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.

Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2014-004887
Article Type:	Protocol
Date Submitted by the Author:	19-Jan-2014
Complete List of Authors:	Gould, Gillian; James Cook University, School of Public Health, Tropical Medicine and Rehabilitation Sciences; Southern Cross University, School of Health and Human Sciences Watt, Kerrianne; James Cook University, School of Public Health, Tropical Medicine and Rehabilitation Sciences McEwen, Andy; University College London, Cancer Research UK Health Behaviour Unit Cadet-James, Yvonne; James Cook University, School of Indigenous Australian Studies Clough, Alan; James Cook University, School of Public Health, Tropical Medicine and Rehabilitation Sciences
Primary Subject Heading:	Smoking and tobacco
Secondary Subject Heading:	Public health, Addiction, Research methods
Keywords:	Substance misuse < PSYCHIATRY, PREVENTIVE MEDICINE, PUBLIC HEALTH

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Title Page

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Running Head: Risk assessment for smoking with Indigenous Australians

Key words: tobacco use, smoking, Australian Aborigines, risk behaviours, health attitudes

Word Count: 3883

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

Ethics and dissemination

The Aboriginal Health & Medical Research Council and ethics committees at James Cook and Southern Cross Universities approved the study. The results will be published in a peer-reviewed journal and a community report will be disseminated by the ACCHS, and at community forums.

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

and Torres Strait Islander women are quadruple (49.3%) those of pregnant women in the general population (12.1%).[6]

Aboriginal and Torres Strait Islander peoples have a long history of tobacco use.[7] It is believed that the effects of colonisation,[7] the stolen generation,[8] and racism,[9] have all contributed to the contemporary use of tobacco, to the detriment of the health and longevity of Aboriginal and Torres Strait Islander peoples, and their future generations. Factors promoting smoking and smoking initiation in Aboriginal and Torres Strait Islander peoples include community and family norms of smoking,[10] smoking to promote social inclusiveness and cohesion,[11] peer group belonging,[12] and daily stressors.[10]

There is limited knowledge about Indigenous attitudes to the risks of smoking. There has been some exploration about what anti-smoking messages are effective and acceptable for Aboriginal and Torres Strait Islander populations,[13] as media messages or as adjuncts to clinical treatment.[14] However, attitudes to prevailing health risk messages about smoking have been particularly under-researched for Aboriginal and Torres Strait Islander maternal smokers and those of childbearing age. A systematic review of knowledge, attitudes and experiences of maternal smoking by Aboriginal and Torres Strait Islander peoples revealed a lack of salience of media messages and potentially some resistance to advice.[10] Equally pregnant women have highly protective attitudes towards babies and children.[10] A recent study of attitudes of maternal Aboriginal smokers and their family members suggested that attitudes about the health risks of smoking may be influenced by messages not matching the women's lived experiences, coupled with inadequate access to

information.[15] Limited knowledge about hazards of smoking and cessation,[16] and the lack of salience of anti-smoking messages are barriers to effective cessation.[10] If attitudes to risk taking behaviour for smoking and responses to anti-tobacco messages are not understood it is difficult to formulate effective messages and interventions. There are no best practice guidelines to develop and personalise such messages for Aboriginal and Torres Strait Islander peoples.[14, 17-18]

Our study therefore aims to determine how 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 or seeking help to quit. We further aim to determine which demographic and behavioural factors (such as age, gender, nicotine dependence level, household smoking rules) are predictors of intentions to quit and seek help for quitting. Two risk assessment scales for smoking will be examined for their cultural acceptability, validity and reliability, and their utility as a pragmatic heuristic.

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.[19]

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.) According to the EPPM "when people perceive a serious and relevant threat, they become scared",[20] (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 that that the level of perceived efficacy determines whether people engage in danger control or fear control responses.[20]

Witte devised and validated a scale called the Risk Behaviour Diagnosis (RBD) scale to measure these responses across four dimensions of perceived threat (perceived susceptibility and severity of threat) and perceived efficacy (response efficacy and self-efficacy).[20] High threat responses coupled with high efficacy tend to lead to danger control responses, in this case to adopt message recommendations, change attitudes, intentions and smoking behaviour. In contrast, if people feel they can not adopt the recommended response to avert the treat, because of a lack of efficacy (it's too hard, too little support, or it is perceived as futile to do so), they typically try to control the fear by avoiding the issue, discount the message, or may consider the issue is exaggerated.

If fear control processes are initiated, it can be difficult to shift attitudes and there is a need for carefully constructed messages to "break through defence

mechanisms".[21] Therefore according to this theory people who are in fear control will need assistance to build up efficacy rather than make them more fearful. Bandura's work on self-efficacy confirms this and he considers self-efficacy is central to any healthy behaviour change.[22]

The EPPM model is a predominant message design theory,[23] and has been widely applied to a range of health behaviours internationally and a wide range of health promotional campaigns, and is the basis of tobacco counter-marketing.[19] A study by Wong and Cappella has used the RBD to measure responses to video-based anti-tobacco television advertisements.[24] Assessment scales for risk behaviour, including the RBD, have been used in several minority groups and across cultures.[25-33] However risk assessment scales for tobacco and the EPPM have not been used or validated for Australian Aboriginal or Torres Strait Islander or other Indigenous populations.

Another theory informing this study is PRIME theory (P-plans; R-responses; I-impulses; M-motives; E-evaluations), which proposes that smokers' motivations are fluid, and can change unexpectedly.[34] The central tenets of PRIME theory include people's wants and needs in the moment, and their self-identity.[34] West suggests that a person can be stimulated to make a quit attempt, even if they have not been thinking about quitting, especially if the intervention is repeated and evidence-based therapy offered.[35] A new measure based on PRIME theory, called the Risk Acceptance Ladder (RAL),[36] (Cattaruzza & West, 2014, in preparation) proposes that the blocks to effective behaviour change can be ascertained by determining the individual level of risk acceptance and at what stage motivation has stalled. For this study the RAL is modified into the Smoking

Risk Assessment Target (SRAT) (see methods). If this measure correlates well with message processing it may be also useful to assess Aboriginal and Torres Strait Islander smokers.

Table 1: Key constructs, definitions and measures (adapted from Witte et al, 1996)

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

Self-efficacy: belief in one's ability to perform recommended response *Response efficacy:* belief about effectiveness of recommended response to avert the threat	Sub-total of self-efficacy scores Sub-total of response efficacy scores
Danger control dominance: 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
Danger control responses (protective motivation): 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
Fear control dominance: 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
Fear control responses (defensive motivation): coping responses that diminish fear	Score from questions about defensive avoidance, denial, reactance, message derogation and perceived manipulation

Critical point: 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
Discriminating value: a numerical value used to discriminate between people in danger vs. fear control	Formula: $(\Sigma\ perceived\ efficacy) - (\Sigma\ perceived\ threat) = discriminating\ value$ A positive score indicates danger control processes; a negative score indicates fear control processes
Protective responses: 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;

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 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?
5. What are the associations between the RBD and SRAT?

