

# Racism, stress, and sense of personal control among Aboriginal Australian pregnant women

Davi M. Macedo<sup>1</sup>  | Lisa G. Smithers<sup>2</sup> | Rachel M. Roberts<sup>3</sup>  | Lisa M. Jamieson<sup>1</sup>

<sup>1</sup>School of Dentistry, University of Adelaide, Adelaide, South Australia, Australia

<sup>2</sup>School of Public Health, University of Adelaide, Adelaide, South Australia, Australia

<sup>3</sup>School of Psychology, University of Adelaide, Adelaide, South Australia, Australia

## Correspondence

Davi M. Macedo, ARCPOH, AHMS Building Level 9, University of Adelaide, North Terrace, Adelaide, SA 5005, Australia.

Email: davi.manzinimacedo@adelaide.edu.au

## Abstract

**Objectives:** To characterise racism experiences in the past year and to investigate a causal association between racism, stress, and sense of personal control in a sample of pregnant South Australian Aboriginal women.

**Methods:** Data was from the baseline sample of 369 Aboriginal women participating in a randomised controlled trial to prevent early caries in children. Data on demographics, racism experiences, stress, sense of personal control, and health behaviours were collected through interview-guided questionnaires. Linear regression modelling was used to test the association between racism and stress and sense of personal control in separate models. The final models presented were adjusted for confounding.

**Results:** Participant mean age was 24.7 years ( $SD \pm 0.30$ ; Min–Max: 14–43 years). Almost two-thirds (64.7%) resided in rural and regional areas and the highest educational attainment for almost three-quarters (73.7%) was high school or less. Nearly half (48.3%) reported at least one experience of racism in the previous year and almost one third (31.8%) reported racism occurring in a public setting. The adjusted regression coefficients for the effect of racism on stress and sense of personal control were respectively 0.61 (95% confidence interval [CI] 0.28, 0.93) and  $-0.36$  (95% CI  $-0.68, -0.04$ ).

**Conclusions:** Our findings contribute with evidence that racism is one of the psychosocial causes of poor mental health among Aboriginal Australians. Culturally sensitive and safe mental health interventions may be beneficial in buffering racism effects during pregnancy. Societal-level policies aimed at both naming and reducing institutionalised racism against Aboriginal Australian Aboriginals are necessary.

## KEYWORDS

Aboriginal Australians, Indigenous, pregnancy, racism, sense of personal control, stress

Racism can be defined as a systemic set of beliefs, attitudes and practices based on ethnic-racial differences. It results in the oppression of citizens due to ethnic-racial membership

and maintenance of other racial groups' privileged position (Berman & Paradies, 2010). At an institutional level, racism might result in inequalities in accessing education, employment, political representation, and health and socio-economic resources. Personal interactions might also be

In beloved memory of Uncle Tauto Sansbury, esteemed friend and mentor.

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influenced by racially determined stereotypes and prejudice, as well as ethno-racial minorities' sense of self-worth and capacity (Berman & Paradies, 2010; Jones, 2002). The different manifestations of racism are both a result of a historical process of exclusion and contemporary factors that contribute to the perpetuation of inequalities (Berman & Paradies, 2010). In Australia, the cumulative effect of a historic process of oppression of Australian Aboriginal people has resulted in entrenched socioeconomic inequalities between the Aboriginal and non-Aboriginal population (Walter & Siggers, 2007).

Aboriginal Australian's experiences of racism are persistent, and can be repeatedly observed in multiple points across time (Shepherd, Li, Cooper, Hopkins, & Farrant, 2017). Racism experience is observed in childhood and adolescence, with students reporting either direct or vicarious experiences of racism (e.g., name-calling or teasing due to Aboriginality) (Priest, Thompson, Mackean, Baker, & Waters, 2017). Aboriginal adults report their experience of racial discrimination in different settings including public spaces such as shops and public transport. Such experiences can lead to avoidance of daily activities due to fear of discrimination (Ferdinand, Paradies, & Kelaher, 2013; Paradies & Cunningham, 2012).

Racism can be understood as a psychosocial stressor considering the cognitive and affective processes involved in identification and coping with it. Experience of discrimination involves constant vigilance over environmental clues that can indicate its re-occurrence, besides the assessment of approach or avoidance strategies to manage the episode and its consequences for one's self concept (Berjot & Gillet, 2011; Contrada et al., 2000). Anticipation of discriminatory encounters is shown to increase psychological and physiological responses, such as worries, rumination, threat cognitions, cardiovascular reactivity, and sympathetic system activation (Brosschot, Gerin, & Thayer, 2006; Sawyer, Major, Casad, Townsend, & Mendes, 2012).

