

BMJ Open Stressful life events and resilience among carers of Aboriginal children in urban New South Wales: cross-sectional findings from the Study of Environment on Aboriginal Resilience and Child Health (SEARCH)

Christian Young,^{1,2} Jonathan C Craig,^{1,2} Kathleen Clapham,³ Sandra Williams,⁴ Anna Williamson,⁵ for the SEARCH investigators

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For numbered affiliations see end of article.

Correspondence to

Christian Young;
christian.young@sydney.edu.au

ABSTRACT

Objective In caregivers of urban Aboriginal children, to determine the frequency of major stressful life events, the proportion who meet criteria for resilience, and factors that are associated with resilience.

Design Cross-sectional survey.

Setting Four Aboriginal Community Controlled Health Services located in urban or regional areas in New South Wales, Australia.

Participants 574 caregivers of Aboriginal children participating in the Study of Environment on Aboriginal Resilience and Child Health.

Primary outcome measure Resilience, defined as having experienced three or more stressful life events in the last 12 months, and having scores of ≤ 21 on the Kessler 10 Psychological Distress scale.

Results Over half (315, 55%) of the caregivers reported three or more stressful life events—the most common being a close family member who was hospitalised with a serious medical problem (259, 45%). Of the participants who experienced three or more stressful life events, almost three-quarters (227, 72%) met the criteria for resilience. Using multivariable analysis, two factors were independently associated with resilience: not having a physical health problem that limited normal activities (adjusted OR (aOR) 4.3; 95% CI 2.0 to 9.0), and not having problems caused by alcohol within the home (aOR 5.3; 95% CI 2.2 to 12.8). Having a child whose behaviour placed a great deal of burden on the family was associated with less resilience (aOR 0.25; 95% CI 0.09 to 0.68).

Conclusions Caregivers of urban Aboriginal children experienced a large number of stressful events, the most common being the poor health of close family members, but most exhibited resilience. Resilience was associated with stable family environments and good physical health. The high number of stressful life events that caregivers experience is reflective of broader inequalities that Aboriginal communities face. The availability of easily accessible and long-term health and support services may go some way to reducing this inequality and improving social and emotional well-being for Aboriginal families.

Strengths and limitations of this study

- The Study of Environment on Aboriginal Resilience and Child Health (SEARCH) is the largest cohort study of urban Aboriginal children and their caregivers in Australia.
- SEARCH is built on strong partnerships with Aboriginal communities, including community determination of research priorities.
- To our knowledge, this study is the first to quantitatively investigate the resilience of caregivers of Aboriginal children in Australia.
- Resilience is a broadly defined construct. Our definition of resilience may differ from definitions given in other studies.
- The Stressful Life Events Scale has been previously used in Aboriginal health research, however, the scale is not exhaustive, and events may not be independent.

BACKGROUND

Aboriginal families often face high levels of stress due to cultural marginalisation, discrimination and the challenges that stem from living in low socioeconomic environments.^{1,2} Consequently, there is some evidence to suggest that caregivers of Aboriginal children experience high levels of psychological distress³ which can in turn negatively impact the social and emotional well-being of children in their care.^{4,5} The ability to maintain positive psychological functioning during times of stress and adversity is conceptualised as resilience.⁶ Given the challenges Aboriginal communities face, identifying factors that help caregivers of Aboriginal children maintain positive functioning despite adversity can aid initiatives designed to enhance resilience.

While the importance of resilience as a framework for individual-level, family-level and community-level health is increasingly recognised,⁷ the various methods with which adversity and positive adaptation can be defined and measured pose conceptual challenges for quantitative research of resilience in this context.⁸ In Australia, most research in the area of resilience has been conducted using qualitative designs. These studies highlight the importance of family and community connectedness, social support, role modelling, autonomy and empowerment as factors that are believed to build resilience.^{9–12} To date, no studies have quantitatively investigated the resilience of caregivers of Aboriginal children, limiting our understanding of the impact individual-level, family-level and community-level factors may have on resilience, and the magnitude of potential effects.

This study aimed to measure the resilience of caregivers of Aboriginal children and to determine individual-level, family-level and community-level factors that are associated with resilience. The results may be used to better understand how resilience is fostered, where threats to caregivers' resilience exist, and to help inform strategies that can boost positive psychological health within Aboriginal families who are exposed to stressful events.

METHODS

Study of Environment on Aboriginal Resilience and Child Health

This study was conducted as part of the Study of Environment on Aboriginal Resilience and Child Health (SEARCH).¹³ SEARCH is the largest cohort study of urban Aboriginal children in Australia. It is built on community-identified research priorities and strong partnerships with four Aboriginal communities in urban and regional New South Wales (NSW). SEARCH aims to investigate factors that are related to the physical and mental health outcomes of Aboriginal children and their caregivers. Survey data were collected on a range of domains including: socioeconomic, health, family and community factors. Clinical measures were also taken. Where possible, the SEARCH survey was based on the NSW Health Survey¹⁴ and the Western Australian Aboriginal Child Health Survey (WAACHS)¹⁵ to facilitate comparability. SEARCH is described in further detail in the published protocol.¹³

Phase 1 SEARCH survey data were collected from over 1600 Aboriginal children and their caregivers from 2006 to 2012. Caregivers of Aboriginal children were approached by an Aboriginal research officer while attending one of four Aboriginal Community Controlled Health Services (ACCHSs) and invited to participate. Eligibility criteria included being 16 years or older and agreeing to participate in follow-up interviews during subsequent phases of data collection. The Aboriginal research officers collected caregivers' written informed consent to participate on behalf of themselves and their children; adolescents (aged 12–17

years) also provided consent to participate. Caregivers completed a survey that asked about themselves and their family and community environments. Caregivers also completed a survey for each of their children (aged 0–17 years). Adolescents completed a separate self-report survey.

