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"Being real when asking the questions, not tip-toeing around": carefully and respectfully adapting the Composite Abuse Scale to create the Aboriginal Women's Experiences of Partner Violence Scale (AEPVS)

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2021-059576
Article Type:	Original research
Date Submitted by the Author:	24-Nov-2021
Complete List of Authors:	Glover, Karen; Murdoch Childrens Research Institute, Intergenerational Health; South Australian Health and Medical Research Institute, Women and Kids Theme Gartland, Deirdre; Murdoch Childrens Research Institute, Intergenerational Health; The University of Melbourne, Department of Paediatrics Leane, Cathy; Women's and Children's Health Network, South Australian Government Nikolof, Arwen; Murdoch Childrens Research Institute, Intergenerational Health; South Australian Health and Medical Research Institute, Women and Kids Theme Weetra, Donna; Murdoch Childrens Research Institute, Intergenerational Health Clark, Yvonne; South Australian Health and Medical Research Institute, Women and Kids Theme Giallo, Rebecca; Murdoch Childrens Research Institute, Intergenerational Health; The University of Melbourne, Department of Paediatrics Brown, Stephanie; Murdoch Childrens Research Institute, Intergenerational Health; The University of Melbourne, Department of General Practice and Department of Paediatrics
Keywords:	PUBLIC HEALTH, EPIDEMIOLOGY, MENTAL HEALTH

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"Being real when asking the questions, not tip-toeing around": carefully and respectfully adapting the Composite Abuse Scale to create the Aboriginal Women's Experiences of Partner Violence Scale (AEPVS)

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Key words: public health, epidemiology, mental health

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Abstract

Objective: Few studies employ culturally safe approaches to understanding Indigenous women's experiences of intimate partner violence (IPV). The aim of this study was to develop a brief, culturally safe, self-report measure of Aboriginal and Torres Strait Islander women's experiences of different types of IPV.

Design: Multi-stage process to select, adapt and test a modified version of the Australian Composite Abuse Scale using community discussion groups and pre-testing. Revised draft measure tested in Wave 2 follow-up of an existing cohort of Aboriginal families. Psychometric testing and revision included assessment of the factor structure, construct validity, scale reliability and acceptability to create the Aboriginal Experiences of Partner Violence Scale (AEPVS).

Setting: South Australia, Australia

Participants: 14 Aboriginal women participated in discussion groups, 58 participated in pretesting of the draft AEPVS, and 216 mothers participating in the Aboriginal Families Study completed the revised draft version of the adapted measure.

Results: The initial version of the AEPVS based on item review and adaptation by the study's Aboriginal Advisory Group comprised 31 items measuring physical, emotional and financial IPV. After feedback from community discussion groups and two rounds of testing, the 18-item AEPVS consists of three subscales representing physical, emotional and financial IPV. All subscales had excellent construct validity and internal consistency. The AEPVS had high acceptability among Aboriginal women participating in the Aboriginal Families Study. **Conclusions:** The AEPVS is the first co-designed, multi-dimensional measure of Aboriginal women's experience of physical, emotional and financial IPV. The measure demonstrated cultural acceptability and construct validity within the setting of an Aboriginal-led, community-based research project. Validation in other settings (e.g. primary care) and populations (e.g. other Indigenous populations) will need to incorporate processes for community governance and tailoring of research processes to local community contexts.

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STRENGTHS AND LIMITATIONS OF THIS STUDY

- The Aboriginal Women's Experience of Partner Violence Scale (AEPVS) is the first co-designed, multi-dimensional measure of Aboriginal and Torres Strait Islander women's experience of physical, emotional and financial partner violence.
- The measure demonstrated cultural acceptability and construct validity within the setting of an Aboriginal-led, community-based research project.
- The research team worked with guidance of the study's Aboriginal Advisory Group and Aboriginal women participating in discussion groups to ensure content validity and cultural acceptability of the new measure.
- While the sample was both geographically and culturally diverse, the results may not apply directly to Aboriginal and Torres Strait Islander communities in other jurisdictions or to other Indigenous populations.

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Background

Intimate partner violence (IPV) is a global public health and human rights issue estimated to affect one in three women at some stage in their lives(1), and more than one in three mothers in the decade after having their first child.(2) Indigenous women are disproportionately impacted by family and community violence due to ongoing impacts of colonisation, including: racism and discrimination; disconnection from traditional lands, culture and language; policies of forced child removal; and constant grief and loss.(3-6) There is mounting evidence of the long term health consequences of IPV for women and children.(2, 6-10) Advocacy programs, focusing on empowerment, safety and resources, and psychological therapies, such as Trauma Informed Cognitive Behaviour Therapy have been shown to be effective in long-term healing and recovery from IPV.(11, 12) However, most women and children impacted by IPV do not access such services.(6, 13-16) Barriers operate at both organisational and systems levels (e.g. fragmented referral pathways, low affordability, insufficient attention to tailoring of care to address needs of culturally diverse communities) and at a personal or family level (e.g. minimising significance of the problem, belief that nothing will help, shame, self-doubt and low self-esteem, concerns about escalation of violence and risk of child removal).(6, 17) At a global level, the World Health Organization has called for systems change to strengthen health sector responses to IPV.(18, 19) In Australia, two recent Royal Commissions have drawn attention to the need for systems reform to improve prevention and early intervention, and for service responses to be developed in partnership with Aboriginal and Torres Strait Islander communities.(20, 21)

There is high quality evidence regarding the prevalence of IPV and longer-term consequences for women's and children's health from large scale studies conducted in high, middle and low income countries.(1, 2, 8, 9) Globally, the experience of Indigenous women remains under-investigated. To our knowledge there are no culturally validated tools for inquiring about Aboriginal and Torres Strait Islander women's experiences of IPV. To address this gap, we adapted an Australian multi-dimensional measure of physical and emotional IPV - the Composite Abuse Scale(22, 23) - for inclusion in a longitudinal study of 344 Aboriginal families in South Australia.

Partner violence takes many forms. The most commonly recognised types of IPV are acts of physical and sexual violence. IPV also takes the form of repeated emotional abuse and/or coercive, controlling behavior, which may include control of financial resources. There is some evidence that Aboriginal and Torres Strait Islander women experience high rates of physical violence.(13) It is not known how commonly Aboriginal and Torres Strait Islander women experience other forms of partner violence, nor what consequences this has for their health and wellbeing, or the health and wellbeing of children.

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This study – conducted in partnership with the Aboriginal Health Council of South Australia - aimed to develop a culturally robust and acceptable approach to inquiring about IPV within an existing prospective birth cohort study called the Aboriginal Families Study. The paper reports iterative steps taken to: (i) select and adapt an existing multi-dimensional measure of intimate partner violence; and (ii) test the cultural acceptability and psychometric properties of the adapted measure within Wave 2 follow-up of the cohort.

Methods

Setting

The Aboriginal Families Study is a prospective, population-based cohort study of 344 Aboriginal children born in South Australia between July 2011 and June 2013, and their mothers and carers. The study protocol was developed with guidance from the study's Aboriginal Advisory Group set up under the auspice of the Aboriginal Health Council of South Australia (the peak body for Aboriginal health in South Australia). Women were recruited by a team of Aboriginal researchers, all of whom had close connections with Aboriginal communities in South Australia. Details regarding community consultation, partnership arrangements, and study procedures are available in previous papers.(24, 25)

Cohort participants have connections with more than 35 Aboriginal and Torres Strait Islander language and community groups across Australia. At recruitment, 39% of mothers were living in Adelaide, 36% in regional areas and 25% in remote areas of South Australia. Mothers ranged in age from 15-49 years. Comparisons with South Australian routinely collected perinatal data showed that the sample was largely representative in relation to maternal age, infant birthweight and gestation, but slightly over-represented women having their first child.(25) Wave 2 follow up of the study children and their mothers and carers was undertaken between 2018 and 2020 around the time that the children were starting primary school.

Prior to commencing Wave 2 follow-up, the research team and the study's Aboriginal Advisory Group undertook extensive preparatory work to design procedures for follow-up. This included selection of culturally appropriate study measures. At Wave 2, the study aims included ascertainment of women's experiences of violence in partner relationships. To address this aim, the research team reviewed existing measures of IPV and looked for epidemiological and clinical studies involving Aboriginal and Torres Strait Islanders or other Indigenous populations where measures of IPV had been used.

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Instruments included in the *CDC Compendium of Assessment Tools for Measuring Intimate Partner Violence Victimization and Perpetration(26)* were reviewed in relation to: (i) likely face validity with Aboriginal women of childbearing age in South Australia; (ii) culturally appropriate use of language; (iii) length of the measure; (iv) capacity to be completed as an interview or by self-administered questionnaire; (iv) inclusion of items asking about different types of violence, including physical, emotional and financial abuse; (v) robust psychometric properties. Based on these criteria, the Composite Abuse Scale (CAS) was selected by the Aboriginal Advisory Group as the measure most likely to be suitable for inclusion. The standard version includes 30 items assessing different types of psychological, physical and sexual violence by a current or former partner over the previous 12 months.(22, 23) A shorter, 18-item version focuses on emotional and physical violence. Both versions have been used extensively in Australian and international research.(2, 27-31) The Aboriginal Advisory Group recommended that the 18-item version be adapted and pre-tested with Aboriginal women to determine whether it would be appropriate for inclusion in the Wave 2 questionnaire. Specifically, the Advisory Group recommended: (i) review of the language in the CAS for cultural and linguistic relevance, (ii) inclusion of additional items to assess financial abuse, and (iii) inclusion of additional items covering actions by a partner that seek to control women's behavior, including actions that seek to prevent women from connecting with members of their Aboriginal family or going to Aboriginal community events.

Step 1: Development of the adapted CAS

A working group – comprising Aboriginal and non-Aboriginal investigators, Aboriginal researchers and members of the Aboriginal Advisory Group - was established to make recommendations regarding adaptation of the CAS (Table 1). Modifications recommended by the working group included changes to the wording of some items to simplify language and/or change the expression to match local Aboriginal ways of using English. For example, the expression "Beat you up" (a common expression in standard Australian English) was replaced with the expression "Flogged you" (a more common expression in Aboriginal English). While few women taking part in the Aboriginal Families Study speak an Aboriginal language at home, many speak some words in local Aboriginal languages. The working group recommended inclusion of some words in local languages likely to be familiar to Aboriginal and Torres Strait Islander people in South Australia.

Twelve new items considered to have particular relevance for Aboriginal communities were added to the measure. These were: two items asking about controlling behavior preventing women from connecting with their Aboriginality or making women feel bad about being Aboriginal; six items asking

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about financial abuse; four items describing types of physical abuse and two items describing emotional abuse.

In the original version of the CAS, women are asked to report the frequency of each behaviour during the previous 12 months, by ticking one of the following six responses: 'never', 'only once', 'several times', 'once per month', 'once per week' and 'daily', scored 0-5. A score of three or more for emotional abuse items or one or more for physical abuse items is used to indicate IPV.(22, 23) The working group recommended that the number of response options be reduced from six to four for ease of administration. The pilot study version included the following four responses: 'never', 'once', 'several times' or 'a lot', scored 0-3. The working group also recommended inclusion of a preamble explaining why the questions were being asked, that all women were being asked the same questions and reminding women that they did not have to answer any questions that they did not wish to answer. The new draft measure was named the Aboriginal Women's Experience of Partner Violence Scale (AEPVS).

Table 1. Items in the Composite Abuse Scale and draft Aboriginal Women's Experience of Partner Violence Scale (AEPVS) - versions 1 and 2

Composite Abuse Scale – Short version	Initial draft version of AEPVS	Final draft version of the AEPVS
Emotional abuse Items		
Told me I wasn't good enough	Told you that you are no good	Told you that you are stupid or no good
Tried to turn my family, friends and children against me	Tried to turn family, friends and children against you	Tried to turn family, friends and children against you
Tried to keep me from seeing or talking to my family	Tried to keep you from seeing or talking to family	Tried to keep you from seeing or talking to family
Blamed me for causing their violent behaviour	Blamed their violent behaviour on you, saying it was your fault because you set them off	Blamed their violent behaviour on you, saying it was your fault because you set them off
Told me I was crazy	Told you that you are crazy (boontha, rama rama	Told you that you are crazy (boontha, rama rama)

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Told me no one would ever want me	Told you that no one would ever want you	Told you that no one would ever want you
Did not want me to socialize with my female friends	Stopped you from seeing female friends	Stopped you from seeing female friends
Told me I was stupid	Told you that you are stupid	
Told me I was ugly	Told you that you are ugly	
Became upset if dinner/house work wasn't done when they thought it should be		
Tried to convince my friends, family or children that I was crazy	Tried to convince friends, family or children that you have lost your spirit, or have bad spirit in you	
	Got jealous or wild (doodla) if you talked to your male friends or their male friends	Got jealous or wild (doodla) if you talked to your male friends or their male friends
	Got wild when you dressed up or put makeup on	Got wild when you dressed up or put makeup on
	Threatened to hurt you, your family or pets	Threatened to hurt you, your family or pets
	Stopped you from connecting with your Aboriginality (e.g. going to community events, going home to Country)	Stopped you from connecting with your Aboriginality (e.g. going to community events, going home to Country)
	Made you feel bad about being Aboriginal	Made you feel bad about being Aboriginal
Physical abuse Items		
Slapped me	Slapped or hit you	Slapped or hit you
Shook me	Shook you	Shook you
Pushed, grabbed or shoved me	Pushed, grabbed or shoved you	Pushed, grabbed or shoved you
Hit or tried to hit me with something	Hit or tried to hit you with something	Hit or tried to hit you with something

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Kicked me, bit me or hit me with a fist	Kicked you, bit you, or punched you	Kicked you, bit you, or punched you
Beat me up	Flogged you	Flogged you
Threw me		
	Stopped you from leaving the house	Stopped you from leaving the house
	Forced you to do something you didn't want to do	Forced you to do something you didn't want to do sexually
	Smashed up or destroyed your things	Smashed up or destroyed your things
		Used a knife or gun or other weapon
Financial abuse items		
	Got wild if you spent money on yourself	Got wild if you spent money on yourself
	Refused to contribute to family finances (e.g. pay bills, buy food)	Refused to contribute to family finances (e.g. pay bills, buy food)
	Stopped you from earning your own money	Stopped you from earning your own money
	Got you to pay their bills	Got you to pay their bills
	Took money from your bank account	Took money you needed for something else (e.g. pay bills, buy food)
	Took your money	Took your money and made you worry about not having enough
	Made you put the bills in your name	Made you put the bills in your name
	Made you ask for money for bills, food or the kids	Made you ask for money for bills, food or the kids

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Step 2: Discussion groups

Discussion groups were held in urban and regional areas to seek advice on the acceptability of the proposed approach, and cultural appropriateness of the draft AEPVS . Eligible women (aged ≥18 years; mothers of Aboriginal children aged 6-10 years) were recruited via Aboriginal community organisations, health services and community centres. Staff in these agencies informed women about the study and facilitated introductions to members of the research team, who then explained what was involved in taking part. Women were provided with written and verbal information, and given time to consider their decision before agreeing to take part. Discussion group methods were used to examine the content of the draft AEPVS, paying particular attention to specific items and response options, and use of Aboriginal language words. After a preliminary discussion about the purpose of the study, and principles for participation, participants were given copies of the standard version of the CAS and the draft AEPVS and asked to comment on which instrument offered the better approach for Aboriginal women. Participants were then asked to look at individual items in the CAS and the draft AEPVS and to comment on their suitability for inclusion. The principles for participation in discussion groups included agreements regarding confidentiality, the importance of everyone being heard, and there being no right and wrong answers. All discussion groups were facilitated by Aboriginal research team members, with notes taken on butchers' paper.

Step 3: Pretesting the new Aboriginal Women's Experience of Partner Violence measure

The Wave 2 questionnaire incorporating the draft AEPVS was pre-tested with Aboriginal women living in urban and regional areas between October 2016 and August 2017. Women were eligible to take part if they were aged ≥18 years and mothers of Aboriginal children aged 6-10 years old. Eligible mothers were identified via community networks of Aboriginal research team members and were offered the choice of completing the questionnaire with an Aboriginal researcher or self-completing the questionnaire. Women consenting to participate were asked for their written and/or verbal feedback on the draft questionnaire including the questions on partner violence. Specifically, they were asked: (i) whether there were any questions or sections of the questionnaire that made them feel uncomfortable or that were 'too personal' or 'intrusive'; (ii) what they liked about the questionnaire, and (iii) what we could do to improve the questionnaire, specific questions or study procedures.