As a psychosocial chronic stressor, racism effects on psychological processes and physiological responses are likely to affect both clinical health and subjective sense of wellbeing (Harrell et al., 2011). A systematic review and meta-analysis of 293 studies from the last 30 years demonstrate that experiences of racism are associated with poorer physical health, such as high blood pressure, hypertension, high cholesterol, and low self-rated general health (Paradies et al., 2015). Racism is also shown to be associated with poor mental health outcomes, such as depression, psychological stress, anxiety, suicide ideation and attempts, and lower levels of self-esteem and sense of personal control (Paradies et al., 2015; Priest et al., 2013). In the Aboriginal Australian context, similar patterns of associations between racism and health are observed (Kelaher, Ferdinand, & Paradies, 2014;

## WHAT IS ALREADY KNOWN ON THIS TOPIC

1. Aboriginal people report experiencing racism in different developmental periods and contexts in Australia, as well as avoidance of daily activities due to fear of discrimination.
2. Experiences of racism during pregnancy are thought to increase stress levels and compromise mother's mental health and future child development. Research on the impact of racism among Aboriginal Australian pregnant women is limited.
3. Policies aimed to reduce health inequalities among Aboriginal and non-Aboriginal Australians have focused on individual health behaviours and might need to target psychosocial causes of poor mental health.

## WHAT THIS PAPER ADDS

1. Our results confirm previous evidence that racism is experienced at the community level, extending findings to the period of pregnancy. Racism effects on the stress and sense of personal control among Australian Aboriginal pregnant women reflect the impact on the mental health and wellbeing of this population.
2. Screening for the need of mental health support during pregnancy and the design and testing of interventions based on Aboriginal cultural values might reduce the effects of psychosocial stressors and increase self-empowerment and sense of personal control among this population.
3. Microsocial policies are necessary to buffer the effect of racism on the Aboriginal Australian community whilst macrosocial policies are designed and implemented to reduce racism in Australian society more generally.

Priest, Paradies, Stewart, & Luke, 2011; Priest, Perry, Ferdinand, Kelaher, & Paradies, 2017).

In addition to the harmful effects to health and wellbeing, the effects of stressors during pregnancy are of special concern due to its effect on mother's mental health and on labour, delivery, and child development. Exposure to racism during both pre- and post-natal periods is linked to depressive symptoms and poorer mental health among mothers of

ethnic minority groups (e.g., Mexicans, Pakistani, Black African, Indian, Bangladeshi) living in the United States and United Kingdom (Becares, Nazroo, & Kelly, 2015; Zeiders, Umana-Taylor, Jahromi, Updegraff, & White, 2016). In turn, high stress levels during pregnancy—such as racial discrimination—are associated with preterm birth and lower birthweight infants, outcomes that might affect long term infant development (Alhusen, Bower, Epstein, & Sharps, 2016; Dunkel Schetter & Tanner, 2012; Shapiro, Fraser, Fransch, & Seguin, 2013; Witt, Litzelman, Cheng, Wakeel, & Barker, 2014). More specifically, worry about racial discrimination was associated with pre-term birth among Black women in a state-wide representative sample in California, United States (Braveman et al., 2017). Maternal and family exposure to racism can also directly affect child socio-emotional development indicators, such as conduct problems, hyperactivity, peer problems, inhibition/separation problems, and negative emotionality (Becares et al., 2015; Rosenthal et al., 2018). The negative impact of racism on maternal mental health can also contribute to maternal use of harsh parenting practices and negatively affect maternal sensitivity to the child emotional needs (Becares et al., 2015; Zeiders et al., 2016).

Another important mental health indicator affected by racism is sense of personal control (Stock, Peterson, Molloy, & Lambert, 2017). It can be defined as one's beliefs about their capacity to achieve goals and control any factors that might interfere with goal achievement (Lachman & Weaver, 1998). Sense of personal control is associated with psychological distress during transition to parenthood as well as with parents' depression and anxiety during the first year of parenthood (Keeton, Perry-Jenkins, & Sayer, 2008). Higher sense of personal control over discriminatory experiences is shown to be associated with improved problem-solving and social support seeking (Scott & House, 2005). On the contrary, there is evidence of associations between poorer sense of control and vulnerability to anxiety in response to challenging situations, as well as dysfunctional coping strategies and poor psychological adjustment (Henselmans et al., 2010; Keeton et al., 2008). Associations with poor physical and mental health outcomes are also reported (Lachman & Weaver, 1998; Moradi & Hasan, 2004).

Racism is not dependent on individual intentions but, rather, on its social effects in terms of reproduction of historical inequalities and maintenance of the *status quo* of the power distribution between ethno-racial groups. It is manifested systemically through attitudes, behaviours, norms, practices, and stereotypes that contribute to its perpetuation (Berman & Paradies, 2010; Paradies, 2007). Racist stereotypes about the Aboriginal community include poor health habits (e.g., smoking, problematic alcohol

consumption, and poor diet) and other complex health issues (e.g., high rates of unplanned pregnancy) attributed to that population as being a matter of personal choice (Pyett, Waples-Crowe, & Sterren, 2008; Reilly et al., 2008). Aboriginal people are then considered to be responsible for the health inequalities they face as a result of poor lifestyle choices, an assumption that deflects attention from the institutionalised deprivation of resources and rights that historically characterises this population (Marwick, Ansari, Sullivan, Parsons, & McNeil, 2014; Mitchell, 2007; Prandl, Rooney, & Bishop, 2012). Continuous research on the effects of racism on health and wellbeing in different periods across the lifespan can contribute with the evidence that investments in providence of support and in reduction of racism across society are necessary (Ferdinand, Paradies, & Kelaher, 2015).

