



**STUDY PROTOCOL - VALIDATION OF RISK ASSESSMENT
SCALES IN A CROSS-SECTIONAL SURVEY OF ATTITUDES TO
TOBACCO SMOKING AND INTENTIONS TO QUIT SMOKING
IN AUSTRALIAN ABORIGINAL AND TORRES STRAIT
ISLANDERS.**

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3 **STUDY PROTOCOL - VALIDATION OF RISK ASSESSMENT SCALES IN A CROSS-**
4 **SECTIONAL SURVEY OF ATTITUDES TO TOBACCO SMOKING AND**
5 **INTENTIONS TO QUIT SMOKING IN AUSTRALIAN ABORIGINAL AND TORRES**
6 **STRAIT ISLANDER PEOPLES.**
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53 Running Head: Risk assessment for smoking with Indigenous Australians
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1
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3 *Key words: tobacco use, smoking, Australian Aborigines, risk behaviours, health*
4
5 *attitudes*
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11 Word Count: 3883
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For peer review only

ABSTRACT:**Introduction**

Tobacco smoking is a very significant behavioural risk factor for the health of Australian Aboriginal and Torres Strait Islanders, and is embedded as a social norm. With a focus on women of child-bearing age, and men of similar age, this project aims to determine how Aboriginal and Torres Strait Islander smokers assess smoking risks and how these assessments contribute to their intentions to quit. The findings from this pragmatic study should contribute to developing culturally targeted interventions.

Methods and analysis

A cross-sectional study using quantitative and qualitative data. 120 Aboriginal and Torres Strait Islander community members aged 18-45 years will be recruited at community events and through an Aboriginal Community Controlled Health Service (ACCHS). Participants will be interviewed using a tablet computer or paper survey. The survey instrument uses modified risk behaviour scales, i.e. the Risk Behaviour Diagnosis (RBD) Scale and the Smoking Risk Assessment Target (SRAT) (adapted from the Risk Acceptance Ladder) to determine whether attitudes of Aboriginal and Torres Strait Islander smokers to health risk messages are predictors of intentions to quit smoking.

The questionnaire will be assessed for face and content validity with a panel of Indigenous community members. The internal consistency of the RBD subscales

1
2
3 and their patterns of correlation will be explored. Multivariate analyses will
4
5 examine predictors of intentions to quit. This will include demographics such as
6
7 age, gender, nicotine dependence, household smoking rules, and perceived
8
9 threat from smoking and efficacy for quitting. The two risk assessment scales
10
11 will be examined to see if participant responses are correlated.
12
13

14 15 **Ethics and dissemination** 16

17
18 The Aboriginal Health & Medical Research Council and ethics committees at
19
20 James Cook and Southern Cross Universities approved the study. The results will
21
22 be published in a peer-reviewed journal and a community report will be
23
24 disseminated by the ACCHS, and at community forums.
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Note about terminology:

We use the term Aboriginal and Torres Strait Islander peoples, except where previous research has reported findings from only one group e.g. Aboriginal people. Indigenous is used here to refer to Indigenous peoples in the international context, and issues, policies or systems, e.g. Indigenous health, Indigenous tobacco control.

ARTICLE SUMMARY

Article focus

- Limited knowledge of smoking behaviours and attitudes in Aboriginal and Torres Strait Islander peoples of childbearing age
- Study aims to validate risk assessment scales for Aboriginal and Torres Strait Islander smokers in NSW Australia
- Study has potential to inform anti-tobacco messages used in social marketing and counselling approaches in clinical consultations
- Privileges the voices of Aboriginal and Torres Strait Islander peoples

Key Messages

- A better understanding of attitudes and experiences of smoking and quitting in this age group will add to current knowledge and could assist in better management of smoking

- Correlations of smokers' attitudes, perceptions of threat and efficacy with intentions to quit smoking will aid the development of tailored approaches

Strengths and Limitations of this Study

- First study on risk assessment scales in the target population
- Unique approach to smoking in Aboriginal and Torres Strait Islander peoples of childbearing age
- Draws on both well-established and new measures
- Potential limitations relate to information and selection biases

INTRODUCTION

Australia claims one of the lowest rates of tobacco smoking in OECD countries of 15.1%.[1] However several subgroups of the population maintain high rates of smoking.[2] Tobacco smoking is the main preventable risk factor contributing to the burden of disease in Aboriginal and Torres Strait Islander peoples.[3] Whilst there has been a significant drop in Indigenous smoking prevalence over the last 10 years overall, smoking rates are 2.6 times that of the general population at 41%, with higher rates of 50% or more in remote areas.[4, 5] However prevalence of Indigenous smoking in the age group 25-34 years has not decreased significantly for either gender,[4] and rates in pregnant Aboriginal

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2
3 and Torres Strait Islander women are quadruple (49.3%) those of pregnant
4
5 women in the general population (12.1%).[6]
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8
9 Aboriginal and Torres Strait Islander peoples have a long history of tobacco
10
11 use.[7] It is believed that the effects of colonisation,[7] the stolen generation,[8]
12
13 and racism,[9] have all contributed to the contemporary use of tobacco, to the
14
15 detriment of the health and longevity of Aboriginal and Torres Strait Islander
16
17 peoples, and their future generations. Factors promoting smoking and smoking
18
19 initiation in Aboriginal and Torres Strait Islander peoples include community
20
21 and family norms of smoking,[10] smoking to promote social inclusiveness and
22
23 cohesion,[11] peer group belonging,[12] and daily stressors.[10]
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28 There is limited knowledge about Indigenous attitudes to the risks of smoking.
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30 There has been some exploration about what anti-smoking messages are
31
32 effective and acceptable for Aboriginal and Torres Strait Islander
33
34 populations,[13] as media messages or as adjuncts to clinical treatment.[14]
35
36 However, attitudes to prevailing health risk messages about smoking have been
37
38 particularly under-researched for Aboriginal and Torres Strait Islander maternal
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40 smokers and those of childbearing age. A systematic review of knowledge,
41
42 attitudes and experiences of maternal smoking by Aboriginal and Torres Strait
43
44 Islander peoples revealed a lack of salience of media messages and potentially
45
46 some resistance to advice.[10] Equally pregnant women have highly protective
47
48 attitudes towards babies and children.[10] A recent study of attitudes of
49
50 maternal Aboriginal smokers and their family members suggested that attitudes
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52 about the health risks of smoking may be influenced by messages not matching
53
54 the women's lived experiences, coupled with inadequate access to
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3 information.[15] Limited knowledge about hazards of smoking and
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5 cessation,[16] and the lack of salience of anti-smoking messages are barriers to
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7 effective cessation.[10] If attitudes to risk taking behaviour for smoking and
8
9 responses to anti-tobacco messages are not understood it is difficult to formulate
10
11 effective messages and interventions. There are no best practice guidelines to
12
13 develop and personalise such messages for Aboriginal and Torres Strait Islander
14
15 peoples.[14, 17-18]
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20 Our study therefore aims to determine how Aboriginal and Torres Strait Islander
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22 smokers of childbearing age assess risks about tobacco smoking and how these
23
24 assessments are associated with their intentions to quit smoking or seeking help
25
26 to quit. We further aim to determine which demographic and behavioural factors
27
28 (such as age, gender, nicotine dependence level, household smoking rules) are
29
30 predictors of intentions to quit and seek help for quitting. Two risk assessment
31
32 scales for smoking will be examined for their cultural acceptability, validity and
33
34 reliability, and their utility as a pragmatic heuristic.
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43 **Underpinning Theories**

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46 Research shows that interventions based on the assessment of risk behaviour
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48 can positively influence the risk taking behaviour that contributes to a range of
49
50 preventable diseases.[19]
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52

53
54 Witte et al proposed a theory called the Extended Parallel Process Model (EPPM)
55
56 to explain message processing and subsequent behavioural intentions.[20] (Key
57
58
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60

1
2
3 constructs shown in Table 1.) According to the EPPM “when people perceive a
4
5 serious and relevant threat, they become scared”, [20] (p 318) and will take an
6
7 action to reduce their fear by one of two general pathways. People can either
8
9 control the danger elicited by the threat by making a positive and conscious shift
10
11 in attitude and behaviour (called protective motivation or danger control
12
13 responses). Alternately they may feel fearful and try and control the fear
14
15 unconsciously by denial, discounting or reactance against the threat (called
16
17 defensive motivation or fear control responses). If people feel no threat at all
18
19 (perhaps due to a lack of knowledge) there may be a low response to the
20
21 message. Furthermore Witte et al has shown that that the level of perceived
22
23 efficacy determines whether people engage in danger control or fear control
24
25 responses. [20]
26
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30

31 Witte devised and validated a scale called the Risk Behaviour Diagnosis (RBD)
32
33 scale to measure these responses across four dimensions of perceived threat
34
35 (perceived susceptibility and severity of threat) and perceived efficacy
36
37 (response efficacy and self-efficacy). [20] High threat responses coupled with
38
39 high efficacy tend to lead to danger control responses, in this case to adopt
40
41 message recommendations, change attitudes, intentions and smoking behaviour.
42
43 In contrast, if people feel they can not adopt the recommended response to avert
44
45 the treat, because of a lack of efficacy (it’s too hard, too little support, or it is
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47 perceived as futile to do so), they typically try to control the fear by avoiding the
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49 issue, discount the message, or may consider the issue is exaggerated.
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55 If fear control processes are initiated, it can be difficult to shift attitudes and
56
57 there is a need for carefully constructed messages to “break through defence
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3 mechanisms".[21] Therefore according to this theory people who are in fear
4
5 control will need assistance to build up efficacy rather than make them more
6
7 fearful. Bandura's work on self-efficacy confirms this and he considers self-
8
9 efficacy is central to any healthy behaviour change.[22]
10

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13 The EPPM model is a predominant message design theory,[23] and has been
14
15 widely applied to a range of health behaviours internationally and a wide range
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17 of health promotional campaigns, and is the basis of tobacco counter-
18
19 marketing.[19] A study by Wong and Cappella has used the RBD to measure
20
21 responses to video-based anti-tobacco television advertisements.[24]
22
23 Assessment scales for risk behaviour, including the RBD, have been used in
24
25 several minority groups and across cultures.[25-33] However risk assessment
26
27 scales for tobacco and the EPPM have not been used or validated for Australian
28
29 Aboriginal or Torres Strait Islander or other Indigenous populations.
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35 Another theory informing this study is PRIME theory (P-plans; R-responses; I-
36
37 impulses; M-motives; E-evaluations), which proposes that smokers' motivations
38
39 are fluid, and can change unexpectedly.[34] The central tenets of PRIME theory
40
41 include people's wants and needs in the moment, and their self-identity.[34]
42
43 West suggests that a person can be stimulated to make a quit attempt, even if
44
45 they have not been thinking about quitting, especially if the intervention is
46
47 repeated and evidence-based therapy offered.[35] A new measure based on
48
49 PRIME theory, called the Risk Acceptance Ladder (RAL),[36] (Cattaruzza & West,
50
51 2014, in preparation) proposes that the blocks to effective behaviour change can
52
53 be ascertained by determining the individual level of risk acceptance and at what
54
55 stage motivation has stalled. For this study the RAL is modified into the Smoking
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3 Risk Assessment Target (SRAT) (see methods). If this measure correlates well
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5 with message processing it may be also useful to assess Aboriginal and Torres
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7 Strait Islander smokers.
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31 Table 1: Key constructs, definitions and measures (adapted from Witte et al.
32 1996)
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| 37 Definitions of constructs | 38 How measured on RBD scale or other |
|---|--|
| 39 <i>Perceived threat:</i> awareness of a specific 40 harm in the environment, consisting of: 41 42 | Total of perceived threat scores |
| 43 <i>Susceptibility to threat:</i> belief about one's 44 risk of experiencing the threat 45 46 | Sub-total of susceptibility scores |
| 47 <i>Severity of threat:</i> belief about the 48 magnitude of the threat 49 50 | Sub-total of severity scores |
| 51 <i>Perceived efficacy:</i> thoughts about ease, 52 feasibility and the effectiveness of averting 53 the threat, consisting of: 54 55 56 57 58 59 60 | Total of perceived efficacy scores |

| | | |
|--|---|--|
| 1 2 3 4 5 6 7 8 9 10 11 12 | <i>Self-efficacy</i> : belief in one's ability to perform recommended response | Sub-total of self-efficacy scores |
| 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 | <i>Response efficacy</i> : belief about effectiveness of recommended response to avert the threat | Sub-total of response efficacy scores |
| 28 29 30 31 32 33 34 35 | <i>Danger control dominance</i> : the dominant response in the person faced with a threat, who considers themselves able to perform the recommended response, believes the response to be effective, therefore tries to reduce the danger by taking positive action (protective motivation) | High efficacy score and high threat score |
| 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 | <i>Danger control responses (protective motivation)</i> : beliefs, attitudes, intentions, and behaviour changes in accordance with the message recommendations | Score from intentions to quit/seek help scales (Wong and Cappella) and responses to MTSS questions |
| 51 52 53 54 55 56 57 58 59 60 | <i>Fear control dominance</i> : the dominant emotional response in the person when faced with a threat, who feels unable to perform the recommended response, and/or believes the response to be ineffectual, and tries to psychologically reduce their fear by defensive motivation | Low efficacy score with high threat score |
| | <i>Fear control responses (defensive motivation)</i> : coping responses that diminish fear | Score from questions about defensive avoidance, denial, reactance, message derogation and perceived manipulation |

| | |
|---|--|
| <p><i>Critical point:</i> when perceptions of threat begin to outweigh perceptions of efficacy, causing shift from danger control to fear control processes</p> | <p>The exact critical point can vary with topics and populations</p> |
| <p><i>Discriminating value:</i> a numerical value used to discriminate between people in danger vs. fear control</p> | <p>Formula: $(\Sigma \text{perceived efficacy}) - (\Sigma \text{perceived threat}) = \text{discriminating value}$</p> <p>A positive score indicates danger control processes; a negative score indicates fear control processes</p> |
| <p><i>Protective responses:</i> similar to danger control responses, but beliefs/attitudes are centred around protecting others from tobacco smoke</p> | <p>Score from 5 new measures to attitudes about smoking exposure for Aboriginal or Torres Strait Islanders, babies and children</p> |

Legend: RBD – risk behaviour diagnosis; MTSS – motivation to stop smoking; Σ – sum of;

METHODS AND ANALYSIS

Study Overview

This is a cross-sectional study to investigate the validity and reliability of risk assessment scales, and predictors of intentions to quit smoking, for Australian Aboriginal and Torres Strait Islander smokers of both genders, aged 18-45 years

1
2
3 old. The study will be conducted through face-to-face interviews in a regional
4
5 centre in NSW Australia.
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7

8 9 Research Questions

- 10
11 1. Are RBD/SRAT and associated measures of tobacco behaviour reliable
12 and valid in Australian Aboriginal and Torres Strait Islander smokers?
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- 14
15 2. What are the main predictors of intentions to quit smoking and intentions
16 to seek help for quitting in Aboriginal and Torres Strait Islander smokers?
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- 18
19 3. What variables confound the associated factors and intentions to quit and
20 seek help in Aboriginal and Torres Strait Islander smokers?
21
- 22
23 4. What smoking related attitudes (e.g., danger/fear control responses) are
24 associated with positive/negative discriminating values on the RBD?
25
- 26
27 5. What are the associations between the RBD and SRAT?
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37 38 Study Population