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Step 4: Validation of the AEPVS in Wave 2 of the Aboriginal Families Study

Wave 2 follow up occurred between mid-2018 and late 2020. All women who took part in Wave 1 were eligible to take part. Women were invited to complete the questionnaire in a face-to-face interview with a female Aboriginal researcher, or to self-complete (if preferred). When women opted to self-complete, study staff either remained present or provided participants with a folder for storing the completed questionnaire, which was then collected within 48 hours by the same team member. Care was taken to inform women that the questionnaire covered sensitive issues such as grief and loss and partner violence, and that they did not have to answer any questions that they do not wish to. Study staff aimed to ensure that interviews took place in locations where women had privacy, and that questionnaires left for self-completion were contained in a sealable envelope or folder to facilitate confidentiality. During the COVID-19 pandemic, women were also given the option of receiving a mailed copy of the questionnaire and/or mailing the questionnaire back to the research team by reply paid envelope. Safety procedures included training and support for study staff to offer referral pathways to women disclosing violence or other life stressors.

Analysis

Data gathered in discussion groups (step 2) were analysed to identify areas of consensus, disagreement or concern about the draft AEPVS items and/or study procedures related to inquiry about partner violence. Analysis of data collected from women participating in pre-testing of the draft questionnaire (step 3) involved examining item distributions and missing values for each of the AEPVS items. Women's feedback about the AEPVS items was also collated and summarised. These combined data were presented to members of the Aboriginal Advisory Group and study investigators for their consideration and interpretation and were used to inform final decisions regarding study measures and procedures for Wave 2 follow-up.

Validation of the AEPVS (step 4) was conducted using data collected from women who participated in Wave 2 follow-up. Confirmatory Factor Analyses (CFA) were conducted for the three subscales - emotional, physical and financial IPV - using MPlus. The AEPVS items were ordinal level data with four response options and generally non-normal in their distribution, therefore Robust Weighted Least Squares estimation (WLSMV) was used. The adequacy of the models was assessed using goodness-of-fit Chi Square, and practical fit indices including the Comparative Fit Index, Goodness-of-Fit index (GFI) and Adjusted Goodness-of-Fit index (AGFI) with estimates of 0.90 or above indicating acceptable model fit. (32) The Root Mean Square Error of Approximation (RMSEA) was also used with values close to or below 0.05 within the 90% confidence interval indicating good model fit.(33) Standardised factor

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3 loadings, error variances, standardised residuals and modification indices were examined to identify potential items contributing to poor model fit. An iterative process was used in which the model was re-estimated and examined after each modification until the model fit was adequate. Internal consistency reliability for each subscale was examined using Cronbach Alpha, with 0.7-0.9 deemed good to excellent. (34, 35) Scoring for the AEPV emotional and physical partner violence scales replicated the original CAS (≥3 and ≥1 respectively). Scoring for the financial partner violence scale was set at ≥2.

Public involvement

This study was conducted in partnership with the Aboriginal Health Council of South Australia and was preceded by extensive community consultations with Aboriginal communities in rural, regional and remote South Australia. Community consultations identified family violence as an issue of concern. The Aboriginal Advisory Group established to oversee the study guided the research team in the best approaches to undertaking the research in ways that were respectful of Aboriginal families and prioritised the cultural safety of participants and study staff. Participatory methods were used throughout. For example, a working group comprising Aboriginal Advisory Group members, Aboriginal researchers and Aboriginal and non-Aboriginal study investigators was established to facilitate cultural adaptation of the CAS. Discussion groups were held in urban and regional areas to seek community feedback on the draft AEPVS and proposed study procedures. The Aboriginal Advisory Group worked with study staff and investigators to guide decision-making at each stage of the research and gave final approval for publication. Authors on this paper include members of the Aboriginal Advisory Group, Aboriginal study investigators and Aboriginal study staff.

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Results

Step 1: Discussion group feedback

Fourteen women participated in five discussion groups (two to four women in each). Two groups were held in regional areas and three in a major city. In all five discussion groups, participants told us that they preferred the draft AEPVS, and considered this to be much more culturally appropriate than the original CAS. There was strong support for inclusion of:

- items in the AEPVS on emotional, physical and financial abuse;
- the two items asking about abuse related to Aboriginality;
- the use of Aboriginal words familiar to South Australian Aboriginal women.

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While there was strong support for the inclusion of Aboriginal words in some items, there were differing views regarding the best words to use. There were also mixed views about the decision **not** to include questions asking about sexual abuse. Women attending separate urban discussion groups independently raised this as an issue and argued for inclusion of at least one item asking about sexual abuse. Women attending a rural discussion group, on the other hand, were uncomfortable with the idea of asking women directly about sexual abuse. One other item which asked about a partner/former partner "trying to convince friends, family or children that you have lost your spirit, or that you have bad spirit in you" was seen as having potential to cause distress.

***Step 2: Results of pre-testing the* AEPVS**

Fifty-eight women completed one of three draft versions of the Wave 2 follow-up questionnaire (nine as an interview and 49 by filling in the questionnaire themselves). Participants included women living in urban, regional and remote areas of South Australia. Overall, feedback was very positive. Women indicated that they found the questions 'easy to read and understand', 'to the point', 'relevant', 'straightforward', and 'honest'. Women also commented that they liked the questions about 'our culture', 'how it flowed', 'all the questions themselves', and 'being real when asking the questions, not tip-toeing around.' Several women said they liked that they didn't have to answer anything that they didn't want to and commented that it was good that they were told beforehand about the 'sensitive' questions as it meant they were 'prepared for these questions' prior to undertaking the survey. Five women (8.9%) said that they thought some of the questions were a bit too personal, in particular the questions asking about partner violence and drugs and alcohol.

***Modifications to the draft AEPV*S**

Analyses of results for the 42 women who completed the initial draft version of the AEPVS were considered alongside feedback from participants (including those taking part in discussion groups and those completing draft versions of the questionnaire). Individual items retained in the AEPVS are discussed below, together with examples of changes made based on the adaptation process.

Physical IPV

The initial version of the draft AEPVS retained six of the original CAS items asking about physical IPV and included an additional three items covering different contexts/ways in which physical violence may occur (see Table 1). New items were worded as follows: "Smashed up or destroyed your things", "Stopped you from leaving the house", "Forced you to do something you didn't want to do". In addition, two items were re-worded to reflect Aboriginal use of English.

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Two items showed poor distribution but were retained for further testing as they formed part of the original scale (Kicked bit or punched you, Flogged you). Overall the physical IPV scale had excellent internal reliability as a scale (Cronbach alpha=0.96). The final approved version of the AEPVS (Table 2) also includes an item asking about whether a partner or ex-partner "Used a knife or gun or other weapon". The Aboriginal Advisory Group approved inclusion of this item to measure more extreme physical violence. In addition, the last item was revised to read: "Forced you to do something you didn't want to do *sexually*" to respect the feedback from two urban discussion groups, while also respecting the view expressed in a regional discussion group that sexual violence should not be asked about directly.

Emotional IPV

Ten of the original CAS items asking about emotional IPV were retained in the initial version of the AEPVS (Table 1). One item asking whether partners "Became upset if dinner/housework wasn't done when they thought it should be" was seen as having limited relevance as a form of abuse in Aboriginal families given the varied nature of household structures and high proportion of women living with other family and/or not living with their partner. Four of the retained items were reworded to reflect Aboriginal use of English. For example, "Did not want you to socialise with your female friends" was revised to read "Stopped you from seeing your female friends". Five items were added to cover specific contexts particularly relevant to Aboriginal women. These included contexts in which a non-Aboriginal partner might seek to control women's behaviour by preventing women from connecting with their Aboriginal family or culture, or making women feel bad about being Aboriginal. In the final consensus version, all of these items were retained (Table 2). The item referring to 'bad spirit' was removed based on feedback from discussion groups and poor item distribution. One other item – 'Told you that you are ugly' was also removed based on poor item distribution. In the final version, two items were amalgamated to read "Told you that you are stupid or no good". This change was to reduce the total number of items measuring emotional abuse.

Financial IPV

The original 18-item CAS does not include any items measuring financial abuse. The longer 30-item version includes one item. This item "Took my wallet and left me stranded" was simplified to read "Took your money" as the phrase "left me stranded" did not resonate with members of the Aboriginal Advisory Group. An extra seven items were included in the initial version of the AEPVS based on the existing literature on financial abuse and to reflect a range of ways in which financial abuse may be

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experienced by Aboriginal women (Table 1). Minor changes were made to two of these items to be more specific in terms of negative impact. The item 'Took your money' was revised to read 'Took your money and made you worry about not having enough', and the item 'Took money from your bank account' was revised to read 'Took money you needed for something else (e.g. pay bills, buy food)'.

Response categories and initial framing of the measure

The wording and number of response categories in the AEPVS were reviewed by discussion group participants and were considered readily understood. The original wording of the introductory sentence was seen as too complex and was simplified in the final version to read "In the LAST 12 MONTHS, has a partner or ex-partner ever…. ", followed by the 30 individual items.

Situating the AEPV in the Wave 2 questionnaire

The Aboriginal Advisory Group emphasised that women needed to be given clear information regarding the purpose for asking questions about partner violence and an explanation about how the data gathered would be used to benefit Aboriginal families and communities. The research team tested two versions of a preamble to the section that included the draft AEPVS. The final preamble conveyed to women that the

> *"Aboriginal Advisory Group wants the study to give women an opportunity to talk about their experiences of partner violence, so that the information can be used to advocate for better services and support for women and families".*

Preceding this statement, the preamble noted:

> *"Many Aboriginal women and men have healthy relationships. We know there are negative stereotypes about violence in Aboriginal families. Our aim is to ensure that the information given to us is used to benefit the community, and not used to reinforce negative stereotypes".*

There was also a specific reminder to women at this point in the questionnaire that they could choose not to answer any of the questions they did not wish to. Women who completed the questionnaire as an interview were also given the option of choosing to self-complete this section.

In addition, the Aboriginal Advisory Group recommended that a question be included immediately following the AEPVS to inquire about what women do to stay strong and protect themselves when

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3 these things happen. This question was regarded as important to dispel stereotypes that Aboriginal
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5 women do not act to protect themselves and their children.
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8 ***Step 4: Validation Study***
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10 A total of 227 mothers participated in Wave 2 follow-up (see Table 2). A majority were Aboriginal (197,
11 90.7%). The mean age at the birth of the study child was 25.4 (range 14.9 - 43.4 years). At Wave 2
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13 follow-up, less than half were living with a partner (41.9%), one in ten (10.2%) had a partner but were
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15 not living in the same household, and 47.9% were single. The AEPVS was completed by 216 women,
16 with very few missing data points observed for individual items (range 0 - 6). The 11 women who
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18 chose not to answer this section ranged in age from 26.7 - 39.7 years (mean=33.5 years, SD=4.7). The
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20 majority were single (72.7%) and lived in regional areas (60%). These women were not included in
21 subsequent analyses.
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25 **Table 2. Social characteristics of women completing the draft Aboriginal Experiences of Partner**
26 **Violence Scale in the Aboriginal Families Study questionnaire (n=216)**
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	No	%
Age (at time of follow-up)		
20-24 years	12	5.6
25-29 years	77	35.8
30-34 years	71	33.0
35-39 years	31	14.4
40+ years	24	11.2
Aboriginal and/or Torres Strait Islander		
Yes	196	90.7
No*	20	9.3
Relationships status		
Single	103	47.9
Living with partner	90	41.9
Relationship, not living together	22	10.2
Place of residence		
Urban	101	47.0
Regional	73	34.0
Remote	41	19.1
Number adults in household (past 4weeks)		
One adult	74	34.4
Two adults	108	50.2
≥3 adults	33	15.3
Own children living with mother		
None	7	3.2
1-2 children	89	41.2
3-4 children	95	44.0

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≥5 children	25	11.6
Total number of children living with mother		
None	6	2.8
1-2 children	83	38.4
3-4 children	91	42.1
5-10 children	36	16.7
Highest level education at follow-up		
Year 10 or less	107	50.5
Completed Year 12	34	16.0
Diploma/Certificate	57	26.9
University Degree	14	6.6
Employment at time of follow-up		
Full time	45	20.9
Part time	33	15.3
Not in paid employment	137	63.7
Total	216	100.0

* Non-Aboriginal women taking part are mothers of Aboriginal children

Table 3 reports the mean and standard deviation for each item included in the draft AEPVS, as well as the standardised factor loadings, proportion of the variance accounted for (R^2) and error variances for each item in the initial and final CFAs tested. The three initial models of the emotional, physical and financial IPV subscales were a good fit to the data, with high factor loadings for all items (≥74). As the goal was to achieve a brief multi-dimensional measure, each subscale was further refined to reduce the number of items. Decisions to remove items were based on item distributions, factor loadings, proportion of variance accounted for in the construct by the items, and error variances. Changes were sequential and model fit re-assessed with each change. The final CFA models showed excellent model fit to the data (See Table 3).

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Table 3. Final draft items and the initial and final Confirmatory Factor Analysis solutions to create the Aboriginal Women's Experiences of Partner Violence Scale (n=216)

Item	n	Mean (SD)	Initial Model: Standardised factor loadings	Initial Model: R^2	Initial Model: Error variance	Final Model: Standardised factor loadings	Final Model: R^2	Final Model: Error variance
Emotional partner violence			$\chi^2_{(54)}$ = 81.95, p=.008, RMSEA=.05 (.03, .07), CFI=1.00, TLI=1.00, SRMR=.04			χ^2 (9) = 9.02, p=.436, RMSEA=.003 (.00, .08), CFI=1.00, TLI=0.99, SRMR=.02		
Told you that you are stupid or no good	214	0.58 (0.97)	.92	.84	.16	.92	.84	.16
Turn family/friends/children against you	215	0.48 (0.94)	.84	.70	.30	.82	.67	.33
Keep you from seeing or talking to family	216	0.33 (0.78)	.95	.90	.10	-	-	-
Blamed their violent behaviour on you	216	0.61 (1.03)	.94	.89	.11	.96	.93	.08
Told you that you were crazy	215	0.60 (1.00)	.94	.88	.12	-	-	-
Told you that no one would ever want you	214	0.44 (0.93)	.93	.87	.13	-	-	-
Stopped from seeing female friends	216	0.36 (0.81)	.92	.84	.16	-	-	-
Stopped you from connecting to Aboriginality	216	0.21 (0.69)	.90	.81	.19	.88	.78	.22
Got jealous/wild if talked to male friends	216	0.56 (1.01)	.93	.86	.14	.91	.83	.17
Made you feel bad about being Aboriginal	216	0.12 (0.50)	.74	.55	.45	-	-	-
Got wild when you dressed up/makeup on	215	0.30 (0.80)	.91	.82	.18	-	-	-
Threatened to hurt you/family/pets	215	0.32 (0.76)	.83	.69	.31	.84	.71	.30
Physical partner violence			$\chi^2_{(35)}$ = 62.93, p=.003, RMSEA=.06 (.04, .09), CFI=1.00, TLI=1.00, SRMR=.07			$\chi^2_{(9)}$ = 14.56, p=.104, RMSEA=.05 (.00, .10), CFI=1.00, TLI=1.00, SRMR=.07		
Slapped or hit you	211	0.30 (0.72)	.95	.91	.09	-	-	-
Shook you	216	0.26 (0.72)	.94	.89	.11	-	-	-
Pushed, grabbed or shoved you	216	0.35 (0.78)	.97	.94	.06	.97	.93	.07
Hit or tried to hit you with something	216	0.30 (0.73)	.95	.90	.10	.95	.90	.10
Kicked you, bit you or punched you	215	0.23 (0.65)	.99	.98	.02	-	-	-
Used a knife/gun/other weapon	213	0.10 (0.43)	.86	.74	.26	.85	.73	.27
Flogged you	215	0.15 (0.57)	.95	.91	.09	-	-	-

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Stopped you from leaving the house	214	0.30 (0.76)	.91	.83	.17	.92	.84	.16
Forced you to do something sexually	216	0.09 (0.42)	.60	.36	.64	.67	.45	.56
Smashed up or destroyed your things	216	0.39 (0.84)	.88	.77	.24	.90	.81	.19
Financial partner violence			$\chi^2_{(20)}$ = 24.37, p=.227, RMSEA=.03 (.00, .07), CFI=1.00, TLI=1.00, SRMR=.04			$\chi^2_{(9)}$ = 5.41, p=.798, RMSEA=.00 (.00, .05), CFI=1.00, TLI=1.00, SRMR=.01		
Refused to contribute to family finances	215	0.52 (1.01)	.88	.77	.23	.88	.77	.23
Took money you needed for something else	216	0.41 (0.86)	.94	.88	.12	.95	.90	.10
Got wild if you spent money on yourself	214	0.26 (0.73)	.89	.80	.20	.89	.79	.21
Stopped from earning your own money	215	0.16 (0.59)	.86	.74	.26	-	-	-
Got you to pay their bills	216	0.31 (0.78)	.91	.82	.18	.91	.83	.17
Took your money made worry ab not having enough	216	0.34 (0.83)	.97	.94	.05	.97	.95	.06
Made you put the bills in your name	216	0.13 (0.55)	.75	.56	.44	-	-	-
Made you ask for money for bills, food or kids	216	0.25 (0.70)	.85	.72	.28	.84	.70	.30

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As shown in Table 4, the AEPV subscales showed excellent internal reliability (≥0.9). The observed scores covered the complete scale range for emotional and financial IPV scales (0-18), while the highest score for physical IPV was 15. Mean scales scores ranged from 1.5 for physical IPV to 2.8 for emotional IPV.