Study Population

Participant recruitment and setting

The study site is a regional centre in NSW. Recruitment into the study will be by personal intercept, primarily at regional community and social events, and in other settings likely to yield interest, including a local Aboriginal Community Controlled Health Service (ACCHS). The survey will be administered by face-to-face interview, using where possible a tablet computer, connected by cellular network to a secure on-line survey site. Where connectivity is unreliable a paper survey will be used and data submitted on-line later. The interviewers will be

either the first author (non-Indigenous female) or Indigenous research assistants, or ACCHS staff.

Inclusion criteria are Aboriginal and/or Torres Strait Islander people, aged 18-45 years old who currently smoke. Participants will be offered a $10 shopping voucher for their time.

Sample size calculation

The estimated sample size is 120 participants. Sample size estimations are based on the procedure described by Altman.[37] Standardised differences for intention to quit smoking and intention to seek help to quit smoking are calculated using means and standard deviations published by Wong and Capella.[24] A total sample size of 110 is required to detect a significant difference between people in 'danger control' versus people in 'fear control' (according to the RDB scale) and intentions to quit smoking, at alpha<.05, and 90% power. However for the multivariate analysis 120 participants is required to adequately estimate the effect of 6 key variables (20 per variable).

Sampling Stratification

Random sampling will not be feasible. To ensure that the convenience sample is as representative of the target group as possible, the sample will be stratified by age group and gender. Data from the 2011 Australian Census determines the population parameters for persons identified as Aboriginal and/or Torres Strait

Islander, by age group and gender in the regional city. The proportion of smokers 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).[38]

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 *N*	Female *N*	Male *%*	Female *%*	Male *N(% of total)*	Female *N(% of total)*	Male *N*	Female *N*

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

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

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).[39]

Strength of Urges to Smoke (SUTS) is another measure of dependence found to be more reliable for predicting cessation than the HSI.[39] It is a routine part of the "Smoking in England" survey, administered to over 10,000 smokers per annum.[40] 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.[41] Intentions to quit and intentions to seek help (Likert scale) are also adapted from Wong & Cappella.[24]

Risk assessment scales

The Risk Behaviour Diagnosis Scale consists of a series of questions (Likert scales) on fours aspects: severity of threat, susceptibility to threat, response efficacy and self-efficacy.[20]

As a measure of fear control responses participants will be asked to respond to four questions about reactance, avoidance and message derogation on a Likert scale.[20] Similarly for danger control responses an aggregate score of the five questions on intentions to change smoking behaviour/seek help will be calculated.[24] Because of the evidence pointing to strong protective attitudes in the target population, five questions on a Likert scale will be asked to determine protective responses about smoking in pregnancy, around children, and for Aboriginal and Torres Strait Islander peoples in general. A protection score will be calculated from these responses.

The Risk Acceptance Ladder is a new measure currently being used in Italy to research a population with high rates of smoking (Cattaruzza & West, 2014, in preparation). The measure has been adapted to the Aboriginal and Torres Strait Islander population, as below.

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 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.

(b) The potential responses of the SRAT were reworded to become more appropriate for the target population, and two additional responses included.

Changes were approved by the HRECs.

ANALYSIS

Table 3 outlines variables that will be measured.

Table 3: Variables from questionnaire

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

diagnosis; SRAT – smoking risk assessment target; MTSS – motivation to stop smoking scale

Statistical analyses

On study completion, the data entered through the survey software will be used to generate a summary report and exported directly to SPSS v 20 for analysis. Descriptive analyses will summarise the data for all variables.

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

1. Content validity and face validity is qualitatively assessed through the community panel and expert consultation for RBD and SRAT
2. The patterns of correlation will be explored between the RBD subscale scores (susceptibility and severity of threat, and response and self-efficacy) and also for danger control responses, fear control responses and protective responses
3. Internal consistency of sub-scales will be assessed with Cronbach's α.

Multivariate analyses will seek the most likely demographic predictors of intentions to quit smoking/seek help for quitting, e.g. age, gender, dependence levels, household smoking rules. Psychological factors such as threat and efficacy scores, danger and fear control responses will be analysed to assess whether they further influence the outcome measures.

RBD scores and the SRAT will be examined to see if participant responses are correlated.

Qualitative and open-ended responses will undergo thematic analyses, and will be used to enrich the quantitative findings.

ETHICS AND DISSEMINATION

The study is low risk. The research will adhere to Australia's National Health and Medical Research Council's Values and Ethics in Aboriginal and Torres Strait Islander Health Research 2003 guidelines, i.e. reciprocity, respect, equality, responsibility, survival and protection, spirit and integrity.[42] The primary HREC is the Aboriginal Health & Medical Research Council (AH&MRC), which approved the study with support from the partnering ACCHS (approval number 928). Additional HRECs ratified the primary approval (James Cook University (H4467) and Southern Cross University (ECN-13-242).

Participants will be approached at community events that are targeted to the local Australian Aboriginal and Torres Strait Islander communities. Potential recruits will be asked if they fulfil the selection criteria and canvassed about their willingness to join in the study. All participants will be provided with a participant information sheet advising of the purpose of the study and implications regarding:

- Objectives of the research
- Why the information is being collected and how it will be used, accessed and stored

- 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

Islander smokers, which could have the potential for research transference to a clinical or public health setting.

The RBD scale was originally designed as a clinical tool to be used in the context of delivering tailored health messages at a clinic for sexually transmitted diseases and HIV testing.[20] Advice was then adapted to individuals according to their responses.

Primary health care practitioners and clinicians are often faced with the task of assisting Aboriginal and Torres Strait Islander smokers to quit smoking. Anti-tobacco messages do not just lie in the domain of social marketing: they also need to be carefully pitched to maximise receptivity and support behaviour change within the clinical consultation. Little is known about the effectiveness of smoking behaviour change models for Aboriginal and Torres Strait Islander peoples. The trans-theoretical model (stages of change or SOC) has been widely used in Australia for Aboriginal and Torres Strait Islander smokers, but outcomes have never been evaluated.[43] Aboriginal smokers in remote areas have been described as more likely to be in the pre-contemplative or contemplative stages of change and require more assistance to be ready to quit smoking.[44] Also it is known that interventions based on the SOC are not effective in pregnancy.[45]

If the measures under examination here are found to be reliable for the target audience of Aboriginal and Torres Strait Islander smokers of childbearing age, then accurate assessments could be made. A new model based on assessment of risk behaviour could have the potential to assess fear versus danger control

responses and facilitate the pitching of tailored anti-tobacco messages for the individual, build motivational tension for quitting, and yet avoid engendering fear control responses or resistance.

If people are engaged in fear control processes, messages developed should focus on the efficacy of the recommended response to counteract the high levels of perceived threat. Focusing on threat messages alone may cause the messages to backfire. It is important to emphasise that the recommended responses are feasible and effective to avert the threat from smoking. It is essential to help people develop a belief in their ability to quit smoking, develop supportive environments for quitting, and provide easy access to treatment.

Central to building self-efficacy are strategies recommended by Bandura.[22] He suggests several approaches: building skills, self-control and mastery for quitting; learning about the experiences of others who have successfully quit; verbal persuasion and motivation; helping people adopt a positive mindset; and importantly having access to effective therapies.[22]

Alternatively, if the target audience is in danger control, messages can remind people about the threat of smoking to maintain motivation, whilst also increasing efficacy for quitting, as above.