39 40 Participant recruitment and setting

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43 The study site is a regional centre in NSW. Recruitment into the study will be by
44 personal intercept, primarily at regional community and social events, and in
45 other settings likely to yield interest, including a local Aboriginal Community
46 Controlled Health Service (ACCHS). The survey will be administered by face-to-
47 face interview, using where possible a tablet computer, connected by cellular
48 network to a secure on-line survey site. Where connectivity is unreliable a paper
49 survey will be used and data submitted on-line later. The interviewers will be
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3 either the first author (non-Indigenous female) or Indigenous research
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5 assistants, or ACCHS staff.
6
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9
10 Inclusion criteria are Aboriginal and/or Torres Strait Islander people, aged 18-
11
12 45 years old who currently smoke. Participants will be offered a \$10 shopping
13
14 voucher for their time.
15

16 17 18 Sample size calculation

19
20
21 The estimated sample size is 120 participants. Sample size estimations are based
22
23 on the procedure described by Altman.[37] Standardised differences for
24
25 intention to quit smoking and intention to seek help to quit smoking are
26
27 calculated using means and standard deviations published by Wong and
28
29 Capella.[24] A total sample size of 110 is required to detect a significant
30
31 difference between people in 'danger control' versus people in 'fear control'
32
33 (according to the RDB scale) and intentions to quit smoking, at $\alpha < .05$, and
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35 90% power. However for the multivariate analysis 120 participants is required
36
37 to adequately estimate the effect of 6 key variables (20 per variable).
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46 47 48 Sampling Stratification

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50 Random sampling will not be feasible. To ensure that the convenience sample is
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52 as representative of the target group as possible, the sample will be stratified by
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54 age group and gender. Data from the 2011 Australian Census determines the
55
56 population parameters for persons identified as Aboriginal and/or Torres Strait
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3 Islander, by age group and gender in the regional city. The proportion of smokers
4
5 within each age group and gender are estimated using smoking prevalence data
6
7 from the 2008 National Aboriginal and Torres Strait Islander Social Survey
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9 (Table 2).[38]
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30 Table 2: Stratified sampling strategy of target Aboriginal and Torres Strait
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32 Islander populations
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| | Target | | Smoking | | % of target | | Sample | | |
|-------|---------------|----------|------------|----------|-------------------|---------------|---------------|----------|--|
| | populations | | Prevalence | | populations in | | stratified by | | |
| | numbers (2011 | | (2008 | | regional city who | | gender & age | | |
| | Census from | | NATSISS) | | smoke | | group | | |
| | regional city | | | | | | | | |
| | LGA) | | | | | | | | |
| Age | | | | | Male | Female | | | |
| range | Male | Female | Male | Female | <i>N(% of</i> | <i>N(% of</i> | Male | Female | |
| (yrs) | <i>N</i> | <i>N</i> | <i>%</i> | <i>%</i> | <i>total)</i> | <i>total)</i> | <i>N</i> | <i>N</i> | |

| | | | | | | | | |
|-------|-----|-----|------|------|---------|---------|-----------|-----------|
| | | | | | 67 | 71 | | |
| 18-24 | 172 | 178 | 38.7 | 39.7 | (13.9%) | (14.7%) | 17 | 18 |
| | | | | | 80 | 92 | | |
| 25-34 | 142 | 184 | 56 | 50.1 | (16.6%) | (19%) | 20 | 23 |
| | | | | | 85 | 88 | | |
| 35-44 | 154 | 187 | 55.5 | 47.3 | (17.6%) | (18.2%) | 21 | 22 |
| | | | | | 232 | 251 | | |
| Total | 468 | 549 | | | (48.1%) | (51.9%) | 58 | 63 |

As can be seen from Table 2, the final sample will be 58 males and 63 female smokers (N= 121). This represents 25% of the Aboriginal and Torres Strait Islander smokers aged 18-45yrs in the regional city (121/483).

MEASURES/DATA COLLECTION

The survey

The survey will collect quantitative data on participants' smoking behaviours, initiation of smoking, attitudes to smoking and cessation, attitudes to health risks of smoking, experiences with quit attempts and smoking cessation, and future intentions to quit smoking or seek help for quitting. Views will be elicited about smoking in pregnancy and the protection of babies and children from tobacco smoke. The questions will explore the support available from family and peers

1
2
3 for quitting and professional support. The survey will use open-ended questions
4
5 to explore general attitudes to smoking, and the interviewer will record
6
7 narratives expressed in the course of the interview in 'notes sections'.
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9

10
11 The questionnaire includes several instruments:
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13

14 15 Tobacco Dependence Scales 16

17
18 Heaviness of Smoking Index (HSI) is an accepted method of assessing nicotine
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20 dependence levels, calculated from the time to first cigarette and number of
21
22 cigarettes smoked per day. Its reliability has been shown to be better than the
23
24 longer Fagerstrom Test for Nicotine Dependence (FTND).[39]
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29
30 Strength of Urges to Smoke (SUTS) is another measure of dependence found to
31
32 be more reliable for predicting cessation than the HSI.[39] It is a routine part of
33
34 the "Smoking in England" survey, administered to over 10,000 smokers per
35
36 annum.[40] It is a newer scale for nicotine dependence and is included here, as it
37
38 has not yet been used with Australian Aboriginal and Torres Strait Islander
39
40 smokers or other Indigenous populations.
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45 46 Intentions to quit 47 48

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50 The Motivation To Stop Scale (MTSS) uses dichotomous measures (yes/no) for
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52 intentions to quit (want to quit, 'should quit', intends to quit) and has shown
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3 good level of prediction for quitting.[41] Intentions to quit and intentions to seek
4 help (Likert scale) are also adapted from Wong & Cappella.[24]
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9 Risk assessment scales

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14 The Risk Behaviour Diagnosis Scale consists of a series of questions (Likert
15 scales) on four aspects: severity of threat, susceptibility to threat, response
16 efficacy and self-efficacy.[20]
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22
23 As a measure of fear control responses participants will be asked to respond to
24 four questions about reactance, avoidance and message derogation on a Likert
25 scale.[20] Similarly for danger control responses an aggregate score of the five
26 questions on intentions to change smoking behaviour/seek help will be
27 calculated.[24] Because of the evidence pointing to strong protective attitudes in
28 the target population, five questions on a Likert scale will be asked to determine
29 protective responses about smoking in pregnancy, around children, and for
30 Aboriginal and Torres Strait Islander peoples in general. A protection score will
31 be calculated from these responses.
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46 The Risk Acceptance Ladder is a new measure currently being used in Italy to
47 research a population with high rates of smoking (Cattaruzza & West, 2014, in
48 preparation). The measure has been adapted to the Aboriginal and Torres Strait
49 Islander population, as below.
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Consultative process, face validity and questionnaire adaption

In the formative phase of the research, before ethics approvals were finalised, several community consultation processes were conducted. The aim was to test the content and face validity, suitability, readability, cultural appropriateness, acceptability and feasibility of the survey instrument. Consultation was through a focus group with Aboriginal and/or Torres Strait Islander people in the target age group, and an Aboriginal elder, recruited from a local Aboriginal Studies class and Aboriginal staff. Several consultative interviews were also held with a senior Aboriginal Health Worker (AHW) specialising in tobacco. Expert input was obtained for the scales from their respective inventors (Witte, and Cattaruzza and West).

The community consultation group and AHW requested changes to several questions and suggested additional questions about smoking initiation. Some of the RBD core statements were reworded to make them easier to understand. Additionally several sensitive questions about socioeconomic status and pregnancy were reworded.

The RAL was adapted for the Aboriginal and Torres Strait Islander populations, and was renamed the SRAT as follows:

(a) It was deemed more culturally appropriate to depict the measure as a target with concentric circles (progressing from the outside to the centre) instead of a ladder, for the Aboriginal and Torres Strait Islander population.

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3 (b) The potential responses of the SRAT were reworded to become more
4 appropriate for the target population, and two additional responses included.
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7
8 Changes were approved by the HRECs.
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10 11 12 13 14 15 **ANALYSIS** 16

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18 Table 3 outlines variables that will be measured.
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22 Table 3: Variables from questionnaire
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Demographics

- Age
- Gender (Male/Female)
- Aboriginal and Torres Strait Islander status (Aboriginal/Torres Strait Islander/both)
- SES (calculated from postcode, suburb, income source, health care card use, education) – for details contact authors
- Environmental variables
 - a. Number of smokers in household (1/2-3/>3)
 - b. Pregnant women in the house (Y/N)
 - c. Children in the house (Y/N)
 - d. Complete, partial or no bans for household smoking
 - e. Smoke free behaviours of participants (house and car)

Smoking behaviour variables

- Nicotine dependence scores (Heaviness of Smoking Index and SUTS)
- Age of smoking initiation and uptake
- Factors influencing smoking initiation (11 response options)
- Patterns of smoking (frequency and type)
- Smoking by others in social circle (Y/N)
- Current/previous quit attempts (Y/N)
- Current/previous use of cessation therapies (Y/N)
- Level of support for quitting (social and professional) (sliding scales 0-10)

Smoking risk related attitudes

- RBD scale resulting a composite score (discriminating value, recoded positive or negative)
- Threat score (three items for susceptibility plus three for severity of threat on Likert scales of 1-5)
- Efficacy score (three items for response efficacy plus three for self-efficacy on Likert scales of 1-5)
- RBD results recoded into four quadrants of high efficacy/high threat; high efficacy/low threat; low efficacy/high threat; low efficacy/low threat;
- Fear control responses score (calculated from questions on avoidance, denial, and refuting messages, Likert scales 1-5)
- Danger control responses score (calculated from questions on intentions to quit or seek help, Likert scales 1-5)
- Protective responses score (calculated from questions on attitudes about protecting babies/children, Likert scales 1-5)
- General attitudes about smoking and quitting (13 response options)
- SRAT (choice of 1 option from 12, will be reduced to 4 categories)

Behavioural intentions

- Intentions to quit (MTSS) (want/do not want) - if affirmative then how soon intends to quit (3month/1 month/hope to soon/don't know)
- Intentions to quit or reduce smoking (Wong & Capella) (Likert scales 1-4)
- Intentions to seek help with quitting (Wong & Capella) (Likert scales 1-4)

Legend: Y – yes; N – no; SUTS – strength of urges to smoke; RBD – risk behaviour

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2
3 diagnosis; SRAT – smoking risk assessment target; MTSS – motivation to stop
4
5 smoking scale
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7

8 9 **Statistical analyses**

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11
12 On study completion, the data entered through the survey software will be used
13
14 to generate a summary report and exported directly to SPSS v 20 for analysis.
15

16
17 Descriptive analyses will summarise the data for all variables.
18

19
20 To measure the reliability and validity of the scales the following will be used.
21

- 22
23 1. Content validity and face validity is qualitatively assessed through the
24
25 community panel and expert consultation for RBD and SRAT
26
27
- 28
29 2. The patterns of correlation will be explored between the RBD subscale
30
31 scores (susceptibility and severity of threat, and response and self-
32
33 efficacy) and also for danger control responses, fear control responses
34
35 and protective responses
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- 37
38 3. Internal consistency of sub-scales will be assessed with Cronbach's α .
39

40
41 Multivariate analyses will seek the most likely demographic predictors of
42
43 intentions to quit smoking/seek help for quitting, e.g. age, gender, dependence
44
45 levels, household smoking rules. Psychological factors such as threat and efficacy
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47 scores, danger and fear control responses will be analysed to assess whether
48
49 they further influence the outcome measures.
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53 RBD scores and the SRAT will be examined to see if participant responses are
54
55 correlated.
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3 Qualitative and open-ended responses will undergo thematic analyses, and will
4
5 be used to enrich the quantitative findings.
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10 11 12 **ETHICS AND DISSEMINATION** 13

14
15 The study is low risk. The research will adhere to Australia's National Health and
16
17 Medical Research Council's Values and Ethics in Aboriginal and Torres Strait
18
19 Islander Health Research 2003 guidelines, i.e. reciprocity, respect, equality,
20
21 responsibility, survival and protection, spirit and integrity.[42] The primary
22
23 HREC is the Aboriginal Health & Medical Research Council (AH&MRC), which
24
25 approved the study with support from the partnering ACCHS (approval number
26
27 928). Additional HRECs ratified the primary approval (James Cook University
28
29 (H4467) and Southern Cross University (ECN-13-242).
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36 Participants will be approached at community events that are targeted to the
37
38 local Australian Aboriginal and Torres Strait Islander communities. Potential
39
40 recruits will be asked if they fulfil the selection criteria and canvassed about
41
42 their willingness to join in the study. All participants will be provided with a
43
44 participant information sheet advising of the purpose of the study and
45
46 implications regarding:
47
48

- 49 • Objectives of the research
- 50
- 51 • Why the information is being collected and how it will be used, accessed
52
53 and stored
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- Voluntary nature of the study, provision for withdrawal of consent, assurance of confidentiality and anonymity

After the information sheet is explained, the participant will be asked to provide informed consent by having their name typed on the touch screen of the tablet computer and ticking the 'agree' box. All data will be de-identified and data and materials will be stored for seven years, in a secure location, and where digitally stored will be password-protected and only accessed by the researchers.

This study is one of several studies contributing to a PhD Public Health thesis for the first author. Journal articles and presentations at relevant national and international conferences to academics, researchers and stakeholders will disseminate these findings. The outcomes of the study will also inform policy and practice recommendations. A community report will be sent to the partnering ACCHS for dissemination to clients at the service and to the communities who have been involved. Community-based forums will be held as appropriate.