Overall, 38.9% of women reported experiences of IPV in the previous 12 months. Almost one in three were scored as experiencing physical IPV (29.2%), emotional IPV (31.9%) or financial IPV (28.7%). Each of the different types of IPV had a total mean score of close to 20 suggesting a similar frequency of behaviours within each scale. A majority of the women experiencing partner violence reported multiple types of violence (65/84, 77.4%) and correspondingly, few women reported emotional, financial or physical abuse alone (19/84, 22.6%).

Table 4. Aboriginal Women's Experiences of Partner Violence Scale (AEPVS) - items, prevalence, and scale psychometrics (n=216)

Scales (scoring) Items	Scale Range	n (%)	Cronbach α	Score Range	Mean Scale score (SD)	Mean Total AEPV score (SD)[1]
Emotional partner violence (score ≥ 3)	0 - 18	69 (31.9)	0.90	0-18	2.8 (4.4)	18.7 (12.3)
Told you that you are stupid or no good						
Turn family/friends/children against you						
Blamed their violent behaviour on you						
Stopped you from connecting to Aboriginality						
Got jealous/wild if talked to male friends						
Threatened to hurt you/family/pets						
Physical partner violence (score ≥ 1)	0-18	63 (29.2)	0.87	0-15	1.5 (3.2)	19.3 (12.8)
Pushed, grabbed or shoved you						
Hit or tried to hit you with something						
Used a knife/gun/other weapon						
Stopped you from leaving the house						
Forced you to do something sexually						
Smashed up or destroyed your things						

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Financial partner violence (score ≥ 2)	0 - 18	62 (28.7)	0.91	0-18	2.1 (4.1)	19.3 (12.8)
Refused to contribute to family finances						
Took money you needed for something else						
Got wild if you spent money on yourself						
Got you to pay their bills						
Took your money made worry about not having enough						
Made you ask for money for bills, food or kids						
Total AEPV score	*0 - 57*	*84 (38.9%)*	*0.96*	*1-54*	*6.4 (11.0)*	*16.0 (12.5)*

[1] Mean total AEPVS score for women reporting partner violence

Women who had experienced IPV in the previous 12 months indicated that they had done a variety of things to protect themselves and stay strong (Table 5). More than half had taken their children to stay with family or friends (55.4%) or called police (51.8%), and just over one in three (37.3%) had taken out an intervention order. Women more commonly talked to family and friends (67.5%) than talked to a health professional. Just under one in three (31.3%) had talked to a local doctor and one in four (26.5%) had talked to a counsellor or psychologist.

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Table 5. What women experiencing partner violence did to protect themselves and stay strong (n=84)

	Recent IPV No. (%)
Talked to family about it	56 (67.5)
Talked to friend about it	50 (60.2)
Left house	49 (59.0)
Took kids to stay with family/friends	46 (55.4)
Phoned police	43 (51.8)
Got intervention order	31 (37.3)
Changed phone number	30 (36.1)
Talked to doctor about it	26 (31.3)
Talked to counsellor/psychologist about it	22 (26.5)
Talked to Aboriginal Health Worker about it	14 (16.9)
Phone domestic violence telephone line	14 (17.1)
Stayed in women's shelter	10 (12.3)

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Discussion

The 15-item Aboriginal Women's Experiences of Partner Violence Scale is the first co-designed, culturally adapted, multi-dimensional measure of partner violence for Aboriginal women. Initial construct validity and reliability testing indicates that it provides a robust measure of Aboriginal women's experiences of physical, emotional and financial partner violence. The adapted measure was developed with extensive input from Aboriginal women and builds on a co-designed program of research conducted in collaboration with the Aboriginal Health Council of South Australia. Aboriginal governance was provided by an Aboriginal Advisory Group that guided the work of the research team at every stage of the co-design process. This included critical input into decisions regarding items included in the initial version of the adapted measure, advice on the inclusion of words in Aboriginal languages, guidance on ways for the research team to facilitate cultural safety for research participants and Aboriginal researchers and providing approval for the final version of the measure.

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Very few women participating in Wave 2 follow-up opted not to complete the measure and the number of individual items skipped by research participants was minimal. The iterative process used for co-designing the adapted measure allowed for multiple stages of feedback and refinement. Importantly, the research team tested several versions of the preamble to the section of the questionnaire asking about partner violence before settling on the final wording. Women were also made aware, during the consent process, that the questionnaire included a section asking about family violence and other things that might be happening in their lives. All contact with women in the study was made by Aboriginal researchers, who in some cases were known to women from the baseline study. Reconnecting with women and building relationships of trust was an important part of the research process led by Aboriginal members of the team.

Strengths of the study include: well-established Aboriginal governance processes guiding decision-making at all stages of the research; and use of participatory methods to engage Aboriginal women living in urban, regional and remote communities in South Australia in co-design of the adapted measure. The research team worked with guidance of the Aboriginal Advisory Group and Aboriginal women participating in discussion groups to ensure content validity and cultural acceptability of the AEPVS and the cultural safety of processes used by the research team to engage women in the study and seek their feedback. By embedding this work in follow-up of an existing cohort, we were able to build on the existing relationships between the research team and women in the study.(25) The current phase of the research also built on our track record of using results to advocate for improvements to services to benefit Aboriginal communities. (36) While we were not able to compare results of the measure with a 'gold standard' (given the lack of availability of other culturally validated measures), the information women provided about the actions they had taken to protect themselves confirm that a significant proportion of women categorised as experiencing IPV had sought assistance from other family members, taken children to stay with family or friends, called police, changed phone numbers or obtained an intervention order. While the sample is both geographically and culturally diverse - including women from urban, regional and remote areas of South Australia and over 35 Aboriginal and Torres Strait Islander language/clan groups (including groups from other Australian jurisdictions) - the results may not apply directly to Aboriginal and Torres Strait Islander communities in other jurisdictions or to other Indigenous populations. Finally, the adapted measure was developed and tested with women of childbearing age. The youngest woman in the study to complete the measure was 20 and the oldest was 49 at the time of Wave 2 follow-up. Further adaptation may be required for younger and older Aboriginal and Torres Strait Islander women, and for use in other jurisdictions.

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The immediate purpose of developing a culturally adapted measure of Aboriginal women's experiences of partner violence was to improve understanding of the health consequences of partner violence for Aboriginal women and children, and build knowledge about cultural and community level factors which may moderate the impacts of partner violence in Aboriginal families. Future papers will explore these issues contributing to a small body of evidence bringing an Indigenous lens and more granulated understanding to the context and impact of IPV within Aboriginal and Torres Strait Islander communities.(6, 37, 38)

Conclusion

The AEPVS is the first co-designed, multi-dimensional measure of Aboriginal women's experience of physical, emotional and financial IPV with demonstrated cultural acceptability, construct validity and reliability within the setting of an Aboriginal-led, community-based and governed research project. Culturally safe research methods and tools are important for generating the evidence needed to inform co-design, implementation and evaluation of tailored strategies to support families impacted by partner violence. The AEPVS cannot be separated from the processes surrounding its culturally safe use. Validation of the measure in other settings and populations will need to incorporate processes for community governance and tailoring of research process to local community contexts.

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The Aboriginal Experiences of Partner Violence Scale (AEPVS) may not be reproduced without permission. There is no fee to use this scale, but permission must be obtained from the Aboriginal Families Study Aboriginal Advisory Group Executive Team before use. Please contact: Karen Glover (karen.glover@mcri.edu.au) or Stephanie Brown (stephanie.brown@mcri.edu.au).

Author contributions: KG, SJB, DW, DG and RG conceptualised the study; SB and KG wrote the study protocol; KG, CL, DW, AN, SJB and DG co-designed the procedures for cultural adaptation of the CAS measure; KG and AN conducted discussion groups and facilitated pre-testing of the draft follow-up questionnaire. KG, AN and DW facilitated wave 2 follow-up. DG and RG undertook psychometric analyses. SJB, DG and KG co-wrote the manuscript. All authors (KG, CL, AN, DW, YC, DG, RG, SB) contributed to interpretation of data, reviewed earlier versions of the manuscript, and approved the final version.

KG and AN facilitated discussion groups; KG, DW and AN led the fieldwork team undertaking data collection; DG and RG conducted quantitative analyses; KG, CL, AN, DW, YC, SB, DG, RG and members of the Aboriginal Advisory Group interpretated the data; SB, DG, RG and KG drafted the paper. All authors critically revised the paper, approved the manuscript to be published and are accountable for the accuracy and integrity of the work.

Acknowledgements: The authors respectfully acknowledge the Aboriginal and Torres Strait Islander Custodians of the Lands and Waters of Australia. We would like to acknowledge members of the Aboriginal Advisory Group who guided all stages of the study, including interpretation of findings, and members of the research team (additional to the authors) who contributed to data collection, all women and families taking part in the study, and the many agencies that assisted us to reconnect with families. Finally, we would like to thank Professor Kelsey Hegarty for permission to adapt the Composite Abuse Scale and for her helpful advice at several stages of the study.

Competing interests: There are no competing interests for any author.

Funding This study was supported by two National Health and Medical Research Council (NHMRC) project grants #1004395 and #1105561, SA Health. Research at the Murdoch Children's Research Institute is supported by the Victorian Government's Operational Infrastructure Support Program.

Ethics approval Ethics approval was obtained from the Aboriginal Human Research Ethics Committee of South Australia (04.09.290; 04.17.737); the South Australian Department of Health (298/06/2012); Women's and Children's Health Network, Adelaide (2335/12/13); the Lyell McEwin Hospital (2010181), Adelaide; and the Royal Children's Hospital, Melbourne (29076A, 36186).

Data availability: No additional data available

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Appendix: Aboriginal Women's Experience of Partner Violence Scale (APVS)

The next few questions ask about partner violence. We know many Aboriginal women and men have healthy relationships, and it is women who usually have the main responsibility for looking after the health of family members. We also know a lot of women experience violence at home, and it affects their health.

The Aboriginal Advisory Group (researchers undertaking this study) want the study to give women an opportunity to talk about experiences of partner violence, so that information can be used to advocate for better services and support for Aboriginal women and families.

We know there are negative stereotypes about violence in Aboriginal families. Our aim is to ensure that the information given to us is used to benefit the community, and not used to reinforce negative stereotypes.

You can choose to fill in the questions in this section yourself if you prefer not to talk to an interviewer about them.

You can also choose not to answer any of the questions. Please put a line through any of the questions you prefer not to answer.

In the LAST 12 MONTHS, has a partner or ex-partner ever …

	NEVER	ONCE	SEVERAL TIMES	A LOT
Told you that you are stupid or no good				
Tried to turn family, friends and children against you				
Refused to contribute to family finances (e.g. pay bills)				
Stopped you from connecting with your Aboriginality (e.g. going to community events, going home to Country)				
Took money you needed for something else (e.g. bills, food)				
Blamed their violent behaviour on you, saying it was your fault because you set them off				
Pushed, grabbed, shoved you				
Got wild if you spent money on yourself				
Got jealous or wild (doodla) if you talked to your male friends or their male friends				
Hit or tried to hit you with something				
Got you to pay their bills				
Used a knife or gun or other weapon				
Stopped you from leaving the house				
Took your money and made you worry about not having enough				
Threatened to hurt you, your family or your pets				
Forced you to do something you didn't want to do sexually				
Smashed up or destroyed your things				
Made you ask for money for bills, food or the kids				

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If you have NOT had any of these experiences IN THE PAST 12 MONTHS, please skip the next question.

When these things happened, what did you do to protect yourself and stay strong?

	YES	NO
Left the house		
Took the kids to stay with family or friends		
Phoned police		
Got intervention order		
Changed phone number		
Talked to family about it		
Talked to friend about it		
Talked to doctor about it		
Talked to an Aboriginal Health Worker		
Talked to a counsellor/psychologist		
Other *(please describe)* ___________________________ ____		

Access to the scale:
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RESEARCH Open Access

Aboriginal Families Study: a population-based study keeping community and policy goals in mind right from the start

Mary Buckskin[1], Jackie Ah Kit[2], Karen Glover[3], Amanda Mitchell[1], Roxanne Miller[4], Donna Weetra[4], Jan Wiebe[4], Jane S Yelland[4], Jonathan Newbury[5], Jeffrey Robinson[6] and Stephanie J Brown[4,7*]

Abstract

Background: Australian Aboriginal and Torres Strait Islander women are between two to five times more likely to die in childbirth than non-Aboriginal women, and two to three times more likely to have a low birthweight infant. Babies with a low birthweight are more likely to have chronic health problems in adult life. Currently, there is limited research evidence regarding effective interventions to inform new initiatives to strengthen antenatal care for Aboriginal families.

Method/Design: The Aboriginal Families Study is a cross sectional population-based study investigating the views and experiences of Aboriginal and non-Aboriginal women having an Aboriginal baby in the state of South Australia over a 2-year period. The primary aims are to compare the experiences and views of women attending standard models of antenatal care with those accessing care via Aboriginal Family Birthing Program services which include Aboriginal Maternal Infant Care (AMIC) Workers as members of the clinical team; to assess factors associated with early and continuing engagement with antenatal care; and to use the information to inform strengthening of services for Aboriginal families. Women living in urban, regional and remote areas of South Australia have been invited to take part in the study by completing a structured interview or, if preferred, a self-administered questionnaire, when their baby is between 4–12 months old.

Discussion: Having a baby is an important life event in all families and in all cultures. How supported women feel during pregnancy, how women and families are welcomed by services, how safe they feel coming in to hospitals to give birth, and what happens to families during a hospital stay and in the early months after the birth of a new baby are important social determinants of maternal, newborn and child health outcomes. The Aboriginal Families Study builds on consultation with Aboriginal communities across South Australia. The project has been implemented with guidance from an Aboriginal Advisory Group keeping community and policy goals in mind right from the start. The results of the study will provide a unique resource to inform quality improvement and strengthening of services for Aboriginal families.

Keywords: Antenatal care, Health inequalities, Indigenous health, Maternal health, Participatory research, Perinatal health outcomes

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Introduction

Australian Aboriginal and Torres Strait Islander women are between two to five times more likely to die in childbirth than non-Indigenous women, and two to three times more likely to have a low birthweight infant [1]. Babies with a low birthweight are more likely to die in infancy [2], more likely to be admitted to neonatal intensive care [3], and may be more likely to have serious health problems (e.g. cardiovascular disease, diabetes) in adult life [4]. Recent data suggest that in some Australian states, including South Australia, the proportion of low birthweight babies born to Aboriginal mothers may be increasing [5,6]. The Australian Government has set agreed targets for closing the gap in Indigenous disadvantage outlined by the Council of Australian Governments (COAG) in the National Indigenous Reform Agenda [7]. Under the terms of this agreement, federal, state and territory governments have committed to closing the gap in life expectancy between Aboriginal and non-Aboriginal Australians within a generation, and halving the gap in mortality rates for Aboriginal children under five within a decade. Key performance indicators for the National Indigenous Reform Agenda include: an increase in the proportion of Aboriginal and Torres Strait Islander mothers receiving antenatal care in the first trimester of pregnancy (≤13 weeks' gestation) and in the proportion of Aboriginal and Torres Strait Islander mothers attending five or more antenatal visits; and a reduction in the proportion of Aboriginal and Torres Strait Islander infants with a low birthweight (<2,500 grams).

New funding made available under the COAG National Partnership Agreement on Indigenous Early Childhood Development has facilitated a range of new programs and initiatives to strengthen antenatal care and child and maternal health services for Aboriginal families in all Australian states and territories [8]. Currently there is a dearth of research evidence regarding effective intervention strategies to inform these initiatives [9-12]. Most of the available evidence comes from small-scale local evaluation studies, predominantly undertaken in regional and remote locations [13-20]. The roll out of COAG funding under the National Partnership Agreement has in effect created an Australia wide 'natural experiment' in seeking to improve maternal and perinatal outcomes for Aboriginal and Torres Strait Islander women and children. It is vital that lessons learned from the range of programs being developed and implemented with COAG funding are captured by concurrent evaluation at a state and territory level. However, there is still no complete national perinatal data for Aboriginal mothers and babies. State and territory based perinatal data collections vary in their capacity to ascertain Aboriginal and Torres Strait Islander status of mothers and infants, and steps have only recently been taken to include information regarding status of the infant in the minimum data set for most state jurisdictions [21].