Patient and public involvement

Identifying factors that contribute to resilience was identified as a research priority through extensive consultation with the ACCHSs that partner with SEARCH. The results of SEARCH studies are fed back to communities via an Aboriginal knowledge broker, presentations for ACCHS staff or at public events, or as advised by the ACCHSs. Study participants were not involved in the research design or recruitment.

Measures

Exposures

Putative risk and protective factors were drawn from the SEARCH carer-report survey items which measured individual-level, family-level and community-level variables. These included variables that captured demographic information, and information about socioeconomic status, history of forced removal or displacement, health, alcohol and gambling, housing, neighbourhood factors and involvement in social groups. Two questions were taken from the Strength and Difficulties questionnaire's impact supplement.¹⁶ These questions asked whether caregivers believed any child in their care has an emotional or behavioural problem, and, if so, how much burden this places on the family. Responses were: 'no burden', 'only a little burden', 'quite a lot of burden' and 'a great deal of burden'.

Stressful Life Events scale

The Stressful Life Events (SLEs) scale describes 14 stressful events that are likely to pose significant challenges to the participant, for example, 'A close family member was badly hurt, injured or sick.' The SLE scale was adapted from a similar scale used in the WAACHS¹⁷ and is available in online supplementary table 1. Among caregivers living in Western Australia, previous research has found that three or more SLEs within a 12-month period increased the risk of a number of psychological and social problems.¹⁸ Participating carers were asked whether they had experienced each of the 14 events. Participants could refuse to answer, or indicate that they were unsure if they had experienced a SLE. Based on the total number of SLEs experienced in the past 12 months, participants were divided into two groups, those who had experienced two or less SLEs (lower-stress group), and those who had experienced three or more SLEs (high-stress group). In this way, the number of SLEs was used as a proxy for adversity, which is necessary when defining resilience.¹⁹ Participants who could not be categorised due to missing or incomplete data were excluded from the analysis.

The Kessler 10 Psychological Distress Scale

The Kessler 10 Psychological Distress Scale (K10) is a widely used screening tool used to detect the frequency and severity of symptoms of anxiety and depression.²⁰ Scores range between 10 and 50, with higher scores indicating more distress. The K10 has demonstrated sound psychometric properties in Australian Aboriginal adults.²¹ We followed the Australian Bureau of Statistics' classification and classified scores of ≤ 21 as indicative of low/moderate psychological distress, scores ≥ 22 were indicative of high psychological distress.²²

Resilience status

Participants were divided into two groups, 'resilient' or 'less resilient' based on the number of SLEs experienced and their K10 score. 'Resilient' participants were defined as those in the high-stress group who scored ≤ 21 on the K10. 'Less resilient' participants were those in the high-stress group who scored ≥ 22 on the K10. Participants in the lower-stress group (ie, who experienced two or less SLEs) did not meet criteria for adversity and were therefore excluded from the initial analysis. However, the final analysis investigated statistical interactions between level of stress and variables found to be significantly associated with resilience. Therefore, all participants were included in this analysis, that is, participants from both the lower-stress and the high-stress groups.

Statistical methods

The number of SLEs and K10 scores were determined for each participant. The effect of SLEs on psychological distress was assessed using a two-sample t-test with stress group (lower vs high stress) as the independent variable and K10 scores as the outcome.

Independent variables were initially analysed in three separate categories representing individual, family and community levels. Age, gender and ACCHS location were included as covariates in all analysis. Variables were first entered into multivariate logistic regression models that tested for an association with resilience status. Variables significant at $p < 0.05$ were then entered into a second model that controlled for significant variables within the individual, family or community category. The final model consisted of one multivariable logistic regression that included all statistically significant variables from all categories. Only the second and third model are shown in the results. A list of all the variables and statistics from the first model is available online in supplementary table 2.

Interaction models

In addition to research that seeks to identify main effects, resilience research also investigates whether the effects of the factors associated with resilience differ in the presence of adversity, compared with lower-risk environments.²³ The purpose of such investigation is to understand whether factors have a protective or detrimental effect that is more pronounced in adverse environments when compared with less challenging circumstances.

These assessments are often made by examining statistical interactions between categorical levels of adversity, and those of an independent variable.¹⁹ In order to assess the presence of an interaction, a separate analysis that included all SEARCH caregivers was conducted (ie, from both stress categories). Independent variables that were significant in the final model of the previous analysis were entered into separate logistic regression models that included an interaction term between levels of adversity (lower-stress vs high-stress groups) and the categorical levels of the independent variable.

All analyses were performed with SAS V.9.4 software (SAS Institute), statistical significance was set at $p < 0.05$.

Aboriginal representation

This study has been conducted as part of SEARCH, and has therefore involved the Aboriginal community at all stages of its development. SEARCH began extensive consultations with five ACCHSs in 2004 in order to identify community research priorities. Resilience, and the risk and protective factors associated with it, was identified from the outset as a key research priority. Partner communities were heavily involved in drafting and approving the SEARCH questionnaires. Two authors on this paper are Aboriginal people and have contributed to the study design (KC) and interpretation of results (KC, SW). Partner ACCHSs own the data arising from SEARCH. The final draft of this manuscript was approved by the governing bodies of each partner ACCHSs and the Aboriginal Health and Medical Research Council of NSW.

RESULTS

Participant characteristics

Of the 627 caregivers who completed the SEARCH survey, 574 (92%) provided sufficient K10 and SLE data for resilience status to be determined. Most participants were female (522, 91%), Aboriginal or Torres Strait Islander (445, 78%) and aged 20–39 years (417, 73%). Overall, 113 (20%) participants reported high psychological distress, 25 (10%) in the lower-stress group and 88 (28%) in the high-stress group, [table 1](#).