DISCUSSION

This study aims to determine how Australian Aboriginal and Torres Strait Islander smokers of childbearing age assess risks about tobacco smoking and how these assessments are associated with their intentions to quit smoking. We aim to validate two risk assessment scales for Aboriginal and Torres Strait

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2
3 Islander smokers, which could have the potential for research transference to a
4
5 clinical or public health setting.
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9 The RBD scale was originally designed as a clinical tool to be used in the context
10
11 of delivering tailored health messages at a clinic for sexually transmitted
12
13 diseases and HIV testing.[20] Advice was then adapted to individuals according
14
15 to their responses.
16
17

18
19 Primary health care practitioners and clinicians are often faced with the task of
20
21 assisting Aboriginal and Torres Strait Islander smokers to quit smoking. Anti-
22
23 tobacco messages do not just lie in the domain of social marketing: they also
24
25 need to be carefully pitched to maximise receptivity and support behaviour
26
27 change within the clinical consultation. Little is known about the effectiveness of
28
29 smoking behaviour change models for Aboriginal and Torres Strait Islander
30
31 peoples. The trans-theoretical model (stages of change or SOC) has been widely
32
33 used in Australia for Aboriginal and Torres Strait Islander smokers, but
34
35 outcomes have never been evaluated.[43] Aboriginal smokers in remote areas
36
37 have been described as more likely to be in the pre-contemplative or
38
39 contemplative stages of change and require more assistance to be ready to quit
40
41 smoking.[44] Also it is known that interventions based on the SOC are not
42
43 effective in pregnancy.[45]
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49
50 If the measures under examination here are found to be reliable for the target
51
52 audience of Aboriginal and Torres Strait Islander smokers of childbearing age,
53
54 then accurate assessments could be made. A new model based on assessment of
55
56 risk behaviour could have the potential to assess fear versus danger control
57
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1
2
3 responses and facilitate the pitching of tailored anti-tobacco messages for the
4
5 individual, build motivational tension for quitting, and yet avoid engendering
6
7 fear control responses or resistance.
8
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10
11 If people are engaged in fear control processes, messages developed should focus
12
13 on the efficacy of the recommended response to counteract the high levels of
14
15 perceived threat. Focusing on threat messages alone may cause the messages to
16
17 backfire. It is important to emphasise that the recommended responses are
18
19 feasible and effective to avert the threat from smoking. It is essential to help
20
21 people develop a belief in their ability to quit smoking, develop supportive
22
23 environments for quitting, and provide easy access to treatment.
24
25
26
27

28 Central to building self-efficacy are strategies recommended by Bandura.[22] He
29
30 suggests several approaches: building skills, self-control and mastery for
31
32 quitting; learning about the experiences of others who have successfully quit;
33
34 verbal persuasion and motivation; helping people adopt a positive mindset; and
35
36 importantly having access to effective therapies.[22]
37
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40 Alternatively, if the target audience is in danger control, messages can remind
41
42 people about the threat of smoking to maintain motivation, whilst also
43
44 increasing efficacy for quitting, as above.
45
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48 People with low threat perceptions may be neither in danger or fear control.
49
50 They may need to be convinced about the seriousness of or their susceptibility to
51
52 the threat. This group requires messages aimed at improving knowledge and
53
54 correcting any misconceptions. This may be best achieved by having messages
55
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1
2
3 come from someone who is very similar to the client (possibly through use of
4
5 tailored videos or personalised narratives).
6
7

8
9 The SRAT may prove a simplified way to approach risk assessment in this target
10
11 group, as it demands a single response to a question. The measures require
12
13 validation for Aboriginal and Torres Strait Islander smokers in this child-rearing
14
15 age bracket, prior to a more formal assessment of feasibility and effectiveness in
16
17 a clinical setting.
18
19

20 21 22 23 24 **Limitations and Strengths** 25 26

27
28 The study will be based on a sample from one regional area of NSW, fostering
29
30 ownership of the project results for the local partnering ACCHS. Australian
31
32 Aboriginal groups are diverse and this study will be conducted in just one region.
33
34 It is unknown how many Torres Strait Islanders reside in the area and how
35
36 many will chose to participate in the study, These limitations impact on
37
38 generalizability and transferability of the findings, although this is a pragmatic
39
40 constraint for all research in diverse Indigenous groups. Selection bias may be
41
42 operant if only those more willing to talk about their smoking agreeing to
43
44 participate, another inevitable challenge for this kind of research. Recruiting
45
46 some participants through a health service may favour those already with health
47
48 problems, and who may already have motivation to quit smoking. There could be
49
50 information biases: smoking status will be based on self-report and not any
51
52 objective measures; recall bias may be operant with asking people to recollect
53
54 their smoking history and perceived level of support for quitting; and social
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1
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3 desirability bias with people reporting what they think the researcher wants to
4
5 hear.
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7

8
9 On the other hand, this is the first study as far as we know to validate risk
10
11 assessment measures for tobacco smoking in a population of Aboriginal and
12
13 Torres Strait Islander smokers. Health education and behaviour studies are
14
15 tested for validity and reliability inconsistently,[46] and very few scales are
16
17 validated for the Aboriginal and Torres Strait Islander population.[47] So the
18
19 study is needed and an important one, although small and specific to one region.
20
21 The study takes a unique approach to smoking in Aboriginal and Torres Strait
22
23 Islander peoples of childbearing age by drawing on both well-established and
24
25 new measures from the health communication and addiction fields. If these
26
27 measures prove to be valid and reliable they have a high potential for research
28
29 translation into clinical settings. The outcomes could further inform the
30
31 development and refining of social marketing policies and strategies for anti-
32
33 tobacco messages through all media.
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42 **AUTHOR CONTRIBUTIONS**

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45
46 GSG is responsible for the concept and design of the project, developing and
47
48 adapting the survey instruments and digital format, testing the suitability of the
49
50 survey for Indigenous participants, conducting surveys, training and supervising
51
52 Indigenous research assistants to conduct surveys, collating and analysing and
53
54 interpreting results, writing reports and manuscripts.
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1
2
3 KW contributed to the research design and statistical analysis and critical review
4
5 of manuscripts. AM advises on any aspect relating to tobacco smoking, smoking
6
7 risk behaviours and the survey, and critical review of manuscripts. YCJ as
8
9 Aboriginal academic advisor advises on the Indigenous community consultation
10
11 processes, recruitment and the cultural interpretation of results. ARC oversees
12
13 the study and advises on all aspects, and provides critical review of manuscripts.
14
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20

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22
23
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25
26 researcher:
27
28
29

- 30 • National Health and Medical Research Council (Australia) and National Heart
31
32 Foundation (Australia) post-graduate scholarship for Indigenous health
33
34 research - APP1039759 and PP 11S 6181
35
36
- 37 • Royal Australian College of General Practitioners and Australian Primary
38
39 Health Care Research Institute Indigenous Health Award 2013
40
41
- 42 • James Cook University, Faculty of Medicine, Health & Molecular Sciences,
43
44 Graduate Research Scheme grant 2013
45
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2
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4
5 support of the partnering ACCHS for this survey, without them the study would
6
7 not be possible.
8
9

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VALIDATION OF RISK ASSESSMENT SCALES AND PREDICTORS OF INTENTIONS TO QUIT SMOKING IN AUSTRALIAN ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLES: A CROSS-SECTIONAL SURVEY PROTOCOL

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Manuscripts

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3 **VALIDATION OF RISK ASSESSMENT SCALES AND PREDICTORS OF**
4 **INTENTIONS TO QUIT SMOKING IN AUSTRALIAN ABORIGINAL AND TORRES**
5 **STRAIT ISLANDER PEOPLES: A CROSS-SECTIONAL SURVEY PROTOCOL**
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13 **Title Page**
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50 Running Head: Risk assessment for smoking with Indigenous Australians
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For peer review only

ABSTRACT:**Introduction**

Tobacco smoking is a very significant behavioural risk factor for the health of Australian Aboriginal and Torres Strait Islanders, and is embedded as a social norm. With a focus on women of child-bearing age, and men of similar age, this project aims to determine how Aboriginal and Torres Strait Islander smokers assess smoking risks and how these assessments contribute to their intentions to quit. The findings from this pragmatic study should contribute to developing culturally targeted interventions.

Methods and analysis

A cross-sectional study using quantitative and qualitative data. 120 Aboriginal and Torres Strait Islander community members aged 18-45 years will be recruited at community events and through an Aboriginal Community Controlled Health Service (ACCHS). Participants will be interviewed using a tablet computer or paper survey. The survey instrument uses modified risk behaviour scales, i.e. the Risk Behaviour Diagnosis (RBD) Scale and the Smoking Risk Assessment Target (SRAT) (adapted from the Risk Acceptance Ladder) to determine whether attitudes of Aboriginal and Torres Strait Islander smokers to health risk messages are predictors of intentions to quit smoking.

The questionnaire will be assessed for face and content validity with a panel of Indigenous community members. The internal consistency of the RBD subscales and their patterns of correlation will be explored. Multivariate analyses will

1
2
3 examine predictors of intentions to quit. This will include demographics such as
4
5 age, gender, nicotine dependence, household smoking rules, and perceived
6
7 threat from smoking and efficacy for quitting. The two risk assessment scales
8
9 will be examined to see if participant responses are correlated.
10

11 12 13 **Ethics and dissemination**

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15
16 The Aboriginal Health & Medical Research Council Ethics Committee and
17
18 university ethics committees approved the study. The results will be published
19
20 in a peer-reviewed journal and a community report will be disseminated by the
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22 ACCHS, and at community forums.
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Note about terminology:

We use the term Aboriginal and Torres Strait Islander peoples, except where previous research has reported findings from only one group e.g. Aboriginal people. Indigenous is used here to refer to Indigenous peoples in the international context, and issues, policies or systems, e.g. Indigenous health, Indigenous tobacco control.

ARTICLE SUMMARY

Article focus

- Limited knowledge of how Aboriginal and Torres Strait Islander peoples of childbearing age assess the risks about smoking, and their levels of efficacy for cessation
- Study aims to validate risk assessment scales for Aboriginal and Torres Strait Islander smokers in New South Wales (NSW) Australia
- Study has potential to inform anti-tobacco messages used in social marketing and counselling approaches in clinical consultations
- Privileges the voices of Aboriginal and Torres Strait Islander peoples

Key Messages

- A better understanding of attitudes and experiences of smoking and quitting in this age group will add to current knowledge and could assist in better management of smoking

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3 • Correlations of smokers' attitudes, perceptions of threat and efficacy with
4 intentions to quit smoking will aid the development of tailored
5 approaches
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10 **Strengths and Limitations of this Study**

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14 • First study on risk assessment scales in the target population
15
16 • Unique approach to smoking in Aboriginal and Torres Strait Islander
17 peoples of childbearing age
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21 • Draws on both well-established and new measures
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24 • Potential limitations relate to information and selection biases.
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INTRODUCTION

Australia claims one of the lowest rates of tobacco smoking in OECD countries of 15.1%.[1] However several subgroups of the population maintain high rates of smoking.[2] Tobacco smoking is the main preventable risk factor contributing to the burden of disease in Aboriginal and Torres Strait Islander peoples.[3] Whilst there has been a significant drop in Indigenous smoking prevalence over the last 10 years overall, smoking rates are 2.6 times that of the general population at 41%, with higher rates of 50% or more in remote areas.[4-5] However prevalence of Indigenous smoking in the age group 25-34 years has not decreased significantly for either gender,[4] and rates in pregnant Aboriginal and Torres Strait Islander women are quadruple (49.3%) those of pregnant women in the general population (12.1%).[6]

While it is acknowledged that Indigenous populations across and even within different continents belong to very diverse communities with their own cultures and norms, some broad factors impact on Indigenous peoples in colonised Western nations. American Indians, Alaskan Natives, New Zealand Māori and Inuit all have a higher prevalence of smoking than the mainstream populations,[7] particularly in their reproductive years, resulting in significant health disparities.[8] Smoking is comparably affected by the social determinants of health, and cultural factors, including for some First Nation peoples ceremonial and spiritual uses of tobacco.[9] Aboriginal and Torres Strait Islander peoples have a long history of tobacco use.[10] It is believed that the effects of colonisation,[10] the stolen generation,[11] and racism,[12] have all contributed to the contemporary use of tobacco, to the detriment of the health and longevity

1
2
3 of Aboriginal and Torres Strait Islander peoples, and their future generations.
4
5 Factors promoting smoking and smoking initiation in Aboriginal and Torres
6
7 Strait Islander peoples include community and family norms of smoking,[13]
8
9 smoking to promote social inclusiveness and cohesion,[14] peer group
10
11 belonging,[15] and daily stressors.[13]
12
13

14
15 Several studies have explored the knowledge levels of Aboriginal and Torres
16
17 Strait Islander peoples about tobacco smoking,[16-18] with more limited
18
19 exploration about Indigenous attitudes and beliefs about the risks of smoking.
20
21

22 There has been some exploration about what anti-smoking messages are
23
24 effective and acceptable for Aboriginal and Torres Strait Islander
25
26 populations,[19] as media messages or as adjuncts to clinical treatment.[20]
27
28

29 Mainstream antismoking campaigns have shown to be effective in terms of recall
30
31 and perceived effectiveness by Indigenous peoples in Australia,[21-22] the U.S.
32
33

34 [23] and NZ,[24] but have not necessarily translated into increased quit rates in
35
36 these populations.[25] Aboriginal and Torres Strait Islander smokers in a forced
37
38 exposure to several television advertisement rated those containing strong
39
40 graphic imagery or personal narratives as effective for a range of measures
41
42 including being more likely to quit.[19] Indigenous peoples in the US, Australia
43
44 and New Zealand (NZ), have a preference for culturally targeted campaigns.[25]
45
46

47 Aboriginal and Torres Strait Islander viewers aged 16-40 years of the 'Break The
48
49 Chain' campaign in Australia positively rated the targeted advertisement, had
50
51 good recall and 57% stated they intended to quit in the following month.[26]
52
53

54 Where culturally targeted campaigns have been tested, alongside generic
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2
3 campaigns, for example in NZ youth, they proved as effective at supporting Maori
4
5 to quit smoking as generic messages were for the general NZ population.[27]
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7

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9 However, attitudes of Indigenous maternal smokers, to prevailing health risk
10
11 messages about smoking, have been under-researched. A systematic review used
12
13 meta-ethnography to synthesise the evidence on the knowledge, attitudes and
14
15 experiences of maternal smoking by Aboriginal and Torres Strait Islander
16
17 peoples,[13] from seven studies.[14, 28-33] The synthesis revealed a lack of
18
19 salience of media messages and potentially some resistance to advice.[13]
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21

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23 Equally pregnant women have highly protective attitudes towards babies and
24
25 children.[13] A recent study of attitudes of maternal Aboriginal smokers and
26
27 their family members suggested that attitudes about the health risks of smoking
28
29 may be influenced by messages not matching the women's lived experiences,
30
31 coupled with inadequate access to information.[34] Limited knowledge about
32
33 the specific hazards of smoking and cessation,[35] and the lack of salience of
34
35 anti-smoking messages are barriers to effective cessation.[13] However, a
36
37 program using a culturally targeted smoking cessation video with pregnant
38
39 Alaska Native smokers was no more efficacious than in the control group.[36]
40
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42
43 Issues less well understood are how Indigenous adults broadly assess their risks
44
45 in relation to tobacco smoking (not just their knowledge of adverse health
46
47 effects) and how these assessments are related to their intentions to quit
48
49 smoking. If attitudes to risk taking behaviour for smoking and responses to anti-
50
51 tobacco messages are not understood it is difficult to formulate effective
52
53 messages and interventions. There are no best practice guidelines to develop and
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1
2
3 personalise such messages for Aboriginal and Torres Strait Islander peoples.[18,
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5 37-38]
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9 Our study therefore aims to determine how Aboriginal and Torres Strait Islander
10
11 smokers of childbearing age assess risks about tobacco smoking and how these
12
13 assessments are associated with their intentions to quit smoking or seeking help
14
15 to quit. We further aim to determine which demographic and behavioural factors
16
17 (such as age, gender, nicotine dependence level, household smoking rules) are
18
19 predictors of intentions to quit and seek help for quitting. Two risk assessment
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21 scales for smoking will be examined for their cultural acceptability, validity and
22
23 reliability, and their utility as a pragmatic heuristic.
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31 **Underpinning Theories**