This paper describes the development of a statewide study in South Australia that aims to invite approximately 300 women giving birth to an Aboriginal baby to talk about their experiences of using services during pregnancy, labour and birth, and the first 4–12 months after having a baby. The study has been developed by researchers based at the Murdoch Childrens Research Institute and the University of Adelaide, in partnership with the Aboriginal Health Council of South Australia Inc. (AHCSA). The project arose in the context of planning for a population-based postal survey of recent mothers in South Australia and Victoria. In 2006, the researchers planning this survey approached the AHCSA about working in partnership on a project to provide avenues for Aboriginal women's voices to be included in the research. At our initial meeting we discussed the idea of seeking funding to facilitate consultations with Aboriginal community organisations and communities in South Australia as a way to seek input into development of the research. The Aboriginal Families Study is the name given to the project that grew out of these discussions. South Australia where the project is based is one of six Australian states, and covers a geographic area four times the size of the UK.

Often when researchers approach Aboriginal community organisations and/or communities, they already have a fairly well developed research question and study protocol in mind. We did not. This paper charts the social history of the project, and outlines the steps we took to get from our initial discussions in 2006 to the stage of developing the study protocol, governance arrangements, and procedures for carrying out the study. These include: obtaining 'in principle' support from the Board of Management of the AHCSA for the conduct of consultations with Aboriginal communities about the project; development of a project agreement between MCRI and the AHCSA; establishment of an Aboriginal Advisory Group to guide the consultations, and subsequently, the development of the study protocol, and conduct of the research; statewide consultations with Aboriginal communities, policy makers and service providers preceding development of the study design and methods; a lengthy pilot study phase that tested different versions of the study questionnaire and recruitment procedures; obtaining ethics approval from a variety of institutional ethics committees; development of a Research Agreement covering governance arrangements for the research phase of the study signed by all partner organisations and study investigators; appointment and training of the fieldwork team; through to recruitment and interviewing of women in urban, regional and remote areas of South Australia.

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Methods

Establishing partnerships and governance arrangements for community consultation

In May 2006, three members of the research team (SB, JY, GS) were invited to attend a meeting of the Board of Management of the AHCSA in Whyalla to discuss our proposal to seek funding for consultations with Aboriginal communities in South Australia about the development of a research project. Whyalla is 380 kilometres north west of Adelaide, and has a relatively large Aboriginal population. At the Board Meeting, we were asked why we wanted to do the project, who would own the information gathered in the course of the research, and what would come out of it for Aboriginal communities. Most of all Board Members wanted to know "Will it make a difference?". Key messages that emerged from discussions with the Board included: the importance of focusing on the whole family; of taking into consideration social factors that influence health and well-being; the need for communities to have a say in whether or not the project should go ahead; and above all, that research would only be welcomed by Aboriginal communities if people could see ways in which it would lead to better services and outcomes for Aboriginal families.

After this meeting, the AHCSA Board gave 'in principle' support for us to proceed with an application to the National Health and Medical Research Council (NHMRC) for seed funding to undertake a 12 month consultation in South Australia. The next steps in formalising collaboration were taken in mid-2007 after seed funding (as part of a larger application to conduct a population based survey of women giving birth in South Australia and Victoria) was secured. This involved developing a project agreement between MCRI and the AHCSA (signed in September 2007) and establishing an Aboriginal Advisory Group to guide the conduct of consultations and development of the research. The Aboriginal Advisory Group - comprising representatives from metropolitan and regional health services, the AHCSA, Aboriginal Elders' Council and Aboriginal Health Workers with expertise in maternity and postnatal care - has met regularly, approximately 6–8 times a year, to provide advice and direction to the research team.

Community and key stakeholder consultations

Two part-time Aboriginal research officers – one based in Adelaide and the other in Port Lincoln on the West Coast of Spencer Gulf - facilitated community consultations in urban, regional and remote communities in South Australia over a 15-month period (October 2007-December 2008). Consultations were held in Adelaide and the major regional centres of Port Augusta, Port Lincoln, Whyalla, West Coast, mid North and Yorke Peninsula, Ceduna, Coober Pedy, Yalata, Point Pearce and Mt Gambier. In addition, consultations were held with policy makers and service providers in a range of metropolitan and regional settings. Recurring themes throughout the consultations were: the importance of family, social context, and social health issues to women's health and wellbeing during pregnancy; the impact on women and families of needing to travel and stay away from home in order to attend regional and/or metropolitan health services; the impact of seeing many different non-Aboriginal health professionals throughout pregnancy, birth and the postnatal period; and lack of information about local community health services for women and families with a new baby. The consultations demonstrated support for the research to go ahead provided that it was community-led and directed towards improving pregnancy, birthing and postnatal services for Aboriginal families. Two reports documenting findings from the consultation were produced in early 2009: a full report and a community report for providing feedback to communities taking part [22,23]. Both are available via the project website [24].

Obtaining approval for research questions and study methods

The major research questions to be addressed in the study, and overall design and methods for the Aboriginal Families Study were developed between mid 2008 and early 2009 drawing on findings from community and key stakeholder consultations, and the advice of the Aboriginal Advisory Group. The study protocol - including aims, methods, and governance arrangements for the study - was approved by the Board of the AHCSA in June 2009, providing the basis for development and pilot testing of data collection methods over the next 12 months.

Policy context and formation of the Aboriginal Families Study Policy Implementation Group

Coinciding with this stage of development of the study, the Council of Australian Governments (COAG) announced funding for new initiatives to strengthen antenatal care and maternal and child health services for Aboriginal communities in all states and territories. In South Australia, COAG funding has been used to roll out an Aboriginal Family Birthing Program (AFBP) based on a model that had been in operation in Port Augusta and Whyalla since 2004. The program enables Aboriginal women to be cared for during pregnancy, labour and birth and the postnatal period by Aboriginal Maternal and Infant Care (AMIC) Workers working in partnership with midwives and doctors [25]. Since 2009, Local Health Networks covering metropolitan and regional areas of South Australia have been working to expand the Aboriginal Family Birthing Program across

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urban, regional and remote communities in South Australia.

In December 2008, the research team, together with members of the Aboriginal Advisory Group, invited senior policy makers in the South Australian Health Department, the Women's and Children's Health Network and Country Health SA to a meeting to discuss the relevance of the Aboriginal Families Study to current policy directions in South Australia. As an outcome of this meeting, the decision was taken to establish a formal partnership between the AHCSA, SA Health and the research institutions involved in the study, initially with the aim of submitting a joint funding application to NHMRC. This application submitted in early 2009 was unsuccessful, but the organisations and individuals that were party to this application agreed to continue working together to secure funding and facilitate translation of research findings. Funding for the study was secured via an NHMRC project grant (#1004395) awarded in 2010, and grants from the Rio Tinto Aboriginal Fund and SA Health.

Aims and hypotheses

The major aims of the study are to:

1. Investigate the views and experiences of a population-based sample of Aboriginal women and women with an Aboriginal partner having a baby in South Australia (i.e. mothers of Aboriginal babies) regarding pregnancy, birthing and postnatal services;
2. Compare the experiences of women attending standard ('mainstream') models of public antenatal care (e.g. public clinic care, shared care) with those of women accessing antenatal care via a co-ordinated program receiving support from COAG under the National Partnership Agreement on Indigenous Early Childhood Development and involving clinical care from a multidisciplinary team including Aboriginal Maternal Infant Care Workers (Aboriginal Family Birthing Program);
3. Assess factors associated with early and continued engagement of Aboriginal families with antenatal care;
4. Compare the experiences of women taking part in the Aboriginal Families Study with the experiences of non-Aboriginal women taking part in a population-based survey of women giving birth in South Australia;
5. Use information gathered in the study to inform early intervention strategies and appropriate care pathways for Aboriginal women and families, especially those experiencing psychological distress and/or social health issues during and after pregnancy;
6. Build capacity for collaborative Aboriginal health research addressing the needs of Aboriginal women and families with young children.

We hypothesised that compared to mothers of Aboriginal babies attending standard or 'mainstream' public models of antenatal care (e.g. public hospital antenatal clinic care, shared care between a public hospital and community based general practitioner), mothers of Aboriginal babies who attend Aboriginal Family Birthing Program services will be *more likely* to have their first antenatal visit in the first trimester of pregnancy (≤13 weeks' gestation) and to attend five or more antenatal visits. In addition, we hypothesised that mothers of Aboriginal babies who attend Aboriginal Family Birthing Program services will be *more likely* to receive support in relation to social health issues; and to report positive experiences of antenatal, intrapartum and postnatal care; and less likely to report experiences of being treated unfairly or discriminated against by health professionals.

Study population

All women giving birth to an Aboriginal baby in South Australia between July 2011 and June 2013 excluding women under 14 years of age were eligible to take part in the study. Women who give birth interstate (e.g. at Alice Springs Hospital), but normally resided in South Australia were also eligible to participate. Women eligible to take part have been invited to participate in an interview when their baby is approximately six months of age (range 4–12 months) consistent with the timing of the *2008 SA Healthy Mothers Healthy Families Survey* [26,27].

Sample size

Data collected by the South Australian Pregnancy Outcome Unit show that over 600 Aboriginal women give birth in South Australia each year [5,6]. Around 60% of Aboriginal women in South Australia give birth in metropolitan public hospitals, some travelling from regional areas. Data on paternity are not recorded in the South Australian Pregnancy Outcome dataset so it is not possible to use these data to identify the number of non-Aboriginal women with an Aboriginal partner giving birth in South Australia. Australian Bureau of Statistics data on births in South Australia indicate that there were 976 Aboriginal births registered in 2008 [28], but it is likely that there is some misclassification and under-ascertainment of Aboriginal births in these data [29]. Based on the available figures we estimated the total number of women eligible to participate in the study over a 2-year period to be approximately 2000, with around half living outside the Adelaide metropolitan

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area. Given that 53% of births to Aboriginal mothers in South Australia are to women aged less than 25 years [5,6], and more than half live outside the metropolitan area, particular attention has been given to strategies to recruit younger women aged 14 to 24 years and women living in regional and remote areas.

Power calculations were conducted at the beginning of the study to assess the required sample size for testing study hypotheses. Since the proportion of Aboriginal mothers receiving antenatal care in the first trimester, and proportion of Aboriginal mothers attending five or more antenatal visits are national targets for health system performance [7,8], we estimated required sample size based on these outcomes. We assumed a ratio of 2:1 for women attending mainstream public antenatal care versus women attending Aboriginal Family Birthing Program services. Based on this assumption, a sample of 330 women with a sub-group size of 80 women attending AFBP services and 160 women attending mainstream public antenatal care with alpha of 0.05 will provide 80% power to detect: i) a 20% absolute increase in the proportion of women attending a first antenatal visit at ≤13 weeks' gestation (from 41% in standard or 'mainstream' models of public antenatal care to 61% in AFBP services) and (ii) a 15% increase in the proportion of women attending 5 or more visits (from 75% in standard models of public antenatal care to 90% in AFBP services).

Recruitment and conduct of interviews

Recruitment strategies include: invitation via public maternity hospitals, primary care and other local services; promotion of the study through community events, posters, leaflets and the Aboriginal media; and drawing on contacts and relationships formed during the extensive period of community consultation. By May 2013, over 350 women had expressed interest in taking part in the study, and 200 women had completed the study questionnaire placing the study on track to achieve a final sample size of approximately 300 participants by December 2013. Preliminary analyses of the first 130 participants show that 18% (23/130) were aged 15–19 years, and 36% 20–24 years (47/130), matching the expected age distribution for births to Aboriginal women in South Australia [6]. Fifty-eight percent of the first 130 participants gave birth at a metropolitan teaching hospital, 40% at a regional hospital, 2% at home or on the way to hospital, and less than 2% in a private hospital, matching the expected distribution for place of birth based on routinely collected perinatal data for South Australia [6]. While more than half of the first 130 participants gave birth in a metropolitan hospital, 56% resided outside the major metropolitan city of Adelaide. Included in the first 130 participants are women living in urban, regional and remote areas from across South Australia, representing more than 20 Aboriginal language and community groups.

There are four main methods via which women have been recruited to the study: 1) an interviewer visiting women while they are in hospital after the birth of their baby and inviting them to register with the study; 2) a health service or other agency informing women about the study and asking them to agree to their contact details being passed on to the research team; 3) an interviewer talking to women at community events, and 4) women hearing about the study from women who have already completed a study questionnaire, and agreeing to their contact details being passed on to an interviewer. Women expressing interest in the study have been followed up by phone, and arrangements are then made for an interviewer to meet with them to provide more information about the study prior to seeking consent to participation. All women interested in taking part have been given an information package about the study, including a Participant Information Sheet, which is also explained by the interviewer before seeking written or oral consent. Young women aged 14–17 years have been encouraged to discuss the information sheet with a parent or guardian, but do not need parental or guardian consent in order to participate.

Interviews following a structured interview schedule have been undertaken by a team of Aboriginal research interviewers: three based in Adelaide, and five in regional centres, including Port Lincoln, Port Augusta and Murray Bridge. Interviews have been conducted in a range of community settings (e.g. early childhood services, Aboriginal health services) as well as in women's homes. If preferred, women may also opt to have a non-Aboriginal interviewer or to complete the 'interview schedule' as a self-administered questionnaire. Study participants are given a supermarket gift voucher to thank them for taking part. All interviewers have participated in training specifically developed for the study, with ongoing training and support provided by the Fieldwork Co-ordinator (DW) and other senior members of the research team (JW, RM, SB). Detailed protocols for recruitment of women to the study, seeking and obtaining informed consent, and conduct of interviews are documented in the *Aboriginal Families Study Interviewer Guidelines*. These guidelines also cover health and safety considerations for interviewers working in urban, regional and remote locations.

Data collection

Table 1 provides an overview of data collected in the Aboriginal Families Study questionnaire. A pilot study undertaken in 2010 established the acceptability and feasibility of using a structured interview schedule, and

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Table 1 Data collected in the Aboriginal Families Study questionnaire*

	Mother	Baby
Social characteristics	Date of birth	Date of birth
	Aboriginality	Aboriginality
	Aboriginal language group/community	Number of siblings
	Place of residence (metro/regional/remote)	
	Number and age of other children	
	Education	
	Employment	
	Health care concession card	
	Access to transport	
Antenatal care	Gestation at first antenatal check-up	
	Number of antenatal check-ups	
	Model of care (e.g. public clinic, Aboriginal Family Birthing Program)	
	Location of antenatal care (e.g. hospital, home)	
	Hospital admission during pregnancy	
	Required to travel and be away overnight in order to access tests or specialist level care	
Birth events	Hospital admission prior to onset of labour	Place of birth
	Intrapartum transfer to another hospital	Infant birthweight
	Caregivers present during labour/birth	Gestational age
	Family present during labour/birth	
	Method of birth	
Postnatal care	Length of postnatal hospital stay	Admission to Neonatal Intensive Care or Special Care Nursery
	Home visits after discharge	
	Contacts with primary care services	Initiation and duration of breastfeeding
	Support in relation to infant feeding	
Women's views of care	Access to information	
	Involvement in decisions about care	
	Satisfaction with pain relief	
	Interaction with health professionals	
	Perceived discrimination (e.g. talked down to, stereotyped, treated unfairly)	
	Support provided if needed to travel/be away from home for care during pregnancy and/or to give birth	
Social health issues	Social health issues (e.g. housing problems, legal issues, drug and alcohol problem, family violence)	
	Smoking during and after pregnancy	
Health and well being	Medical conditions during pregnancy	
	Postpartum physical health problems	
	Postpartum psychological distress	

* Copy of the questionnaire available on request to the corresponding author.

allowed for refinement of interview questions. Several versions of the interview schedule were piloted with women living in Adelaide and in regional and remote communities. Feedback on the questionnaire was also sought from service providers, policy makers and from members of the Aboriginal Advisory Group. A copy of the questionnaire will be made available on request to the corresponding author. Researchers and/or organisations wishing to utilise the questionnaire (or components of the questionnaire) in other research contexts are requested to contact the corresponding author to seek written approval.

All women taking part in the study have been asked to give consent for record linkage to routinely collected

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perinatal and child health data sets, and permission for future follow-up. Data from consenting participants will be linked with routinely collected health data from a range of population databases including data collected by the South Australian Pregnancy Outcome Unit (perinatal data) and SA Health (Child Health Record). Record linkage will be facilitated by SA-NT Data Link [30]. Additional funding is being sought currently to follow-up a sub-sample of families to invite them to participate in a study focusing on childhood resilience. This planned follow-up study takes up a community priority identified in the community consultations conducted at the outset of the Aboriginal Families Study.

