

# The role of Aboriginal community attachment in promoting lifestyle changes after hepatitis C diagnosis

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## Abstract

This research assessed whether greater attachment to an Aboriginal community buffers against the negative effects of stigma and promotes positive health outcomes. Aboriginal Australians ( $n = 203$ ) living with hepatitis C completed a survey assessing community attachment, stigma, resilience, quality of life, treatment intent, hepatitis C knowledge and positive lifestyle changes. A stronger sense of community attachment was associated with greater resilience, increased quality of life, less hepatitis C–related stigma and with increased lifestyle changes after diagnosis. Hence, community attachment can buffer against the negative health effects of stigma and may promote the resources to engage in positive behaviour changes, ultimately increasing long-term health outcomes.

## Keywords

Aboriginal Australian, hepatitis C, community attachment, stigma, health outcomes

## Introduction

Hepatitis C (HCV) is a significant public health problem, affecting more than 123 million people globally (Global Burden of Disease Working Group, 2004). In Australia, a country of approximately 22 million, it is now estimated that 310,000 people have been exposed to HCV and over 200,000 people are living with chronic HCV (Kirby Institute, 2013). The primary route of transmission of HCV in the developed world is through sharing of equipment used to inject drugs (Razali et al., 2007). The Australian Aboriginal and Torres Strait Islander (hereafter Aboriginal Australians) population, which comprises 3 per cent of Australia's population, is overrepresented in both the prevalence of HCV and incidence of newly reported HCV infections (Maher et al., 2007). It was estimated in 2008 that around 16,000 Aboriginal Australians were chronically infected with HCV, representing around 8.3 per cent of the total Australian population living with chronic HCV at the time. More recent research has indicated that the prevalence of HCV among Aboriginal Australians may be much higher than previously estimated. As of 2011, the rate of newly diagnosed HCV in the Aboriginal population was

142 per 100,000 compared to 40 per 100,000 among the non-Aboriginal population (Kirby Institute, 2012).

As a group, Aboriginal Australians face a number of disadvantages on a range of health and socio-economic outcomes which may place them at risk of acquiring HCV. On a global scale, Aboriginal people have poorer health than non-Aboriginal people, which is associated with poverty, malnutrition, and infection and is exacerbated by inadequate healthcare and health promotion (Gracey and King, 2009). Often disadvantages faced by Aboriginal Australians are a result of unequal access to the same opportunities as non-Aboriginal Australians, such as access to education, employment, and healthcare. Additionally, many of these disadvantages are compounded for Aboriginal Australians living in rural and remote areas of the country (Hunter, 2007). Health and social

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issues faced by Aboriginal Australians include poverty, homelessness, and mental illness, which may all be linked to the higher prevalence of HCV among Aboriginal compared with non-Aboriginal Australians. A further issue to consider is the cumulative toll and intergenerational effects of trauma related to the colonisation of Australia by White settlers. Research in Canada has found a direct link between incidence of HCV infection and having at least one parent attend a residential school (Craib et al., 2009). For Australian Aboriginal communities, the forced removal of children from families (The Stolen Generation), the dispossession of lands and repression of cultural practices, protocol and language, and other racist governmental policies can be read in parallel to the Canadian experience and as contributing to ongoing, trans-generational trauma (Atkinson, 2002).

The numerous hardships which Aboriginal people have and continue to experience has also led to an overrepresentation of Indigenous people within priority populations identified by the Australian national HCV strategy (Australian Government Department of Health and Ageing, 2010), people who inject drugs (PWID) and people in custodial settings. Although the prevalence of injecting drug use specifically among Aboriginal Australians is not well known (Australian Institute of Health and Welfare, 2006; Kratzmann et al., 2011), available research suggests that it is high (Day et al., 2003; Iversen et al., 2013). For example, between 2008 and 2012, the proportion of Aboriginal Australians who participated in the Australian Needle and Syringe Program Survey, which annually recruits over 2000 participants, ranged from 11 to 12 per cent (Iversen et al., 2013). The Pharmacy Needle and Syringe Survey conducted in New South Wales reported an even higher proportion of Aboriginal participants, with 15–20 per cent of the sample identifying as Aboriginal in the surveys conducted between 2006 and 2008 (Bryant et al., 2010). Additionally, 16 per cent of the participants recruited nationally in the 2012 Illicit Drugs Reporting System who reported injecting drugs identified as Aboriginal (Stafford and Burns, 2013).

Research has shown that Aboriginal status is associated with an earlier onset of injecting drug use and increased likelihood of sharing injecting equipment, placing Aboriginal Australians at a greater risk of acquiring blood borne virus such as HCV (Correll et al., 2000; Paquette et al., 2012; Ward et al., 2011). It may be that the increased likelihood of sharing unsterile injecting equipment among Aboriginal groups could be linked to cultural practices, such as shared use of possessions with kin (Correll et al., 2000; Larson et al., 1999). As reciprocity may be an important cultural value, Aboriginal people may consequently feel obliged to share equipment with close relations (Van der Sterren and Anderson, 2002). Research also indicates that Aboriginal Australians may be less knowledgeable about blood-borne virus transmission than the general community, due to limited access to health education especially for Aboriginal people residing in rural and remote areas (Paquette et al., 2012).