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35 Research shows that interventions based on the assessment of risk behaviour
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37 can positively influence the risk taking behaviour that contributes to a range of
38
39 preventable diseases.[39]
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42
43 Witte et al proposed a theory called the Extended Parallel Process Model (EPPM)
44
45 to explain message processing and subsequent behavioural intentions.[20] (Key
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47 constructs shown in Table 1.)
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Table 1: Key constructs, definitions and measures (adapted from Witte et al.[40])

| Definitions of constructs | How measured on RBD scale or other |
|--|---|
| <p><i>Perceived threat</i>: awareness of a specific harm in the environment, consisting of:</p> <p><i>Susceptibility to threat</i>: belief about one's risk of experiencing the threat</p> <p><i>Severity of threat</i>: belief about the magnitude of the threat</p> | <p>Total of perceived threat scores</p> <p>Sub-total of susceptibility scores</p> <p>Sub-total of severity scores</p> |
| <p><i>Perceived efficacy</i>: thoughts about ease, feasibility and the effectiveness of averting the threat, consisting of:</p> <p><i>Self-efficacy</i>: belief in one's ability to perform recommended response</p> <p><i>Response efficacy</i>: belief about effectiveness of recommended response to avert the threat</p> | <p>Total of perceived efficacy scores</p> <p>Sub-total of self-efficacy scores</p> <p>Sub-total of response efficacy scores</p> |
| <p><i>Danger control dominance</i>: the dominant response in the person faced with a threat, who considers themselves able to perform the recommended response, believes the response to be effective, therefore tries to reduce the danger by taking positive action (protective motivation)</p> | <p>High efficacy score and high threat score</p> |
| <p><i>Danger control responses (protective motivation)</i>: beliefs, attitudes, intentions, and behaviour changes in accordance with</p> | <p>Score from intentions to quit/seek help scales (Wong and Cappella) and responses to MTSS questions</p> |

| | |
|--|--|
| the message recommendations | |
| <i>Fear control dominance</i> : the dominant emotional response in the person when faced with a threat, who feels unable to perform the recommended response, and/or believes the response to be ineffectual, and tries to psychologically reduce their fear by defensive motivation | Low efficacy score with high threat score |
| <i>Fear control responses (defensive motivation)</i> : coping responses that diminish fear | Score from questions about defensive avoidance, denial, reactance, message derogation and perceived manipulation |
| <i>Critical point</i> : when perceptions of threat begin to outweigh perceptions of efficacy, causing shift from danger control to fear control processes | The exact critical point can vary with topics and populations |
| <i>Discriminating value</i> : a numerical value used to discriminate between people in danger vs. fear control | Formula: $(\Sigma \text{perceived efficacy}) - (\Sigma \text{perceived threat}) = \text{discriminating value}$ A positive score indicates danger control processes; a negative score indicates fear control processes |
| <i>Protective responses</i> : similar to danger control responses, but beliefs/attitudes are centred around protecting others from tobacco smoke | Score from 5 new measures to attitudes about smoking exposure for Aboriginal or Torres Strait Islanders, babies and children |

1
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3 Legend: RBD – risk behaviour diagnosis; MTSS – motivation to stop smoking; Σ –
4
5 sum of.
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12 According to the EPPM, “when people perceive a serious and relevant threat,
13
14 they become scared”, [40] (p 318) and will take an action to reduce their fear by
15
16 one of two general pathways. People can either control the danger elicited by
17
18 the threat by making a positive and conscious shift in attitude and behaviour
19
20 (called protective motivation or danger control responses). Alternately they may
21
22 feel fearful and try and control the fear unconsciously by denial, discounting or
23
24 reactance against the threat (called defensive motivation or fear control
25
26 responses). If people feel no threat at all (perhaps due to a lack of knowledge)
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28 there may be a low response to the message. Furthermore Witte et al has shown
29
30 that that the level of perceived efficacy determines whether people engage in
31
32 danger control or fear control responses. [40]
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37

38 Witte devised and validated a scale called the Risk Behaviour Diagnosis (RBD)
39
40 scale to measure these responses across four dimensions of perceived threat
41
42 (perceived susceptibility and severity of threat) and perceived efficacy (response
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44 efficacy and self-efficacy). [40] High threat responses coupled with high efficacy
45
46 tend to lead to danger control responses, in this case to adopt message
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48 recommendations, change attitudes, intentions and smoking behaviour. In
49
50 contrast, if people feel they cannot adopt the recommended response to avert
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52 the treat, because of a lack of efficacy (it’s too hard, too little support, or it is
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3 perceived as futile to do so), they typically try to control the fear by avoiding the
4
5 issue, discount the message, or may consider the issue is exaggerated.
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9 If fear control processes are initiated, it can be difficult to shift attitudes and
10
11 there is a need for carefully constructed messages to “break through defence
12
13 mechanisms”.^[41] Therefore according to this theory people who are in fear
14
15 control will need assistance to build up efficacy rather than make them more
16
17 fearful. Bandura’s work on self-efficacy confirms this and he considers self-
18
19 efficacy is central to any healthy behaviour change.^[42]
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22
23 The EPPM model is a predominant message design theory,^[43] and has been
24
25 widely applied to a range of health behaviours internationally and a wide range
26
27 of health promotional campaigns, and is the basis of tobacco counter-
28
29 marketing.^[37] A study by Wong and Cappella has used the RBD to measure
30
31 responses to video-based anti-tobacco television advertisements.^[44]
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33 Assessment scales for risk behaviour, including the RBD, have been used in
34
35 several minority groups and across cultures.^[45-53] However risk assessment
36
37 scales for tobacco and the EPPM have not been used or validated for Australian
38
39 Aboriginal or Torres Strait Islander or other Indigenous populations.
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43
44 Another theory informing this study is PRIME theory (P-plans; R-responses; I-
45
46 impulses; M-motives; E-evaluations), which proposes that smokers’ motivations
47
48 are fluid, and can change unexpectedly.^[54] The central tenets of PRIME theory
49
50 include people’s wants and needs in the moment, and their self-identity.^[54]
51
52 West suggests that a person can be stimulated to make a quit attempt, even if
53
54 they have not been thinking about quitting, especially if the intervention is
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3 repeated and evidence-based therapy offered.[55] A new measure based on
4
5 PRIME theory, called the Risk Acceptance Ladder (RAL),[56] (Cattaruzza & West,
6
7 2014, in preparation) proposes that the blocks to effective behaviour change can
8
9 be ascertained by determining the individual level of risk acceptance and at what
10
11 stage motivation has stalled. For this study the RAL is modified into the Smoking
12
13 Risk Assessment Target (SRAT) (see methods). If this measure correlates well
14
15 with message processing it may be also useful to assess Aboriginal and Torres
16
17 Strait Islander smokers.
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20 21 22 23 24 25 26 **Rationale for assessing validity and reliability of the scales for Aboriginal** 27 28 **and Torres Strait Islander smokers**

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31 Assessment scales, developed for Western populations, are important to validate
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33 before use in a cross-cultural context.[57] Theoretical concepts developed in the
34
35 context of the dominant Western psychology and communication fields may not
36
37 transfer into a cross-cultural or Indigenous setting.[57-58] Preliminary phases of
38
39 community engagement are an important part of the process of validation, and
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41 will be described below.[58] Results from the validation and reliability process
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43 also need careful interpretation with culturally competent advisors.[58]
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52 **METHODS AND ANALYSIS**

53 54 55 **Study Overview** 56 57 58 59 60

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3 This is a cross-sectional study to investigate the validity and reliability of risk
4 assessment scales, and predictors of intentions to quit smoking, for Australian
5 Aboriginal and Torres Strait Islander smokers of both genders, aged 18-45 years
6
7 old. The study will be conducted through face-to-face interviews in a regional
8
9 centre in NSW Australia.
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12

13 14 15 Research Questions

- 16
17
18 1. Are RBD/SRAT and associated measures of tobacco behaviour reliable
19 and valid in Australian Aboriginal and Torres Strait Islander smokers?
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21
- 22
23 2. What are the main predictors of intentions to quit smoking and intentions
24 to seek help for quitting in Aboriginal and Torres Strait Islander smokers?
25
26
- 27
28 3. What variables confound the associated factors and intentions to quit and
29 to seek help in Aboriginal and Torres Strait Islander smokers?
30
31
- 32
33 4. What smoking related attitudes (e.g., danger/fear control responses) are
34 associated with positive/negative discriminating values on the RBD?
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36
- 37
38 5. What are the associations between the RBD and SRAT?
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43

44 45 Study Population

46 47 Participant recruitment and setting

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49
50 The study site is a regional centre in NSW. Recruitment into the study will be by
51 personal intercept, primarily at regional community and social events, and in
52 other settings likely to yield interest, including a local Aboriginal Community
53
54 Controlled Health Service (ACCHS). The survey will be administered by face-to-
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1
2
3 face interview, using where possible a tablet computer, connected by cellular
4 network to a secure on-line survey site. Where connectivity is unreliable a paper
5 survey will be used and data submitted on-line later. The interviewers will be
6 either the first author (non-Indigenous female) or Indigenous research
7 assistants, or ACCHS staff.
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16 Aboriginal and/or Torres Strait Islander people, aged 18-45 years old who
17 currently smoke will be included in the study, if they self-report as Indigenous
18 and are in the age bracket. Although we would have preferred to include
19 participants under 18yrs, the ethics committee did not support this. Participants
20 will be offered a \$10 shopping voucher for their time.
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33 Sample size calculation

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36 The estimated sample size is 120 participants. Sample size estimations are based
37 on the procedure described by Altman.[59] Standardised differences for
38 intention to quit smoking and intention to seek help to quit smoking are
39 calculated using means (M) and standard deviations (SD) published by Wong
40 and Capella (intent to quit M 2.48, SD 0.78; intent to seek help M 1.85, SD
41 0.77).[44] These figures are taken from a different population because there
42 have been no relevant studies in Indigenous peoples. A total sample size of 110
43 is required to detect a significant difference between people in 'danger control'
44 versus people in 'fear control' (according to the RDB scale) and intentions to quit
45 smoking, at $\alpha < .05$, and 90% power. An additional sample size calculation
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1
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3 was performed to determine the required sample size to detect prevalence of
4
5 knowledge, attitudes and behavior within the target population. The required
6
7 sample size is 100, based on 50% prevalence, 10% precision and 95%
8
9 confidence intervals. However for the multivariate analysis 120 participants are
10
11 required (assuming 6 key variables).[60]
12
13

14 15 16 17 18 19 Sampling Stratification

20
21
22 Random sampling will not be feasible. To ensure that the convenience sample is
23
24 as representative of the target group as possible, the sample will be stratified by
25
26 age group and gender. Data from the 2011 Australian Census determines the
27
28 population parameters for persons identified as Aboriginal and/or Torres Strait
29
30 Islander, by age group and gender in the regional city. The proportion of smokers
31
32 within each age group and gender are estimated using smoking prevalence data
33
34 from the 2008 National Aboriginal and Torres Strait Islander Social Survey
35
36 (Table 2).[61]
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Table 2: Stratified sampling strategy of target Aboriginal and Torres Strait

Islander populations

| Target | | Smoking | | % of target | | Sample | | |
|---------------|----------|------------|----------|-------------------|---------------|---------------|-----------|-----------|
| populations | | Prevalence | | populations in | | stratified by | | |
| numbers (2011 | | (2008 | | regional city who | | gender & age | | |
| Census from | | NATSISS) | | smoke | | group | | |
| regional city | | | | | | | | |
| LGA) | | | | | | | | |
| Age | | | | Male | Female | | | |
| range | Male | Female | Male | Female | <i>N(% of</i> | <i>N(% of</i> | Male | Female |
| (yrs) | <i>N</i> | <i>N</i> | <i>%</i> | <i>%</i> | <i>total)</i> | <i>total)</i> | <i>N</i> | <i>N</i> |
| | | | | | 67 | 71 | | |
| 18-24 | 172 | 178 | 38.7 | 39.7 | (13.9%) | (14.7%) | 17 | 18 |
| | | | | | 80 | 92 | | |
| 25-34 | 142 | 184 | 56 | 50.1 | (16.6%) | (19%) | 20 | 23 |
| | | | | | 85 | 88 | | |
| 35-44 | 154 | 187 | 55.5 | 47.3 | (17.6%) | (18.2%) | 21 | 22 |
| | | | | | 232 | 251 | | |
| Total | 468 | 549 | | | (48.1%) | (51.9%) | 58 | 63 |

As can be seen from Table 2, the final sample will be 58 males and 63 female smokers (N= 121). This represents 25% of the Aboriginal and Torres Strait Islander smokers aged 18-45yrs in the regional city (121/483).

MEASURES/DATA COLLECTION

The survey

The survey will collect quantitative data, requiring categorical responses or responses on Likert scales where appropriate, on participants' smoking behaviours, initiation of smoking, attitudes to smoking and cessation, attitudes to health risks of smoking, experiences with quit attempts and smoking cessation, and future intentions to quit smoking or seek help for quitting. The questionnaire will also elicit responses about smoking in pregnancy and the protection of babies and children from tobacco smoke. The participants will be asked to rate the level of support available from family and peers for quitting and professional support. Three open-ended questions are used in the survey: 1) to initially explore general attitudes to smoking; 2) to ascertain if there is any more the participant would like to say about smoking or quitting at the end of the interview; and 3) to elicit more detail from those who indicate that they do not want to quit smoking. The survey guide includes 'notes sections' on most of the pages, so that the interviewer can record relevant comments or narratives expressed by the participant in the course of the interview. The survey was pilot tested with an Aboriginal Health Worker (AHW), and based on this it is anticipated that it will take approximately 20 minutes for participants to complete.

The questionnaire includes several instruments:

Tobacco Dependence Scales

Heaviness of Smoking Index (HSI) is an accepted method of assessing nicotine dependence levels, calculated from the time to first cigarette and number of cigarettes smoked per day. Its reliability has been shown to be better than the longer Fagerstrom Test for Nicotine Dependence (FTND).[62]

Strength of Urges to Smoke (SUTS) is another measure of dependence found to be more reliable for predicting cessation than the HSI.[62] It is a routine part of the "Smoking in England" survey, administered to over 10,000 smokers per annum.[63] It is a newer scale for nicotine dependence and is included here, as it has not yet been used with Australian Aboriginal and Torres Strait Islander smokers or other Indigenous populations.

Intentions to quit

The Motivation To Stop Scale (MTSS) uses dichotomous measures (yes/no) for intentions to quit (want to quit, 'should quit', intends to quit) and has shown good level of prediction for quitting.[64] Intentions to quit and intentions to seek help (Likert scale) are also adapted from Wong & Cappella.[44]

Risk assessment scales

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3 The Risk Behaviour Diagnosis Scale consists of a series of questions (Likert
4 scales) on four aspects: severity of threat, susceptibility to threat, response
5 efficacy and self-efficacy.[40]
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11 As a measure of fear control responses participants will be asked to respond to
12 four questions about reactance, avoidance and message derogation on a Likert
13 scale.[40] Similarly for danger control responses an aggregate score of the five
14 questions on intentions to change smoking behaviour/seek help will be
15 calculated.[44] Because of the evidence pointing to strong protective attitudes in
16 the target population, five questions on a Likert scale will be asked to determine
17 protective responses about smoking in pregnancy, around children, and for
18 Aboriginal and Torres Strait Islander peoples in general. A protection score will
19 be calculated from these responses.
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35 The Risk Acceptance Ladder is a new measure currently being used in Italy to
36 research a population with high rates of smoking (Cattaruzza & West, 2014, in
37 preparation). The measure has been adapted to the Aboriginal and Torres Strait
38 Islander population, as below.
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Consultative process, face validity and questionnaire adaptation

In the formative phase of the research, before ethics approvals were finalised,
several community consultation processes were conducted. The aim was to test
the content and face validity, suitability, readability, cultural appropriateness,

1
2
3 acceptability and feasibility of the survey instrument. Consultation was through
4
5 a focus group with Aboriginal and/or Torres Strait Islander people in the target
6
7 age group, and an Aboriginal elder, recruited from an Aboriginal Studies class at
8
9 a local tertiary college and two Aboriginal Indigenous student liaison staff from
10
11 the University campus (N=7). Several consultative interviews were also held
12
13 with a senior AHW specialising in tobacco. Expert input was obtained for the
14
15 scales from their respective inventors, to informally assess if they maintained
16
17 integrity once adapted, rather than assess their cultural suitability for this
18
19 population (Witte, and Cattaruzza and West).
20
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25
26 The RBD scales were adapted to tobacco-related risks from the templates in
27
28 Witte's manual (see Appendix 1).[41] The community consultation group and
29
30 AHW requested changes to several questions and suggested additional questions
31
32 about reason for smoking initiation. Minor rewording was suggested for some of
33
34 the RBD core statements to make them more comprehensible to this population.
35
36 Additionally several sensitive questions about socioeconomic status and
37
38 pregnancy were reworded.
39
40
41
42