Frequency, spectrum and correlations between SLEs

On average, caregivers reported 3.1 SLEs in the 12 months prior to completing the survey. [Figure 1](#) displays the proportion of participants experiencing each of the 14 SLEs. [Figure 2](#) displays the frequency distribution of the number of SLEs experienced by participants. The most commonly reported SLEs related to family members' health with 259 (45%) participants reporting that a close family member was in hospital with a serious medical problem (illness or accident), 231 participants (40%) reporting that a close family member was badly hurt, injured or sick and 197 (34%) participants reporting that an important family member has passed away.

[Table 2](#) shows correlations between each of the SLEs. Almost all of the correlation coefficients were

Table 1 Participant characteristics

Characteristic (n, %)	No of stressful life events			Total (n=574)
	0–2	Three or more		
	(n=259)	Resilient* (n=227)	Less Resilient (n=88)	
<i>Individual level</i>				
High psychological distress	25 (10)	0 (0)	88 (100)	113 (20)
<i>Age, years</i>				
16–19	7 (3)	6 (3)	1 (1)	14 (2)
20–29	103 (40)	73 (32)	33 (38)	209 (36)
30–39	87 (34)	90 (40)	31 (35)	208 (36)
40–49	41 (16)	30 (13)	20 (23)	91 (16)
50–59	18 (7)	23 (10)	3 (3)	44 (8)
60+	3 (1)	5 (2)	0 (0)	8 (1)
Female	236 (91)	204 (90)	82 (93)	522 (91)
Aboriginal or Torres Strait Islander	191 (74)	179 (79)	75 (85)	445 (78)
Employed or studying	90 (35)	84 (37)	21 (24)	195 (34)
Any tertiary qualification	116 (45)	103 (45)	46 (52)	265 (46)
Parent(s) removed from their natural family	22 (8)	26 (11)	22 (25)	70 (12)
<i>Forced to move from traditional country or homeland</i>				
Participant	2 (1)	3 (1)	4 (5)	9 (2)
Participant's parents	10 (4)	12 (5)	6 (7)	28 (5)
Chronic medical condition	61 (24)	83 (37)	51 (58)	195 (34)
<i>Limitation of normal daily activities due to</i>				
Health problem	22 (8)	34 (15)	35 (40)	91 (16)
<i>Family level</i>				
<i>Burden placed on family due to child(ren)'s behaviour</i>				
None	187 (72)	156 (69)	43 (49)	386 (67)
A Little	37 (14)	34 (15)	15 (17)	86 (15)
Quite a lot	25 (10)	24 (11)	14 (16)	63 (11)
A great deal	10 (4)	13 (6)	16 (18)	39 (7)
Alcohol problems in household	9 (3)	16 (7)	23 (26)	48 (8)
Gambling problems in household	1 (0)	15 (7)	12 (14)	28 (5)
Three or more housing problems	94 (36)	128 (56)	71 (81)	293 (51)
<i>Community level</i>				
Feeling of safety in the neighbourhood	203 (78)	160 (70)	45 (51)	408 (71)
Feeling of belonging in the neighbourhood	180 (69)	132 (58)	37 (42)	349 (61)
Feeling of helpfulness in the neighbourhood	144 (56)	95 (42)	27 (31)	266 (46)
Feeling of trust in the neighbourhood	137 (53)	88 (39)	26 (30)	251 (44)
Regular participation in sporting groups	98 (38)	80 (35)	18 (20)	196 (34)
Neighbourhood problems: gangs	86 (33)	109 (48)	55 (63)	250 (44)
Neighbourhood problems: assaults	60 (23)	79 (35)	46 (52)	185 (32)

*Resilience, as indicated by scores of ≤ 21 on the Kessler 10 Psychological Distress Scale.

positive with strengths ranging from negligible to medium. Health-related stressful events appeared to cluster together with the largest association between participants who had a family member who was hurt or sick, and those who had a family member in hospital

($r=0.72$, $p<0.001$). Drug and alcohol problems were associated with children who had been upset due to family arguments ($r=0.41$, $p<0.001$), and a family member who had been arrested or was in gaol ($r=0.39$, $p<0.001$).

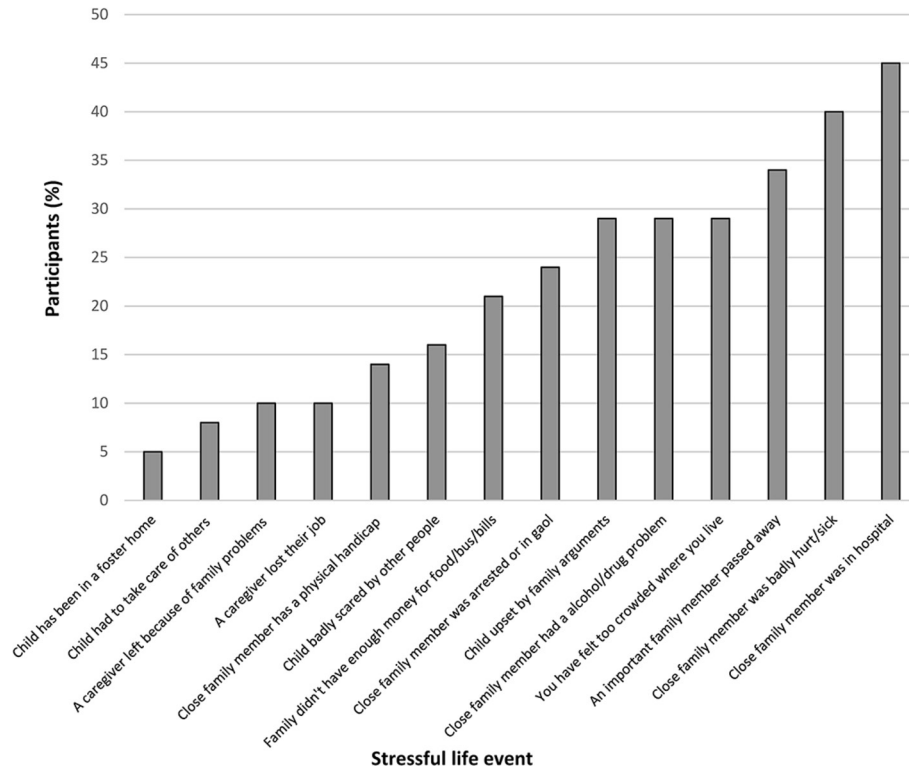


Figure 1 Proportion of participants experiencing each of the 14 stressful life events.