Although racism is pervasive in Australian society (Paradies et al., 2009; Paradies & Cunningham, 2012; Priest et al., 2011; Shepherd et al., 2017), research on its effects on the mental health and wellbeing of Aboriginal Australian women during pregnancy is limited. Our first goal, in this article, is thus to characterise the experience of racial discrimination among a sample of Aboriginal South Australian pregnant women. To explore the negative effect of racism on mental health and wellbeing, the second objective is to test the association of racism with stress and sense of personal control during pregnancy. Our main hypothesis is that increases in the experience of racial discrimination is associated with higher levels of maternal stress and lower levels of sense of personal control after adjusting for socioeconomic indicators and health-related behaviours.

## 1 | METHODS

### 1.1 | Study design

This is a cross-sectional study from a convenience sample of pregnant South Australian Aboriginal women participating in a randomised controlled trial aimed to prevent early childhood caries among Aboriginal children (Merrick et al., 2012). The recruitment phase of the study was February 2011 to May 2012. Ethics approval was obtained from the University of Adelaide Human Research Ethics Committee, and the Aboriginal Health Council of South Australia. The project design and data collection procedures were based on consultancy with an Indigenous reference group and in collaboration with Aboriginal researchers on the topic of social determinants of health among Aboriginal Australians (Merrick et al., 2012). Participants were fully informed about the confidential nature of the study and written informed consent was obtained. Consent was obtained in accordance to the National Health and Medical Research

Council of Australia (NHMRC) Guidelines for Ethical Conduct in Aboriginal and Torres Strait Islander Health Research (NHMRC, 2003).

## 1.2 | Participants

Participants were 446 women pregnant with an Aboriginal child residing in South Australia. Only data from respondents identifying as being Aboriginal or Torres Strait Islander background (or both) were included ( $n = 369$ ). Participants were recruited from referrals from antenatal clinics, hospitals, community services, and Aboriginal reference groups. The mean age of participants was 24.7 years ( $SD \pm 5.30$ ; Min–Max: 14–43 years) and 64.7% of them resided in rural and regional parts of South Australia.

## 1.3 | Data collection procedures

Data was collected through an interview-guided questionnaire conducted by an Aboriginal research officer in a place of participants' choice (e.g., their homes, the local Aboriginal Community Controlled Health Organisation).

## 1.4 | Variables measurement and categorisation

### 1.4.1 | Racism (exposure)

Prevalence of racism was estimated by the Measure of Indigenous Racism Experiences instrument, developed and validated by Paradies and Cunningham (2008) to assess experience of racism among Aboriginal Australians. The instrument asks "In the last twelve months, have you felt that you have been treated unfairly in any of the following ways because you are Aboriginal?" A "Yes" or "No" option was presented to a range of nine contexts. Examples include "Applying for work, or when at work"; "At home, by neighbours or at somebody else's house"; "While doing any sporting, recreational or leisure activities"; and "By staff of government agencies." Response options were summed to estimate levels of exposure to discrimination in different settings, ranging from 0 to 9.

### 1.4.2 | Stress and sense of personal control (outcomes)

Stress was measured by the Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983), which assesses the frequency of threatening/stressful situations and perceptions of coping abilities to manage these situations. The PSS comprises 14 items with response options presented on a 5-point Likert Scale ranging from "Not at all" (0); "Rarely" (1); "Sometimes" (2); "Fairly often" (3); and "Very often"

(4). Statements include "How often during the last twelve months did you felt troubles were piling up so high you could not deal with them?" and "How often during the last twelve months did felt thing were going your way?." Scores range from 0 to 56, with high scores indicating higher stress levels (Cronbach's  $\alpha = 0.75$ ). The PSS acceptable psychometric properties have been demonstrated across different populations and cultures (Lee, 2012).

The Midlife Developmental Inventory Sense of Personal Control Scale measures perceptions of personal effectiveness over goal achievements (personal mastery domain) and personal beliefs of factors beyond one's control that interfere in goals achievement (perceived restraints domain) (Lachman & Weaver, 1998;). Twelve items are presented on a 5-point Likert scale with responses ranging from "Strongly disagree" (0) to "Strongly agree" (4). Personal mastery domain includes statements such as "I can do just about anything I really set my mind to" and "What happens to me in the future mostly depends on me." Perceived restraint statements include "I sometimes feel I am being pushed around in my life" and "I often feel helpless in dealing with life problems." Response values were summed (perceived restraint domain items were reverse-scored) generating a score range from 0 to 48. Higher scores indicated a higher sense of personal control (Cronbach's  $\alpha$  was 0.83). The measure is validated for use with adolescents, young adults and adults in the mid-life period (Lachman & Weaver, 1998; Lewis, Ross, & Mirowsky, 1999).