43
44 The RAL was adapted for the Aboriginal and Torres Strait Islander populations,
45
46 and was renamed the SRAT as follows:
47

48 (a) It was deemed more culturally appropriate to depict the measure as a target
49
50 with concentric circles (progressing from the outside to the centre) instead of a
51
52 ladder, for the Aboriginal and Torres Strait Islander population.
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3 (b) The potential responses of the SRAT were reworded to become more
4 appropriate for the target population, and two additional responses included
5
6 appropriate for the target population, and two additional responses included
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8 (see Appendix 1).
9

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11 Changes were approved by the HRECs.
12

13 14 **ANALYSIS**

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17 Table 3 outlines variables that will be measured.
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1
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3 Table 3: Variables from questionnaire
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7 Demographics

- 8
- 9 • Age
 - 10 • Gender (Male/Female)
 - 11 • Aboriginal and Torres Strait Islander status (Aboriginal/Torres Strait
 - 12 Islander/both)
 - 13 • SES (calculated from postcode, suburb, income source, health care card
 - 14 use, education) – for details contact authors
 - 15 • Environmental variables
 - 16 a. Number of smokers in household (1/2-3/>3)
 - 17 b. Pregnant women in the house (Y/N)
 - 18 c. Children in the house (Y/N)
 - 19 d. Complete, partial or no bans for household smoking
 - 20 e. Smoke free behaviours of participants (house and car)

21
22 Smoking behaviour variables

- 23
- 24 • Nicotine dependence scores (Heaviness of Smoking Index and SUTS)
 - 25 • Age of smoking initiation and uptake
 - 26 • Factors influencing smoking initiation (11 response options)
 - 27 • Patterns of smoking (frequency and type)
 - 28 • Smoking by others in social circle (Y/N)
 - 29 • Current/previous quit attempts (Y/N)
 - 30 • Current/previous use of cessation therapies (Y/N)
 - 31 • Level of support for quitting (social and professional) (sliding scales 0-10)

32
33 Smoking risk related attitudes

- 34
- 35 • RBD scale resulting a composite score (discriminating value, recoded
 - 36 positive or negative)
 - 37 • Threat score (three items for susceptibility plus three for severity of threat
 - 38 on Likert scales of 1-5)
 - 39 • Efficacy score (three items for response efficacy plus three for self-efficacy
 - 40 on Likert scales of 1-5)
 - 41 • RBD results recoded into four quadrants of high efficacy/high threat;
 - 42 high efficacy/low threat; low efficacy/high threat; low efficacy/low threat;
 - 43 • Fear control responses score (calculated from questions on avoidance,
 - 44 denial, and refuting messages, Likert scales 1-5)
 - 45 • Danger control responses score (calculated from questions on intentions
 - 46 to quit or seek help, Likert scales 1-5)
 - 47 • Protective responses score (calculated from questions on attitudes about
 - 48 protecting babies/children, Likert scales 1-5)
 - 49 • General attitudes about smoking and quitting (13 response options)
 - 50 • SRAT (choice of 1 option from 12, will be reduced to 4 categories)

51
52 Behavioural intentions

- 53
- 54 • Intentions to quit (MTSS) (want/do not want) - if affirmative then how soon
 - 55 intends to quit (3month/1 month/hope to soon/don't know)
 - 56 • Intentions to quit or reduce smoking (Wong & Capella) (Likert scales 1-4)
 - 57 • Intentions to seek help with quitting (Wong & Capella) (Likert scales 1-4)

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6 Legend: Y – yes; N – no; SUTS – strength of urges to smoke; RBD – risk behaviour
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9
10 diagnosis; SRAT – smoking risk assessment target; MTSS – motivation to stop
11
12 smoking scale
13

14 15 **Statistical analyses** 16

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19 On study completion, the data entered through the survey software will be used
20
21 to generate a summary report and exported directly to SPSS v 20 for analysis.
22

23 Descriptive analyses will summarise the data for all variables.
24

25
26 To measure the reliability and validity of the scales the following will be used.
27

- 28
29
30 1. Content validity and face validity is qualitatively assessed through the
31
32 community panel and expert consultation for RBD and SRAT
33
- 34
35 2. The patterns of correlation will be explored between the RBD subscale
36
37 scores (susceptibility and severity of threat, and response and self-
38
39 efficacy) and also for danger control responses, fear control responses
40
41 and protective responses
42
- 43
44 3. Internal consistency of sub-scales will be assessed with Cronbach's α .
45

46
47 Multivariate analyses will seek the most likely demographic predictors of
48
49 intentions to quit smoking/seek help for quitting, e.g. age, gender, dependence
50
51 levels, household smoking rules. Psychological factors such as threat and efficacy
52
53 scores, danger and fear control responses will be analysed to assess whether
54
55 they further influence the outcome measures.
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1
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3 RBD scores and the SRAT will be examined to see if participant responses are
4
5 correlated.
6
7

8
9 Qualitative and open-ended responses will undergo a general inductive thematic
10
11 analysis,[65] by two researchers independently. A cut and paste technique will
12
13 be used for initial coding using Excel spread sheets, and consensus reached by
14
15 discussion. The themes will be used to enrich the quantitative findings.
16
17

21 22 **ETHICS AND DISSEMINATION** 23 24

25
26 The study is low risk in terms of ethics, however, discussing smoking may be
27
28 considered a sensitive issue for Aboriginal and Torres Strait Islander
29
30 participants, and researchers collecting the data will be suitably briefed. The
31
32 research will adhere to Australia's National Health and Medical Research
33
34 Council's Values and Ethics in Aboriginal and Torres Strait Islander Health
35
36 Research 2003 guidelines, i.e. reciprocity, respect, equality, responsibility,
37
38 survival and protection, spirit and integrity.[66] Examples of reciprocity include
39
40 the first author sharing her knowledge and skill base (as a GP and Tobacco
41
42 Treatment Specialist) about tobacco control and research with the participating
43
44 organisations and their staff members. The participants also would be offered
45
46 brief advice on smoking cessation if they wished after the interview, and extra
47
48 resources such as a culturally adapted DVD. The primary HREC is the Aboriginal
49
50 Health & Medical Research Council Ethics Committee (AH&MRC), which
51
52 approved the study with support from the partnering ACCHS (approval number
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3 928). Additional HRECs ratified the primary approval (James Cook University
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5 (H4467) and Southern Cross University (ECN-13-242).
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9
10 Participants will be approached at community events that are targeted to the
11
12 local Australian Aboriginal and Torres Strait Islander communities. Potential
13
14 recruits will be asked if they fulfil the selection criteria and canvassed about
15
16 their willingness to join in the study. All participants will be provided with a
17
18 participant information sheet advising of the purpose of the study and
19
20 implications regarding:
21

- 22 • Objectives of the research
- 23 • Why the information is being collected and how it will be used, accessed
24 and stored
- 25 • Voluntary nature of the study, provision for withdrawal of consent,
26 assurance of confidentiality and anonymity
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37 After the information sheet is explained, the participant will be asked to provide
38
39 informed consent by having their name typed on the touch screen of the tablet
40
41 computer and ticking the 'agree' box. All data will be de-identified and data and
42
43 materials will be stored for seven years, in a secure location, and where digitally
44
45 stored will be password-protected and only accessed by the researchers.
46
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50
51 This study is one of several studies contributing to a PhD Public Health thesis for
52
53 the first author. Journal articles and presentations at relevant national and
54
55 international conferences to academics, researchers and stakeholders will
56
57 disseminate these findings. The outcomes of the study will also inform policy and
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1
2
3 practice recommendations. A community report will be sent to the partnering
4
5 ACCHS for dissemination to clients at the service and to the communities who
6
7 have been involved. Community-based forums will be held as appropriate.
8
9

10 11 12 13 14 **DISCUSSION**

15
16
17 This study aims to determine how Australian Aboriginal and Torres Strait
18
19 Islander smokers of childbearing age assess risks about tobacco smoking and
20
21 how these assessments are associated with their intentions to quit smoking. We
22
23 aim to validate two risk assessment scales for Aboriginal and Torres Strait
24
25 Islander smokers, which could have the potential for research transference to a
26
27 clinical or public health setting.
28
29

30
31
32 The RBD scale was originally designed as a clinical tool to be used in the context
33
34 of delivering tailored health messages at a clinic for sexually transmitted
35
36 diseases and HIV testing.[40] Advice was then adapted to individuals according
37
38 to their responses.
39
40

41
42 Primary health care practitioners and clinicians are often faced with the task of
43
44 assisting Aboriginal and Torres Strait Islander smokers to quit smoking. Anti-
45
46 tobacco messages do not just lie in the domain of social marketing: they also
47
48 need to be carefully pitched to maximise receptivity and support behaviour
49
50 change within the clinical consultation. Little is known about the effectiveness of
51
52 smoking behaviour change models for Aboriginal and Torres Strait Islander
53
54 peoples. The trans-theoretical model (stages of change or SOC) has been widely
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1
2
3 used in Australia for Aboriginal and Torres Strait Islander smokers, but
4
5 outcomes have never been evaluated.[67] Aboriginal smokers in remote areas
6
7 have been described as more likely to be in the pre-contemplative or
8
9 contemplative stages of change and require more assistance to be ready to quit
10
11 smoking.[68] Also it is known that motivational interviewing, including that
12
13 based on the SOC, is not as effective in pregnancy as in the general
14
15 population,[69] and holds no special advantages over other types of psychosocial
16
17 counselling.[70]
18
19

20
21
22 If the measures under examination here are found to be reliable for the target
23
24 audience of Aboriginal and Torres Strait Islander smokers of childbearing age,
25
26 then accurate assessments could be made. A new model based on assessment of
27
28 risk behaviour could have the potential to assess fear versus danger control
29
30 responses and facilitate the pitching of tailored anti-tobacco messages for the
31
32 individual, build motivational tension for quitting, and yet avoid engendering
33
34 fear control responses or resistance.
35
36

37
38
39 If people are engaged in fear control processes, messages developed should focus
40
41 on the efficacy of the recommended response to counteract the high levels of
42
43 perceived threat. Focusing on threat messages alone may cause the messages to
44
45 backfire. It is important to emphasise that the recommended responses are
46
47 feasible and effective to avert the threat from smoking. It is essential to help
48
49 people develop a belief in their ability to quit smoking, develop supportive
50
51 environments for quitting, and provide easy access to treatment.
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3 Central to building self-efficacy are strategies recommended by Bandura.[42] He
4
5 suggests several approaches: building skills, self-control and mastery for
6
7 quitting; learning about the experiences of others who have successfully quit;
8
9 verbal persuasion and motivation; helping people adopt a positive mindset; and
10
11 importantly having access to effective therapies.[42]
12

13
14
15 Alternatively, if the target audience is in danger control, messages can remind
16
17 people about the threat of smoking to maintain motivation, whilst also
18
19 increasing efficacy for quitting, as above.
20
21

22
23 People with low threat perceptions may be neither in danger or fear control.
24
25 They may need to be convinced about the seriousness of or their susceptibility to
26
27 the threat. This group requires messages aimed at improving knowledge and
28
29 correcting any misconceptions. This may be best achieved by having messages
30
31 come from someone who is very similar to the client (possibly through use of
32
33 tailored videos or personalised narratives).
34
35

36
37
38 The SRAT may prove a simplified way to approach risk assessment in this target
39
40 group, as it demands a single response to a question. The measures require
41
42 validation for Aboriginal and Torres Strait Islander smokers in this child-rearing
43
44 age bracket, prior to a more formal assessment of feasibility and effectiveness in
45
46 a clinical setting.
47
48

49
50 Previous research has demonstrated the strong social and environmental
51
52 influences on smoking cessation, and the role health professionals play in
53
54 supporting smoking cessation in Aboriginal and Torres Strait Islander
55
56 communities.[71] The study will also assess predictors of intentions to quit that
57
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1
2
3 include measures of socio-economic position, smoking by friends, and household
4
5 members, support offered by family and health professionals, and a range of
6
7 other factors. These measures have the potential to determine social and health
8
9 profession influences on intentions to quit smoking in this population. The
10
11 analysis will determine if once these factors are controlled for whether the
12
13 responses to the risk assessment measures have any additional impact.
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21 **Limitations and Strengths**

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23
24 The study will be based on a sample from one regional area of NSW, fostering
25
26 ownership of the project results for the local partnering ACCHS. Australian
27
28 Aboriginal groups are diverse and this study will be conducted in just one region.
29
30 It is unknown how many Torres Strait Islanders reside in the area and how
31
32 many will chose to participate in the study. As the validity and reliability
33
34 measures to be used are context specific, they should be considered provisional,
35
36 pending a larger study. These limitations impact on generalisability and
37
38 transferability of the findings, although this is a pragmatic constraint for all
39
40 research in diverse Indigenous groups. Selection bias may be operant if only
41
42 those more willing to talk about their smoking agreeing to participate, another
43
44 inevitable challenge for this kind of research. Recruiting some participants
45
46 through a health service may favour those already with health problems, and
47
48 who may already have motivation to quit smoking. There could be information
49
50 biases: smoking status will be based on self-report and not any objective
51
52 measures; recall bias may be operant with asking people to recollect their
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3 smoking history and perceived level of support for quitting; and social
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5 desirability bias with people reporting what they think the researcher wants to
6
7 hear.
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10
11 On the other hand, this is the first study as far as we know to validate risk
12
13 assessment measures for tobacco smoking in a population of Aboriginal and
14
15 Torres Strait Islander smokers. Health education and behaviour studies are
16
17 tested for validity and reliability inconsistently,[72] and very few scales are
18
19 validated for the Aboriginal and Torres Strait Islander population.[73] So the
20
21 study is needed and an important one, although small and specific to one region.
22
23 The study takes a unique approach to smoking in Aboriginal and Torres Strait
24
25 Islander peoples of childbearing age by drawing on both well-established and
26
27 new measures from the health communication and addiction fields. If these
28
29 measures prove to be valid and reliable they have a high potential for research
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31 translation into clinical settings. The outcomes could further inform the
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33 development and refining of social marketing policies and strategies for anti-
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35 tobacco messages through all media.
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AUTHOR CONTRIBUTIONS

GSG is responsible for the concept and design of the project, developing and adapting the survey instruments and digital format, testing the suitability of the survey for Indigenous participants, conducting surveys, training and supervising Indigenous research assistants to conduct surveys, collating and analysing and interpreting results, writing reports and manuscripts.

KW contributed to the research design and statistical analysis and critical review of manuscripts. AM advises on any aspect relating to tobacco smoking, smoking risk behaviours and the survey, and critical review of manuscripts. YCJ as Aboriginal academic advisor advises on the Indigenous community consultation processes, recruitment and the cultural interpretation of results. ARC oversees the study and advises on all aspects, and provides critical review of manuscripts.

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- James Cook University, Faculty of Medicine, Health & Molecular Sciences, Graduate Research Scheme grant 2013

ARC holds a National Health and Medical Research Council Career Development Award (APP1046773)

COMPETING INTERESTS

AM receives a personal income from Cancer Research UK via University College London. He has received travel funding, honorariums and consultancy payments from manufacturers of smoking cessation products (Pfizer Ltd, Novartis UK and GSK Consumer Healthcare Ltd). He also receives payment for providing training to smoking cessation specialists; receives royalties from books on smoking cessation and has a share in a patent of a nicotine delivery device.

