Using the risk behaviour diagnosis scale to understand Australian Aboriginal smoking — A cross-sectional validation survey in regional New South Wales

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ABSTRACT

Objective. To validate, for the first time, the Risk Behaviour Diagnosis (RBD) Scale for Aboriginal Australian tobacco smokers, based on the Extended Parallel Process Model (EPPM). Despite high smoking prevalence, little is known about how Indigenous peoples assess their smoking risks. *Methods.* In a cross-sectional study of 121 aboriginal smokers aged 18–45 in regional New South Wales, in 2014, RBD subscales were assessed for internal consistency. Scales included measures of perceived threat (susceptibility to and severity of smoking risks) and perceived efficacy (response efficacy and self-efficacy for quitting). An Aboriginal community panel appraised face and content validity. EPPM constructs of danger control (protective motivation) and fear control (defensive motivation) were assessed for cogency. *Results.* Scales had acceptable to good internal consistency (Cronbach's alpha = 0.65–1.0). Most participants demonstrated high-perceived threat (77%, n = 93); and half had high-perceived efficacy (52%, n = 63). High-perceived efficacy with high-threat appeared consistent with danger control dominance; low-perceived efficacy with high-threat was consistent with fear control dominance. *Conclusions.* In these Aboriginal smokers of reproductive age, the RBD Scale appeared valid and reliable. Further research is required to assess whether the RBD Scale and EPPM can predict quit attempts and assist with tailored approaches to counselling and targeted health promotion campaigns.

Introduction

Tobacco smoking by Indigenous peoples is of major concern globally, with high prevalence rates showing little decline. The decline of smoking in the general population in Western nations is in part due to successful anti-tobacco campaigns. The small downward shift in Aboriginal Australian smoking rates over the last decade has not been replicated in the peak reproductive subgroup of 25–34 years (Australian Bureau of Statistics, 2014), when exposure is highest for babies and children. The disparity in daily smoking rates in Australia is stark at 12.8% for the general population (Australian Institute of Health and Welfare, 2013), versus 42% in Aboriginal Australians (Australian Bureau of Statistics, 2014), with remote community rates up to 85% (Robertson et al., 2013). This raises the question, how can we improve the effectiveness of tobacco control messages for Indigenous populations and in particular Aboriginal Australians?

Much is known about the historical antecedents of smoking in Aboriginal Australians (Brady, 2002), the impact of the social determinants of health (Shepherd et al., 2011), and the knowledge levels of Aboriginal Australians about smoking (Gould et al., 2013a). Little is known, in contrast, about how Indigenous populations, including Aboriginal Australians assess the threat of smoking, and their perceived efficacy for quitting. Such information is required to inform the development of targeted campaigns.

Indigenous peoples have good recall of mainstream campaigns (Boyle et al., 2010), and highly rate the message efficacy of mainstream campaigns (Stewart et al., 2011), but these campaigns have not translated into quitting behaviour (Gould et al., 2013b; Ivers et al., 2005). Anti-tobacco messages which are not pitched at the right level can fail or have unintended consequences (Witte and Allen, 2000). Fear-based campaigns, for example, have been found to be most effective for those who have high self-efficacy or high motivation (Wong and Cappella, 2009; Peters et al., 2013).

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Targeted approaches are a key objective of Australian national tobacco strategies (Commonwealth of Australia, 2012), and the WHO Framework Convention on Tobacco Control (Article 4) (World Health Organization, 2003), and are preferred by Indigenous peoples (Gould et al., 2013b). In Australia, the majority of organisations developing culturally targeted anti-tobacco messages for Aboriginal smokers avoided fear campaigns and favoured positive and educational messages (Gould et al., 2014a), although the rationale for this approach has not been explored.

It is important to validate psychometric measures before use in a cross-cultural Indigenous context (Drew et al., 2010). Instruments to assess mental health and substance use (Stephens et al., 2013), have been recently validated for Aboriginal Australians, but not tobacco smoking. This study uses the findings from a cross-sectional study of Aboriginal Australians to validate risk assessment scales for tobacco smoking in this population.

Materials and methods

The protocol for the study has been published (Gould et al., 2014b), thus we provide a brief summary of methods.

Study setting and recruitment

In a regional area of New South Wales (NSW) on Australia's east coast, the cross-sectional study was conducted in a community sample of Aboriginal smokers aged 18–45 years from January to May 2014. Quota sampling was used by gender and age groups to represent the target population, calculated from the 2008 Aboriginal smoking prevalence (Australian Bureau of Statistics, 2009), and the 2011 Aboriginal population census (Table 1). Participants (N = 121) were recruited by personal intercept through community events, such as Aboriginal cultural festivals (n = 35) and cultural centres (n = 15), health days (n = 20), sporting events (n = 19), through community/health services (n = 15), street intercept (n = 8) and by personal contact (n = 9). An Aboriginal 'Tackling Tobacco and Healthy Lifestyle Team' facilitated the attendance of the interview team at several local events.