Resilience: frequency and predictors

Three hundred and fifteen (55%) participants reported that they had experienced three or more SLEs, of these, 227 (72%) met the criteria for resilience. The mean K10 score for caregivers in the lower-stress group and the high-stress group was 14.1 and 18.8, respectively (Cohen's $d=0.67$, $p<0.001$).

Individual-level variables

In the final model (adjusting for age, gender, ACCHS and all significant covariates) caregivers who were not functionally limited by health problems were significantly more likely to be resilient than those who were limited

(adjusted OR (aOR) 4.3; 95% CI 2.0 to 9.0). No other individual-level variables were significant (table 3).

Family-level variables

In the final model, caregivers who reported that overuse of alcohol did not cause problems in their household were significantly more likely to be resilient than those that did report such problems (aOR 5.3; 95% CI 2.2 to 12.8). Caregivers who reported they had a child or children whose behaviour placed a great deal of burden on the family (compared with caregivers who did not report a burden of this nature) were less likely to meet the criteria for resilience (aOR 0.25; 95% CI 0.09 to 0.68, respectively).

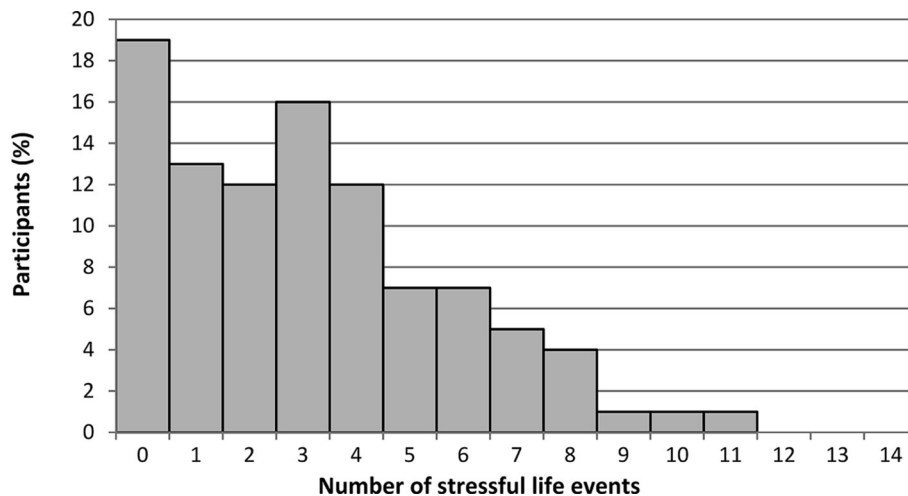


Figure 2 Frequency distribution of the number of stressful life events experienced in the past 12 months.

Table 2 Correlation between stressful life events

	Family member passed away	Family member was in hospital	Family member was badly hurt/sick	Family member has a physical handicap	Caregiver lost their job	Child has been in foster home	Caregiver lost their physical handicap job	Child had to take care of others	Child had to take care of others	Family did not have enough money for basics	Caregiver left because of family problems	Child had to take care of others	Child badly scarred by other people	Family member was arrested or in gaol	Family member had a alcohol/drug problem
Family member passed away	1.00														
Family member was in hospital	0.33	1.00													
Family member was badly hurt/sick	0.33	0.72	1.00												
Family member has a physical handicap	0.16	0.26	0.26	1.00											
Caregiver lost their job	0.01	0.06	0.10	0.05	1.00										
Child has been in a foster home	0.02	-0.03	-0.08	0.07	0.06	1.00									
Child had to take care of others	0.12	0.15	0.18	0.11	0.08	0.06	1.00								
Caregiver left because of family problems	-0.01	0.02	-0.01	0.08	0.06	0.08	0.06	1.00							
Not enough money for basics	0.13	0.19	0.20	0.21	0.14	0.05	0.21	0.12	1.00						
Felt too crowded where you live	0.05	0.22	0.17	0.11	0.12	0.03	0.23	0.06	0.20	1.00					
Child upset by family arguments	0.06	0.19	0.13	0.21	0.08	0.08	0.21	0.30	0.29	0.28	1.00				
Child badly scarred by other people	0.10	0.16	0.13	0.21	0.11	0.24	0.22	0.24	0.30	0.28	0.37	1.00			
Family member was arrested or in gaol	0.12	0.22	0.21	0.20	0.13	-0.02	0.09	0.06	0.17	0.13	0.22	0.16	1.00		
Family member had a alcohol/drug problem	0.08	0.22	0.17	0.24	0.17	0.07	0.17	0.22	0.23	0.16	0.41	0.24	0.39	1.00	

Correlation coefficients in bold are significant at p<0.05.