People with low threat perceptions may be neither in danger or fear control. They may need to be convinced about the seriousness of or their susceptibility to the threat. This group requires messages aimed at improving knowledge and correcting any misconceptions. This may be best achieved by having messages

come from someone who is very similar to the client (possibly through use of tailored videos or personalised narratives).

The SRAT may prove a simplified way to approach risk assessment in this target group, as it demands a single response to a question. The measures require validation for Aboriginal and Torres Strait Islander smokers in this child-rearing age bracket, prior to a more formal assessment of feasibility and effectiveness in a clinical setting.

Limitations and Strengths

The study will be based on a sample from one regional area of NSW, fostering ownership of the project results for the local partnering ACCHS. Australian Aboriginal groups are diverse and this study will be conducted in just one region. It is unknown how many Torres Strait Islanders reside in the area and how many will chose to participate in the study, These limitations impact on generalizability and transferability of the findings, although this is a pragmatic constraint for all research in diverse Indigenous groups. Selection bias may be operant if only those more willing to talk about their smoking agreeing to participate, another inevitable challenge for this kind of research. Recruiting some participants through a health service may favour those already with health problems, and who may already have motivation to quit smoking. There could be information biases: smoking status will be based on self-report and not any objective measures; recall bias may be operant with asking people to recollect their smoking history and perceived level of support for quitting; and social

desirability bias with people reporting what they think the researcher wants to hear.

On the other hand, this is the first study as far as we know to validate risk assessment measures for tobacco smoking in a population of Aboriginal and Torres Strait Islander smokers. Health education and behaviour studies are tested for validity and reliability inconsistently,[46] and very few scales are validated for the Aboriginal and Torres Strait Islander population.[47] So the study is needed and an important one, although small and specific to one region. The study takes a unique approach to smoking in Aboriginal and Torres Strait Islander peoples of childbearing age by drawing on both well-established and new measures from the health communication and addiction fields. If these measures prove to be valid and reliable they have a high potential for research translation into clinical settings. The outcomes could further inform the development and refining of social marketing policies and strategies for anti-tobacco messages through all media.

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.

FUNDING

This study was funded by the following grants awarded to GSG as principal researcher:

- National Health and Medical Research Council (Australia) and National Heart Foundation (Australia) post-graduate scholarship for Indigenous health research - APP1039759 and PP 11S 6181
- Royal Australian College of General Practitioners and Australian Primary Health Care Research Institute Indigenous Health Award 2013
- James Cook University, Faculty of Medicine, Health & Molecular Sciences, Graduate Research Scheme grant 2013

ACKNOWLEDGEMENTS

We acknowledge the valuable input of the Aboriginal community panel and the support of the partnering ACCHS for this survey, without them the study would not be possible.

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BMJ Open

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

Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2014-004887.R1
Article Type:	Protocol
Date Submitted by the Author:	14-May-2014
Complete List of Authors:	Gould, Gillian; James Cook University, School of Public Health, Tropical Medicine and Rehabilitation Sciences; Southern Cross University, School of Health and Human Sciences Watt, Kerrianne; James Cook University, School of Public Health, Tropical Medicine and Rehabilitation Sciences McEwen, Andy; University College London, Cancer Research UK Health Behaviour Unit Cadet-James, Yvonne; James Cook University, School of Indigenous Australian Studies Clough, Alan; James Cook University, Australian Institute of Tropical Health and Medicine
Primary Subject Heading:	Smoking and tobacco
Secondary Subject Heading:	Public health, Addiction, Research methods
Keywords:	Substance misuse < PSYCHIATRY, PREVENTIVE MEDICINE, PUBLIC HEALTH

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Title Page

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Running Head: Risk assessment for smoking with Indigenous Australians

Key words: tobacco use, smoking, Australian Aborigines, Indigenous population, risk behaviours

Word Count: 4787

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

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

Ethics and dissemination

The Aboriginal Health & Medical Research Council Ethics Committee and university ethics committees approved the study. The results will be published in a peer-reviewed journal and a community report will be disseminated by the ACCHS, and at community forums.

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

- 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 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

of Aboriginal and Torres Strait Islander peoples, and their future generations. Factors promoting smoking and smoking initiation in Aboriginal and Torres Strait Islander peoples include community and family norms of smoking,[13] smoking to promote social inclusiveness and cohesion,[14] peer group belonging,[15] and daily stressors.[13]

Several studies have explored the knowledge levels of Aboriginal and Torres Strait Islander peoples about tobacco smoking,[16-18] with more limited exploration about Indigenous attitudes and beliefs about the risks of smoking. There has been some exploration about what anti-smoking messages are effective and acceptable for Aboriginal and Torres Strait Islander populations,[19] as media messages or as adjuncts to clinical treatment.[20] Mainstream antismoking campaigns have shown to be effective in terms of recall and perceived effectiveness by Indigenous peoples in Australia,[21-22] the U.S. [23] and NZ,[24] but have not necessarily translated into increased quit rates in these populations.[25] Aboriginal and Torres Strait Islander smokers in a forced exposure to several television advertisement rated those containing strong graphic imagery or personal narratives as effective for a range of measures including being more likely to quit.[19] Indigenous peoples in the US, Australia and New Zealand (NZ), have a preference for culturally targeted campaigns.[25] Aboriginal and Torres Strait Islander viewers aged 16-40 years of the 'Break The Chain' campaign in Australia positively rated the targeted advertisement, had good recall and 57% stated they intended to quit in the following month.[26] Where culturally targeted campaigns have been tested, alongside generic

campaigns, for example in NZ youth, they proved as effective at supporting Maori to quit smoking as generic messages were for the general NZ population.[27]

However, attitudes of Indigenous maternal smokers, to prevailing health risk messages about smoking, have been under-researched. A systematic review used meta-ethnography to synthesise the evidence on the knowledge, attitudes and experiences of maternal smoking by Aboriginal and Torres Strait Islander peoples,[13] from seven studies.[14, 28-33] The synthesis revealed a lack of salience of media messages and potentially some resistance to advice.[13] Equally pregnant women have highly protective attitudes towards babies and children.[13] A recent study of attitudes of maternal Aboriginal smokers and their family members suggested that attitudes about the health risks of smoking may be influenced by messages not matching the women's lived experiences, coupled with inadequate access to information.[34] Limited knowledge about the specific hazards of smoking and cessation,[35] and the lack of salience of anti-smoking messages are barriers to effective cessation.[13] However, a program using a culturally targeted smoking cessation video with pregnant Alaska Native smokers was no more efficacious than in the control group.[36] Issues less well understood are how Indigenous adults broadly assess their risks in relation to tobacco smoking (not just their knowledge of adverse health effects) and how these assessments are related to their intentions to quit smoking. If attitudes to risk taking behaviour for smoking and responses to anti-tobacco messages are not understood it is difficult to formulate effective messages and interventions. There are no best practice guidelines to develop and

personalise such messages for Aboriginal and Torres Strait Islander peoples.[18, 37-38]

Our study therefore aims to determine how 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 or seeking help to quit. We further aim to determine which demographic and behavioural factors (such as age, gender, nicotine dependence level, household smoking rules) are predictors of intentions to quit and seek help for quitting. Two risk assessment scales for smoking will be examined for their cultural acceptability, validity and reliability, and their utility as a pragmatic heuristic.