### 1.4.3 | Confounding variables

Adjustment for confounding based on previous evidence of its association with both exposure and outcomes is an analytical strategy to reduce bias in testing for casual associations (Greenland & Morgenstern, 2001). The variables selected were based on their theoretical relevance as elicited from evidence in the literature with Indigenous populations (Maxson, Edwards, Ingram, & Miranda, 2012; Shepherd et al., 2017). Socio-demographic variables included age, residential location, education and income, shown to be associated with both racial discrimination and mental health outcomes (Shepherd et al., 2017). Age was calculated through participant's date of birth. Residence was obtained through the open question "Where do you live (suburb, town, city)?," with responses dichotomised into "Metropolitan" and "Rural or Regional." Highest level of educational attainment was computed through a single item with response options being "No schooling," "Primary School," "High School," "Technical or Further Education (TAFE)," and "University." Income was measured through a single item specifying source of income with the options "Private job" and "Centrelink." Centrelink is part of the Department

**TABLE 1** Frequency distribution of racism, stress, sense of personal control, and confounding variables

<b>Means (95% CI)</b>	
<b>Racism</b>	1.6 (1.3, 1.8)
<b>Stress</b>	25.1 (24.3, 25.8)
<b>Sense of control</b>	31.8 (31.0, 32.5)
<b>Age</b>	24.7 (24.1, 25.3)
<b>Number of children cared for</b>	1.4 (1.2, 1.5)
<b>Prevalence (95% CI)</b>	
<b>Location</b>	
Rural or regional	64.7 (59.8, 69.6)
Metropolitan	35.2 (30.3, 40.1)
<b>Education</b>	
No schooling	1.9 (0.5, 3.3)
Primary school	1.3 (0.1, 2.5)
High school	70.4 (65.7, 75.1)
Technical	19.3 (15.2, 23.4)
University	6.9 (4.3, 9.5)
<b>Income</b>	
Private job	12.4 (0.9, 15.8)
Centrelink	87.5 (84.1, 90.9)
<b>Smoking status</b>	
Currently do	52.0 (46.8, 57.1)
Used to	27.1 (22.5, 31.7)
Never did	20.8 (16.6, 25.0)
<b>Alcohol consumption</b>	
Currently do	9.6 (6.5, 12.6)
Used to	82.4 (78.4, 86.3)
Never did	7.9 (5.1, 10.7)
<b>Felt uncomfortable about teeth appearance</b>	
Very often	20.3 (16.2, 24.4)
Often	13.5 (10.0, 17.0)
Sometimes	28.3 (23.6, 32.9)
Hardly ever	14.1 (10.5, 17.6)
Never	23.6 (19.2, 28.0)
<b>Identify with a tribal group, language, group, or clan?</b>	
Yes	43.0 (37.4, 48.6)
No	57.0 (51.3, 62.5)

of Human Services of Australia which provides social security payments for people who are unemployed or unable to work (Australian Government Department of Human Services, 2018).

Health behaviour variables included tobacco smoking and alcohol drinking, both associated with racial discrimination and mental health outcomes in pregnant women from racial minority groups (Maxson et al., 2012). These were

assessed through single items with the options “Currently do,” “Used to,” and “Never did.” Perception of oral health (teeth appearance), number of children under care, and identification with an Aboriginal group were also selected as to approximate social stereotypes associated with racism and mental health outcomes (Ferdinand et al., 2013; Pyett et al., 2008; (Reilly et al., 2008). Perception of oral health was assessed by the item “How often during the last year did you

**TABLE 2** Frequency of exposure to discrimination in the previous 12 months

Setting of exposure to racism	Prevalence (95% CI)
Applying for work or when at work ( <i>n</i> = 367)	14.7 (11.4, 18.7)
At home, by neighbours, or at somebody else's house ( <i>n</i> = 368)	19.8 (16.0, 24.2)
At school, university, training course, or other educational setting ( <i>n</i> = 367)	15.5 (12.1, 19.6)
While doing any sporting, recreational, or leisure activities ( <i>n</i> = 367)	12.2 (9.2, 16.0)
By the police, security people, lawyers, or in a court of law ( <i>n</i> = 368)	22.8 (18.8, 27.4)
By doctors, dentists, nurses, or other staff at hospitals, dental clinics, or doctor's surgeries ( <i>n</i> = 369)	10.8 (8.0, 14.4)
By staff of government agencies ( <i>n</i> = 369)	14.3 (11.1, 18.3)
When seeking any other services ( <i>n</i> = 369)	18.1 (14.5, 22.4)
By members of the general public ( <i>n</i> = 368)	31.7 (27.2, 36.7)
Overall experience of racism	Prevalence (95% CI)
Experience of racism in at least one setting ( <i>n</i> = 364)	48.3 (46.4, 56.7)
Experience of racism in 1–3 settings ( <i>n</i> = 364)	29.1 (24.6, 34.0)
Experience of racism in 4–9 settings ( <i>n</i> = 364)	19.2 (15.4, 23.6)
No experience of racism ( <i>n</i> = 364)	51.6 (46.4, 56.7)

feel uncomfortable about the way your teeth looked?" with response options ranging from "Very often" to "Never." Number of children cared for was composed by a single item with an open response option. Finally, identification with an Aboriginal group was assessed through the question "Do you identify with a tribal group, a language group, or clan?" with response options being "Yes" or "No."