The interviewers included a non-Aboriginal female (author GG), a male Aboriginal research assistant, and a female Aboriginal volunteer who approached potential participants, informed them of the study and canvassed their interest in participating. Author GG trained all the interviewers. The study adhered to the guideline for ethical research in Indigenous populations, and relevant ethics committee approvals as detailed in the study protocol (Gould et al., 2014b).

Theory/calculation

The survey included questions based on the Risk Behaviour Diagnosis (RBD) Scale (Witte et al., 1996, 2001), adapted for tobacco smoking, and the Aboriginal target populations from the Extended Parallel Process Model (EPPM) (Witte et al., 1996, 2001). The central premise of the EPPM is that when under a health risk threat people may control the danger by making a positive shift in attitude and behaviour, termed

'danger control dominance'. Alternately they may feel fearful and try to control the emotion of fear by denial, reactance, or message derogation, called 'fear control dominance' (Witte et al., 2001). The pathways proposed by the EPPM are depicted in Fig. 1.

The level of perceived efficacy (response efficacy and self-efficacy) moderates responses to high threat. People with high efficacy are more likely to be in danger control and change their attitudes or behaviour (e.g. quit smoking). Alternatively, if efficacy is low, people are more likely to exhibit defensive avoidance and fear control. When the perceived threat is low or absent then people may be indifferent, and unlikely to change attitudes or behaviour.

The RBD Scale comprises questions to measure the EPPM constructs (Witte et al., 2001). The scale is used to calculate a discriminating value predicted to be diagnostic for danger vs. fear control. The EPPM has been validated and used for many health risks, including smoking (Wong and Cappella, 2009), and in a wide range of populations (including cross-cultural groups).

We conducted a process of Aboriginal community consultation to test the content and face validity, suitability, readability, cultural appropriateness, acceptability and feasibility of the survey instruments. The process of scale adaption for the Aboriginal target population is described in the study protocol (Gould et al., 2014b).

The RBD subscales and scales for protection responses and fear control responses (details in Supplementary Table A.1) were measured using 5 point Likert Scales. Intentions to quit smoking were measured using 4 point Likert Scales. The total score for each scale was divided by the number of questions in the scale to create mean indices. Median splits around the distribution of scale scores produced binary categories of high-low responses. This resulted in the following variables: total perceived threat (high vs low); total perceived efficacy (high vs low); protection responses (high vs low); fear control responses (high vs low); and danger control responses (intentions to quit: high vs low).

We grouped the responses to the RBD Scale into four quadrants as suggested by Popova (Popova, 2012), subtitled with descriptors from Rimal and Real (Rimal and Real, 2003), as follows:

- I — high threat-high efficacy — responsive
- II — high threat-low efficacy — pro-active
- III — low threat-high efficacy — avoidant
- IV — low threat-low efficacy — indifferent.

Discriminating value was calculated from the formula ($\sum$ perceived efficacy) − ($\sum$ perceived threat) = discriminating value, then categorised into positive (>0) or negative (≤0) (Witte et al., 2001).

Statistical analysis

Analyses, including descriptive, were performed using SPSS v20. The internal reliability of the scales was assessed with Cronbach's alpha coefficient. A factor analysis explored the RBD subscale dimensions. Separate chi-squared analyses were performed stratified by each RBD

Table 1
Stratified sampling strategy of target Aboriginal population on the Mid North Coast of New South Wales, and actual sample (N = 121).

Age range (years)	Target population (2011 census from regional LGA)		Smoking prevalence (2008 NATSISS)		% of target populations in regional city who smoke		Proposed sample stratified by gender & age group		Actual sample recruited	
	Male N	Female N	Male %	Female %	Male N (% of total)	Female N (% of total)	Male N	Female N	Male N	Female N
18–24	172	178	38.7	39.7	67 (13.9)	71 (14.7)	17	18	18	18
25–34	142	184	56	50.1	80 (16.6)	92 (19)	20	23	18	23
35–44	154	187	55.5	47.3	85 (17.6)	88 (18.2)	21	22	22	22
Total	468	549			232 (48.1)	251 (51.9)	**58**	**63**	**58**	**63**

Adapted with permission of the authors (Gould et al., 2014b).
Bold figures indicate total numbers of men and women proposed for the sample and actually recruited.