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]

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**
Perceived threat: awareness of a specific harm in the environment, consisting of:	Total of perceived threat scores
Susceptibility to threat: belief about one's risk of experiencing the threat	Sub-total of susceptibility scores
Severity of threat: belief about the magnitude of the threat	Sub-total of severity scores
Perceived efficacy: thoughts about ease, feasibility and the effectiveness of averting the threat, consisting of:	Total of perceived efficacy scores
Self-efficacy: belief in one's ability to perform recommended response	Sub-total of self-efficacy scores
Response efficacy: belief about effectiveness of recommended response to avert the threat	Sub-total of response efficacy scores
Danger control dominance: 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
Danger control responses (protective motivation): beliefs, attitudes, intentions, and behaviour changes in accordance with	Score from intentions to quit/seek help scales (Wong and Cappella) and responses to MTSS questions

the message recommendations	
Fear control dominance: 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
Fear control responses (defensive motivation): coping responses that diminish fear	Score from questions about defensive avoidance, denial, reactance, message derogation and perceived manipulation
Critical point: 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
Discriminating value: a numerical value used to discriminate between people in danger vs. fear control	Formula: $(\Sigma\ perceived\ efficacy) - (\Sigma\ perceived\ threat) = discriminating\ value$ A positive score indicates danger control processes; a negative score indicates fear control processes
Protective responses: 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",[40] (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 that that the level of perceived efficacy determines whether people engage in danger control or fear control responses.[40]

Witte devised and validated a scale called the Risk Behaviour Diagnosis (RBD) scale to measure these responses across four dimensions of perceived threat (perceived susceptibility and severity of threat) and perceived efficacy (response efficacy and self-efficacy).[40] High threat responses coupled with high efficacy tend to lead to danger control responses, in this case to adopt message recommendations, change attitudes, intentions and smoking behaviour. In contrast, if people feel they cannot adopt the recommended response to avert the treat, because of a lack of efficacy (it's too hard, too little support, or it is

perceived as futile to do so), they typically try to control the fear by avoiding the issue, discount the message, or may consider the issue is exaggerated.

If fear control processes are initiated, it can be difficult to shift attitudes and there is a need for carefully constructed messages to "break through defence mechanisms".[41] Therefore according to this theory people who are in fear control will need assistance to build up efficacy rather than make them more fearful. Bandura's work on self-efficacy confirms this and he considers self-efficacy is central to any healthy behaviour change.[42]

The EPPM model is a predominant message design theory,[43] and has been widely applied to a range of health behaviours internationally and a wide range of health promotional campaigns, and is the basis of tobacco counter-marketing.[37] A study by Wong and Cappella has used the RBD to measure responses to video-based anti-tobacco television advertisements.[44] Assessment scales for risk behaviour, including the RBD, have been used in several minority groups and across cultures.[45-53] However risk assessment scales for tobacco and the EPPM have not been used or validated for Australian Aboriginal or Torres Strait Islander or other Indigenous populations.

Another theory informing this study is PRIME theory (P-plans; R-responses; I-impulses; M-motives; E-evaluations), which proposes that smokers' motivations are fluid, and can change unexpectedly.[54] The central tenets of PRIME theory include people's wants and needs in the moment, and their self-identity.[54] West suggests that a person can be stimulated to make a quit attempt, even if they have not been thinking about quitting, especially if the intervention is

repeated and evidence-based therapy offered.[55] A new measure based on PRIME theory, called the Risk Acceptance Ladder (RAL),[56] (Cattaruzza & West, 2014, in preparation) proposes that the blocks to effective behaviour change can be ascertained by determining the individual level of risk acceptance and at what stage motivation has stalled. For this study the RAL is modified into the Smoking Risk Assessment Target (SRAT) (see methods). If this measure correlates well with message processing it may be also useful to assess Aboriginal and Torres Strait Islander smokers.

Rationale for assessing validity and reliability of the scales for Aboriginal and Torres Strait Islander smokers

Assessment scales, developed for Western populations, are important to validate before use in a cross-cultural context.[57] Theoretical concepts developed in the 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?
5. What are the associations between the RBD and SRAT?

Study Population

Participant recruitment and setting

The study site is a regional centre in NSW. Recruitment into the study will be by personal intercept, primarily at regional community and social events, and in other settings likely to yield interest, including a local Aboriginal Community Controlled Health Service (ACCHS). The survey will be administered by face-to-

face interview, using where possible a tablet computer, connected by cellular network to a secure on-line survey site. Where connectivity is unreliable a paper survey will be used and data submitted on-line later. The interviewers will be either the first author (non-Indigenous female) or Indigenous research assistants, or ACCHS staff.

Aboriginal and/or Torres Strait Islander people, aged 18-45 years old who currently smoke will be included in the study, if they self-report as Indigenous and are in the age bracket. Although we would have preferred to include participants under 18yrs, the ethics committee did not support this. Participants will be offered a $10 shopping voucher for their time.

Sample size calculation

The estimated sample size is 120 participants. Sample size estimations are based on the procedure described by Altman.[59] Standardised differences for intention to quit smoking and intention to seek help to quit smoking are calculated using means (M) and standard deviations (SD) published by Wong and Capella (intent to quit M 2.48, SD 0.78; intent to seek help M 1.85, SD 0.77).[44] These figures are taken from a different population because there have been no relevant studies in Indigenous peoples. A total sample size of 110 is required to detect a significant difference between people in 'danger control' versus people in 'fear control' (according to the RDB scale) and intentions to quit smoking, at alpha<.05, and 90% power. An additional sample size calculation

was performed to determine the required sample size to detect prevalence of knowledge, attitudes and behavior within the target population. The required sample size is 100, based on 50% prevalence, 10% precision and 95% confidence intervals. However for the multivariate analysis 120 participants are required (assuming 6 key variables).[60]

Sampling Stratification

Random sampling will not be feasible. To ensure that the convenience sample is as representative of the target group as possible, the sample will be stratified by age group and gender. Data from the 2011 Australian Census determines the population parameters for persons identified as Aboriginal and/or Torres Strait Islander, by age group and gender in the regional city. The proportion of smokers 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).[61]

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

The Risk Behaviour Diagnosis Scale consists of a series of questions (Likert scales) on fours aspects: severity of threat, susceptibility to threat, response efficacy and self-efficacy.[40]

As a measure of fear control responses participants will be asked to respond to four questions about reactance, avoidance and message derogation on a Likert scale.[40] Similarly for danger control responses an aggregate score of the five questions on intentions to change smoking behaviour/seek help will be calculated.[44] Because of the evidence pointing to strong protective attitudes in the target population, five questions on a Likert scale will be asked to determine protective responses about smoking in pregnancy, around children, and for Aboriginal and Torres Strait Islander peoples in general. A protection score will be calculated from these responses.

The Risk Acceptance Ladder is a new measure currently being used in Italy to research a population with high rates of smoking (Cattaruzza & West, 2014, in preparation). The measure has been adapted to the Aboriginal and Torres Strait Islander population, as below.

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 an 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 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 some of the RBD core statements to make them more comprehensible to this population. 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.

(b) The potential responses of the SRAT were reworded to become more appropriate for the target population, and two additional responses included (see Appendix 1).

Changes were approved by the HRECs.

ANALYSIS

Table 3 outlines variables that will be measured.