No other competing interests to declare.

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6 **STUDY PROTOCOL - VALIDATION OF RISK ASSESSMENT SCALES IN A CROSS-**
7 **SECTIONAL SURVEY OF ATTITUDES TO TOBACCO SMOKING AND**
8 **INTENTIONS TO QUIT SMOKING IN AUSTRALIAN ABORIGINAL AND TORRES**
9 **STRAIT ISLANDER PEOPLES AND PREDICTORS OF INTENTIONS TO QUIT**
10 **SMOKING IN AUSTRALIAN ABORIGINAL AND TORRES STRAIT ISLANDER**
11 **PEOPLES: A CROSS-SECTIONAL SURVEY PROTOCOL**
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21 **Title Page**
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32 Running Head: Risk assessment for smoking with Indigenous Australians

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38 *Key words: tobacco use, smoking, Australian Aborigines, Indigenous population, risk*
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ABSTRACT:**Introduction**

Tobacco smoking is a very significant behavioural risk factor for the health of Australian Aboriginal and Torres Strait Islanders, and is embedded as a social norm. With a focus on women of child-bearing age, and men of similar age, this project aims to determine how Aboriginal and Torres Strait Islander smokers assess smoking risks and how these assessments contribute to their intentions to quit. The findings from this pragmatic study should contribute to developing culturally targeted interventions.

Methods and analysis

A cross-sectional study using quantitative and qualitative data. 120 Aboriginal and Torres Strait Islander community members aged 18-45 years will be recruited at community events and through an Aboriginal Community Controlled Health Service (ACCHS). Participants will be interviewed using a tablet computer or paper survey. The survey instrument uses modified risk behaviour scales, i.e. the Risk Behaviour Diagnosis (RBD) Scale and the Smoking Risk Assessment Target (SRAT) (adapted from the Risk Acceptance Ladder) to determine whether attitudes of Aboriginal and Torres Strait Islander smokers to health risk messages are predictors of intentions to quit smoking.

The questionnaire will be assessed for face and content validity with a panel of Indigenous community members. The internal consistency of the RBD subscales

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6 and their patterns of correlation will be explored. Multivariate analyses will
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8 examine predictors of intentions to quit. This will include demographics such as
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10 age, gender, nicotine dependence, household smoking rules, and perceived
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12 threat from smoking and efficacy for quitting. The two risk assessment scales
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14 will be examined to see if participant responses are correlated.
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16 17 **Ethics and dissemination**

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20 The Aboriginal Health & Medical Research Council [Ethics Committee](#) and ethics
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22 committees at James Cook and Southern Cross Universities approved the study.
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24 The results will be published in a peer-reviewed journal and a community report
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26 will be disseminated by the ACCHS, and at community forums.
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Note about terminology:

We use the term Aboriginal and Torres Strait Islander peoples, except where previous research has reported findings from only one group e.g. Aboriginal people. Indigenous is used here to refer to Indigenous peoples in the international context, and issues, policies or systems, e.g. Indigenous health, Indigenous tobacco control.

ARTICLE SUMMARY

Article focus

- Limited knowledge of [how smoking behaviours and attitudes in Aboriginal and Torres Strait Islander peoples of childbearing age assess the risks about smoking, and their levels of efficacy for cessation](#)
- Study aims to validate risk assessment scales for Aboriginal and Torres Strait Islander smokers in [New South Wales \(NSW\)](#) Australia
- Study has potential to inform anti-tobacco messages used in social marketing and counselling approaches in clinical consultations
- Privileges the voices of Aboriginal and Torres Strait Islander peoples

Key Messages

- A better understanding of attitudes and experiences of smoking and quitting in this age group will add to current knowledge and could assist in better management of smoking

- Correlations of smokers' attitudes, perceptions of threat and efficacy with intentions to quit smoking will aid the development of tailored approaches

Strengths and Limitations of this Study

- First study on risk assessment scales in the target population
- Unique approach to smoking in Aboriginal and Torres Strait Islander peoples of childbearing age
- Draws on both well-established and new measures
- Potential limitations relate to information and selection biases.

INTRODUCTION

Australia claims one of the lowest rates of tobacco smoking in OECD countries of 15.1%.^[1] However several subgroups of the population maintain high rates of smoking.^[2] Tobacco smoking is the main preventable risk factor contributing to the burden of disease in Aboriginal and Torres Strait Islander peoples.^[3] Whilst there has been a significant drop in Indigenous smoking prevalence over the last 10 years overall, smoking rates are 2.6 times that of the general population at 41%, with higher rates of 50% or more in remote areas.^[4-5] However prevalence of Indigenous smoking in the age group 25-34 years has not decreased significantly for either gender,^[4] and rates in pregnant Aboriginal

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6 and Torres Strait Islander women are quadruple (49.3%) those of pregnant
7 women in the general population (12.1%).[6]
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11 While it is acknowledged that Indigenous populations across and even within
12 different continents belong to very diverse communities with their own cultures
13 and norms, some broad factors impact on Indigenous peoples in colonised
14 Western nations. American Indians, Alaskan Natives, New Zealand Māori and
15 Inuit all have a higher prevalence of smoking than the mainstream
16 populations,[7] particularly in their reproductive years, resulting in significant
17 health disparities.[8] Smoking is comparably affected by the social determinants
18 of health, and cultural factors, including for some First Nation peoples
19 ceremonial and spiritual uses of tobacco.[9] Aboriginal and Torres Strait Islander
20 peoples have a long history of tobacco use.[107] It is believed that the effects of
21 colonisation,[107] the stolen generation,[118] and racism,[129] have all
22 contributed to the contemporary use of tobacco, to the detriment of the health
23 and longevity of Aboriginal and Torres Strait Islander peoples, and their future
24 generations. Factors promoting smoking and smoking initiation in Aboriginal
25 and Torres Strait Islander peoples include community and family norms of
26 smoking,[130] smoking to promote social inclusiveness and cohesion,[144] peer
27 group belonging,[152] and daily stressors.[130] [1][2][3]

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41 Several studies have explored the knowledge levels of Aboriginal and Torres
42 Strait Islander peoples about tobacco smoking.[16-184] with moreThere is
43 limited knowledge-exploration about Indigenous attitudes and beliefs about the
44 risks of smoking. There has been some exploration about what anti-smoking
45 messages are effective and acceptable for Aboriginal and Torres Strait Islander
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6 populations,[193] as media messages or as adjuncts to clinical treatment.[2044]
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8 Mainstream antismoking campaigns have shown to be effective in terms of recall
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10 and perceived effectiveness by Indigenous peoples in Australia,[21-225-6] the
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12 U.S. [237] and NZ,[248] but have not necessarily translated into increased quit
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14 rates in these populations.[259] Aboriginal and Torres Strait Islander smokers in
15
16 a forced exposure to several television advertisement rated those containing
17
18 strong graphic imagery or personal narratives as effective for a range of
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20 measures including being more likely to quit.[190] Indigenous peoples in the US,
21
22 Australia and New Zealand (NZ), have a preference for culturally targeted
23
24 campaigns.[259] Aboriginal and Torres Strait Islander viewers aged 16-40 years
25
26 of the 'Break The Chain' campaign in Australia positively rated the targeted
27
28 advertisement, had good recall and 57% stated they intended to quit in the
29
30 following month.[2644] Where culturally targeted campaigns have been tested,
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32 alongside generic campaigns, for example in NZ youth, they proved as effective at
33
34 supporting Maori to quit smoking as generic messages were for the general NZ
35
36 population.[2742]

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39 However, attitudes of Indigenous maternal smokers, to prevailing health risk
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41 messages about smoking, have been ~~particularly~~ under-researched ~~for~~
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43 ~~Aboriginal and Torres Strait Islander maternal smokers and those of~~
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45 ~~childbearing age. [13]~~ A systematic review used meta-ethnography to synthesise
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47 the evidence onf the knowledge, attitudes and experiences of maternal smoking
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49 by Aboriginal and Torres Strait Islander peoples,[1343] from seven studies.[14,
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51 28-3320] The synthesis revealed a lack of salience of media messages and
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53 potentially some resistance to advice.[130] Equally pregnant women have highly
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6 protective attitudes towards babies and children.^[1310] A recent study of
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8 attitudes of maternal Aboriginal smokers and their family members suggested
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10 that attitudes about the health risks of smoking may be influenced by messages
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12 not matching the women's lived experiences, coupled with inadequate access to
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14 information.^[3415] Limited knowledge about the specific hazards of smoking
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16 and cessation,^[3516] and the lack of salience of anti-smoking messages are
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18 barriers to effective cessation.^[130] However, a program using a culturally
19
20 targeted smoking cessation video with pregnant Alaska Native smokers was no
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22 more efficacious than in the control group.^[3621] Issues less well understood are
23
24 how Indigenous adults broadly assess their risks in relation to tobacco smoking
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26 (not just their knowledge of adverse health effects) and how these assessments
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28 are related to their intentions to quit smoking. If attitudes to risk taking
29
30 behaviour for smoking and responses to anti-tobacco messages are not
31
32 understood it is difficult to formulate effective messages and interventions.
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34 There are no best practice guidelines to develop and personalise such messages
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36 for Aboriginal and Torres Strait Islander peoples.^[184, 3717-3818]
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39 Our study therefore aims to determine how Aboriginal and Torres Strait Islander
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41 smokers of childbearing age assess risks about tobacco smoking and how these
42
43 assessments are associated with their intentions to quit smoking or seeking help
44
45 to quit. We further aim to determine which demographic and behavioural factors
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47 (such as age, gender, nicotine dependence level, household smoking rules) are
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49 predictors of intentions to quit and seek help for quitting. Two risk assessment
50
51 scales for smoking will be examined for their cultural acceptability, validity and
52
53 reliability, and their utility as a pragmatic heuristic.
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Underpinning Theories

Research shows that interventions based on the assessment of risk behaviour can positively influence the risk taking behaviour that contributes to a range of preventable diseases.^[39,49]

Witte et al proposed a theory called the Extended Parallel Process Model (EPPM) to explain message processing and subsequent behavioural intentions.^[20] (Key constructs shown in Table 1.)

Table 1: Key constructs, definitions and measures (adapted from Witte et al.[40])

| Definitions of constructs | How measured on RBD scale or other |
|---|------------------------------------|
| <i>Perceived threat</i> : awareness of a specific harm in the environment, consisting of: | Total of perceived threat scores |
| <i>Susceptibility to threat</i> : belief about one's risk of experiencing the threat | Sub-total of susceptibility scores |
| <i>Severity of threat</i> : belief about the magnitude of the threat | Sub-total of severity scores |
| <i>Perceived efficacy</i> : thoughts about ease, feasibility and the effectiveness of averting the threat, consisting of: | Total of perceived efficacy scores |
| <i>Self-efficacy</i> : belief in one's ability to perform recommended response | Sub-total of self-efficacy scores |

| | | |
|--|---|--|
| 1 2 3 4 5 6 7 8 9 10 | <i>Response efficacy</i> : belief about effectiveness of recommended response to avert the threat | Sub-total of response efficacy scores |
| 11 12 13 14 15 16 17 18 19 20 21 22 23 | <i>Danger control dominance</i> : the dominant response in the person faced with a threat, who considers themselves able to perform the recommended response, believes the response to be effective, therefore tries to reduce the danger by taking positive action (protective motivation) | High efficacy score and high threat score |
| 24 25 26 27 28 29 30 31 | <i>Danger control responses (protective motivation)</i> : beliefs, attitudes, intentions, and behaviour changes in accordance with the message recommendations | Score from intentions to quit/seek help scales (Wong and Cappella) and responses to MTSS questions |
| 32 33 34 35 36 37 38 39 40 41 42 43 44 | <i>Fear control dominance</i> : the dominant emotional response in the person when faced with a threat, who feels unable to perform the recommended response, and/or believes the response to be ineffectual, and tries to psychologically reduce their fear by defensive motivation | Low efficacy score with high threat score |
| 45 46 47 48 49 | <i>Fear control responses (defensive motivation)</i> : coping responses that diminish fear | Score from questions about defensive avoidance, denial, reactance, message derogation and perceived manipulation |
| 50 51 52 53 54 | <i>Critical point</i> : when perceptions of threat begin to outweigh perceptions of efficacy, | The exact critical point can vary with topics and populations |

| | |
|--|--|
| causing shift from danger control to fear control processes | |
| <i>Discriminating value</i> : a numerical value used to discriminate between people in danger vs. fear control | Formula: $(\Sigma \textit{perceived efficacy}) - (\Sigma \textit{perceived threat}) = \textit{discriminating value}$ A positive score indicates danger control processes; a negative score indicates fear control processes |
| <i>Protective responses</i> : similar to danger control responses, but beliefs/attitudes are centred around protecting others from tobacco smoke | Score from 5 new measures to attitudes about smoking exposure for Aboriginal or Torres Strait Islanders, babies and children |

Legend: RBD – risk behaviour diagnosis; MTSS – motivation to stop smoking; Σ – sum of.

According to the EPPM, “when people perceive a serious and relevant threat, they become scared”, [4020] (p 318) and will take an action to reduce their fear by one of two general pathways. People can either control the danger elicited by the threat by making a positive and conscious shift in attitude and behaviour (called protective motivation or danger control responses). Alternately they may feel fearful and try and control the fear unconsciously by denial, discounting or reactance against the threat (called defensive motivation or fear control responses). If people feel no threat at all (perhaps due to a lack of knowledge) there may be a low response to the message. Furthermore Witte et al has shown

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6 that that the level of perceived efficacy determines whether people engage in
7
8 danger control or fear control responses.[4020]
9

10 Witte devised and validated a scale called the Risk Behaviour Diagnosis (RBD)
11
12 scale to measure these responses across four dimensions of perceived threat
13
14 (perceived susceptibility and severity of threat) and perceived efficacy (response
15
16 efficacy and self-efficacy).[4020] High threat responses coupled with high
17
18 efficacy tend to lead to danger control responses, in this case to adopt message
19
20 recommendations, change attitudes, intentions and smoking behaviour. In
21
22 contrast, if people feel they can-not adopt the recommended response to avert
23
24 the treat, because of a lack of efficacy (it's too hard, too little support, or it is
25
26 perceived as futile to do so), they typically try to control the fear by avoiding the
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28 issue, discount the message, or may consider the issue is exaggerated.
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32 If fear control processes are initiated, it can be difficult to shift attitudes and
33
34 there is a need for carefully constructed messages to “break through defence
35
36 mechanisms”.[4124] Therefore according to this theory people who are in fear
37
38 control will need assistance to build up efficacy rather than make them more
39
40 fearful. Bandura’s work on self-efficacy confirms this and he considers self-
41
42 efficacy is central to any healthy behaviour change.[4222]
43
44

45 The EPPM model is a predominant message design theory,[4323] and has been
46
47 widely applied to a range of health behaviours internationally and a wide range
48
49 of health promotional campaigns, and is the basis of tobacco counter-
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51 marketing.[3749] A study by Wong and Cappella has used the RBD to measure
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53 responses to video-based anti-tobacco television advertisements.[4424]
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6 Assessment scales for risk behaviour, including the RBD, have been used in
7
8 several minority groups and across cultures.[4525-5333] However risk
9
10 assessment scales for tobacco and the EPPM have not been used or validated for
11
12 Australian Aboriginal or Torres Strait Islander or other Indigenous populations.
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14
15 Another theory informing this study is PRIME theory (P-plans; R-responses; I-
16
17 impulses; M-motives; E-evaluations), which proposes that smokers' motivations
18
19 are fluid, and can change unexpectedly.[5434] The central tenets of PRIME
20
21 theory include people's wants and needs in the moment, and their self-
22
23 identity.[5434] West suggests that a person can be stimulated to make a quit
24
25 attempt, even if they have not been thinking about quitting, especially if the
26
27 intervention is repeated and evidence-based therapy offered.[5535] A new
28
29 measure based on PRIME theory, called the Risk Acceptance Ladder
30
31 (RAL),[5636] (Cattaruzza & West, 2014, in preparation) proposes that the blocks
32
33 to effective behaviour change can be ascertained by determining the individual
34
35 level of risk acceptance and at what stage motivation has stalled. For this study
36
37 the RAL is modified into the Smoking Risk Assessment Target (SRAT) (see
38
39 methods). If this measure correlates well with message processing it may be also
40
41 useful to assess Aboriginal and Torres Strait Islander smokers.
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47 **Rationale for assessing validity and reliability of the scales for Aboriginal**
48
49 **and Torres Strait Islander smokers**

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52 Assessment scales, developed for Western populations, are important to validate
53
54 before use in a cross-cultural context.[57] Theoretical concepts developed in the
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context of the dominant Western psychology and communication fields may not transfer into a cross-cultural or Indigenous setting.[57-58] Preliminary phases of community engagement are an important part of the process of validation, and will be described below.[58] Results from the validation and reliability process also need careful interpretation with culturally competent advisors.[58]

METHODS AND ANALYSIS

Study Overview

This is a cross-sectional study to investigate the validity and reliability of risk assessment scales, and predictors of intentions to quit smoking, for Australian Aboriginal and Torres Strait Islander smokers of both genders, aged 18-45 years old. The study will be conducted through face-to-face interviews in a regional centre in NSW Australia.

