (55.9%) of prisoners surveyed reported  
41 observing members of staff smoking as a barrier to quitting (109). Participants also reported  
42 that cigarettes were used as a way to reward or punish behaviour by health professionals and  
43 other service providers (93, 95, 96, 110). Twenty-nine percent of prisoners also indicated  
44 that not receiving cessation support from prison staff prevented them from quitting smoking  
45 (109). Twenty-six percent of substance abusing individuals reported they did not have  
46 enough support to quit. The study involving at risk youth identified mixed messages sent by  
47 those in places of authority (for example teachers, members of the police force) also acted as  
48 a barrier for at risk youth (111).

## **Living and working conditions**

### ***Access to resources to quit***

Thirteen studies cited the cost of Nicotine Replacement Therapy (NRT) and other pharmacological interventions as a barrier to access that directly prevented cessation (52, 55, 61, 68, 69, 73, 74, 78, 81, 93, 96, 98, 108). Cost was also a barrier for 40% of participants diagnosed with substance abuse disorder (101). There was also poor knowledge and low uptake of programs available to participants (52, 56, 61-63, 72, 74, 78, 86, 96, 108, 110). Social and geographical isolation were reported in four studies as barriers to quitting (56, 62, 64, 85). Geographical isolation referred to the lack of access to cessation services that rural and remote communities experience. Social isolation referred to the racial and economic segregation that separates disadvantaged neighbourhoods and individuals from others (56) further contributing to differences in perceived acceptability and prevalence of tobacco use (62, 85). Unsafe neighbourhoods also limited unnecessary outings and inhibited accessing smoking cessation support (56).

### ***Boredom and limited structure in day to day life***

Fourteen qualitative studies (50-52, 54, 55, 65, 75, 86, 94, 95, 97, 99, 108, 110) and four quantitative studies (60, 79, 88, 90) indicated that smoking alleviated boredom. Limited opportunities for leisure and high levels of unemployment often meant that participants had large amounts of free time and smoking was used to mark the transition from one task or part of the day to another (56, 59, 93, 97, 102, 108).

### ***Concerns regarding cessation treatment and services***

Ten qualitative studies reported that participants were reluctant to access psychological or pharmacological resources to quit smoking due to a belief that these treatments were largely ineffective (56, 58, 61-63, 69, 72, 80, 81, 97). In one survey almost a third (31%) of homeless participants reported that no existing pharmacological treatments would be able to help them stop smoking (107).

The possible side effects of pharmacological interventions (50, 73, 78, 81, 105, 108), uncertainty about the correct use of pharmacological interventions (52, 81, 108); or the possible interactions between NRT and other medications (108) presented barriers to cessation. Participants in one study reported reluctance to add NRT on top of the medications they were already using (105). Homeless participants in one study expressed concerns about the possibility of becoming addicted to NRT (108). Concerns about existing treatment services included lack of continuity of care(91); being capable of addressing smoking simultaneously with mental health issues (91, 93, 96); cultural appropriateness (74, 77, 78,

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3 86); feeling judged by programs (61, 67, 91, 93) and a cynicism regarding the medical  
4 profession (77). Telephone quitlines were not viewed as culturally appropriate resources (77)  
5 and participants were sceptical of the effectiveness of quitline support (52).  
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### 8 *Stressful factors*

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10 Participants across ten studies (56, 58, 59, 62, 63, 65, 68, 74, 75, 85) reported that increased  
11 stress due to the events and life circumstances intrinsically linked to their socioeconomic  
12 position were barriers to quitting smoking. The following situations compounded feelings of  
13 stress, hopelessness and meant that cessation was not prioritised: unemployment (56, 58, 59,  
14 62, 63, 65, 68, 85); poverty and financial stress (62, 65, 75, 85); housing issues including  
15 substandard housing, homelessness and overcrowding (56, 58, 75, 85); violence and crime  
16 (56, 62, 68, 75); drug use (56, 62, 75); increased morbidity and mortality (68, 74, 75, 85);  
17 chronic disease (74, 75); low education (65, 75); and limited recreational activities (62, 65).  
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21 Two studies carried out with Indigenous Australians found that additional stressors  
22 experienced by this group included racism, stigma, dispossession of traditional lands, high  
23 burden of illness, premature deaths within the community and collective grief and loss  
24 relating to the Stolen Generation and the removal of children (74, 75, 85). Unique stressors  
25 facing prisoners including; transfers within and across prisons; legal matters; bullying;  
26 missing family; and restricted movement for most of the day were also identified (110).  
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### 29 *Living and working environments*

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31 Participants reported lack of control over exposure to smoking due to others smoking in the  
32 home; a lack of smoke free policies or policies that did not cover the whole environment or  
33 were only partially enforced were barriers to quitting smoking (54, 58, 74, 96, 103, 107). In  
34 one study involving prisoners, 59% of participants reported that the 'smoky atmosphere'  
35 within the prison was a barrier to quitting (109). Work environments that were conducive to  
36 smoking also presented a barrier in one study (29).  
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### 39 **Cultural, socioeconomic and environmental factors**

#### 40 *Cultural norms*

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42 The importance of tobacco use in traditional and ceremonial contexts was expressed in three  
43 studies concerning American Indian participants (72, 73, 82) and one study including  
44 Aboriginal and Torres Strait Islander participants (85) and one study including Alaska Native  
45 participants (86). Cultural values of self-reliance, pride and independence prevented  
46 American Indian participants from seeking cessation support in two studies (81, 82) and in  
47 one study with low income African Americans (56). Historical factors including  
48 dispossession of land, colonisation and collective grief and loss of cultural identity were  
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3 reported as barriers to cessation in three studies of Aboriginal and Torres Strait Islanders (74,  
4 75, 85). Studies carried out with American Indian participants (73, 82) and Aboriginal and  
5 Torres Strait Islanders (74, 75, 83, 85) highlighted the function of smoking as a way of  
6 maintaining cultural identity and belonging. Maintenance of identity and belonging were also  
7 reported in three studies concerning people with a mental illness (93, 94, 98) and one study  
8 carried out with low income participants in the UK (62). In prison settings, use of cigarettes  
9 as a substitute currency also provided a barrier to cessation (110).

### 16 *Socioeconomic factors*

17 Two qualitative studies reported participants linking their status as smokers and their inability  
18 to quit smoking with their lower socioeconomic position (65, 97). In a study conducted with  
19 people with a mental illness, participants endorsed the belief that non-smokers were able to  
20 refrain from becoming smokers because they were more advantaged (97) and in a study of  
21 low income women, participants referred to their low socioeconomic position and poverty as  
22 a barrier to quitting smoking (65).  
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