Table 3: Variables from questionnaire

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 quableadrants 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 diagnosis; SRAT – smoking risk assessment target; MTSS – motivation to stop smoking scale

Statistical analyses

On study completion, the data entered through the survey software will be used to generate a summary report and exported directly to SPSS v 20 for analysis. Descriptive analyses will summarise the data for all variables.

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

1. Content validity and face validity is qualitatively assessed through the community panel and expert consultation for RBD and SRAT
2. The patterns of correlation will be explored between the RBD subscale scores (susceptibility and severity of threat, and response and self-efficacy) and also for danger control responses, fear control responses and protective responses
3. Internal consistency of sub-scales will be assessed with Cronbach's α.

Multivariate analyses will seek the most likely demographic predictors of intentions to quit smoking/seek help for quitting, e.g. age, gender, dependence levels, household smoking rules. Psychological factors such as threat and efficacy scores, danger and fear control responses will be analysed to assess whether they further influence the outcome measures.

RBD scores and the SRAT will be examined to see if participant responses are correlated.

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

ETHICS AND DISSEMINATION

The study is low risk in terms of ethics, however, discussing smoking may be considered a sensitive issue for Aboriginal and Torres Strait Islander participants, and researchers collecting the data will be suitably briefed. The research will adhere to Australia's National Health and Medical Research Council's Values and Ethics in Aboriginal and Torres Strait Islander Health Research 2003 guidelines, i.e. reciprocity, respect, equality, responsibility, survival and protection, spirit and integrity.[66] Examples of reciprocity include the first author sharing her knowledge and skill base (as a GP and Tobacco Treatment Specialist) about tobacco control and research with the participating organisations and their staff members. The participants also would be offered brief advice on smoking cessation if they wished after the interview, and extra resources such as a culturally adapted DVD. The primary HREC is the Aboriginal Health & Medical Research Council Ethics Committee (AH&MRC), which approved the study with support from the partnering ACCHS (approval number

928). Additional HRECs ratified the primary approval (James Cook University (H4467) and Southern Cross University (ECN-13-242).

Participants will be approached at community events that are targeted to the local Australian Aboriginal and Torres Strait Islander communities. Potential recruits will be asked if they fulfil the selection criteria and canvassed about their willingness to join in the study. All participants will be provided with a participant information sheet advising of the purpose of the study and implications regarding:

- Objectives of the research
- Why the information is being collected and how it will be used, accessed and stored
- 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 Islander smokers, which could have the potential for research transference to a clinical or public health setting.

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

Primary health care practitioners and clinicians are often faced with the task of assisting Aboriginal and Torres Strait Islander smokers to quit smoking. Anti-tobacco messages do not just lie in the domain of social marketing: they also need to be carefully pitched to maximise receptivity and support behaviour change within the clinical consultation. Little is known about the effectiveness of smoking behaviour change models for Aboriginal and Torres Strait Islander peoples. The trans-theoretical model (stages of change or SOC) has been widely

used in Australia for Aboriginal and Torres Strait Islander smokers, but outcomes have never been evaluated.[67] Aboriginal smokers in remote areas have been described as more likely to be in the pre-contemplative or contemplative stages of change and require more assistance to be ready to quit smoking.[68] Also it is known that motivational interviewing, including that based on the SOC, is not as effective in pregnancy as in the general population,[69] and holds no special advantages over other types of psychosocial counselling.[70]

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

If people are engaged in fear control processes, messages developed should focus on the efficacy of the recommended response to counteract the high levels of perceived threat. Focusing on threat messages alone may cause the messages to backfire. It is important to emphasise that the recommended responses are feasible and effective to avert the threat from smoking. It is essential to help people develop a belief in their ability to quit smoking, develop supportive environments for quitting, and provide easy access to treatment.

Central to building self-efficacy are strategies recommended by Bandura.[42] He suggests several approaches: building skills, self-control and mastery for quitting; learning about the experiences of others who have successfully quit; verbal persuasion and motivation; helping people adopt a positive mindset; and importantly having access to effective therapies.[42]

Alternatively, if the target audience is in danger control, messages can remind people about the threat of smoking to maintain motivation, whilst also increasing efficacy for quitting, as above.

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

The SRAT may prove a simplified way to approach risk assessment in this target group, as it demands a single response to a question. The measures require validation for Aboriginal and Torres Strait Islander smokers in this child-rearing age bracket, prior to a more formal assessment of feasibility and effectiveness in a clinical setting.

Previous research has demonstrated the strong social and environmental influences on smoking cessation, and the role health professionals play in supporting smoking cessation in Aboriginal and Torres Strait Islander communities.[71] The study will also assess predictors of intentions to quit that

include measures of socio-economic position, smoking by friends, and household members, support offered by family and health professionals, and a range of other factors. These measures have the potential to determine social and health profession influences on intentions to quit smoking in this population. The analysis will determine if once these factors are controlled for whether the responses to the risk assessment measures have any additional impact.

Limitations and Strengths

The study will be based on a sample from one regional area of NSW, fostering ownership of the project results for the local partnering ACCHS. Australian Aboriginal groups are diverse and this study will be conducted in just one region. It is unknown how many Torres Strait Islanders reside in the area and how many will chose to participate in the study. As the validity and reliability measures to be used are context specific, they should be considered provisional, pending a larger study. These limitations impact on generalisability and transferability of the findings, although this is a pragmatic constraint for all research in diverse Indigenous groups. Selection bias may be operant if only those more willing to talk about their smoking agreeing to participate, another inevitable challenge for this kind of research. Recruiting some participants through a health service may favour those already with health problems, and who may already have motivation to quit smoking. There could be information biases: smoking status will be based on self-report and not any objective measures; recall bias may be operant with asking people to recollect their

smoking history and perceived level of support for quitting; and social desirability bias with people reporting what they think the researcher wants to hear.

On the other hand, this is the first study as far as we know to validate risk assessment measures for tobacco smoking in a population of Aboriginal and Torres Strait Islander smokers. Health education and behaviour studies are tested for validity and reliability inconsistently,[72] and very few scales are validated for the Aboriginal and Torres Strait Islander population.[73] So the study is needed and an important one, although small and specific to one region. The study takes a unique approach to smoking in Aboriginal and Torres Strait Islander peoples of childbearing age by drawing on both well-established and new measures from the health communication and addiction fields. If these measures prove to be valid and reliable they have a high potential for research translation into clinical settings. The outcomes could further inform the development and refining of social marketing policies and strategies for anti-tobacco messages through all media.

ACKNOWLEDGEMENTS

We acknowledge the valuable input of the Aboriginal community panel and the support of the partnering ACCHS for this survey, and role of the Aboriginal Health Worker in the study, without them the study would not be possible.

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.

FUNDING

This study was funded by the following grants awarded to GSG as principal researcher:

- National Health and Medical Research Council (Australia) and National Heart Foundation (Australia) post-graduate scholarship for Indigenous health research - APP1039759 and PP 11S 6181
- Royal Australian College of General Practitioners and Australian Primary Health Care Research Institute Indigenous Health Award 2013
- 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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~~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 ISLANDER PEOPLES~~AND PREDICTORS OF INTENTIONS TO QUIT SMOKING IN AUSTRALIAN ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLES: A CROSS-SECTIONAL SURVEY PROTOCOL

Title Page

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Running Head: Risk assessment for smoking with Indigenous Australians

Key words: tobacco use, smoking, Australian Aborigines, Indigenous population, risk behaviours~~, health attitudes~~

Word Count: 4787~~3883~~

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

Ethics and dissemination

The Aboriginal Health & Medical Research Council Ethics Committee and ethics committees at James Cook and Southern Cross Universities approved the study. The results will be published in a peer-reviewed journal and a community report will be disseminated by the ACCHS, and at community forums.