Research Questions

1. Are RBD/SRAT and associated measures of tobacco behaviour reliable and valid in Australian Aboriginal and Torres Strait Islander smokers?
2. What are the main predictors of intentions to quit smoking and intentions to seek help for quitting in Aboriginal and Torres Strait Islander smokers?
3. What variables confound the associated factors and intentions to quit and [to seek help](#) in Aboriginal and Torres Strait Islander smokers?
4. What smoking related attitudes (e.g., danger/fear control responses) are associated with positive/negative discriminating values on the RBD?

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6 5. What are the associations between the RBD and SRAT?
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10 11 **Study Population**

12 Participant recruitment and setting

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15 The study site is a regional centre in NSW. Recruitment into the study will be by
16 personal intercept, primarily at regional community and social events, and in
17 other settings likely to yield interest, including a local Aboriginal Community
18 Controlled Health Service (ACCHS). The survey will be administered by face-to-
19 face interview, using where possible a tablet computer, connected by cellular
20 network to a secure on-line survey site. Where connectivity is unreliable a paper
21 survey will be used and data submitted on-line later. The interviewers will be
22 either the first author (non-Indigenous female) or Indigenous research
23 assistants, or ACCHS staff.
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38 ~~Inclusion criteria are~~ Aboriginal and/or Torres Strait Islander people, aged 18-
39 45 years old who currently smoke. ~~Participants will be included in the study, if~~
40 ~~they self-report as Indigenous and are in the age bracket. Although we would~~
41 ~~have preferred to include participants under 18yrs, the ethics committee did not~~
42 ~~support this.~~ Participants will be offered a \$10 shopping voucher for their time.
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52 Sample size calculation
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6 The estimated sample size is 120 participants. Sample size estimations are based
7
8 on the procedure described by Altman.^[5937] Standardised differences for
9
10 intention to quit smoking and intention to seek help to quit smoking are
11
12 calculated using means (M) and standard deviations (SD) published by Wong
13
14 and Capella (intent to quit M 2.48, SD 0.78; intent to seek help M 1.85, SD
15
16 0.77).^[4424] These figures are taken from a different population because there
17
18 have been no relevant studies in Indigenous peoples. A total sample size of 110
19
20 is required to detect a significant difference between people in 'danger control'
21
22 versus people in 'fear control' (according to the RDB scale) and intentions to quit
23
24 smoking, at $\alpha < .05$, and 90% power. An additional sample size calculation
25
26 was performed to determine the required sample size to detect prevalence of
27
28 knowledge, attitudes and behavior within the target population. The required
29
30 sample size is 100, based on 50% prevalence, 10% precision and 95%
31
32 confidence intervals. However for the multivariate analysis 120 participants
33
34 are required (assuming to adequately estimate the effect of 6 key variables (20
35
36 per variable).^[60]

41 42 Sampling Stratification

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45 Random sampling will not be feasible. To ensure that the convenience sample is
46
47 as representative of the target group as possible, the sample will be stratified by
48
49 age group and gender. Data from the 2011 Australian Census determines the
50
51 population parameters for persons identified as Aboriginal and/or Torres Strait
52
53 Islander, by age group and gender in the regional city. The proportion of smokers
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within each age group and gender are estimated using smoking prevalence data from the 2008 National Aboriginal and Torres Strait Islander Social Survey

(Table 2).^[6138]

Table 2: Stratified sampling strategy of target Aboriginal and Torres Strait Islander populations

| Target populations numbers (2011 Census from regional city LGA) | | Smoking Prevalence (2008 NATSISS) | | % of target populations in regional city who smoke | | Sample stratified by gender & age group | | |
|---|------------------|-----------------------------------|-----------|--|-------------------------------|---|------------------|--------------------|
| Age range (yrs) | Male <i>N</i> | Female <i>N</i> | Male % | Female % | Male <i>N</i> (% of total) | Female <i>N</i> (% of total) | Male <i>N</i> | Female <i>N</i> |
| | | | | | 67 | 71 | | |
| 18-24 | 172 | 178 | 38.7 | 39.7 | (13.9%) | (14.7%) | 17 | 18 |
| | | | | | 80 | 92 | | |
| 25-34 | 142 | 184 | 56 | 50.1 | (16.6%) | (19%) | 20 | 23 |
| | | | | | 85 | 88 | | |
| 35-44 | 154 | 187 | 55.5 | 47.3 | (17.6%) | (18.2%) | 21 | 22 |
| Total | 468 | 549 | | | 232 | 251 | 58 | 63 |

(48.1%) (51.9%)

As can be seen from Table 2, the final sample will be 58 males and 63 female smokers (N= 121). This represents 25% of the Aboriginal and Torres Strait Islander smokers aged 18-45yrs in the regional city (121/483).

MEASURES/DATA COLLECTION

The survey

The survey will collect quantitative data, requiring categorical responses or responses on Likert scales where appropriate, on participants' smoking behaviours, initiation of smoking, attitudes to smoking and cessation, attitudes to health risks of smoking, experiences with quit attempts and smoking cessation, and future intentions to quit smoking or seek help for quitting. Views The questionnaire will also ~~will be~~ elicit responses ~~ed~~ about smoking in pregnancy and the protection of babies and children from tobacco smoke. The participants questions ~~will be explore~~ asked to rate the level of support available from family and peers for quitting and professional support. Three open-ended questions are used in the survey: 1) to initially explore general attitudes to smoking; 2) to ascertain if there is any more the participant would like to say about smoking or quitting at the end of the interview; and 3) to elicit more detail from those who indicate that they do not want to quit smoking. The survey will use open-ended questions to explore general attitudes to smoking, and The survey guide includes 'notes sections' on most of the pages, so that the

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6 interviewer ~~can~~will record relevant comments or narratives expressed by the
7 participant in the course of the interview. The survey was pilot tested with an
8 Aboriginal Health Worker (AHW), and based on this it is anticipated that it will
9 take approximately 20 minutes for participants to complete.
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17 The questionnaire includes several instruments:
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19

20 Tobacco Dependence Scales 21 22

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24
25 Heaviness of Smoking Index (HSI) is an accepted method of assessing nicotine
26 dependence levels, calculated from the time to first cigarette and number of
27 cigarettes smoked per day. Its reliability has been shown to be better than the
28
29 longer Fagerstrom Test for Nicotine Dependence (FTND).^[6239]
30
31
32

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34
35 Strength of Urges to Smoke (SUTS) is another measure of dependence found to
36
37 be more reliable for predicting cessation than the HSI.^[6239] It is a routine part
38 of the “Smoking in England” survey, administered to over 10,000 smokers per
39
40 annum.^[6340] It is a newer scale for nicotine dependence and is included here,
41
42 as it has not yet been used with Australian Aboriginal and Torres Strait Islander
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44 smokers or other Indigenous populations.
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49 Intentions to quit 50 51 52 53 54 55 56 57 58 59 60

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6 The Motivation To Stop Scale (MTSS) uses dichotomous measures (yes/no) for
7 intentions to quit (want to quit, 'should quit', intends to quit) and has shown
8 good level of prediction for quitting.[6441] Intentions to quit and intentions to
9 seek help (Likert scale) are also adapted from Wong & Cappella.[4424]
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14 Risk assessment scales

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20 The Risk Behaviour Diagnosis Scale consists of a series of questions (Likert
21 scales) on four aspects: severity of threat, susceptibility to threat, response
22 efficacy and self-efficacy.[4020]
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28 As a measure of fear control responses participants will be asked to respond to
29 four questions about reactance, avoidance and message derogation on a Likert
30 scale.[4020] Similarly for danger control responses an aggregate score of the five
31 questions on intentions to change smoking behaviour/seek help will be
32 calculated.[4424] Because of the evidence pointing to strong protective attitudes
33 in the target population, five questions on a Likert scale will be asked to
34 determine protective responses about smoking in pregnancy, around children,
35 and for Aboriginal and Torres Strait Islander peoples in general. A protection
36 score will be calculated from these responses.
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48 The Risk Acceptance Ladder is a new measure currently being used in Italy to
49 research a population with high rates of smoking (Cattaruzza & West, 2014, in
50 preparation). The measure has been adapted to the Aboriginal and Torres Strait
51 Islander population, as below.
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Consultative process, face validity and questionnaire adaption

In the formative phase of the research, before ethics approvals were finalised, several community consultation processes were conducted. The aim was to ~~at~~ test the content and face validity, suitability, readability, cultural appropriateness, acceptability and feasibility of the survey instrument. Consultation was through a focus group with Aboriginal and/or Torres Strait Islander people in the target age group, and an Aboriginal elder, recruited from ~~an local~~ Aboriginal Studies class at a local tertiary college and two Aboriginal Indigenous student liaison staff from the University campus (N=7). Several consultative interviews were also held with a senior ~~Aboriginal Health Worker~~ (AHW) specialising in tobacco. Expert input was obtained for the scales from their respective inventors, to informally assess if they maintained integrity once adapted, rather than assess their cultural suitability for this population (Witte, and Cattaruzza and West).

The RBD scales were adapted to tobacco-related risks from the templates in Witte's manual (see Appendix 1).[41] The community consultation group and AHW requested changes to several questions and suggested additional questions about reason for smoking initiation. Minor rewording was suggested for sSome of the RBD core statements ~~were reworded~~ to make them more comprehensible to this population easier to understand. Additionally several sensitive questions about socioeconomic status and pregnancy were reworded.

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6 The RAL was adapted for the Aboriginal and Torres Strait Islander populations,
7
8 and was renamed the SRAT as follows:
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10 (a) It was deemed more culturally appropriate to depict the measure as a target
11
12 with concentric circles (progressing from the outside to the centre) instead of a
13
14 ladder, for the Aboriginal and Torres Strait Islander population.
15

16 (b) The potential responses of the SRAT were reworded to become more
17
18 appropriate for the target population, and two additional responses included
19
20 [\(see Appendix 1\)](#).
21
22

23 Changes were approved by the HRECs.
24
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29 ANALYSIS

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31
32 Table 3 outlines variables that will be measured.
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35 Table 3: Variables from questionnaire
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Demographics

- Age
- Gender (Male/Female)
- Aboriginal and Torres Strait Islander status (Aboriginal/Torres Strait Islander/both)
- SES (calculated from postcode, suburb, income source, health care card use, education) – for details contact authors
- Environmental variables
 - a. Number of smokers in household (1/2-3/>3)
 - b. Pregnant women in the house (Y/N)
 - c. Children in the house (Y/N)
 - d. Complete, partial or no bans for household smoking
 - e. Smoke free behaviours of participants (house and car)

Smoking behaviour variables

- Nicotine dependence scores (Heaviness of Smoking Index and SUTS)
- Age of smoking initiation and uptake
- Factors influencing smoking initiation (11 response options)
- Patterns of smoking (frequency and type)
- Smoking by others in social circle (Y/N)
- Current/previous quit attempts (Y/N)
- Current/previous use of cessation therapies (Y/N)
- Level of support for quitting (social and professional) (sliding scales 0-10)

Smoking risk related attitudes

- RBD scale resulting a composite score (discriminating value, recoded positive or negative)
- Threat score (three items for susceptibility plus three for severity of threat on Likert scales of 1-5)
- Efficacy score (three items for response efficacy plus three for self-efficacy on Likert scales of 1-5)
- RBD results recoded into four quadrants of high efficacy/high threat; high efficacy/low threat; low efficacy/high threat; low efficacy/low threat;
- Fear control responses score (calculated from questions on avoidance, denial, and refuting messages, Likert scales 1-5)
- Danger control responses score (calculated from questions on intentions to quit or seek help, Likert scales 1-5)
- Protective responses score (calculated from questions on attitudes about protecting babies/children, Likert scales 1-5)
- General attitudes about smoking and quitting (13 response options)
- SRAT (choice of 1 option from 12, will be reduced to 4 categories)

Behavioural intentions

- Intentions to quit (MTSS) (want/do not want) - if affirmative then how soon intends to quit (3month/1 month/hope to soon/don't know)
- Intentions to quit or reduce smoking (Wong & Capella) (Likert scales 1-4)
- Intentions to seek help with quitting (Wong & Capella) (Likert scales 1-4)

Legend: Y – yes; N – no; SUTS – strength of urges to smoke; RBD – risk behaviour

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6 diagnosis; SRAT – smoking risk assessment target; MTSS – motivation to stop
7
8 smoking scale
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10 11 12 13 14 **Statistical analyses** 15

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17 On study completion, the data entered through the survey software will be used
18
19 to generate a summary report and exported directly to SPSS v 20 for analysis.
20

21 Descriptive analyses will summarise the data for all variables.
22

23
24 To measure the reliability and validity of the scales the following will be used.
25

- 26
27 1. Content validity and face validity is qualitatively assessed through the
28
29 community panel and expert consultation for RBD and SRAT
30
- 31 2. The patterns of correlation will be explored between the RBD subscale
32
33 scores (susceptibility and severity of threat, and response and self-
34
35 efficacy) and also for danger control responses, fear control responses
36
37 and protective responses
38
- 39 3. Internal consistency of sub-scales will be assessed with Cronbach's α .
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43 Multivariate analyses will seek the most likely demographic predictors of
44
45 intentions to quit smoking/seek help for quitting, e.g. age, gender, dependence
46
47 levels, household smoking rules. Psychological factors such as threat and efficacy
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49 scores, danger and fear control responses will be analysed to assess whether
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51 they further influence the outcome measures.
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6 RBD scores and the SRAT will be examined to see if participant responses are
7
8 correlated.