Table 3 Associations between resilience and individual-level variables in caregivers in the high-stress group (n=315)

Variable	Adjusted for age, sex, ACCHS and all significant individual-level variables		Adjusted for age, sex, ACCHS and all significant variables	
	aOR (95% CI)	P values	aOR (95% CI)	P values
Gender				
Female	Reference			
Male	1.9 (0.42 to 8.2)	0.42		
Employment status				
Employed/studying	Reference			
Unemployed/retired/unable to work	0.43 (0.13 to 1.4)	0.16		
Home duties	0.42 (0.17 to 1.0)	0.06		
Carer's parents or other relatives removed from their natural family				
No	Reference			
Either or both parents	0.46 (0.15 to 1.4)	0.17		
Other relatives	1.5 (0.51 to 4.2)	0.48		
Forced to move from traditional country or homeland				
No	Reference			
Yes, participant	0.26 (0.02 to 3.0)	0.28		
Yes, parents	0.54 (0.12 to 2.4)	0.42		
Yes, other relatives	0.93 (0.30 to 2.9)	0.90		
Chronic medical condition				
Yes	Reference			
No	2.0 (0.84 to 4.9)	0.12		
Limitation of normal daily activities due to health problem				
Yes	Reference		Reference	
No	3.6 (1.3 to 9.4)	0.011	4.3 (2.0 to 9.0)	<0.001

ACCHS, Aboriginal Community Controlled Health Service; aOR, adjusted OR.

Caregivers whose children's behaviour placed 'a little' or 'quite a lot' of burden on the family were not at significantly elevated risk of less resilience. Participants who reported three or more housing problems were significantly less likely to meet the criteria for resilience in the first two models, but this association was not significant ($p=0.07$) in the fully adjusted model (table 4).

Community-level variables

In the final model, no community-level variables retained significance. Caregivers who regularly participated in sporting groups were more likely to meet the criteria for resilience in the first two models, but this association was not significant ($p=0.07$) in the fully adjusted model (table 5).

Interaction models

The interaction models assessed whether the effect of significant factors identified through the previous analysis differed when measured in the two stress groups (lower vs high), hence these models used data from all caregivers.

None of the interaction terms were found to be significant (all p values >0.20). Figure 3 shows the mean K10 scores of participants grouped by levels of the factors associated with resilience and stress group. In each case, the effects of being in the high-stress group and the presence of alcohol problems, functional limitations or burdensome child behavioural problems appeared to have an additive effect on psychological distress.

DISCUSSION

To our knowledge, this is the first study in Australia to quantitatively explore the resilience profile of caregivers of urban Aboriginal children. Over half of the caregivers reported experiencing three or more SLEs in the past year. Of these, almost three-quarters met the criteria for resilience. Participants who were not limited by health problems or who lived in households where alcohol overuse did not cause problems had significantly higher odds of meeting criteria for resilience. Caregivers whose

Table 4 Associations between resilience and family-level variables in caregivers in the high-stress group (n=315)

Variable	Adjusted for age, sex, ACCHS and all significant family-level variables		Adjusted for age, sex, ACCHS and all significant variables	
	aOR (95% CI)	P values	aOR (95% CI)	P values
Burden placed on family due to child(ren)'s behaviour				
None	Reference		Reference	
A little	0.83 (0.38 to 1.8)	0.65	0.55 (0.23 to 1.3)	0.18
Quite a lot	0.45 (0.19 to 1.1)	0.07	0.50 (0.19 to 1.4)	0.17
A great deal	0.14 (0.05 to 0.36)	<0.001	0.25 (0.09 to 0.68)	<0.001
Overuse of alcohol cause problems in the household				
Yes	Reference		Reference	
No	4.7 (2.1 to 10.6)	<0.001	5.3 (2.2 to 12.8)	<0.001
Betting or gambling causes problems in the household				
Yes	Reference			
No	1.2 (0.45 to 3.3)	0.70		
Housing problems				
None	Reference		Reference	
1–2	0.56 (0.16 to 2.0)	0.38	0.72 (0.18 to 2.9)	0.64
3+	0.22 (0.07 to 0.69)	<0.01	0.31 (0.09 to 1.1)	0.07

ACCHS, Aboriginal Community Controlled Health Service; aOR, adjusted OR.

children's behaviour placed a great deal of burden on their family had significantly lower odds of meeting criteria for resilience. No interaction was detected between stress and each of the factors associated with resilience, with mean K10 scores increasing additively in the presence of three or more stressful events.

On average, caregivers reported experiencing a slightly lower number of SLEs over 12 months than primary caregivers in the WAACHS (means: 3.1 and 3.9, respectively).¹⁵ In comparison, caregivers of non-Aboriginal children have reported a much lower number of SLEs, an average 1.2 SLEs during the previous year.¹⁷ The three most frequently reported SLEs in this study corresponded to those reported in the WAACHS study, though proportionally fewer participants in our study (between 11% and 16% less) experienced each event. These events related to the poor health of family members, reflect well-documented disparities between Aboriginal and non-Aboriginal health outcomes.²⁴ Between one-quarter and one-third of participants reported that they felt too crowded where they lived, that a close family member had a drug or alcohol problem, and that their children had been involved in or upset by family arguments. SLEs were seen to aggregate, with the presence of one event often being associated with one or more other stressful events, however, most correlations were not strong. Aligning with results from the WAACHS, health-related stressful events appeared to cluster together. Similarly, other associations between substance use and incarceration, and between having children who were badly

scared and having children who were upset by family arguments were also observed.¹⁵ Despite the high incidence of SLEs among carers of Aboriginal children, this study highlights their ability to cope with stress and maintain positive psychological functioning during times of adversity. Given the many adversities Aboriginal families are known to face, including those not measured by SEARCH, it is likely that many caregivers of Aboriginal children are extremely resilient.

The three factors associated with resilience indicate that caregivers of urban Aboriginal children who experience good health and who live in stable home environments are more likely to be resilient in the presence of other stressors. The lack of a significant interaction suggests that these factors are associated with improved mental health in the presence of few or many stressful events. While proportionally few of the participants reported children whose behaviour placed a great deal of burden on the family (7%), or experienced problems in their household caused by alcohol overuse (8%), a greater number of participants reported being functionally limited due to health problems (16%). This result aligns with research that has shown that the prevalence of serious physical limitations is higher in Aboriginal than non-Aboriginal Australians.²⁵ This is concerning given previous evidence that links these factors to poor mental health,^{1 26} and the results of this study that highlight the compounding risk of psychological distress when vulnerability factors and SLEs co-occur.