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

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.[107] It is believed that the effects of colonisation,[107] the stolen generation,[118] and racism,[129] have all contributed to the contemporary use of tobacco, to the detriment of the health and longevity of Aboriginal and Torres Strait Islander peoples, and their future generations. Factors promoting smoking and smoking initiation in Aboriginal and Torres Strait Islander peoples include community and family norms of smoking,[130] smoking to promote social inclusiveness and cohesion,[141] peer group belonging,[152] and daily stressors.[130] ~~[1][2][3]~~

Several studies have explored the knowledge levels of Aboriginal and Torres Strait Islander peoples about tobacco smoking,[16-184] with more~~There is limited knowledge~~ exploration about Indigenous attitudes and beliefs about ~~to~~ the risks of smoking. There has been some exploration about what anti-smoking messages are effective and acceptable for Aboriginal and Torres Strait Islander

populations,[193] as media messages or as adjuncts to clinical treatment.[2014] Mainstream antismoking campaigns have shown to be effective in terms of recall and perceived effectiveness by Indigenous peoples in Australia,[21-225 6] the U.S. [237] and NZ,[248] but have not necessarily translated into increased quit rates in these populations.[259] Aboriginal and Torres Strait Islander smokers in a forced exposure to several television advertisement rated those containing strong graphic imagery or personal narratives as effective for a range of measures including being more likely to quit.[190] Indigenous peoples in the US, Australia and New Zealand (NZ), have a preference for culturally targeted campaigns.[259] Aboriginal and Torres Strait Islander viewers aged 16-40 years of the 'Break The Chain' campaign in Australia positively rated the targeted advertisement, had good recall and 57% stated they intended to quit in the following month.[2611] Where culturally targeted campaigns have been tested, alongside generic campaigns, for example in NZ youth, they proved as effective at supporting Maori to quit smoking as generic messages were for the general NZ population.[2712]

However, attitudes of Indigenous maternal smokers, to prevailing health risk messages about smoking, have been particularly under-researched for Aboriginal and Torres Strait Islander maternal smokers and those of childbearing age. [13]A systematic review used meta-ethnography to synthesise the evidence of the knowledge, attitudes and experiences of maternal smoking by Aboriginal and Torres Strait Islander peoples,[1313] from seven studies.[14, 28-3320] The synthesis revealed a lack of salience of media messages and potentially some resistance to advice.[130] Equally pregnant women have highly

protective attitudes towards babies and children.[13~~10~~] A recent study of attitudes of maternal Aboriginal smokers and their family members suggested that attitudes about the health risks of smoking may be influenced by messages not matching the women's lived experiences, coupled with inadequate access to information.[34~~15~~] Limited knowledge about the specific hazards of smoking and cessation,[35~~16~~] and the lack of salience of anti-smoking messages are barriers to effective cessation.[13~~0~~] However, a program using a culturally targeted smoking cessation video with pregnant Alaska Native smokers was no more efficacious than in the control group.[36~~21~~] Issues less well understood are how Indigenous adults broadly assess their risks in relation to tobacco smoking (not just their knowledge of adverse health effects) and how these assessments are related to their intentions to quit smoking. If attitudes to risk taking behaviour for smoking and responses to anti-tobacco messages are not understood it is difficult to formulate effective messages and interventions. There are no best practice guidelines to develop and personalise such messages for Aboriginal and Torres Strait Islander peoples.[18~~4~~, 37~~17~~-38~~18~~]

Our study therefore aims to determine how 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 or seeking help to quit. We further aim to determine which demographic and behavioural factors (such as age, gender, nicotine dependence level, household smoking rules) are predictors of intentions to quit and seek help for quitting. Two risk assessment scales for smoking will be examined for their cultural acceptability, validity and reliability, and their utility as a pragmatic heuristic.

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.[3919]

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**
Perceived threat: awareness of a specific harm in the environment, consisting of:	Total of perceived threat scores
Susceptibility to threat: belief about one's risk of experiencing the threat	Sub-total of susceptibility scores
Severity of threat: belief about the magnitude of the threat	Sub-total of severity scores
Perceived efficacy: thoughts about ease, feasibility and the effectiveness of averting the threat, consisting of:	Total of perceived efficacy scores
Self-efficacy: belief in one's ability to perform recommended response	Sub-total of self-efficacy scores

Response efficacy: belief about effectiveness of recommended response to avert the threat	Sub-total of response efficacy scores
Danger control dominance: 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
Danger control responses (protective motivation): 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
Fear control dominance: 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
Fear control responses (defensive motivation): coping responses that diminish fear	Score from questions about defensive avoidance, denial, reactance, message derogation and perceived manipulation
Critical point: 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	
Discriminating value: a numerical value used to discriminate between people in danger vs. fear control	Formula: $(\Sigma\ perceived\ efficacy) - (\Sigma\ perceived\ threat) = discriminating\ value$ A positive score indicates danger control processes; a negative score indicates fear control processes
Protective responses: 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",[40~~20~~] (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

that that the level of perceived efficacy determines whether people engage in danger control or fear control responses.[40~~20~~]

Witte devised and validated a scale called the Risk Behaviour Diagnosis (RBD) scale to measure these responses across four dimensions of perceived threat (perceived susceptibility and severity of threat) and perceived efficacy (response efficacy and self-efficacy).[40~~20~~] High threat responses coupled with high efficacy tend to lead to danger control responses, in this case to adopt message recommendations, change attitudes, intentions and smoking behaviour. In contrast, if people feel they can-not adopt the recommended response to avert the treat, because of a lack of efficacy (it's too hard, too little support, or it is perceived as futile to do so), they typically try to control the fear by avoiding the issue, discount the message, or may consider the issue is exaggerated.

If fear control processes are initiated, it can be difficult to shift attitudes and there is a need for carefully constructed messages to "break through defence mechanisms".[41~~21~~] Therefore according to this theory people who are in fear control will need assistance to build up efficacy rather than make them more fearful. Bandura's work on self-efficacy confirms this and he considers self-efficacy is central to any healthy behaviour change.[42~~22~~]

The EPPM model is a predominant message design theory,[43~~23~~] and has been widely applied to a range of health behaviours internationally and a wide range of health promotional campaigns, and is the basis of tobacco counter-marketing.[37~~19~~] A study by Wong and Cappella has used the RBD to measure responses to video-based anti-tobacco television advertisements.[44~~24~~]

Assessment scales for risk behaviour, including the RBD, have been used in several minority groups and across cultures.[45~~25~~-53~~33~~] However risk assessment scales for tobacco and the EPPM have not been used or validated for Australian Aboriginal or Torres Strait Islander or other Indigenous populations.