#### 1.4.4 | Auxiliary variables to the imputation model

Social support was assessed through four items with response options ranging from "Strongly disagree (1)" to "Strongly agree (5)." The items were "There are people in my life who pay attention to my feelings and problems," "There are people in my life who appreciate what I do," "There are people in my life who I can get help from if I need it," and "There are people in my life who I can talk to about how to handle things." A summary score variable was generated by summing up participants' responses.

## 2 | ANALYSIS

Analyses were performed using Stata (v. 14.0). Based on the assumption of missing at random, or that the probability of the observed pattern of missing data is the same for all possible values of the missing data (Rubin, 1976), multiple imputation with chained equations was used. Sequential regression models for each variable with missing values were generated conditional on complete case variables. Twenty imputed datasets were generated using 50 cycles of regression switching for imputation on discrimination, stress, sense of personal control, and the confounding variables. Social support was also inserted as an auxiliary variable to the imputed model due to its association with the outcome variables (Chong et al., 2016). Imputed data was predicted conditional on the complete case variables, age, and residential location. The frequency of missing values for each variable is presented in Appendix I (Table A1).

The analyses were based on the imputed datasets. Descriptive frequencies on the percentage of participants experiencing discrimination in each given setting were generated based on the respondent sample, as the individual items for each setting where discrimination occurred were not entered in the imputation model. Means and proportions with respective 95% confidence intervals were generated to describe the sample and to inform on the prevalence of discrimination, stress, and sense of personal control per level of the confounding variables. It was verified that the distribution of the outcome variables stress, and sense of personal control were normally distributed. Linear regression models tested the association between racism, stress and sense of personal control in separate models. The associations were tested before and after adjustment for confounding.

## 3 | RESULTS

The mean age of participants was 24.7 years (*SD* ±5.30; Min–Max: 14–43 years). Almost two thirds (64.7%) resided in rural and regional parts of South Australia and 73.7% had high school or less as their highest educational attainment. The mean number of children already being cared for by the mothers was 1.4 (*SD* ±1.4). Around 90% (87.5%) of respondents had Centrelink as their income source. Half the participants (52.0%) reported being a current tobacco smoker and 9.6% reported current consumption of alcohol. Discomfort over teeth appearance at least sometimes was reported by nearly two-thirds of respondents (62.2%). Just under half (43%) reported identifying with an Aboriginal group, language group, or clan. The prevalence characteristics of the sample are described in Table 1. As shown in Appendix I, the prevalence and estimates of the imputed and complete cases are very similar.

**TABLE 3** Distribution of discrimination, stress, and sense of personal control per strata of confounding

	Mean discrimination (95% CI)	Mean stress (95% CI)	Mean sense of personal control (95% CI)
<b>Location</b>			
Regional	1.5 (1.2, 1.8)	25.1 (24.2, 25.9)	31.5 (30.6, 32.4)
Metropolitan	1.7 (1.3, 2.1)	25.1 (23.8, 26.5)	32.4 (31.2, 33.5)
<b>Education</b>			
No schooling	2.6 (2.3, 4.9)	26.3 (22.3, 30.3)	31.4 (26.3, 36.5)
Primary school	3.3 (2.3, 6.5)	29.3 (21.8, 36.8)	25.7 (18.6, 32.8)
High school	1.4 (1.2, 1.7)	25.4 (24.5, 26.3)	31.2 (30.3, 32.0)
Technical	1.3 (0.9, 1.8)	24.3 (22.6, 26.0)	33.3 (31.7, 35.0)
University	2.9 (1.6, 4.2)	22.4 (19.9, 24.9)	35.2 (32.9, 37.6)
<b>Income</b>			
Private job	1.8 (1.0, 2.6)	21.5 (19.6, 23.5)	35.3 (33.5, 37.2)
Centrelink	1.5 (1.3, 1.8)	25.6 (24.8, 26.4)	31.3 (30.5, 32.0)
<b>Smoking status</b>			
Currently do	1.6 (1.3, 1.9)	26.1 (25.1, 27.2)	31.0 (30.0, 32.0)
Used to	1.4 (1.0, 1.9)	24.7 (23.3, 26.2)	32.6 (31.2, 34.1)
Never did	1.5 (1.0, 2.1)	22.9 (21.5, 24.4)	32.7 (31.3, 34.1)
<b>Alcohol consumption</b>			
Currently do	1.9 (1.1, 2.8)	26.6 (24.5, 28.6)	29.7 (27.8, 31.7)
Used to	1.6 (1.3, 1.8)	25.1 (24.3, 25.9)	32.0 (31.2, 32.8)
Never did	1.1 (0.3, 1.9)	23.2 (20.6, 25.8)	32.2 (29.6, 34.8)
<b>Felt uncomfortable about teeth appearance</b>			
Very often	2.2 (1.6, 2.8)	27.3 (25.6, 29.1)	31.1 (29.4, 32.8)
Often	1.9 (1.2, 2.6)	26.9 (24.8, 28.9)	30.8 (28.9, 32.8)
Sometimes	1.4 (0.9, 1.8)	24.5 (23.3, 25.6)	31.1 (29.8, 32.4)
Hardly ever	1.2 (0.6, 1.6)	24.8 (23.2, 26.3)	31.8 (30.0, 33.5)
Never	1.3 (0.9, 1.7)	23.0 (21.3, 24.8)	33.8 (32.3, 35.3)
<b>Identify with a tribal group, language, group, or clan?</b>			
Yes	1.1 (0.8, 1.5)	25.1 (23.9, 26.3)	32.1 (31.0, 33.2)
No	1.9 (1.5, 2.4)	25.1 (24.1, 26.1)	31.6 (30.6, 32.6)