Table 5 Associations between resilience and community-level variables in caregivers in the high-stress group (n=315)

Variable	Adjusted for age, sex, ACCHS and all significant community-level variables		Adjusted for age, sex, ACCHS and all significant variables	
	aOR (95% CI)	P values	aOR (95% CI)	P values
I feel safe in this neighbourhood				
Disagree	Reference			
Neutral	1.7 (0.51 to 5.6)	0.39		
Agree	1.6 (0.53 to 4.7)	0.42		
I belong in this neighbourhood				
Disagree	Reference			
Neutral	1.2 (0.40 to 3.6)	0.76		
Agree	2.6 (0.78 to 8.7)	0.12		
People in this neighbourhood are very willing to help others				
Disagree	Reference			
Neutral	0.78 (0.29 to 2.1)	0.63		
Agree	0.92 (0.27 to 3.1)	0.89		
I trust most of the people in my neighbourhood				
Disagree	Reference			
Neutral	1.4 (0.44 to 4.6)	0.56		
Agree	0.56 (0.16 to 1.9)	0.35		
Participated in sporting groups (last 12 months)				
Occasionally or never	Reference			
Monthly or more	3.2 (1.4 to 7.1)	<0.01	2.6 (0.95 to 4.1)	0.07
Neighbourhood problems: gangs				
Problem	Reference			
No problem	1.5 (0.57 to 3.9)	0.42		
Neighbourhood problems: assaults				
Problem	Reference			
No problem	1.6 (0.57 to 4.8)	0.36		

ACCHS, Aboriginal Community Controlled Health Service; aOR, adjusted OR.

The results suggest that participation in sporting groups and living in homes with few problems is associated with resilience, though these factors may covary with other predictors. While not statistically significant in the fully adjusted model, the influence of these factors on mental health has been identified in previous research with Aboriginal people.^{27–29} Providing more opportunities for social support through sporting and other community groups, and addressing housing problems, including overcrowding, is a potentially beneficial strategy to reducing psychological distress among caregivers who are under stress.

Given the associations found in this study, it is plausible that poor physical health contributes to psychological distress both directly, through functionally limiting health problems, and indirectly, through the stress of living with or looking after a sick family member. Addressing health

issues within Aboriginal communities remains a difficult and long-standing challenge for Australia governments. A legacy of discrimination and cultural marginalisation has resulted in unequal living conditions for Aboriginal people,³⁰ including socioeconomic disparities that are believed to account for between one-third and one-half of the health gap between Aboriginal and non-Aboriginal Australians.³¹ This inequality is reflected in the disproportionate number of SLEs that caregivers of Aboriginal children experience. Given our findings, initiatives that seek to improve physical health or minimise the impact of functional limitations (such as occupational therapy services), reduce problem drinking and provide caregivers with resources to assist in caring for children experiencing emotional or behavioural problems may improve carer resilience. However, as health disparities experienced by Aboriginal families are known to be rooted