Another theory informing this study is PRIME theory (P-plans; R-responses; I-impulses; M-motives; E-evaluations), which proposes that smokers' motivations are fluid, and can change unexpectedly.[54~~34~~] The central tenets of PRIME theory include people's wants and needs in the moment, and their self-identity.[54~~34~~] West suggests that a person can be stimulated to make a quit attempt, even if they have not been thinking about quitting, especially if the intervention is repeated and evidence-based therapy offered.[55~~35~~] A new measure based on PRIME theory, called the Risk Acceptance Ladder (RAL),[56~~36~~] (Cattaruzza & West, 2014, in preparation) proposes that the blocks to effective behaviour change can be ascertained by determining the individual level of risk acceptance and at what stage motivation has stalled. For this study the RAL is modified into the Smoking Risk Assessment Target (SRAT) (see methods). If this measure correlates well with message processing it may be also useful to assess Aboriginal and Torres Strait Islander smokers.

Rationale for assessing validity and reliability of the scales for Aboriginal and Torres Strait Islander smokers

Assessment scales, developed for Western populations, are important to validate before use in a cross-cultural context.[57] Theoretical concepts developed in the

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?

5. What are the associations between the RBD and SRAT?

Study Population

Participant recruitment and setting

The study site is a regional centre in NSW. Recruitment into the study will be by personal intercept, primarily at regional community and social events, and in other settings likely to yield interest, including a local Aboriginal Community Controlled Health Service (ACCHS). The survey will be administered by face-to-face interview, using where possible a tablet computer, connected by cellular network to a secure on-line survey site. Where connectivity is unreliable a paper survey will be used and data submitted on-line later. The interviewers will be either the first author (non-Indigenous female) or Indigenous research assistants, or ACCHS staff.

~~Inclusion criteria are~~ Aboriginal and/or Torres Strait Islander people, aged 18-45 years old who currently smoke. ~~Participants~~ will be included in the study, if they self-report as Indigenous and are in the age bracket. Although we would have preferred to include participants under 18yrs, the ethics committee did not support this. Participants will be offered a $10 shopping voucher for their time.

Sample size calculation

The estimated sample size is 120 participants. Sample size estimations are based on the procedure described by Altman.[5937] Standardised differences for intention to quit smoking and intention to seek help to quit smoking are calculated using means (M) and standard deviations (SD) published by Wong and Capella (intent to quit M 2.48, SD 0.78; intent to seek help M 1.85, SD 0.77).[4424] These figures are taken from a different population because there have been no relevant studies in Indigenous peoples. A total sample size of 110 is required to detect a significant difference between people in 'danger control' versus people in 'fear control' (according to the RDB scale) and intentions to quit smoking, at alpha<.05, and 90% power. An additional sample size calculation was performed to determine the required sample size to detect prevalence of knowledge, attitudes and behavior within the target population. The required sample size is 100, based on 50% prevalence, 10% precision and 95% confidence intervals. However for the multivariate analysis 120 participants areis required (assuming ~~to adequately estimate the effect of~~ 6 key variables ~~(20 per variable~~).[60]

Sampling Stratification

Random sampling will not be feasible. To ensure that the convenience sample is as representative of the target group as possible, the sample will be stratified by age group and gender. Data from the 2011 Australian Census determines the population parameters for persons identified as Aboriginal and/or Torres Strait Islander, by age group and gender in the regional city. The proportion of smokers

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).[61~~38~~]

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 *N*	Female *N*	Male *%*	Female *%*	Male *N(% of total)*	Female *N(% of total)*	Male *N*	Female *N*
18-24	172	178	38.7	39.7	67 (13.9%)	71 (14.7%)	17	18
25-34	142	184	56	50.1	80 (16.6%)	92 (19%)	20	23
35-44	154	187	55.5	47.3	85 (17.6%)	88 (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

interviewer can~~will~~ 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~~39~~]

Strength of Urges to Smoke (SUTS) is another measure of dependence found to be more reliable for predicting cessation than the HSI.[62~~39~~] It is a routine part of the "Smoking in England" survey, administered to over 10,000 smokers per annum.[63~~40~~] 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.[6441] Intentions to quit and intentions to seek help (Likert scale) are also adapted from Wong & Cappella.[4424]

Risk assessment scales

The Risk Behaviour Diagnosis Scale consists of a series of questions (Likert scales) on fours aspects: severity of threat, susceptibility to threat, response efficacy and self-efficacy.[4020]

As a measure of fear control responses participants will be asked to respond to four questions about reactance, avoidance and message derogation on a Likert scale.[4020] Similarly for danger control responses an aggregate score of the five questions on intentions to change smoking behaviour/seek help will be calculated.[4424] Because of the evidence pointing to strong protective attitudes in the target population, five questions on a Likert scale will be asked to determine protective responses about smoking in pregnancy, around children, and for Aboriginal and Torres Strait Islander peoples in general. A protection score will be calculated from these responses.

The Risk Acceptance Ladder is a new measure currently being used in Italy to research a population with high rates of smoking (Cattaruzza & West, 2014, in preparation). The measure has been adapted to the Aboriginal and Torres Strait Islander population, as below.

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 s~~S~~ome 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.~~-~~

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.

(b) The potential responses of the SRAT were reworded to become more appropriate for the target population, and two additional responses included (see Appendix 1).

Changes were approved by the HRECs.

ANALYSIS

Table 3 outlines variables that will be measured.

Table 3: Variables from questionnaire

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

diagnosis; SRAT – smoking risk assessment target; MTSS – motivation to stop smoking scale

Statistical analyses

On study completion, the data entered through the survey software will be used to generate a summary report and exported directly to SPSS v 20 for analysis. Descriptive analyses will summarise the data for all variables.

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

1. Content validity and face validity is qualitatively assessed through the community panel and expert consultation for RBD and SRAT
2. The patterns of correlation will be explored between the RBD subscale scores (susceptibility and severity of threat, and response and self-efficacy) and also for danger control responses, fear control responses and protective responses
3. Internal consistency of sub-scales will be assessed with Cronbach's α.

Multivariate analyses will seek the most likely demographic predictors of intentions to quit smoking/seek help for quitting, e.g. age, gender, dependence levels, household smoking rules. Psychological factors such as threat and efficacy scores, danger and fear control responses will be analysed to assess whether they further influence the outcome measures.

RBD scores and the SRAT will be examined to see if participant responses are correlated.

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

ETHICS AND DISSEMINATION

The study is low risk in terms of ethics, however, discussing smoking may be considered a sensitive issue for Aboriginal and Torres Strait Islander participants, and researchers collecting the data will be suitably briefed. The research will adhere to Australia's National Health and Medical Research Council's Values and Ethics in Aboriginal and Torres Strait Islander Health Research 2003 guidelines, i.e. reciprocity, respect, equality, responsibility, survival and protection, spirit and integrity.[66] Examples of reciprocity include the first author sharing her knowledge and skill base (as a GP and Tobacco Treatment Specialist) about tobacco control and research with the participating organisations and their staff members. The participants also would be offered brief advice on smoking cessation if they wished after the interview, and extra resources such as a culturally adapted DVD. The primary HREC is the Aboriginal Health & Medical Research Council Ethics Committee (AH&MRC), which approved the study with support from the partnering ACCHS (approval

number 928). Additional HRECs ratified the primary approval (James Cook University (H4467) and Southern Cross University (ECN-13-242).