Ethics approval and funding

Ethics approval for the study was first of all obtained from the Aboriginal Health Research Ethics Committee (AHREC) of the Aboriginal Health Council of South Australia. Institutional ethics approval has also been obtained from SA Health, Women's and Children's Health Network, Lyell McEwin Hospital, the Royal Children's Hospital and the University of Adelaide.

Building capacity for collaborative Aboriginal health research

A major objective of the Aboriginal Families Study is to build capacity for collaborative 'community-led' Aboriginal health research. Establishing agreed governance arrangements for the research phase of the study has been an important tool for clarifying roles and expectations of partner organisations and study investigators, and underpins the way that the Aboriginal Families Study collaborators are working together to conduct the study. Governance arrangements are defined in a Research Agreement developed over a series of meetings in 2010–2011, and signed by all partner organisations and study investigators in early 2012. This agreement covers: roles and responsibilities of partner organisations and study investigators; ethics clearance and reporting; Aboriginal cultural and intellectual property rights; storage, access and archiving of research materials; analysis and interpretation of results; and publication and dissemination of research findings (including acknowledgements and authorship). The agreement recognises the obligations of study investigators named on the National Health and Medical Research Council (NHMRC) project grant awarded to the study in 2011, but places this within the broader context of the agreement between the parties to conduct the study in accord with the *NHMRC Values and Ethics: Guidelines for Ethical Conduct in Aboriginal and Torres Strait Islander Health Research and RoadMap II frameworks* [31,32]. In practice, this means that the study investigators and research team report to the Aboriginal Advisory Group, which in turn reports to the Board of the Aboriginal Health Council of South Australia. An Executive Committee comprising the CEO of the AHCSA (MB), the Chairperson of the Aboriginal Advisory Group (KG) and the Principal Investigator (SB) was established to act as an out of session source of advice and support for the Principal Investigator, and is also responsible for providing advice regarding key decisions relating to the progress of the study between meetings of the Aboriginal Advisory Group.

The study is also providing opportunities for building capacity and research skills for Aboriginal health research within the team of researchers working together to conduct the study. Across the team participating in the conduct of the research there is a wealth of community knowledge and expertise, and connections to communities across South Australia. Three senior members of the fieldwork team have completed the Certificate IV qualification in Indigenous research capacity building (EA, RM, DW). The Interviewer Guidelines for the study were developed collaboratively over a 12-month period drawing on the collective knowledge and expertise of members of the Aboriginal Advisory Group, Aboriginal members of the fieldwork team, and non-Aboriginal study investigators and fieldwork team members. The training program for research interviewers comprised an initial series of two training blocks, with regular times for the fieldwork team to get together to share knowledge and review how things are going at roughly two month intervals throughout the fieldwork phase. The AHCSA was involved in planning of the initial training modules and conducted a workshop on research ethics in the early stages of fieldwork. A set of core principles to inform the way we work with each other, and how we work with study participants and study investigators, were developed collaboratively, and approved by the Aboriginal Advisory Group, prior to commencement of the fieldwork phase of the study. In general, presentations at conferences are co-presented by Aboriginal and non-Aboriginal members of the fieldwork team and/or members of the Aboriginal Advisory Group. Procedures for quality assurance, data analysis and interpretation of study findings are being managed collaboratively to maximise opportunities for capacity building and exchange.

Discussion

The Aboriginal Families Study is underpinned by strong community, policy and research partnerships that have been developed over an extended period of working together to develop the project. As others have argued, this takes time, resources, flexibility and a commitment to 'mutually respectful partnerships' [33-35]. In the Aboriginal Families Study, research questions and study methods were defined collaboratively following extensive statewide

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community consultations with Aboriginal communities and discussions with policy makers. Development of the study protocol and study instruments happened over an extended period, with many opportunities for community input and feedback. The study represents a long-term investment by the AHCSA, MCRI and the University of Adelaide in partnership and collaborative development of 'community-led' Aboriginal health research focusing on health system reform in South Australia. Three sections of SA Health – the Women's and Children's Health Network, Country Health SA, and the South Australian Department of Health – have also made substantial contributions to the project via involvement in the Aboriginal Families Study Policy Implementation Partnership, and via seed funding awarded to the study prior to securing the NHMRC project grant.

The study findings will provide important information about the experiences of Aboriginal families accessing both mainstream services and new services funded by COAG. In particular, the study will provide avenues for Aboriginal women's voices about their experiences of using services to be heard by policy makers and service providers with responsibility for quality improvement and strengthening of the current round of COAG initiatives. Too often when initiatives like these are implemented the people most affected by changes to services do not have a voice in the process. The Aboriginal Families Study aims to ensure that the voices of Aboriginal women and families are accessible to policy makers, health service managers and service providers as evidence to inform ongoing efforts to strengthen services. By keeping community and policy goals in mind right from the start, the project is laying important foundations for sustained improvements in Aboriginal women's and children's health.

In addition, the study is providing opportunities for capacity building and capacity exchange through the process of working together to develop and implement the study. This is occurring at all levels of the study, and involves all the major contributors, including Aboriginal and non-Aboriginal researchers, members of the Aboriginal Advisory Group and members of the Policy Implementation Partnership.

Having a baby is an important life event in all families and in all cultures. How supported women feel during pregnancy, how women and families are welcomed by services, how safe they feel coming in to hospitals to give birth, and what happens to families during a hospital stay and in the early months after the birth of a new baby are important social determinants of maternal, newborn and child health outcomes. The Aboriginal Families Study provides a unique resource to inform quality improvement and strengthening of services for Australian Aboriginal women and families in South Australia and nationally. The study is also a testament to what can be achieved by collaboration and partnership.

Endnotes

The term 'Aboriginal' used throughout this paper is intended to refer to people of Aboriginal and Torres Strait Islander origin.

Abbreviations

AFBP: Aboriginal Family Birthing Program; AHCSA: Aboriginal Health Council of South Australia; AHREC: Aboriginal Health Research Ethics Committee; AMIC: Aboriginal Maternal Infant Care Worker; COAG: Council of Australian Governments; MCRI: Murdoch Childrens Research Institute; NHMRC: National Health and Medical Research Council; SA: South Australia.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

MB, JAK, and KG contributed to study conception, design and conduct of the study as members of the Aboriginal Advisory Group. RM undertook consultations with Aboriginal communities, and contributed to the conception and design of the study, and piloting of study procedures and study instruments. SB, JY, KG, AM, JN, and JR contributed to study conception, design and conduct of the study. SB, JW and JY co-wrote the successful grant application to NHMRC, and applications for ethical approval, in collaboration with other study investigators. SB, RM, JW, and JY co-facilitated the consultation and pilot stages of the project with guidance from members of the Aboriginal Advisory Group. JW, DW, RM and SB developed the interviewer guidelines and procedures for fieldwork. SB wrote the initial draft of the manuscript. All authors were involved in revising the manuscript and have given final approval for the manuscript to be published.

Acknowledgements

The authors respectfully acknowledge the Aboriginal Custodians of the Lands and Waters of Australia. We thank the many Aboriginal families who have played a role in development of the Aboriginal Families Study through the community consultation and development of the questionnaire; the women who have taken part; their communities and the staff in the many agencies that have supported the study. The Aboriginal Families Study is funded by the National Health and Medical Research Council (project grant ID1004395, 2011–2013), the Rio Tinto Aboriginal Fund, and SA Health, and supported by the Victorian Government's Operational Infrastructure Support Program. SB was supported by a National Health and Medical Research Council Career Development Fellowship (ID491205, 2008–2011), and currently holds an Australian Research Council Future Fellowship (2012–2015).

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Received: 19 March 2013 Accepted: 11 June 2013
Published: 14 June 2013

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doi:10.1186/1475-9276-12-41
Cite this article as: Buckskin *et al.*: Aboriginal Families Study: a population-based study keeping community and policy goals in mind right from the start. *International Journal for Equity in Health* 2013 **12**:41.

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STROBE Statement—Checklist of items that should be included in reports of ***cohort studies***

Although our paper reports a validation study, we have used this check-list as the most suitable choice in the context of embedding validation within a prospective cohort study.

	Item No	Recommendation	
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	See abstract, p 2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	See abstract, p2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	Pp 4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	See abstract and background, p 4-5
Methods			
Study design	4	Present key elements of study design early in the paper	See abstract and methods, p 5-9
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	See abstract and methods, p5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	See methods for discussion groups, pre-testing questionnaire and validation study, p 7-9
		(*b*) For matched studies, give matching criteria and number of exposed and unexposed	n/a
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Paper describes multi-stage process for developing adapted measure of intimate partner violence (exposure of main interest). Criteria for identification of IPV are discussed in the methods and results. This paper does not report health outcomes.
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Methods of culturally adapting the CAS to develop the AEPVS are discussed in detail.
Bias	9	Describe any efforts to address potential sources of bias	See study methods – particularly steps taken to include women from regional, remote and urban areas of SA.
Study size	10	Explain how the study size was arrived at	See study methods and results, esp p10 and 13.
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe	See analysis methods for validation study, p8-9

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		which groupings were chosen and why	
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	See analysis methods p8-9 – Confirmatory Factor Analysis was conducted to assess validity of 3 sub-scales.
		(*b*) Describe any methods used to examine subgroups and interactions	
		(*c*) Explain how missing data were addressed	See results, p 13
		(*d*) If applicable, explain how loss to follow-up was addressed	n/a to this paper
		(*e*) Describe any sensitivity analyses	n/a
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	See results
		(b) Give reasons for non-participation at each stage	See results
		(c) Consider use of a flow diagram	n/a to current paper
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	See results and Table 2
		(b) Indicate number of participants with missing data for each variable of interest	See results – Step 4 validation study
		(c) Summarise follow-up time (eg, average and total amount)	See methods
Outcome data	15*	Report numbers of outcome events or summary measures over time	n/a
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n/a
		(*b*) Report category boundaries when continuous variables were categorized	n/a
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	See analysis methods : Steps 1 to 4, including validation study using CFA
Discussion			
Key results	18	Summarise key results with reference to study objectives	See first paragraph of discussion, p 14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or	See paragraph 3 of discussion, p 15

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		imprecision. Discuss both direction and magnitude of any potential bias	
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	See concluding paragraph, p 16
Generalisability	21	Discuss the generalisability (external validity) of the study results	See study limitations – paragraph 3 and conclusion
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	See acknowledgements

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at http://www.strobe-statement.org.

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Development, acceptability and construct validity of the Aboriginal Women's Experiences of Partner Violence Scale (AEPVS): a co-designed, multi-phase study nested within an Australian Aboriginal and Torres Strait Islander birth cohort

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2021-059576.R1
Article Type:	Original research
Date Submitted by the Author:	14-Jun-2022
Complete List of Authors:	Glover, Karen; Murdoch Childrens Research Institute, Intergenerational Health; South Australian Health and Medical Research Institute, Women and Kids Theme Gartland, Deirdre; Murdoch Childrens Research Institute, Intergenerational Health; The University of Melbourne, Department of Paediatrics Leane, Cathy; Women's and Children's Health Network, South Australian Government Nikolof, Arwen; Murdoch Childrens Research Institute, Intergenerational Health; South Australian Health and Medical Research Institute, Women and Kids Theme Weetra, Donna; Murdoch Childrens Research Institute, Intergenerational Health Clark, Yvonne; South Australian Health and Medical Research Institute, Women and Kids Theme Giallo, Rebecca; Murdoch Childrens Research Institute, Intergenerational Health; The University of Melbourne, Department of Paediatrics Brown, Stephanie; Murdoch Childrens Research Institute, Intergenerational Health; The University of Melbourne, Department of General Practice and Department of Paediatrics
Primary Subject Heading:	Public health
Secondary Subject Heading:	Epidemiology, Mental health, Public health
Keywords:	PUBLIC HEALTH, EPIDEMIOLOGY, MENTAL HEALTH

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Development, acceptability and construct validity of the Aboriginal Women's Experiences of Partner Violence Scale (AEPVS): a co-designed, multi-phase study nested within an Australian Aboriginal and Torres Strait Islander birth cohort

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Key words: public health, epidemiology, mental health

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Abstract

Objective: Few studies employ culturally safe approaches to understanding Indigenous women's experiences of intimate partner violence (IPV). The aim of this study was to develop a brief, culturally safe, self-report measure of Aboriginal and Torres Strait Islander women's experiences of different types of IPV.

Design: Multi-stage process to select, adapt and test a modified version of the Australian Composite Abuse Scale using community discussion groups and pre-testing. Revised draft measure tested in Wave 2 follow-up of an existing cohort of Aboriginal families. Psychometric testing and revision included assessment of the factor structure, construct validity, scale reliability and acceptability to create the Aboriginal Experiences of Partner Violence Scale (AEPVS).

Setting: South Australia, Australia

Participants: 14 Aboriginal women participated in discussion groups, 58 participated in pretesting of the draft AEPVS, and 216 women participating in the Aboriginal Families Study completed the revised draft version of the adapted measure.

Results: The initial version of the AEPVS based on item review and adaptation by the study's Aboriginal Advisory Group comprised 31 items measuring physical, emotional and financial IPV. After feedback from community discussion groups and two rounds of testing, the 18-item AEPVS consists of three subscales representing physical, emotional and financial IPV. All subscales had excellent construct validity and internal consistency. The AEPVS had high acceptability among Aboriginal women participating in the Aboriginal Families Study. **Conclusions:** The AEPVS is the first co-designed, multi-dimensional measure of Aboriginal women's experience of physical, emotional and financial IPV. The measure demonstrated cultural acceptability and construct validity within the setting of an Aboriginal-led, community-based research project. Validation in other settings (e.g. primary care) and populations (e.g. other Indigenous populations) will need to incorporate processes for community governance and tailoring of research processes to local community contexts.

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STRENGTHS AND LIMITATIONS OF THIS STUDY

- The Aboriginal Women's Experience of Partner Violence Scale (AEPVS) is the first co-designed, multi-dimensional measure of Aboriginal and Torres Strait Islander women's experience of physical, emotional and financial partner violence.
- The measure demonstrated cultural acceptability and construct validity within the setting of an Aboriginal-led, community-based research project.
- The research team worked with guidance of the study's Aboriginal Advisory Group and Aboriginal women participating in discussion groups to ensure content validity and cultural acceptability of the new measure.
- While the sample was both geographically and culturally diverse, the results may not apply directly to Aboriginal and Torres Strait Islander communities in other jurisdictions or to other Indigenous populations.

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Background

Intimate partner violence (IPV) is a global public health and human rights issue estimated to affect one in three women at some stage in their lives[1]. An Australian longitudinal study of over 1500 first-time mothers found that more than one in three women experienced IPV in the decade after having their first child.[2] Indigenous women are disproportionately impacted by family and community violence due to ongoing impacts of colonisation, including: racism and discrimination; disconnection from traditional lands, culture and language; policies of forced child removal; and constant grief and loss.[3-6] There is mounting evidence of the long term health consequences of IPV for women and children.[2,6-10] Advocacy programs, focusing on empowerment, safety and resources, and psychological therapies, such as Trauma Informed Cognitive Behaviour Therapy have been shown to be effective in long-term healing and recovery from IPV.[11,12] However, most women and children impacted by IPV do not access such services[6,13-16] Barriers operate at both organisational and systems levels (e.g. fragmented referral pathways, low affordability, insufficient attention to tailoring of care to address needs of culturally diverse communities) and at a personal or family level (e.g. minimising significance of the problem, belief that nothing will help, shame, self-doubt and low self-esteem, concerns about escalation of violence and risk of child removal).[6,17] At a global level, the World Health Organization has called for systems change to strengthen health sector responses to IPV.[18,19] In Australia, two recent Royal Commissions have drawn attention to the need for systems reform to improve prevention and early intervention, and for service responses to be developed in partnership with Aboriginal and Torres Strait Islander communities.[20,21]

There is high quality evidence regarding the prevalence of IPV and longer-term consequences for women's and children's health from large scale studies conducted in high, middle and low income countries.[1,2,8,9] Globally, the experience of Indigenous women remains under-investigated. To our knowledge there are no culturally validated tools for inquiring about Aboriginal and Torres Strait Islander women's experiences of IPV. To address this gap, we adapted an Australian multi-dimensional measure of physical and emotional IPV - the Composite Abuse Scale[22,23] - for inclusion in a longitudinal study of 344 Aboriginal families in South Australia.

Partner violence takes many forms. The most commonly recognised types of IPV are acts of physical and sexual violence. IPV also takes the form of repeated emotional abuse and/or coercive, controlling behavior, which may include control of financial resources. There is some evidence that Aboriginal and Torres Strait Islander women experience high rates of physical violence.[13] It is not known how

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commonly Aboriginal and Torres Strait Islander women experience other forms of partner violence, nor what consequences this has for their health and wellbeing, or the health and wellbeing of children.