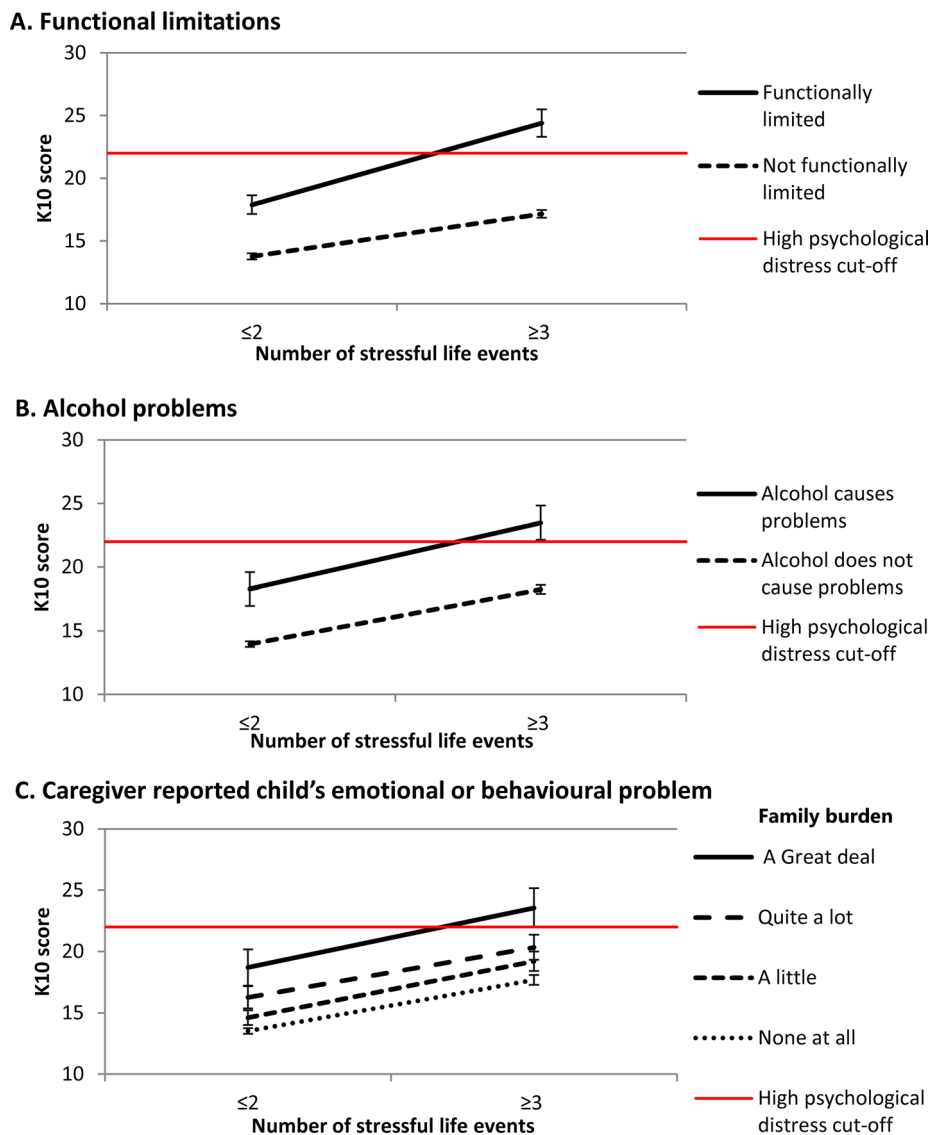


Figure 3 Mean K10 scores by stressful life events and: function limitations, alcohol problems and family burden due to children's behaviour. K10 scores range from 10 to 50, scores ≥ 22 are indicative of high psychological distress. Error bars represent 1 SE. K10, Kessler 10 Psychological Distress Scale.

in socioeconomic disparities, it is likely that while these persist, so too will disparities in health.^{31 32} Addressing the social determinants of health for Aboriginal people must remain a key priority if real progress is to be made in closing the health gap.³³

A challenge facing health professionals who work with Aboriginal communities is identifying and providing support for families who experience heightened stress, health or alcohol problems, given they are also likely to face significant barriers that can prevent seeking and accessing services.³⁴ Initiatives that can address these barriers by being low cost, culturally safe and by providing personalised support for families (e.g. by offering free transportation), have a greater chance of success.³⁵ General practitioners and ACCHS health staff should be aware that caregivers presenting with functional limitations are facing additional challenges to resilience and may need extra support.

Limitations

While SEARCH measured a wide range of variables that align with resilience theory including individual-level, family-level and community-level factors—personality traits and individual abilities were not assessed by the survey. Given that individual traits such as optimism, self-esteem and having an internal locus of control have been identified in the literature as being robust predictors of resilience,^{19 36 37} this limits the interpretation of our results. However, as survey items were determined by the ACCHS the results of this study are directly relevant to the concerns and priorities voiced by the communities that are partners in SEARCH. Due to the range of variables that can be used to measure positive adaptation and adversity it is possible to define resilience using contrasting methodologies, and thus derive different results based on the criteria employed. Using the SLEs scale as a measure of adversity may have

introduced error as the list of events was not exhaustive and some participants may have experienced stressful events that were not included. Furthermore, stressful events concerning the health of family members may refer to the same incident, potentially leading to some events being counted more than once. This scale has been used before in a large-scale study with Aboriginal people¹⁷ and was therefore unaltered for comparative purposes. We note that other, non-mental health measures could be used to measure positive adaptation. Given concerns regarding the prevalence of poor mental health in Aboriginal communities³⁸ and that the K10 has been validated with Aboriginal populations,²¹ we believe that the K10 is appropriate for measuring resilience in this setting. This study is cross-sectional and therefore associations may not infer causality. For example, it is plausible that a bidirectional relationship exists between parent's psychological distress and children's emotional or behavioural problems. Study participants were recruited from four partner urban/regional ACCHS and most of the participants were female (91%), therefore, the results may not be representative of the broader population of caregivers of Aboriginal children. However, results drawn from internal (within-study) comparisons have been found to remain generalisable to study populations, despite the presence of a relatively distinct sample.³⁹

CONCLUSION

Our findings indicate that caregivers of urban Aboriginal children experience a greater number of stressful events than Australian parents in general, however, most are resilient. Providing easily accessible services for caregivers who experience health and social problems may provide some gains in resilience. However, real improvements in health are likely to result from sustainable strategies that address the broader social inequalities between Aboriginal and non-Aboriginal people.

Author affiliations

¹Sydney School of Public Health, The University of Sydney, Sydney, New South Wales, Australia

²Centre for Kidney Research, The Children's Hospital, Westmead, New South Wales, Australia

³Australian Health Services Research Institute, The University of Wollongong, Wollongong, New South Wales, Australia