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11 Qualitative and open-ended responses will undergo a general inductive thematic
12 analyses, [65] by two researchers independently. A cut and paste technique will
13 be used for initial coding using Excel spread sheets, and consensus reached by
14 discussion. The themes and will be used to enrich the quantitative findings.
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20 21 22 23 **ETHICS AND DISSEMINATION**

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25
26 The study is low risk in terms of ethics, however, discussing smoking may be
27 considered a sensitive issue for Aboriginal and Torres Strait Islander
28 participants, and researchers collecting the data will be suitably briefed. The
29
30 research will adhere to Australia's National Health and Medical Research
31
32 Council's Values and Ethics in Aboriginal and Torres Strait Islander Health
33
34 Research 2003 guidelines, i.e. reciprocity, respect, equality, responsibility,
35
36 survival and protection, spirit and integrity. [6642] Examples of reciprocity
37 include the first author sharing her knowledge and skill base (as a GP and
38 Tobacco Treatment Specialist) about tobacco control and research with the
39 participating organisations and their staff members. The participants also would
40 be offered brief advice on smoking cessation if they wished after the interview,
41 and extra resources such as a culturally adapted DVD. The primary HREC is the
42
43 Aboriginal Health & Medical Research Council Ethics Committee (AH&MRC),
44
45 which approved the study with support from the partnering ACCHS (approval
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6 number 928). Additional HRECs ratified the primary approval (James Cook
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8 University (H4467) and Southern Cross University (ECN-13-242).
9

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11
12 Participants will be approached at community events that are targeted to the
13
14 local Australian Aboriginal and Torres Strait Islander communities. Potential
15
16 recruits will be asked if they fulfil the selection criteria and canvassed about
17
18 their willingness to join in the study. All participants will be provided with a
19
20 participant information sheet advising of the purpose of the study and
21
22 implications regarding:
23

- 24 • Objectives of the research
- 25
- 26 • Why the information is being collected and how it will be used, accessed
27
28 and stored
- 29
- 30 • Voluntary nature of the study, provision for withdrawal of consent,
31
32 assurance of confidentiality and anonymity
33
34
35

36
37 After the information sheet is explained, the participant will be asked to provide
38
39 informed consent by having their name typed on the touch screen of the tablet
40
41 computer and ticking the 'agree' box. All data will be de-identified and data and
42
43 materials will be stored for seven years, in a secure location, and where digitally
44
45 stored will be password-protected and only accessed by the researchers.
46
47

48
49 This study is one of several studies contributing to a PhD Public Health thesis for
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51 the first author. Journal articles and presentations at relevant national and
52
53 international conferences to academics, researchers and stakeholders will
54
55 disseminate these findings. The outcomes of the study will also inform policy and
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6 practice recommendations. A community report will be sent to the partnering
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8 ACCHS for dissemination to clients at the service and to the communities who
9
10 have been involved. Community-based forums will be held as appropriate.
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13

14 15 16 **DISCUSSION**

17
18 This study aims to determine how Australian Aboriginal and Torres Strait
19
20 Islander smokers of childbearing age assess risks about tobacco smoking and
21
22 how these assessments are associated with their intentions to quit smoking. We
23
24 aim to validate two risk assessment scales for Aboriginal and Torres Strait
25
26 Islander smokers, which could have the potential for research transference to a
27
28 clinical or public health setting.
29
30

31
32 The RBD scale was originally designed as a clinical tool to be used in the context
33
34 of delivering tailored health messages at a clinic for sexually transmitted
35
36 diseases and HIV testing.^[40-29] Advice was then adapted to individuals
37
38 according to their responses.
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40

41
42 Primary health care practitioners and clinicians are often faced with the task of
43
44 assisting Aboriginal and Torres Strait Islander smokers to quit smoking. Anti-
45
46 tobacco messages do not just lie in the domain of social marketing; they also
47
48 need to be carefully pitched to maximise receptivity and support behaviour
49
50 change within the clinical consultation. Little is known about the effectiveness of
51
52 smoking behaviour change models for Aboriginal and Torres Strait Islander
53
54 peoples. The trans-theoretical model (stages of change or SOC) has been widely
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6 used in Australia for Aboriginal and Torres Strait Islander smokers, but
7
8 outcomes have never been evaluated.[6743] Aboriginal smokers in remote areas
9
10 have been described as more likely to be in the pre-contemplative or
11
12 contemplative stages of change and require more assistance to be ready to quit
13
14 smoking.[6844] Also it is known that ~~interventions-motivational interviewing,~~
15
16 ~~including that~~ based on the SOC, ~~isare~~ not ~~as~~ effective in pregnancy ~~as in the~~
17
18 ~~general population,[6925] and holds no special advantages over other types of~~
19
20 ~~psychosocial counselling.[7045]~~
21
22

23 If the measures under examination here are found to be reliable for the target
24
25 audience of Aboriginal and Torres Strait Islander smokers of childbearing age,
26
27 then accurate assessments could be made. A new model based on assessment of
28
29 risk behaviour could have the potential to assess fear versus danger control
30
31 responses and facilitate the pitching of tailored anti-tobacco messages for the
32
33 individual, build motivational tension for quitting, and yet avoid engendering
34
35 fear control responses or resistance.
36
37

38 If people are engaged in fear control processes, messages developed should focus
39
40 on the efficacy of the recommended response to counteract the high levels of
41
42 perceived threat. Focusing on threat messages alone may cause the messages to
43
44 backfire. It is important to emphasise that the recommended responses are
45
46 feasible and effective to avert the threat from smoking. It is essential to help
47
48 people develop a belief in their ability to quit smoking, develop supportive
49
50 environments for quitting, and provide easy access to treatment.
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6 Central to building self-efficacy are strategies recommended by Bandura.^[4222]

7
8 He suggests several approaches: building skills, self-control and mastery for
9
10 quitting; learning about the experiences of others who have successfully quit;
11
12 verbal persuasion and motivation; helping people adopt a positive mindset; and
13
14 importantly having access to effective therapies.^[4222]

15
16
17 Alternatively, if the target audience is in danger control, messages can remind
18
19 people about the threat of smoking to maintain motivation, whilst also
20
21 increasing efficacy for quitting, as above.
22

23
24 People with low threat perceptions may be neither in danger or fear control.
25
26 They may need to be convinced about the seriousness of or their susceptibility to
27
28 the threat. This group requires messages aimed at improving knowledge and
29
30 correcting any misconceptions. This may be best achieved by having messages
31
32 come from someone who is very similar to the client (possibly through use of
33
34 tailored videos or personalised narratives).
35

36
37 The SRAT may prove a simplified way to approach risk assessment in this target
38
39 group, as it demands a single response to a question. The measures require
40
41 validation for Aboriginal and Torres Strait Islander smokers in this child-rearing
42
43 age bracket, prior to a more formal assessment of feasibility and effectiveness in
44
45 a clinical setting.
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47
48 Previous research has demonstrated the strong social and environmental
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50 influences on smoking cessation, and the role health professionals play in
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52 supporting smoking cessation in Aboriginal and Torres Strait Islander
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54 communities.^[71] The study will also assess predictors of intentions to quit that
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6 include measures of socio-economic position, smoking by friends, and household
7 members, support offered by family and health professionals, and a range of
8 other factors. These measures have the potential to determine social and health
9 profession influences on intentions to quit smoking in this population. The
10 analysis will determine if once these factors are controlled for whether the
11 responses to the risk assessment measures have any additional impact.
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20 21 22 **Limitations and Strengths** 23

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25 The study will be based on a sample from one regional area of NSW, fostering
26 ownership of the project results for the local partnering ACCHS. Australian
27 Aboriginal groups are diverse and this study will be conducted in just one region.
28
29 It is unknown how many Torres Strait Islanders reside in the area and how
30 many will chose to participate in the study. As the validity and reliability
31 measures to be used are context specific, they should be considered provisional,
32 pending a larger study. These limitations impact on generalisability and
33 transferability of the findings, although this is a pragmatic constraint for all
34 research in diverse Indigenous groups. Selection bias may be operant if only
35 those more willing to talk about their smoking agreeing to participate, another
36 inevitable challenge for this kind of research. Recruiting some participants
37 through a health service may favour those already with health problems, and
38 who may already have motivation to quit smoking. There could be information
39 biases: smoking status will be based on self-report and not any objective
40 measures; recall bias may be operant with asking people to recollect their
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6 smoking history and perceived level of support for quitting; and social
7 desirability bias with people reporting what they think the researcher wants to
8 hear.
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12
13 On the other hand, this is the first study as far as we know to validate risk
14 assessment measures for tobacco smoking in a population of Aboriginal and
15 Torres Strait Islander smokers. Health education and behaviour studies are
16 tested for validity and reliability inconsistently,[7246] and very few scales are
17 validated for the Aboriginal and Torres Strait Islander population.[7347] So the
18 study is needed and an important one, although small and specific to one region.
19
20 The study takes a unique approach to smoking in Aboriginal and Torres Strait
21 Islander peoples of childbearing age by drawing on both well-established and
22 new measures from the health communication and addiction fields. If these
23 measures prove to be valid and reliable they have a high potential for research
24 translation into clinical settings. The outcomes could further inform the
25 development and refining of social marketing policies and strategies for anti-
26 tobacco messages through all media.
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43 **AUTHOR CONTRIBUTIONS**

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46 GSG is responsible for the concept and design of the project, developing and
47 adapting the survey instruments and digital format, testing the suitability of the
48 survey for Indigenous participants, conducting surveys, training and supervising
49 Indigenous research assistants to conduct surveys, collating and analysing and
50 interpreting results, writing reports and manuscripts.
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6 KW contributed to the research design and statistical analysis and critical review
7
8 of manuscripts. AM advises on any aspect relating to tobacco smoking, smoking
9
10 risk behaviours and the survey, and critical review of manuscripts. YCJ as
11
12 Aboriginal academic advisor advises on the Indigenous community consultation
13
14 processes, recruitment and the cultural interpretation of results. ARC oversees
15
16 the study and advises on all aspects, and provides critical review of manuscripts.
17
18
19
20
21

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24
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26
27 researcher:
28
29

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31 Foundation (Australia) post-graduate scholarship for Indigenous health
32 research - APP1039759 and PP 11S 6181
33
34
- 35 • Royal Australian College of General Practitioners and Australian Primary
36 Health Care Research Institute Indigenous Health Award 2013
37
38
- 39 • James Cook University, Faculty of Medicine, Health & Molecular Sciences,
40 Graduate Research Scheme grant 2013
41
42

43
44
45 [ARC holds a National Health and Medical Research Council Career Development](#)
46
47 [Award \(APP1046773\)](#)
48
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9
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Appendix 1: Risk Behaviour Diagnosis Scale (RBD) and Smoking Risk Assessment Target (SRAT)

Readability formulas indicate the Flesch-Kincaid Grade Level for the whole survey, the RBD and SRAT are grade 5, and the SMOG index is grade 4. The estimated reading age is aged 8-10 years, and considered 'easy to read'.

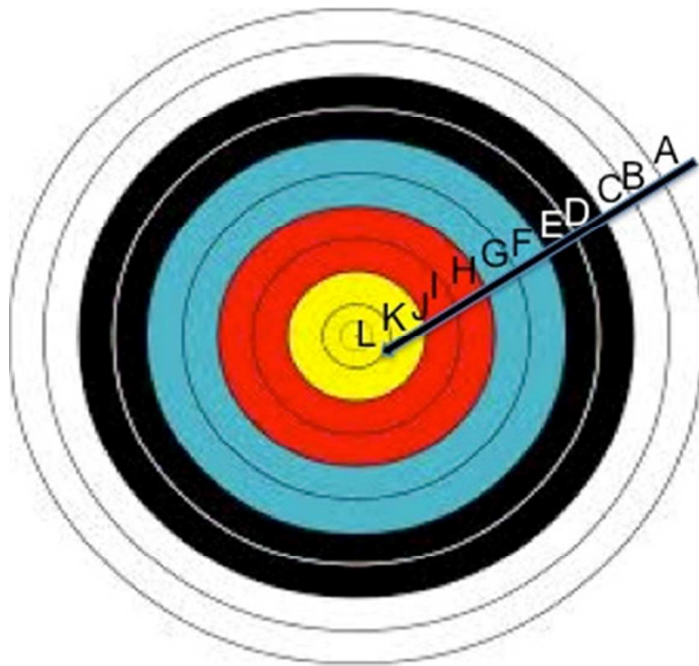
Risk Behaviour Diagnosis Scale

Participants are asked to indicate which response applies best to them depending how strongly they agree or disagree with the statements. (The statements were mixed-up and embedded in a section with others assessing beliefs on fear control responses and protective responses).

| | <i>Strongly Agree</i> | <i>Agree</i> | <i>Neither/ Not sure</i> | <i>Disagree</i> | <i>Strongly Disagree</i> |
|---|-----------------------|--------------|--------------------------|-----------------|--------------------------|
| <i>Response Efficacy</i> | | | | | |
| Stopping smoking prevents serious sickness or disease (such as heart or lung disease or cancer) | 5 | 4 | 3 | 2 | 1 |
| Giving up smoking helps avoid serious sickness or disease | 5 | 4 | 3 | 2 | 1 |
| If I stop smoking I am less likely to get a serious sickness or disease | 5 | 4 | 3 | 2 | 1 |
| <i>Self-efficacy</i> | | | | | |
| I am confident I can stop smoking | 5 | 4 | 3 | 2 | 1 |
| I am able to stop smoking | 5 | 4 | 3 | 2 | 1 |
| It is easy to stop smoking | 5 | 4 | 3 | 2 | 1 |
| <i>Susceptibility to threat</i> | | | | | |
| It is likely that I will get ill from smoking | 5 | 4 | 3 | 2 | 1 |
| Smoking could possibly affect my health | 5 | 4 | 3 | 2 | 1 |
| I believe I am seriously at risk of getting ill from smoking | 5 | 4 | 3 | 2 | 1 |
| <i>Severity of threat</i> | | | | | |
| Smoking is harmful to health | 5 | 4 | 3 | 2 | 1 |
| Smoking can severely affect health | 5 | 4 | 3 | 2 | 1 |
| The health effects of smoking are of serious concern | 5 | 4 | 3 | 2 | 1 |

Smoking Risk Assessment Target (SRAT) – adapted from the Risk Acceptance Ladder (with permission from Cattaruzza and West)

Participants are asked to indicate which **one** of the following statements is closest to their position when it comes to smoking. This is explained by the interviewer as a big target with question A on the outside ring (see picture below). 'As you move through the rings you get closer to the target of quitting (response A is on the outer ring and as you move further down the list you get closer to the centre. Response L is near the 'bulls-eye'). Your response to this question helps us understand the phases on the journey to quitting and where you personally may be up to.'



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- A. I have never heard that smoking can be harmful
 - B. I have heard that smoking can be harmful, but its too scary to think about
 - C. I have heard that smoking can be harmful, but I think the risk is exaggerated
 - D. I accept that smoking can be harmful, but I do not think it will be for me
 - E. I accept that smoking could be harmful for me, but I do not care *very much*
 - F. I care that I could be harmed by smoking, but I think the risk is worth it
 - G. I do not think the risk of smoking is worth it, but there is no point in trying to stop because the damage has been done
 - H. I do not think the risk of smoking is worth it, but I do not think I can stop
 - I. I accept that smoking can be harmful, and the danger is part of the attraction
 - J. I accept that smoking can be harmful, but I would feel shame if I failed at quitting
 - K. I care about the risks of smoking and plan to try to stop, but it is not a priority at the moment
 - L. I care about the risks of smoking, and definitely intend to try to stop soon

NB: Items B and J were additions to the original Risk Acceptance Ladder

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