This study – conducted in partnership with the Aboriginal Health Council of South Australia - aimed to develop a culturally robust and acceptable approach to inquiring about IPV within an existing prospective birth cohort study called the Aboriginal Families Study. The paper reports iterative steps taken to: (i) select and adapt an existing multi-dimensional measure of intimate partner violence; and (ii) test the cultural acceptability and psychometric properties of the adapted measure within Wave 2 follow-up of the cohort.

Methods

Setting

The Aboriginal Families Study is a prospective, population-based cohort study of 344 Aboriginal children born in South Australia between July 2011 and June 2013, and their mothers and carers. The study protocol was developed with guidance from the study's Aboriginal Advisory Group set up under the auspice of the Aboriginal Health Council of South Australia (the peak body for Aboriginal health in South Australia). Women were recruited by a team of Aboriginal researchers, all of whom had close connections with Aboriginal communities in South Australia. Details regarding community consultation, partnership arrangements, and study procedures are available in previous papers.[24,25]

Cohort participants have connections with more than 35 Aboriginal and Torres Strait Islander language and community groups across Australia. At recruitment, 39% of mothers were living in Adelaide, 36% in regional areas and 25% in remote areas of South Australia. Mothers ranged in age from 15-49 years. Comparisons with South Australian routinely collected perinatal data showed that the sample was largely representative in relation to maternal age, infant birthweight and gestation, but slightly over-represented women having their first child.[25] Wave 2 follow up of the study children and their mothers and carers was undertaken between 2018 and 2020 around the time that the children were starting primary school.

Prior to commencing Wave 2 follow-up, the research team and the study's Aboriginal Advisory Group undertook extensive preparatory work to design procedures for follow-up. This included selection of culturally appropriate study measures. The steps involved are outlined in Figure 1. At Wave 2, the study aims included ascertainment of women's experiences of violence in partner relationships. To address this aim, the research team reviewed existing measures of IPV and looked for epidemiological

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3 and clinical studies involving Aboriginal and Torres Strait Islanders or other Indigenous populations where measures of IPV had been used. Instruments included in the *CDC Compendium of Assessment Tools for Measuring Intimate Partner Violence Victimization and Perpetration*[26] were reviewed in relation to: (i) likely face validity with Aboriginal women of childbearing age in South Australia; (ii) culturally appropriate use of language; (iii) length of the measure; (iv) capacity to be completed as an interview or by self-administered questionnaire; (iv) inclusion of items asking about different types of violence, including physical, emotional and financial abuse; (v) robust psychometric properties. Based on these criteria, the Composite Abuse Scale (CAS) was selected by the Aboriginal Advisory Group as the measure most likely to be suitable for inclusion. The standard version includes 30 items assessing different types of psychological, physical and sexual violence by a current or former partner over the previous 12 months.[22,23] A shorter, 18-item version focuses on emotional and physical violence. Both versions have been used extensively in Australian and international research.[2,27-31] The Aboriginal Advisory Group recommended that the 18-item version be adapted and pre-tested with Aboriginal women to determine whether it would be appropriate for inclusion in the Wave 2 questionnaire. Specifically, the Advisory Group recommended: (i) review of the language in the CAS for cultural and linguistic relevance, (ii) inclusion of additional items to assess financial abuse, and (iii) inclusion of additional items covering actions by a partner that seek to control women's behavior, including actions that seek to prevent women from connecting with members of their Aboriginal family or going to Aboriginal community events.

Step 1: Development of the adapted CAS

A working group – comprising Aboriginal and non-Aboriginal investigators, Aboriginal researchers and members of the Aboriginal Advisory Group - was established to make recommendations regarding adaptation of the CAS (Table 1). Working Group members were asked to review the original 18-item version of the Composite Abuse Scale for acceptability and suitability for use with Aboriginal and Torres Strait Islander women of childbearing age living in South Australia. Modifications recommended by the working group included changes to the wording of some items to simplify language and/or change the expression to match local Aboriginal ways of using English. For example, the expression "Beat you up" (a common expression in standard Australian English) was replaced with the expression "Flogged you" (a more common expression in Aboriginal English). While few women taking part in the Aboriginal Families Study speak an Aboriginal language at home, many speak some words in local Aboriginal languages. The working group recommended inclusion of some words in local languages likely to be familiar to Aboriginal and Torres Strait Islander people in South Australia.

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Twelve new items considered to have particular relevance for Aboriginal communities were added to the measure. These were: two items asking about controlling behavior preventing women from connecting with their Aboriginality or making women feel bad about being Aboriginal; six items asking about financial abuse; four items describing types of physical abuse and two items describing emotional abuse.

In the original version of the CAS, women are asked to report the frequency of each behaviour during the previous 12 months, by ticking one of the following six responses: 'never', 'only once', 'several times', 'once per month', 'once per week' and 'daily', scored 0-5. A score of three or more for emotional abuse items or one or more for physical abuse items is used to indicate IPV.[22,23] The working group recommended that the number of response options be reduced from six to four for ease of administration. The pilot study version included the following four responses: 'never', 'once', 'several times' or 'a lot', scored 0-3. The working group also recommended inclusion of a preamble explaining why the questions were being asked, that all women were being asked the same questions and reminding women that they did not have to answer any questions that they did not wish to answer. The new draft measure was named the Aboriginal Women's Experience of Partner Violence Scale (AEPVS).

Table 1. Items in the Composite Abuse Scale and draft Aboriginal Women's Experience of Partner Violence Scale (AEPVS) - versions 1 and 2

Composite Abuse Scale – Short version	Initial draft version of AEPVS	Final draft version of the AEPVS
Emotional abuse Items		
Told me I wasn't good enough	Told you that you are no good	Told you that you are stupid or no good
Tried to turn my family, friends and children against me	Tried to turn family, friends and children against you	Tried to turn family, friends and children against you
Tried to keep me from seeing or talking to my family	Tried to keep you from seeing or talking to family	Tried to keep you from seeing or talking to family
Blamed me for causing their violent behaviour	Blamed their violent behaviour on you, saying it was your fault because you set them off	Blamed their violent behaviour on you, saying it was your fault because you set them off

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Told me I was crazy	Told you that you are crazy (boontha, rama rama)	Told you that you are crazy (boontha, rama rama)
Told me no one would ever want me	Told you that no one would ever want you	Told you that no one would ever want you
Did not want me to socialize with my female friends	Stopped you from seeing female friends	Stopped you from seeing female friends
Told me I was stupid	Told you that you are stupid	
Told me I was ugly	Told you that you are ugly	
Became upset if dinner/house work wasn't done when they thought it should be		
Tried to convince my friends, family or children that I was crazy	Tried to convince friends, family or children that you have lost your spirit, or have bad spirit in you	
	Got jealous or wild (doodla) if you talked to your male friends or their male friends	Got jealous or wild (doodla) if you talked to your male friends or their male friends
	Got wild when you dressed up or put makeup on	Got wild when you dressed up or put makeup on
	Threatened to hurt you, your family or pets	Threatened to hurt you, your family or pets
	Stopped you from connecting with your Aboriginality (e.g. going to community events, going home to Country)	Stopped you from connecting with your Aboriginality (e.g. going to community events, going home to Country)
	Made you feel bad about being Aboriginal	Made you feel bad about being Aboriginal
Physical abuse Items		
Slapped me	Slapped or hit you	Slapped or hit you
Shook me	Shook you	Shook you

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Pushed, grabbed or shoved me	Pushed, grabbed or shoved you	Pushed, grabbed or shoved you
Hit or tried to hit me with something	Hit or tried to hit you with something	Hit or tried to hit you with something
Kicked me, bit me or hit me with a fist	Kicked you, bit you, or punched you	Kicked you, bit you, or punched you
Beat me up	Flogged you	Flogged you
Threw me		
	Stopped you from leaving the house	Stopped you from leaving the house
	Forced you to do something you didn't want to do	Forced you to do something you didn't want to do sexually
	Smashed up or destroyed your things	Smashed up or destroyed your things
		Used a knife or gun or other weapon
Financial abuse items		
	Got wild if you spent money on yourself	Got wild if you spent money on yourself
	Refused to contribute to family finances (e.g. pay bills, buy food)	Refused to contribute to family finances (e.g. pay bills, buy food)
	Stopped you from earning your own money	Stopped you from earning your own money
	Got you to pay their bills	Got you to pay their bills
	Took money from your bank account	Took money you needed for something else (e.g. pay bills, buy food)
	Took your money	Took your money and made you worry about not having enough
	Made you put the bills in your name	Made you put the bills in your name

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	Made you ask for money for bills, food or the kids	Made you ask for money for bills, food or the kids

Step 2: Discussion groups

Discussion groups were held in urban and regional areas to seek advice on the acceptability of the proposed approach, and cultural appropriateness of the draft AEPVS . Eligible women (aged ≥18 years; mothers of Aboriginal children aged 6-10 years) were recruited via Aboriginal community organisations, health services and community centres. Staff in these agencies informed women about the study and facilitated introductions to members of the research team, who then explained what was involved in taking part. Women were provided with written and verbal information, and given time to consider their decision before agreeing to take part. Discussion group methods were used to examine the content of the draft AEPVS, paying particular attention to specific items and response options, and use of Aboriginal language words. After a preliminary discussion about the purpose of the study, and principles for participation, participants were given copies of the standard version of the CAS and the draft AEPVS and asked to comment on which instrument offered the better approach for Aboriginal women. Participants were then asked to look at individual items in the CAS and the draft AEPVS and to comment on their suitability for inclusion. The principles for participation in discussion groups included agreements regarding confidentiality, the importance of everyone being heard, and there being no right and wrong answers. All discussion groups were facilitated by Aboriginal research team members, with notes taken on butchers' paper.

Step 3: Pretesting the new Aboriginal Women's Experience of Partner Violence measure

The Wave 2 questionnaire incorporating the draft AEPVS was pre-tested with Aboriginal women living in urban and regional areas between October 2016 and August 2017. Women were eligible to take part if they were aged ≥18 years and mothers of Aboriginal children aged 6-10 years old. Eligible women were identified via community networks of Aboriginal research team members with connections to different communities in South Australia and were offered the choice of completing the questionnaire with an Aboriginal researcher or self-completing the questionnaire. Women consenting to participate were asked for their written and/or verbal feedback on the draft questionnaire including the questions on partner violence. Specifically, they were asked: (i) whether there were any questions or sections of the questionnaire that made them feel uncomfortable or that

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were 'too personal' or 'intrusive'; (ii) what they liked about the questionnaire, and (iii) what we could do to improve the questionnaire, specific questions or study procedures.

Step 4: Validation of the AEPVS in Wave 2 of the Aboriginal Families Study

Wave 2 follow up occurred between mid-2018 and late 2020. All women who took part in Wave 1 were eligible to take part. Women were invited to complete the questionnaire in a face-to-face interview with a female Aboriginal researcher, or to self-complete (if preferred). When women opted to self-complete, study staff either remained present or provided participants with a folder for storing the completed questionnaire, which was then collected within 48 hours by the same team member. Care was taken to inform women that the questionnaire covered sensitive issues such as grief and loss and partner violence, and that they did not have to answer any questions that they do not wish to. Study staff aimed to ensure that interviews took place in locations where women had privacy, and that questionnaires left for self-completion were contained in a sealable envelope or folder to facilitate confidentiality. During the COVID-19 pandemic, women were also given the option of receiving a mailed copy of the questionnaire and/or mailing the questionnaire back to the research team by reply paid envelope. Safety procedures included training and support for study staff to offer referral pathways to women disclosing violence or other life stressors.

Analysis

Data gathered in discussion groups (step 2) were analysed to identify areas of consensus, disagreement or concern about the draft AEPVS items and/or study procedures related to inquiry about partner violence. Analysis of data collected from women participating in pre-testing of the draft questionnaire (step 3) involved examining item distributions and missing values for each of the AEPVS items. Women's feedback about the AEPVS items was also collated and summarised. These combined data were presented to members of the Aboriginal Advisory Group and study investigators for their consideration and interpretation and were used to inform final decisions regarding study measures and procedures for Wave 2 follow-up.

Validation of the AEPVS (step 4) was conducted using data collected from women who participated in Wave 2 follow-up. Confirmatory Factor Analyses (CFA) were conducted for the three subscales - emotional, physical and financial IPV - using MPlus. The AEPVS items were ordinal level data with four response options and generally non-normal in their distribution, therefore Robust Weighted Least Squares estimation (WLSMV) was used. The adequacy of the models was assessed using goodness-of-fit Chi Square, and practical fit indices including the Comparative Fit Index, Goodness-of-Fit index (GFI)

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and Adjusted Goodness-of-Fit index (AGFI) with estimates of 0.90 or above indicating acceptable model fit. [32] The Root Mean Square Error of Approximation (RMSEA) was also used with values close to or below 0.05 within the 90% confidence interval indicating good model fit.[33] Standardised factor loadings, error variances, standardised residuals and modification indices were examined to identify potential items contributing to poor model fit. An iterative process was used in which the model was re-estimated and examined after each modification until the model fit was adequate. Internal consistency reliability for each subscale was examined using Cronbach Alpha, with 0.7-0.9 deemed good to excellent. [34,35] Scoring for the AEPV emotional and physical partner violence scales replicated the original CAS (≥3 and ≥1 respectively). Scoring for the financial partner violence scale was set at ≥2.

Patient and Public involvement

No patients were involved in the study. The study was conducted in partnership with the Aboriginal Health Council of South Australia and was preceded by extensive community consultations with Aboriginal communities in rural, regional and remote South Australia. Community consultations identified family violence as an issue of concern. The Aboriginal Advisory Group established to oversee the study guided the research team in the best approaches to undertaking the research in ways that were respectful of Aboriginal families and prioritised the cultural safety of participants and study staff. Participatory methods were used throughout. For example, a working group comprising Aboriginal Advisory Group members, Aboriginal researchers and Aboriginal and non-Aboriginal study investigators was established to facilitate cultural adaptation of the CAS. Discussion groups were held in urban and regional areas to seek community feedback on the draft AEPVS and proposed study procedures. The Aboriginal Advisory Group worked with study staff and investigators to guide decision-making at each stage of the research and gave final approval for publication. Authors of this paper include members of the Aboriginal Advisory Group, Aboriginal study investigators and Aboriginal study staff.

Results

Step 2: Discussion group feedback

Fourteen women participated in five discussion groups (two to four women in each). Two groups were held in regional areas and three in a major city. In all five discussion groups, participants told us that they preferred the draft AEPVS, and considered this to be much more culturally appropriate than the original CAS. There was strong support for inclusion of:

- items in the AEPVS on emotional, physical and financial abuse;
- the two items asking about abuse related to Aboriginality;

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- the use of Aboriginal words familiar to South Australian Aboriginal women.

While there was strong support for the inclusion of Aboriginal words in some items, there were differing views regarding the best words to use. There were also mixed views about the decision **not** to include questions asking about sexual abuse. Women attending separate urban discussion groups independently raised this as an issue and argued for inclusion of at least one item asking about sexual abuse. Women attending a rural discussion group, on the other hand, were uncomfortable with the idea of asking women directly about sexual abuse. One other item which asked about a partner/former partner "trying to convince friends, family or children that you have lost your spirit, or that you have bad spirit in you" was seen as having potential to cause distress.

***Step 3: Results of pre-testing the* AEPVS**

Fifty-eight women completed one of three draft versions of the Wave 2 follow-up questionnaire (nine as an interview and 49 by filling in the questionnaire themselves). Participants included women living in urban, regional and remote areas of South Australia. Overall, feedback was very positive. Women indicated that they found the questions 'easy to read and understand', 'to the point', 'relevant', 'straightforward', and 'honest'. Women also commented that they liked the questions about 'our culture', 'how it flowed', 'all the questions themselves', and 'being real when asking the questions, not tip-toeing around.' Several women said they liked that they didn't have to answer anything that they didn't want to and commented that it was good that they were told beforehand about the 'sensitive' questions as it meant they were 'prepared for these questions' prior to undertaking the survey. Five women (8.9%) said that they thought some of the questions were a bit too personal, in particular the questions asking about partner violence and drugs and alcohol.

***Modifications to the draft AEPV*S**

Analyses of results for the 42 women who completed the initial draft version of the AEPVS were considered alongside feedback from participants (including those taking part in discussion groups and those completing draft versions of the questionnaire). Individual items retained in the AEPVS are discussed below, together with examples of changes made based on the adaptation process.