⁴Tharawal Aboriginal Corporation, Sydney, New South Wales, Australia

⁵The Sax Institute, Haymarket, New South Wales, Australia

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REFERENCES

- Zubrick SR, Dudgeon P, Gee G, *et al.* Social determinants of Aboriginal and Torres Strait Islander social and emotional wellbeing. In: Nola P, Pat D, Roz W, eds. *Working together: Aboriginal and Torres Strait Islander mental health and wellbeing principles and practice*. Canberra, A. C. T: Commonwealth of Australia, 2010:75–90.
- Anderson I, Baum F, Bentley M, eds. *Beyond Band-aids: Exploring the Underlying Social Determinants of Aboriginal Health. Papers from the Social Determinants of Aboriginal Health Workshop, Adelaide, July 2004*. Casuarina, N.T: Cooperative Research Centre for Aboriginal Health, 2007.
- Williamson AB, D'Este CA, Clapham KF, *et al.* Psychological distress in carers of Aboriginal children in urban New South Wales: findings from SEARCH (phase one). *Med J Aust* 2016;205:27–32.
- Silburn SR, Blair E, Griffin JA, *et al.* Developmental and environmental factors supporting the health and well-being of Aboriginal adolescents. *Int J Adolesc Med Health* 2007;19:345–54.
- Hopkins KD, Taylor CL, Zubrick SR. The differential influence of contextual risks on psychosocial functioning and participation of Australian Aboriginal youth. *Am J Orthopsychiatry* 2013;83:459–71.
- Aburn G, Gott M, Hoare K. What is resilience? An integrative review of the empirical literature. *J Adv Nurs* 2016;72:980–1000.
- Lisa E, Schipper F, Langston L. *A comparative overview of resilience measurement frameworks. Working Paper 422*. London, United Kingdom: Overseas Development Institute, 2015.
- Luthar SS. Annotation: methodological and conceptual issues in research on childhood resilience. *J Child Psychol Psychiatry* 1993;34:441–53.
- McLennan V. *Family and community resilience in an Australian Indigenous community*. Australian Indigenous Health Bulletin. 2015;15.
- Bond C, Brough M, Spurling G, *et al.* 'It had to be my choice' Indigenous smoking cessation and negotiations of risk, resistance and resilience. *Health Risk Soc* 2012;14:565–81.
- Gale F, Bolzan N. Social resilience: challenging neo-colonial thinking and practices around 'risk'. *J Youth Stud* 2013;16:257–71.
- Young C, Tong A, Nixon J, *et al.* Perspectives on childhood resilience among the Aboriginal community: an interview study. *Aust N Z J Public Health* 2017;41:405–10.
- Study of Environment on Aboriginal Resilience and Child Health Investigators. The Study of Environment on Aboriginal Resilience and Child Health (SEARCH): study protocol. *BMC Public Health* 2010;10:287.
- Centre for Epidemiology and Research. *2005–2006 Report on Child Health from the New South Wales Population Health Survey*. Sydney: NSW Department of Health, 2008.
- Zubrick SR, Silburn SR, Lawrence D, *et al.* *The Western Australian Aboriginal Child Health Survey: the social and emotional wellbeing of Aboriginal children and young people*. Perth: Curtin University of Technology and Telethon Institute for Child Health Research, 2005.
- Goodman R. The extended version of the Strengths and Difficulties Questionnaire as a guide to child psychiatric caseness and consequent burden. *J Child Psychol Psychiatry* 1999;40:791–9.
- Silburn SR, Zubrick SR, De Maio JA, *et al.* *The Western Australian Aboriginal Child Health Survey: Strengthening the Capacity of Aboriginal Children, Families and Communities*. Perth: Curtin

- University of Technology and Telethon Institute for Child Health Research, 2006.
18. Zubrick SR, Silburn SR, Garton AF, *et al.* *Western Australian child health survey: family and community health*: Australian Bureau of Statistics, 1996.
 19. Rutter M. Psychosocial resilience and protective mechanisms. *Am J Orthopsychiatry* 1987;57:316–31.
 20. Kessler RC, Andrews G, Colpe LJ, *et al.* Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychol Med* 2002;32:959–76.
 21. McNamara BJ, Banks E, Gubhaju L, *et al.* Measuring psychological distress in older Aboriginal and Torres Strait Islanders Australians: a comparison of the K-10 and K-5. *Aust N Z J Public Health* 2014;38:567–73.
 22. Australian Bureau of Statistics. Use of the Kessler Psychological Distress Scale in ABS health surveys. 2017. <http://www.abs.gov.au/ausstats/abs@.nsf/mf/4817.0.55.001>
 23. Luthar SS, Cicchetti D, Becker B. The construct of resilience: a critical evaluation and guidelines for future work. *Child Dev* 2000;71:543–62.
 24. Australian Indigenous HealthInfoNet. Summary of Aboriginal and Torres Strait Islander health. 2016. <http://www.healthinonet.edu.au/health-facts/summary>
 25. Gubhaju L, Banks E, MacNiven R, *et al.* Physical functional limitations among Aboriginal and non-Aboriginal older adults: associations with socio-demographic factors and health. *PLoS One* 2015;10:e0139364.
 26. Byles JE, Robinson I, Banks E, *et al.* Psychological distress and comorbid physical conditions: disease or disability? *Depress Anxiety* 2014;31:524–32.
 27. Andersen MJ, Williamson AB, Fernando P, *et al.* “There’s a housing crisis going on in Sydney for Aboriginal people”: focus group accounts of housing and perceived associations with health. *BMC Public Health* 2016;16:429.
 28. Peralta LR, Cinelli RL. An evaluation of an Australian Aboriginal controlled-community organization’s remote sports-based programme: a qualitative investigation. *Sport Soc* 2016;19:973–89.
 29. Ware V. Housing strategies that improve Indigenous health outcomes: Australian Institute of Health and Welfare. 2013.
 30. Raphael B, Swan P, Martinek N. *Intergenerational aspects of trauma for Australian Aboriginal people*. Springer: International handbook of multigenerational legacies of trauma. 1998:327–39.
 31. Booth AL, Carroll N. The health status of Indigenous and non-Indigenous Australians. *IZA Discussion Paper* 2005.
 32. Marmot M. *The status syndrome: how your social standing affects your health and life expectancy*. London: Bloomsbury, 2004.
 33. Calma T, Dick D. A human rights based approach. Workshop paper presented by Mr Darren Dick on behalf of Mr Tom Calma, Aboriginal and Torres Strait Islander Social Justice Commissioner. 2007
 34. Aspin C, Brown N, Jowsey T, *et al.* Strategic approaches to enhanced health service delivery for Aboriginal and Torres Strait Islander people with chronic illness: a qualitative study. *BMC Health Serv Res* 2012;12:143.
 35. Young C, Tong A, Gunasekera H, *et al.* Health professional and community perspectives on reducing barriers to accessing specialist health care in metropolitan Aboriginal communities: a semi-structured interview study. *J Paediatr Child Health* 2017;53:277–82.
 36. Finn JD, Rock DA. Academic success among students at risk for school failure. *J Appl Psychol* 1997;82:221–34.
 37. Luthar SS, Zigler E. Vulnerability and competence: a review of research on resilience in childhood. *Am J Orthopsychiatry* 1991;61:6–22.
 38. Jorm AF, Bourchier SJ, Cvetkovski S, *et al.* Mental health of Indigenous Australians: a review of findings from community surveys. *Med J Aust* 2012;196:118–21.
 39. Mealing NM, Banks E, Jorm LR, *et al.* Investigation of relative risk estimates from studies of the same population with contrasting response rates and designs. *BMC Med Res Methodol* 2010;10:26.