Participants will be approached at community events that are targeted to the local Australian Aboriginal and Torres Strait Islander communities. Potential recruits will be asked if they fulfil the selection criteria and canvassed about their willingness to join in the study. All participants will be provided with a participant information sheet advising of the purpose of the study and implications regarding:

- Objectives of the research
- Why the information is being collected and how it will be used, accessed and stored
- 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 Islander smokers, which could have the potential for research transference to a clinical or public health setting.

The RBD scale was originally designed as a clinical tool to be used in the context of delivering tailored health messages at a clinic for sexually transmitted diseases and HIV testing.[40~~20~~] Advice was then adapted to individuals according to their responses.

Primary health care practitioners and clinicians are often faced with the task of assisting Aboriginal and Torres Strait Islander smokers to quit smoking. Anti-tobacco messages do not just lie in the domain of social marketing: they also need to be carefully pitched to maximise receptivity and support behaviour change within the clinical consultation. Little is known about the effectiveness of smoking behaviour change models for Aboriginal and Torres Strait Islander peoples. The trans-theoretical model (stages of change or SOC) has been widely

used in Australia for Aboriginal and Torres Strait Islander smokers, but outcomes have never been evaluated.[67~~43~~] Aboriginal smokers in remote areas have been described as more likely to be in the pre-contemplative or contemplative stages of change and require more assistance to be ready to quit smoking.[68~~44~~] Also it is known that ~~interventions~~ motivational interviewing, including that based on the SOC, is~~are~~ not as effective in pregnancy as in the general population,[69~~25~~] and holds no special advantages over other types of psychosocial counselling.[70~~45~~]

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

If people are engaged in fear control processes, messages developed should focus on the efficacy of the recommended response to counteract the high levels of perceived threat. Focusing on threat messages alone may cause the messages to backfire. It is important to emphasise that the recommended responses are feasible and effective to avert the threat from smoking. It is essential to help people develop a belief in their ability to quit smoking, develop supportive environments for quitting, and provide easy access to treatment.

Central to building self-efficacy are strategies recommended by Bandura.[42~~22~~] He suggests several approaches: building skills, self-control and mastery for quitting; learning about the experiences of others who have successfully quit; verbal persuasion and motivation; helping people adopt a positive mindset; and importantly having access to effective therapies.[42~~22~~]

Alternatively, if the target audience is in danger control, messages can remind people about the threat of smoking to maintain motivation, whilst also increasing efficacy for quitting, as above.

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

The SRAT may prove a simplified way to approach risk assessment in this target group, as it demands a single response to a question. The measures require validation for Aboriginal and Torres Strait Islander smokers in this child-rearing age bracket, prior to a more formal assessment of feasibility and effectiveness in a clinical setting.

Previous research has demonstrated the strong social and environmental influences on smoking cessation, and the role health professionals play in supporting smoking cessation in Aboriginal and Torres Strait Islander communities.[71] The study will also assess predictors of intentions to quit that

include measures of socio-economic position, smoking by friends, and household members, support offered by family and health professionals, and a range of other factors. These measures have the potential to determine social and health profession influences on intentions to quit smoking in this population. The analysis will determine if once these factors are controlled for whether the responses to the risk assessment measures have any additional impact.

Limitations and Strengths

The study will be based on a sample from one regional area of NSW, fostering ownership of the project results for the local partnering ACCHS. Australian Aboriginal groups are diverse and this study will be conducted in just one region. It is unknown how many Torres Strait Islanders reside in the area and how many will chose to participate in the study. As the validity and reliability measures to be used are context specific, they should be considered provisional, pending a larger study. These limitations impact on generalisability and transferability of the findings, although this is a pragmatic constraint for all research in diverse Indigenous groups. Selection bias may be operant if only those more willing to talk about their smoking agreeing to participate, another inevitable challenge for this kind of research. Recruiting some participants through a health service may favour those already with health problems, and who may already have motivation to quit smoking. There could be information biases: smoking status will be based on self-report and not any objective measures; recall bias may be operant with asking people to recollect their

smoking history and perceived level of support for quitting; and social desirability bias with people reporting what they think the researcher wants to hear.

On the other hand, this is the first study as far as we know to validate risk assessment measures for tobacco smoking in a population of Aboriginal and Torres Strait Islander smokers. Health education and behaviour studies are tested for validity and reliability inconsistently,[72~~46~~] and very few scales are validated for the Aboriginal and Torres Strait Islander population.[73~~47~~] So the study is needed and an important one, although small and specific to one region. The study takes a unique approach to smoking in Aboriginal and Torres Strait Islander peoples of childbearing age by drawing on both well-established and new measures from the health communication and addiction fields. If these measures prove to be valid and reliable they have a high potential for research translation into clinical settings. The outcomes could further inform the development and refining of social marketing policies and strategies for anti-tobacco messages through all media.

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.

FUNDING

This study was funded by the following grants awarded to GSG as principal researcher:

- National Health and Medical Research Council (Australia) and National Heart Foundation (Australia) post-graduate scholarship for Indigenous health research - APP1039759 and PP 11S 6181
- Royal Australian College of General Practitioners and Australian Primary Health Care Research Institute Indigenous Health Award 2013
- 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)

ACKNOWLEDGEMENTS

We acknowledge the valuable input of the Aboriginal community panel and the support of the partnering ACCHS for this survey, and role of the Aboriginal Health Worker in the study, without them the study would not be possible.

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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'.

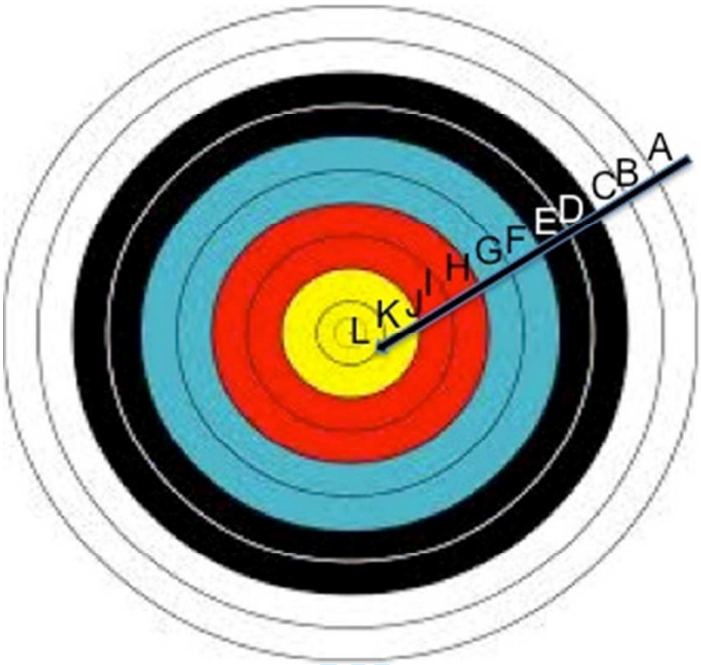
Risk Behaviour Diagnosis Scale

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).

	Strongly Agree	*Agree*	*Neither/ Not sure*	*Disagree*	*Strongly Disagree*
Response Efficacy					
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
Self-efficacy					
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
Susceptibility to threat					
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
Severity of threat					
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.'*



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