The mean score for discrimination experience over the previous year was 1.6 ( $SD \pm 2.24$ ). Any experience of discrimination was reported by almost half the participants (48.2%) with 29.1% reporting 1 to 3 experiences and 19.2% indicating 4 to 9 experiences. The most frequent experience was being discriminated by members of the general public (31.8%), whilst also common was: "By the police, security people, lawyers or in a court of law (22.8%)," "At home, by neighbours or at somebody else's house (19.8%)," "When seeking any other services (18.1%)," and "By staff of government agencies (14.3%)." Table 2 presents the prevalence of discrimination by scenario and the respective confidence

intervals. The mean stress and sense of personal control scores were respectively 25.1 ( $SD \pm 7.17$ ) and 31.8 ( $SD \pm 6.96$ ). The distribution of means of racism, stress, and sense of personal control per strata of the confounding variables with respective confidence intervals are summarised in Table 3.

The regression analyses showed that stress scores increase by 0.69 for each one unit increase in number of settings where racism was experienced ( $\beta = .69$ , 95% confidence interval [CI] 0.36, 1.01). After adjusting for socio demographics and health-related behaviours, the effect decreased slightly ( $\beta = .61$ , 95% CI 0.29, 0.94).

**TABLE 4** Regression coefficients for the unadjusted and adjusted effects of racism on stress and sense of personal control

	Unadjusted $\beta$ (95% CI)	Adjusted <sup>a</sup> $\beta$ (95% CI)
Perceived stress	0.67 (0.35, 1.00)	0.61 (0.28, 0.93)
Sense of personal control	-0.39 (-0.71, -0.07)	-0.36 (-0.68, -0.04)

<sup>a</sup>Adjusted for age, education, income, residential location, smoking status, alcohol consumption, oral health perception, number of children being cared for, and cultural identification.

The unadjusted model for the effect of racism on sense of personal control indicated that one unit increase in racism experiences was associated with a decrease of 0.39 on the sense of personal control score ( $\beta = -.39$ , 95% CI  $-0.71, -0.07$ ). The adjusted model showed a decrease of 0.35 on sense of personal control score points ( $\beta = -.35$ , 95% CI  $-0.67, -0.03$ ). Table 4 summarises the coefficients obtained in each model and the respective confidence intervals.

## 4 | DISCUSSION

The results add to the evidence that racism is present in different settings of Aboriginal Australians daily activities. The fact that 48.3% of the sample reported at least one episode of racism in the previous year indicates that racism is pervasive among Aboriginal Australian women during pregnancy. The results support previous evidence showing that the frequency and pervasiveness of racism experienced can contribute to worse mental health indicators among a socially marginalised group (Ferdinand et al., 2013). An increase in experiences of racism was shown to be associated with higher levels of stress and decreased sense of personal control through levels of demographics, health behaviours, and discriminatory stereotypes. The observation of a casual association between racism, stress, and sense of personal control after adjustment for confounding according to a theoretically based model further corroborates the evidence of the deleterious effects of racism on Aboriginal people mental health.

To our knowledge, no studies on the impact of racism on the mental health of Aboriginal Australian women who are pregnant have been published. Our findings thus highlight an important concern given that, for mothers in our study, pregnancy was a time when they were planning and raising their families whilst dealing with poor socioeconomic conditions and a range of psychosocial stressors, including racism. The sample of this study is not representative of the Aboriginal population. Nonetheless, for the purposes of the present study, non-representativeness is not likely to be an issue as it is not a requirement for identification of casual associations

(Richiardi, Pizzi, & Pearce, 2013; Rothman, Gallacher, & Hatch, 2013). The associations between racism and mental health have been observed in multiple studies with Indigenous people in different developmental periods (Ferdinand et al., 2015; Prandl et al., 2012; Priest, Thompson, et al., 2017). Our results extend that findings to the period of pregnancy.

Although public health interventions usually target changes in poor health habits, the inequalities in health between Aboriginal and non-Aboriginal Australians are not solely due to differences in lifestyle risk behaviours (Marwick et al., 2014; Prandl et al., 2012). The results in this study suggest that interventions aimed to address stress and its psychosocial causes among Aboriginal Australian mothers might need to be contemplated (Adams, Halacas, Cincotta, & Pesich, 2014; Marwick et al., 2014). Focusing on antenatal screening for racism experiences and provision of mental health support may address some of the causes of this population's poor mental and physical health indicators (Baba, Brolan, & Hill, 2014), although wider measures addressing societal acceptance of racism are also important. The perinatal period might be an optimistic time for intervention, as there is the potential to elicit much change in parent-child interactions (Shorey et al., 2019). Opportunistic intervention in such a period can change life trajectories and contribute to the interruption of the intergenerational effects of oppression Aboriginal people face (Chamberlain et al., 2019).