Physical IPV

The initial version of the draft AEPVS retained six of the original CAS items asking about physical IPV and included an additional three items covering different contexts/ways in which physical violence may occur (see Table 1). New items were worded as follows: "Smashed up or destroyed your things",

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3 “Stopped you from leaving the house”, “Forced you to do something you didn’t want to do”. In
4
5 addition, two items were re-worded to reflect Aboriginal use of English.
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8 Two items showed poor distribution but were retained for further testing as they formed part of the
9
10 original scale (Kicked bit or punched you, Flogged you). Overall the physical IPV scale had excellent
11
12 internal reliability as a scale (Cronbach alpha=0.96). The final approved version of the AEPVS (Table 2)
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14 also includes an item asking about whether a partner or ex-partner “Used a knife or gun or other
15
16 weapon”. The Aboriginal Advisory Group approved inclusion of this item to measure more extreme
17
18 physical violence. In addition, the Aboriginal Advisory Group recommended a change to the last item.
19
20 This was revised to read: “Forced you to do something you didn’t want to do *sexually*” to respect the
21
22 feedback from two urban discussion groups, while also respecting the view expressed in a regional
23
24 discussion group that sexual violence should not be asked about directly.
25
26 *Emotional IPV*
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28 Ten of the original CAS items asking about emotional IPV were retained in the initial version of the
29
30 AEPVS (Table 1). One item asking whether partners “Became upset if dinner/housework wasn’t done
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32 when they thought it should be” was seen as having limited relevance as a form of abuse in Aboriginal
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34 families given the varied nature of household structures and high proportion of women living with
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36 other family and/or not living with their partner. Four of the retained items were reworded to reflect
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38 Aboriginal use of English. For example, “Did not want you to socialise with your female friends” was
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40 revised to read “Stopped you from seeing your female friends”. Five items were added to cover
41
42 specific contexts particularly relevant to Aboriginal women. These included contexts in which a non-
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44 Aboriginal partner might seek to control women’s behaviour by preventing women from connecting
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46 with their Aboriginal family or culture, or making women feel bad about being Aboriginal. In the final
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48 consensus version, all of these items were retained (Table 2). The item referring to ‘bad spirit’ was
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50 removed based on feedback from discussion groups and poor item distribution. One other item – ‘Told
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52 you that you are ugly’ was also removed based on poor item distribution. In the final version, two
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54 items were amalgamated to read “Told you that you are stupid or no good”. This change was to reduce
55
56 the total number of items measuring emotional abuse.
57
58 *Financial IPV*
59
60 The original 18-item CAS does not include any items measuring financial abuse. The longer 30-item

version includes one item. This item “Took my wallet and left me stranded” was simplified to read

“Took your money” as the phrase “left me stranded” did not resonate with members of the Aboriginal

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Advisory Group. An extra seven items were included in the initial version of the AEPVS based on the existing literature on financial abuse and to reflect a range of ways in which financial abuse may be experienced by Aboriginal women (Table 1). Minor changes were made to two of these items to be more specific in terms of negative impact. The item 'Took your money' was revised to read 'Took your money and made you worry about not having enough', and the item 'Took money from your bank account' was revised to read 'Took money you needed for something else (e.g. pay bills, buy food)'.

Response categories and initial framing of the measure

The wording and number of response categories in the AEPVS were reviewed by discussion group participants and were considered readily understood. The original wording of the introductory sentence was seen as too complex and was simplified in the final version to read "In the LAST 12 MONTHS, has a partner or ex-partner ever…. ", followed by the 30 individual items.

Situating the AEPV in the Wave 2 questionnaire

The Aboriginal Advisory Group emphasised that women needed to be given clear information regarding the purpose for asking questions about partner violence and an explanation about how the data gathered would be used to benefit Aboriginal families and communities. The research team tested two versions of a preamble to the section that included the draft AEPVS. The final preamble conveyed to women that the

> *"Aboriginal Advisory Group wants the study to give women an opportunity to talk about their experiences of partner violence, so that the information can be used to advocate for better services and support for women and families".*

Preceding this statement, the preamble noted:

> *"Many Aboriginal women and men have healthy relationships. We know there are negative stereotypes about violence in Aboriginal families. Our aim is to ensure that the information given to us is used to benefit the community, and not used to reinforce negative stereotypes".*

There was also a specific reminder to women at this point in the questionnaire that they could choose not to answer any of the questions they did not wish to. Women who completed the questionnaire as an interview were also given the option of choosing to self-complete this section.

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In addition, the Aboriginal Advisory Group recommended that a question be included immediately following the AEPVS to inquire about what women do to stay strong and protect themselves when these things happen. This question was regarded as important to dispel stereotypes that Aboriginal women do not act to protect themselves and their children.

Step 4: Validation Study

A total of 227 women participated in Wave 2 follow-up (see Table 2). A majority were Aboriginal and/or Torres Strait Islanders (197, 90.7%). The mean age at the birth of the study child was 25.4 (range 14.9 - 43.4 years). Women who participated in Wave 2 follow-up were largely representative of the original cohort in relation to maternal age and Indigenous status. At Wave 2 follow-up, less than half were living with a partner (41.9%), one in ten (10.2%) had a partner but were not living in the same household, and 47.9% were single. Just under half of the women participating in Wave 2 were living in the major metropolitan city of Adelaide, approximately a third in regional areas of South Australia, and just under one in five in areas classified as remote. This reflects the slightly higher participation of women living in urban areas and slightly lower participation of women living in remote areas in Wave 2 compared with Wave 1.

The AEPVS was completed by 216 women, with very few missing data points observed for individual items (range 0 - 6). The 11 women who chose not to answer this section ranged in age from 19.4 - 32.7 years (mean=26.1 years, SD=4.8) at the time of giving birth to the study child. The majority were single (72.7%) and lived in regional areas (60%). These women were not included in subsequent analyses.

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Table 2. Socio-demographic characteristics of women participating in Waves 1 and 2 of the Aboriginal Families Study and completing the draft Aboriginal Experiences of Partner Violence Scale at Wave 2

	Wave 1 (n= 344) n (%)	Wave 2 (n= 227) n (%)	AEPVS (Wave 2) (n=216) n (%)
Maternal age at birth of study child			
15-19 years	55 (16.0)	34 (15.0)	32 (14.8)
20-24 years	140 (40.7)	89 (39.2)	86 (39.8)
25-29 years	91 (26.5)	62 (27.3)	58 (26.9)
30-35 years	33 (9.6)	25 (11.0)	23 (10.7)
35+ years	25 (7.3)	17 (7.5)	17 (7.9)
Indigenous status			
Aboriginal and/or Torres Strait Islander	319 (92.7)	207 (91.2)	196 (90.7)
Non- Aboriginal*	25 (7.3)	20 (8.8)	20 (9.3)
Relationship Status (Wave 2)			
Single	Not asked	111 (49.1)	103 (47.9)
Living with partner		93 (41.2)	90 (41.9)
In relationship, not living with partner		22 (9.7)	22 (10.2)
Place of residence			
Metropolitan area	134 (39.0)	101 (44.7)	97 (45.1)
Regional	123 (35.8)	81 (35.8)	75 (34.9)
Remote	87 (25.3)	44 (19.5)	43 (20.0)
Number of adults in household			
One	56 (16.9)	81 (35.8)	74 (34.4)
Two	157 (47.3)	112 (49.6)	108 (50.2)
Three or more	119 (35.8)	33 (14.6)	33 (15.4)
Own children living with participant			
None	2 (0.6)	8 (3.5)	7 (3.2)
One to two	233 (68.9)	93 (41.0)	89 (41.2)
Three to four	81 (24.0)	99 (43.6)	95 (44.0)
Five or more	22 (6.5)	27 (11.9)	25 (11.6)
Total number of children living with participant			
None	2 (0.6)	7 (3.1)	6 (2.8)
One to two	193 (58.1)	87 (38.3)	83 (38.4)
Three to four	97 (29.2)	95 (41.9)	91 (42.1)
Five or more	40 (12.1)	38 (16.7)	36 (16.7)
Highest educational qualification			
University degree	22 (6.4)	16 (7.1)	15 (6.9)
Diploma/certificate	155 (45.1)	126 (55.1)	124 (57.4)
Year 12	33 (9.6)	19 (8.4)	19 (8.8)
Less than Year 12	134 (39.0)	66 (29.1)	58 (26.8)
Paid employment			
Full time job	14 (4.1)	33 (14.6)	33 (15.4)
Part time job	23 (6.8)	45 (19.9)	45 (20.9)
Not in paid employment	303 (89.1)	148 (65.5)	137 (63.7)
Health care card			
No	44 (12.9)	51 (22.5)	49 (22.7)
Yes	296 (87.1)	176 (77.5)	167 (77.3)

* Non-Aboriginal women taking part are mothers of Aboriginal and/or Torres Strait Islander children

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Table 3 reports the mean and standard deviation for each item included in the draft AEPVS, as well as the standardised factor loadings, proportion of the variance accounted for (R^2) and error variances for each item in the initial and final CFAs tested. The three initial models of the emotional, physical and financial IPV subscales were a good fit to the data, with high factor loadings for all items (≥74). As the goal was to achieve a brief multi-dimensional measure, each subscale was further refined to reduce the number of items. Decisions to remove items were based on item distributions, factor loadings, proportion of variance accounted for in the construct by the items, and error variances. Changes were sequential and model fit re-assessed with each change. The final CFA models showed excellent model fit to the data (See Table 3).

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Table 3. Final draft items and the initial and final Confirmatory Factor Analysis solutions to create the Aboriginal Women's Experiences of Partner Violence Scale (n=216)

Item			Initial Model			Final Model		
	n	Mean (SD)	Standardised factor loadings	R^2	Error variance	Standardised factor loadings	R^2	Error variance
Emotional partner violence			$\chi^2_{(54)}$ = 81.95, p=.008, RMSEA=.05 (.03, .07), CFI=1.00, TLI=1.00, SRMR=.04			χ^2 (9) = 9.02, p=.436, RMSEA=.003 (.00, .08), CFI=1.00, TLI=0.99, SRMR=.02		
Told you that you are stupid or no good	214	0.58 (0.97)	.92	.84	.16	.92	.84	.16
Turn family/friends/children against you	215	0.48 (0.94)	.84	.70	.30	.82	.67	.33
Keep you from seeing or talking to family	216	0.33 (0.78)	.95	.90	.10	-	-	-
Blamed their violent behaviour on you	216	0.61 (1.03)	.94	.89	.11	.96	.93	.08
Told you that you were crazy	215	0.60 (1.00)	.94	.88	.12	-	-	-
Told you that no one would ever want you	214	0.44 (0.93)	.93	.87	.13	-	-	-
Stopped from seeing female friends	216	0.36 (0.81)	.92	.84	.16	-	-	-
Stopped you from connecting to Aboriginality	216	0.21 (0.69)	.90	.81	.19	.88	.78	.22
Got jealous/wild if talked to male friends	216	0.56 (1.01)	.93	.86	.14	.91	.83	.17
Made you feel bad about being Aboriginal	216	0.12 (0.50)	.74	.55	.45	-	-	-
Got wild when you dressed up/makeup on	215	0.30 (0.80)	.91	.82	.18	-	-	-
Threatened to hurt you/family/pets	215	0.32 (0.76)	.83	.69	.31	.84	.71	.30
Physical partner violence			$\chi^2_{(35)}$ = 62.93, p=.003, RMSEA=.06 (.04, .09), CFI=1.00, TLI=1.00, SRMR=.07			$\chi^2_{(9)}$ = 14.56, p=.104, RMSEA=.05 (.00, .10), CFI=1.00, TLI=1.00, SRMR=.07		
Slapped or hit you	211	0.30 (0.72)	.95	.91	.09	-	-	-
Shook you	216	0.26 (0.72)	.94	.89	.11	-	-	-
Pushed, grabbed or shoved you	216	0.35 (0.78)	.97	.94	.06	.97	.93	.07
Hit or tried to hit you with something	216	0.30 (0.73)	.95	.90	.10	.95	.90	.10
Kicked you, bit you or punched you	215	0.23 (0.65)	.99	.98	.02	-	-	-
Used a knife/gun/other weapon	213	0.10 (0.43)	.86	.74	.26	.85	.73	.27
Flogged you	215	0.15 (0.57)	.95	.91	.09	-	-	-

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Stopped you from leaving the house	214	0.30 (0.76)	.91	.83	.17	.92	.84	.16
Forced you to do something sexually	216	0.09 (0.42)	.60	.36	.64	.67	.45	.56
Smashed up or destroyed your things	216	0.39 (0.84)	.88	.77	.24	.90	.81	.19
Financial partner violence			$\chi^2_{(20)}$ = 24.37, p=.227, RMSEA=.03 (.00, .07), CFI=1.00, TLI=1.00, SRMR=.04			$\chi^2_{(9)}$ = 5.41, p=.798, RMSEA=.00 (.00, .05), CFI=1.00, TLI=1.00, SRMR=.01		
Refused to contribute to family finances	215	0.52 (1.01)	.88	.77	.23	.88	.77	.23
Took money you needed for something else	216	0.41 (0.86)	.94	.88	.12	.95	.90	.10
Got wild if you spent money on yourself	214	0.26 (0.73)	.89	.80	.20	.89	.79	.21
Stopped from earning your own money	215	0.16 (0.59)	.86	.74	.26	-	-	-
Got you to pay their bills	216	0.31 (0.78)	.91	.82	.18	.91	.83	.17
Took your money made worry ab not having enough	216	0.34 (0.83)	.97	.94	.05	.97	.95	.06
Made you put the bills in your name	216	0.13 (0.55)	.75	.56	.44	-	-	-
Made you ask for money for bills, food or kids	216	0.25 (0.70)	.85	.72	.28	.84	.70	.30

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As shown in Table 4, the AEPV subscales showed excellent internal reliability (≥0.9). The observed scores covered the complete scale range for emotional and financial IPV scales (0-18), while the highest score for physical IPV was 15. Mean scales scores ranged from 1.5 for physical IPV to 2.8 for emotional IPV.

Overall, 38.9% of women reported experiences of IPV in the previous 12 months. Almost one in three were scored as experiencing physical IPV (29.2%), emotional IPV (31.9%) or financial IPV (28.7%). Each of the different types of IPV had a total mean score of close to 20 suggesting a similar frequency of behaviours within each scale. A majority of the women experiencing partner violence reported multiple types of violence (65/84, 77.4%) and correspondingly, few women reported emotional, financial or physical abuse alone (19/84, 22.6%).

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Table 4. Aboriginal Women's Experiences of Partner Violence Scale (AEPVS) - items, prevalence, and scale psychometrics (n=216)

Scales (scoring) Items	Scale Range	n (%)	Cronbach α	Score Range	Mean Scale score (SD)	Mean Total AEPV score (SD)[1]
Emotional partner violence (score ≥ 3)	0 - 18	69 (31.9)	0.90	0-18	2.8 (4.4)	18.7 (12.3)
Told you that you are stupid or no good						
Turn family/friends/children against you						
Blamed their violent behaviour on you						
Stopped you from connecting to Aboriginality						
Got jealous/wild if talked to male friends						
Threatened to hurt you/family/pets						
Physical partner violence (score ≥ 1)	0-18	63 (29.2)	0.87	0-15	1.5 (3.2)	19.3 (12.8)
Pushed, grabbed or shoved you						
Hit or tried to hit you with something						
Used a knife/gun/other weapon						
Stopped you from leaving the house						
Forced you to do something sexually						
Smashed up or destroyed your things						

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Financial partner violence (score ≥ 2)	0 - 18	62 (28.7)	0.91	0-18	2.1 (4.1)	19.3 (12.8)
Refused to contribute to family finances						
Took money you needed for something else						
Got wild if you spent money on yourself						
Got you to pay their bills						
Took your money made worry about not having enough						
Made you ask for money for bills, food or kids						
Total AEPV score	*0 - 57*	*84 (38.9%)*	*0.96*	*1-54*	*6.4 (11.0)*	*16.0 (12.5)*

[1] Mean total AEPVS score for women reporting partner violence

Women who had experienced IPV in the previous 12 months indicated that they had done a variety of things to protect themselves and stay strong (Table 5). More than half had taken their children to stay with family or friends (55.4%) or called police (51.8%), and just over one in three (37.3%) had taken out an intervention order. Women more commonly talked to family and friends (67.5%) than talked to a health professional. Just under one in three (31.3%) had talked to a local doctor and one in four (26.5%) had talked to a counsellor or psychologist.

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Table 5. What women experiencing partner violence did to protect themselves and stay strong (n=84)

	Recent IPV No. (%)
Talked to family about it	56 (67.5)
Talked to friend about it	50 (60.2)
Left house	49 (59.0)
Took kids to stay with family/friends	46 (55.4)
Phoned police	43 (51.8)
Got intervention order	31 (37.3)
Changed phone number	30 (36.1)
Talked to doctor about it	26 (31.3)
Talked to counsellor/psychologist about it	22 (26.5)
Talked to Aboriginal Health Worker about it	14 (16.9)
Phone domestic violence telephone line	14 (17.1)
Stayed in women's shelter	10 (12.3)

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Discussion

The 18-item Aboriginal Women's Experiences of Partner Violence Scale is the first co-designed, culturally adapted, multi-dimensional measure of partner violence for Aboriginal women. Initial construct validity and reliability testing indicates that it provides a robust measure of Aboriginal women's experiences of physical, emotional and financial partner violence. The adapted measure (see Appendix 1) was developed with extensive input from Aboriginal women and builds on a co-designed program of research conducted in collaboration with the Aboriginal Health Council of South Australia. Aboriginal governance was provided by an Aboriginal Advisory Group that guided the work of the research team at every stage of the co-design process. This included critical input into decisions regarding items included in the initial version of the adapted measure, advice on the inclusion of words in Aboriginal languages, guidance on ways for the research team to facilitate cultural safety for research participants and Aboriginal researchers and providing approval for the final version of the measure.