One of the few strategies reported to be effective in reduction of discrimination-related stress among Aboriginal Australians was talking to someone about it (Ferdinand et al., 2013). In general terms, social support and group identification are shown to buffer psychosocial stressors and assist in health promotion through enhancement of sense of personal control (Greenaway et al., 2015). In other words, group membership assists people in feeling in control over their actions and life outcomes and promote functional coping and adjustment when facing adversities (Greenaway et al., 2015; Outten, Schmitt, Garcia, & Branscombe, 2009). This might suggest that the planning of mental health support for this population might benefit from the creation of collective spaces in which experiences can be shared and cultural bonds reinforced. Such an approach is also in accordance with Aboriginal cultural centrality of collectiveness (Baba et al., 2014; Hepworth et al., 2015).

Cognitive therapy principles and techniques (e.g., psychoeducation and cognitive restructuring) could help to address unhelpful cognitive schemes and less helpful coping strategies related to racism, including worrying, rumination, and emotional suppression (Harrell et al., 2011). The changes in unhelpful ways of thinking could also contribute to the enhancement of sense of personal control (Keeton

et al., 2008). Adaptation of such techniques to the Australian Aboriginal context and the effectiveness of its use in a culturally safe environment to buffer racism effects during pregnancy might be important directions for future research. There is also evidence of interventions with Australian Aboriginal families that benefitted from using narrative therapy principles such as sharing of stories and use of art work to engage participants and create a sense of self-empowerment (Smith, O'Grady, Cubillo, & Cavanagh, 2017). Narrative therapy can be easily assimilated by Australian Aboriginals due to the cultural practice of sharing stories for connecting people and transmitting knowledge (Denborough et al., 2006). Narrative therapy might permit sharing stories of resilience and acting to empower current initiatives and inspire communities based on past experience (Denborough et al., 2006; Smith et al., 2017; Stock, Mares, & Robinson, 2012).

The insertion of cultural values, consultation, and participation of community members is pointed as an effective strategy in the success of mental health care of Indigenous people (Gone, 2013; Nelson & Wilson, 2017). The Australian experience of implementing Aboriginal Community Controlled Health Services, which are autonomous and culturally appropriate services controlled by Aboriginal communities, showed an increase in Aboriginal people seeking and reporting satisfaction with health care (Hepworth et al., 2015). Such improvement was reported to be due to users' perception of respect for the cultural values on the importance of kinship, community, and oral transmission of knowledge and experience (Baba et al., 2014; Hepworth et al., 2015).

Health services controlled by Aboriginal communities may additionally assist in identifying Aboriginal people's real needs and exert a positive effect on Aboriginal people's autonomy (Baba et al., 2014). By fostering initiatives to take action, this strategy may assist in developing a stronger sense of personal control that can be generalised to different life domains (Keeton et al., 2008). Regarding mainstream health care institutions, the integration of culturally sensitive mental health professionals (e.g., social workers and psychologists) might be an important step in ensuring Aboriginal people's adherence and satisfaction with health care (Hepworth et al., 2015). More specifically, a study with Aboriginal Maternal and Infant Care workers in South Australia suggests health professionals and midwives' cultural sensitivity as a key factor in antenatal education and care, support in labour, and postnatal care (Stamp et al., 2008).

Beyond and above tackling the consequences of racism at an individual level, anti-racist policies must promote macrosocial changes that could prevent racist discrimination on a societal level (Ferdinand et al., 2015). Specifically, for the

antenatal care of Aboriginal pregnant women, education of health professionals on the complex factors that characterises institutionalised racism and shape health inequalities among the Aboriginal population is a must (Berman & Paradies, 2010; Harrell et al., 2011; Prandl et al., 2012). Promotion of cultural competency in health care settings—or the capacity to provide quality health-care for diverse patient populations—is also shown to increase positive diversity attitudes among health professionals (Weech-Maldonado et al., 2018). Education and promotion of cultural competency could thus contribute to avoidance of prejudgment of risky health behaviours (e.g., smoking during pregnancy), support of patients in health promotion as well as reduction of perceived racism by the Aboriginal population in health care settings (Ferdinand et al., 2013; Prandl et al., 2012; Weech-Maldonado et al., 2018). Such a change could contribute to reduction of stress-related consequences to mother, child, and their families, as well as the creation of a sense of trust between patients and health professionals (Kelaher et al., 2014).

The present study contributes to the evidence base demonstrating the association between racism and determinants of Aboriginal pregnant women's mental health. Limitations do exist, however. It is possible that individualistic Western values could bias the conception of sense of personal control as a determinant of mental health. It is argued that this concept might not be entirely relevant for the comprehension of stress and coping in more collectivist societies (O'Connor & Shimizu, 2002). On the other hand, research on Aboriginal Australian people's perception on determinants of health shows that sense of personal control is valued as an important feature to promote personal well-being and to be balanced with obligations towards the community (Reilly et al., 2008). Culturally appropriated measures that encompass Aboriginal Australian's understanding of well-being and collective coping strategies might further contribute to the understanding on how psychosocial stressors impact these communities and provide insight into interventions that could reduce health inequalities among the Aboriginal population (Le Grande et al., 2017).

The results are based on a cross-sectional sample thus causality should be inferred with care. Investigation of mental health indicators with a longitudinal perspective might permit greater understanding of the associations between exposure to racism during pregnancy and Aboriginal Australian mother and child physical and mental health. In addition, though bias due to confounding was addressed and multiple imputation was used to address any non-response bias, residual and unmeasured confounding might remain, as for all observational studies.

## 5 | CONCLUSION

Our findings demonstrate the scale to which racial discrimination manifests in almost every context of Aboriginal women's lives, impacting their daily activities, and adding extra difficulties to the already large spectrum of social inequalities faced. As a psychosocial cause of poor mental health and an indirect determinant of physical health, interventions aimed to reduce racism effects are suggested. By the empowerment of Aboriginal communities in health promotion decisions, research initiatives, and respect of Aboriginal holistic cultural values of health and well-being, collective strategies of coping to psychosocial stress can be built and a sense of self-worth and personal control can be achieved. More generally, our results align with the view that microsocial policies are necessary to buffer the effect of racism on the Aboriginal Australian community whilst macrosocial policies are designed and implemented to reduce racism in Australian society more generally.

### ORCID

Davi M. Macedo  <https://orcid.org/0000-0001-9342-0888>

Rachel M. Roberts  <https://orcid.org/0000-0002-9547-9995>

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**How to cite this article:** Macedo DM, Smithers LG, Roberts RM, Jamieson LM. Racism, stress, and sense of personal control among Aboriginal Australian pregnant women. *Aust Psychol*. 2020;55:336–348. <https://doi.org/10.1111/ap.12435>

## APPENDIX I

TABLE A1

	Imputed sample ( <i>n</i> = 369)	Complete cases sample ( <i>n</i> = 259) <sup>a</sup>	Missing values
	Means (95% CI)		Frequency
<b>Racism</b>	1.6 (1.3, 1.8)	1.6 (1.3, 1.9)	05
<b>Stress</b>	25.1 (24.3, 25.8)	24.9 (24.0, 25.8)	14
<b>Sense of control</b>	31.8 (31.0, 32.5)	32.5 (31.6, 33.4)	11
<b>Age</b>	24.7 (24.1, 25.3)	25.3 (24.6, 26.0)	0
<b>Number of children cared for</b>	1.4 (1.2, 1.5)	1.4 (1.2, 1.5)	29
	<b>Prevalence (95% CI)</b>		
<b>Location</b>			0
Rural or regional	64.7 (59.8, 69.6)	65.2 (59.2, 70.8)	
Metropolitan	35.3 (30.3, 40.1)	34.8 (29.1, 40.8)	
<b>Education</b>			03
No schooling	1.9 (0.5, 3.3)	1.9 (0.08, 4.5)	
Primary school	1.4 (0.1, 2.6)	1.5 (0.05, 4.0)	
High school	70.4 (65.7, 75.1)	69.9 (63.9, 75.2)	
Technical	19.3 (15.3, 23.4)	18.9 (14.6, 24.2)	
University	6.9 (4.3, 9.5)	7.7 (5.0, 11.7)	
<b>Income</b>			05
Private job	12.4 (0.9, 15.8)	13.9 (10.1, 18.7)	
Centrelink	87.6 (84.1, 90.9)	86.1 (81.2, 89.8)	
<b>Smoking status</b>			04
Currently do	52.0 (46.9, 57.1)	53.2 (47.1, 59.3)	
Used to	27.1 (22.5, 31.7)	28.5 (23.3, 34.4)	
Never did	20.9 (16.6, 25.0)	18.1 (13.8, 23.3)	
<b>Alcohol consumption</b>			05
Currently do	9.6 (6.5, 12.6)	8.5 (5.6, 12.5)	
Used to	82.4 (78.4, 86.3)	84.9 (80.0, 88.8)	
Never did	7.9 (5.1, 10.7)	6.5 (4.1, 10.3)	
<b>Felt uncomfortable about teeth appearance</b>			01
Very often	20.3 (16.2, 24.4)	22.7 (18.0, 28.3)	
Often	13.5 (10.0, 17.0)	12.7 (9.1, 17.4)	
Sometimes	28.3 (23.6, 32.9)	26.2 (21.2, 31.9)	
Hardly ever	14.1 (10.5, 17.6)	14.6 (10.8, 19.5)	
Never	23.6 (19.2, 28.0)	23.5 (18.7, 29.1)	
<b>Identify with a tribal group, language, group or clan?</b>			62
Yes	43.0 (37.4, 48.6)	43.6 (37.6, 49.7)	
No	57.0 (51.3, 62.6)	56.3 (50.2, 62.3)	

Note: Comparison of frequency distributions between the imputed and complete cases and presentation of missing values in the respondent sample.

<sup>a</sup>Complete cases on all exposure, outcome, and confounding variables.