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Very few women participating in Wave 2 follow-up opted not to complete the measure and the number of individual items skipped by research participants was minimal. The iterative process used for co-designing the adapted measure allowed for multiple stages of feedback and refinement. Importantly, the research team tested several versions of the preamble to the section of the questionnaire asking about partner violence before settling on the final wording. Women were also made aware, during the consent process, that the questionnaire included a section asking about family violence and other things that might be happening in their lives. All contact with women in the study was made by Aboriginal researchers, who in some cases were known to women from the baseline study. Reconnecting with women and building relationships of trust was an important part of the research process led by Aboriginal members of the team. This is a major strength of the study and is likely to have contributed to participation of women who may otherwise have been reluctant to take part. Embedding the development of the AEPVS within follow-up of an existing cohort allowed us to build on established relationships and processes designed to build trust and confidence in research processes .[25] The community connections of Aboriginal research team members were central to our success in reconnecting with families. At the same time, the research team was mindful of the need to maintain confidentiality for families in the study. Where members of the team had close connections with families, contact was generally initiated by another member of the team and/or participants were offered the choice of meeting with another team member.

The current phase of the research also built on our track record of using results to advocate for improvements to services to benefit Aboriginal communities.[36] Approximately a quarter of Aboriginal and Torres Strait Islander women who gave birth in South Australia over a two-year period (mid 2011 to mid 2013) took part in Wave 1.[25] Evidence of extreme social disadvantage in the cohort is apparent in the high proportion of women eligible for a government health care card at both Wave 1 and Wave 2 follow-up. The geographic distribution of the cohort, age of women at the time of giving birth to the study children, and high proportion of women who were not living with a partner at Wave 2 follow-up reflect population characteristics of Aboriginal and Torres Strait Islander families in South Australia.[37] Both the diversity and representativeness of the women participating in validation of the AEPVS contribute to the robustness of the findings.

Other strengths of the study include: well-established Aboriginal governance processes guiding decision-making at all stages of the research; and use of participatory methods to engage Aboriginal women living in urban, regional and remote communities in South Australia in co-design of the adapted measure. The research team worked with guidance of the Aboriginal Advisory Group and

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Aboriginal women participating in discussion groups to ensure content validity and cultural acceptability of the AEPVS and the cultural safety of processes used by the research team to engage women in the study and seek their feedback. Importantly, women were advised why the questions on partner violence were being asked and how the information gathered would be used. Questions asking about experiences of partner violence were followed by a strengths-based question asking about the things women did to protect themselves and stay strong. In taking these steps, our aim was to minimise the potential for women to feel judged for things that had happened to them, to acknowledge the many things that women do to manage complex circumstances surrounding partner violence, and to reduce the risk of participation in the study causing harm or distress to women. The research team were trained and supported to respond to women who either sought support or conveyed particularly complex circumstances.

While we were not able to compare results of the measure with a 'gold standard' (given the lack of availability of other culturally validated measures), the information women provided about the actions they had taken to protect themselves confirm that a significant proportion of women categorised as experiencing IPV had sought assistance from other family members, taken children to stay with family or friends, called police, changed phone numbers or obtained an intervention order. While the sample is both geographically and culturally diverse - including women from urban, regional and remote areas of South Australia and over 35 Aboriginal and Torres Strait Islander language/clan groups (including groups from other Australian jurisdictions) - the results may not apply directly to Aboriginal and Torres Strait Islander communities in other jurisdictions or to other Indigenous populations. Finally, the adapted measure was developed and tested with women of childbearing age. The youngest woman in the study to complete the measure was 20 and the oldest was 49 at the time of Wave 2 follow-up. Further adaptation may be required for younger and older Aboriginal and Torres Strait Islander women, and for use in other jurisdictions.

The immediate purpose of developing a culturally adapted measure of Aboriginal women's experiences of partner violence was to improve understanding of the health consequences of partner violence for Aboriginal women and children, and build knowledge about cultural and community level factors which may moderate the impacts of partner violence in Aboriginal families. Future papers will explore these issues contributing to a small body of evidence bringing an Indigenous lens and more granulated understanding to the context and impact of IPV within Aboriginal and Torres Strait Islander communities.[6,38,39]

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Concurrent with the conduct of the study, a revised short-form of the Composite Abuse Scale was developed drawing on data from five Canadian studies and feedback from an international panel of experts. The study, published while our study was underway, identified gaps in the original measure, including the lack of items on financial abuse, use of threats and choking. [40] It is important to recognise that no measure can be comprehensive and that methods of abuse will vary across populations and contexts.

Conclusion

The AEPVS is the first co-designed, multi-dimensional measure of Aboriginal women's experience of physical, emotional and financial IPV with demonstrated cultural acceptability, construct validity and reliability within the setting of an Aboriginal-led, community-based and governed research project. Culturally safe research methods and tools are important for generating the evidence needed to inform co-design, implementation and evaluation of tailored strategies to support families impacted by partner violence. The AEPVS cannot be separated from the processes surrounding its culturally safe use. Validation of the measure in other settings and populations will need to incorporate processes for community governance and tailoring of research process to local community contexts.

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The Aboriginal Experiences of Partner Violence Scale (AEPVS) may not be reproduced without permission. There is no fee to use this scale, but permission must be obtained from the Aboriginal Families Study Aboriginal Advisory Group Executive Team before use. Please contact: Karen Glover (karen.glover@sahmri.com) or Stephanie Brown (stephanie.brown@mcri.edu.au).

Author contributions: KG, SJB, DW, DG and RG conceptualised the study; SB and KG wrote the study protocol; KG, CL, DW, AN, SJB and DG co-designed the procedures for cultural adaptation of the CAS measure; KG and AN conducted discussion groups and facilitated pre-testing of the draft follow-up questionnaire. KG, AN and DW facilitated wave 2 follow-up. DG and RG undertook psychometric analyses. SJB, DG and KG co-wrote the manuscript. All authors (KG, CL, AN, DW, YC, DG, RG, SB) contributed to interpretation of data, reviewed earlier versions of the manuscript, and approved the final version.

KG and AN facilitated discussion groups; KG, DW and AN led the fieldwork team undertaking data collection; DG and RG conducted quantitative analyses; KG, CL, AN, DW, YC, SB, DG, RG and members of the Aboriginal Advisory Group interpretated the data; SB, DG, RG and KG drafted the paper. All authors critically revised the paper, approved the manuscript to be published and are accountable for the accuracy and integrity of the work.

Acknowledgements: The authors respectfully acknowledge the Aboriginal and Torres Strait Islander Custodians of the Lands and Waters of Australia. We would like to acknowledge members of the Aboriginal Advisory Group who guided all stages of the study, including interpretation of findings, and members of the research team (additional to the authors) who contributed to data collection, all women and families taking part in the study, and the many agencies that assisted us to reconnect with families. Finally, we would like to thank Professor Kelsey Hegarty for permission to adapt the Composite Abuse Scale and for her helpful advice at several stages of the study.

Competing interests: There are no competing interests for any author.

Funding This study was supported by two National Health and Medical Research Council (NHMRC) project grants #1004395 and #1105561, SA Health. Research at the Murdoch Children's Research Institute is supported by the Victorian Government's Operational Infrastructure Support Program.

Ethics approval Ethics approval was obtained from the Aboriginal Human Research Ethics Committee of South Australia (04.09.290; 04.17.737); the South Australian Department of Health (298/06/2012); Women's and Children's Health Network, Adelaide (2335/12/13); the Lyell McEwin Hospital (2010181), Adelaide; and the Royal Children's Hospital, Melbourne (29076A, 36186).

Data availability: No additional data available

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Figure 1: Steps involved in developing and validating the Aboriginal Experiences of Partner Violence Scale (AEPVS)

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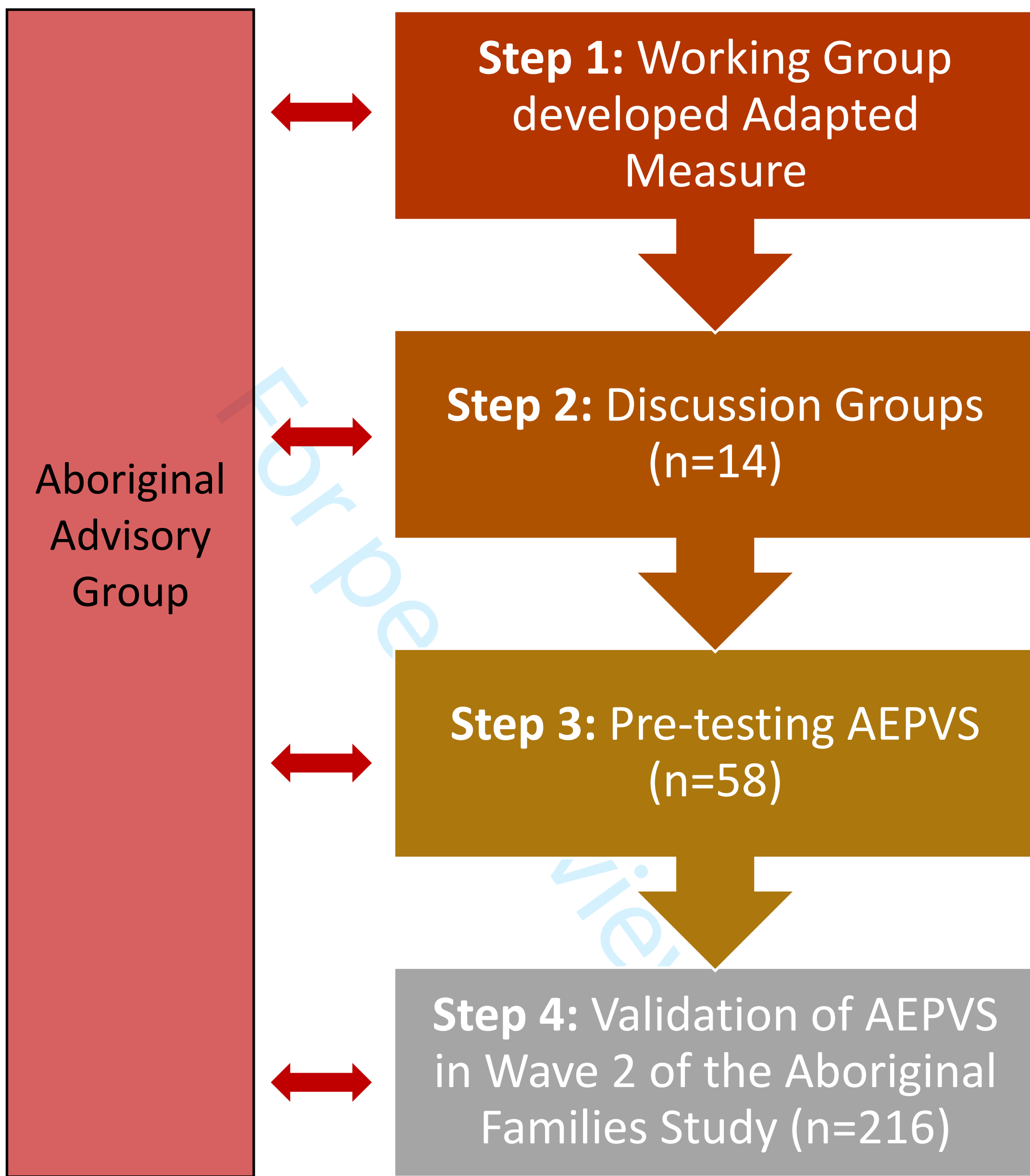

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Appendix 1: Aboriginal Women's Experience of Partner Violence Scale (AEPVS)

The next few questions ask about partner violence. We know many Aboriginal women and men have healthy relationships, and it is women who usually have the main responsibility for looking after the health of family members. We also know a lot of women experience violence at home, and it affects their health.

The Aboriginal Advisory Group (researchers undertaking this study) want the study to give women an opportunity to talk about experiences of partner violence, so that information can be used to advocate for better services and support for Aboriginal women and families.

We know there are negative stereotypes about violence in Aboriginal families. Our aim is to ensure that the information given to us is used to benefit the community, and not used to reinforce negative stereotypes.

You can choose to fill in the questions in this section yourself if you prefer not to talk to an interviewer about them.

You can also choose not to answer any of the questions. Please put a line through any of the questions you prefer not to answer.

In the LAST 12 MONTHS, has a partner or ex-partner ever ...

	NEVER	ONCE	SEVERAL TIMES	A LOT
Told you that you are stupid or no good				
Tried to turn family, friends and children against you				
Refused to contribute to family finances (e.g. pay bills)				
Stopped you from connecting with your Aboriginality (e.g. going to community events, going home to Country)				
Took money you needed for something else (e.g. bills, food)				
Blamed their violent behaviour on you, saying it was your fault because you set them off				
Pushed, grabbed, shoved you				
Got wild if you spent money on yourself				
Got jealous or wild (doodla) if you talked to your male friends or their male friends				
Hit or tried to hit you with something				
Got you to pay their bills				
Used a knife or gun or other weapon				
Stopped you from leaving the house				
Took your money and made you worry about not having enough				
Threatened to hurt you, your family or your pets				
Forced you to do something you didn't want to do sexually				
Smashed up or destroyed your things				
Made you ask for money for bills, food or the kids				

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If you have NOT had any of these experiences IN THE PAST 12 MONTHS, please skip the next question.

When these things happened, what did you do to protect yourself and stay strong?

	YES	NO
Left the house		
Took the kids to stay with family or friends		
Phoned police		
Got intervention order		
Changed phone number		
Talked to family about it		
Talked to friend about it		
Talked to doctor about it		
Talked to an Aboriginal Health Worker		
Talked to a counsellor/psychologist		
Other *(please describe)* ___________________________ ____		

Access to the scale:
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STROBE Statement—Checklist of items that should be included in reports of ***cohort studies***

Although our paper reports a validation study, we have used this check-list as the most suitable choice in the context of embedding validation within a prospective cohort study.

	Item No	**Recommendation**	
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	See abstract, p 2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	See abstract, p2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	Pp 4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	See abstract and background, p 4-5
Methods			
Study design	4	Present key elements of study design early in the paper	See abstract and methods, p 5-9
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	See abstract and methods, p5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	See methods for discussion groups, pre-testing questionnaire and validation study, p 7-9
		(*b*) For matched studies, give matching criteria and number of exposed and unexposed	n/a
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Paper describes multi-stage process for developing adapted measure of intimate partner violence (exposure of main interest). Criteria for identification of IPV are discussed in the methods and results. This paper does not report health outcomes.
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Methods of culturally adapting the CAS to develop the AEPVS are discussed in detail.
Bias	9	Describe any efforts to address potential sources of bias	See study methods – particularly steps taken to include women from regional, remote and urban areas of SA.
Study size	10	Explain how the study size was arrived at	See study methods and results, esp p10 and 13.
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe	See analysis methods for validation study, p8-9

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		which groupings were chosen and why	
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	See analysis methods p8-9 – Confirmatory Factor Analysis was conducted to assess validity of 3 sub-scales.
		(*b*) Describe any methods used to examine subgroups and interactions	
		(*c*) Explain how missing data were addressed	See results, p 13
		(*d*) If applicable, explain how loss to follow-up was addressed	n/a to this paper
		(*e*) Describe any sensitivity analyses	n/a
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	See results
		(b) Give reasons for non-participation at each stage	See results
		(c) Consider use of a flow diagram	n/a to current paper
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	See results and Table 2
		(b) Indicate number of participants with missing data for each variable of interest	See results – Step 4 validation study
		(c) Summarise follow-up time (eg, average and total amount)	See methods
Outcome data	15*	Report numbers of outcome events or summary measures over time	n/a
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n/a
		(*b*) Report category boundaries when continuous variables were categorized	n/a
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	See analysis methods : Steps 1 to 4, including validation study using CFA
Discussion			
Key results	18	Summarise key results with reference to study objectives	See first paragraph of discussion, p 14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or	See paragraph 3 of discussion, p 15

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		imprecision. Discuss both direction and magnitude of any potential bias	
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	See concluding paragraph, p 16
Generalisability	21	Discuss the generalisability (external validity) of the study results	See study limitations – paragraph 3 and conclusion
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	See acknowledgements

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at http://www.strobe-statement.org.

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