While there is a treatment for HCV, uptake remains globally low (Grebely et al., 2009; Iversen et al., 2013). Research indicates that 3000–4000 people living with HCV receive treatment annually in Australia (Grebely et al., 2009). These numbers are small because of the numerous deterrents to HCV treatment, which include side effects, the rigorous nature of treatment, and the impact of treatment on work and family (Doab et al., 2005; McNally et al., 2006; Wilson et al., 2010). Additionally, people with HCV may face competing health and social concerns that impede their access to care and treatment, including poverty (Edlin et al., 2005; McNally et al., 2006), unemployment, lack of stable housing (Edlin et al., 2005; Grebely et al., 2008) and comorbidity such as mental health problems (Weiss et al., 2012). Given the social and economic disadvantages experienced by Aboriginal Australians, these barriers could be exacerbated (Hunter, 2007). Additionally, individuals may not be psychologically ready to engage with the relatively arduous nature of HCV treatment; hence, adopting positive lifestyle changes such as reducing alcohol consumption, reducing illicit drug use, increasing medical visits and increasing exercise have been found to be important for the management of chronic HCV (Hickman et al., 2002; Sladden et al., 1998). In a recent study of people living with HCV who attended a community HCV clinic in New Zealand, Horwitz et al. (2012) found over 70 per cent of respondents made lifestyle changes to better manage their illness and therefore were more capable of coping with the long-term consequences of their infection. Preventing progression of HCV is particularly important in the Aboriginal community, where the life expectancy is lower than the general national average and where lack of preventative care and excessive alcohol consumption are common, further exacerbating liver damage (Battersby et al., 2008; Pink and Allbon, 2008).

As with many minority groups of Indigenous status, being of Aboriginal descent may carry a particular stigma in Australia. Goffman (1963) defines stigma as a trait or characteristic that is deeply disreputable to an individual or a group of people. Stigmatised people are labelled as different and structures are put in place to protect the majority from the discrediting attribute (Crocker et al., 1998). Parker and Aggleton (2003) further explain stigma as a means to reinforce social power. This is accomplished by marking and establishing social inequalities through the use of boundaries or 'norms', such as ethnicity, gender, sexuality and socio-economic status (Scrambler, 2006; Simbayi et al., 2007). Feelings of stigmatisation are likely to be compounded for Aboriginal people who have a history of injecting drug use and are living with HCV because they may experience multiple or layered stigma (Henkel et al., 2008; Rao et al., 2008).

Stigma becomes discrimination when thoughts, beliefs or attitudes evolve into direct action against the stigmatised group (Giddens, 2009). A large body of research has shown

that stigma has a negative effect on the health and well-being of those who are stigmatised. Feelings of stigmatisation have been linked to poor mental health, poverty, low social status, physical illness, low self-esteem and academic underachievement (Allison, 1998; Clarke et al., 1999; Crocker and Major, 1989; Link and Phelan, 2006; Major and O'Brien, 2005). Furthermore, experiencing stigma or discrimination has been shown to adversely affect the health-seeking behaviours of people living with a stigmatised condition such as HCV (Ahern et al., 2007; Butt, 2008; Pascoe and Smart Richman, 2009). However, stigmatised individuals have also been found to function as well as people who are not stigmatised, despite experiencing stigma and discrimination (Miller and Kaiser, 2001). Thus, the consequences of belonging to a stigmatised group are not always negative. Miller and Kaiser (2001) suggest that stress associated with stigma will only be detrimental if the individual does not have the resources to cope with that stress. One factor that can buffer or protect individuals from the negative effects of stigma is a strong sense of minority group belonging or community attachment (Branscombe et al., 1999; Phinney, 1996; Sellers et al., 2003; Sellers and Shelton, 2003). Yet aside from research noted above which focuses on African American racial identity and community attachment, little empirical research has assessed the impact of attachment to a minority group for other stigmatised groups. This study helps address this gap by establishing the role of Aboriginal community attachment in determining health outcomes associated with HCV for Aboriginal people who are HCV positive. We hypothesise that greater attachment to participants' Aboriginal community will serve a protective function for people who are living with HCV. Specifically, those with stronger attachment to their Aboriginal community will show greater psychological resilience, will be less affected by stigma and discrimination based on their Aboriginal or HCV status and will report a better quality of life. We further predict that individuals with stronger community attachment will be better able to cope with their illness, enabling them to make important positive lifestyle changes to better manage their health.

## Methods

### *Sample and recruitment*

The main recruitment strategy was the distribution of recruitment postcards in a range of health service across New South Wales known to either specifically target Aboriginal people (e.g. Aboriginal Community Controlled Health Services) or mainstream services that attract a large number of Aboriginal clients (e.g. needle and syringe programmes or liver clinics in areas where there many Aboriginal people live), at community health events and through community contacts. Recruitment postcards were

designed to look similar to advertising postcards often found in cafes, libraries and movie theatres. The cards did not mention injecting drug use or HCV, but rather asked if people had problems with their liver. A toll free number was included to allow individuals to contact the Aboriginal Liaison Officer, free of charge, to receive further information about the study and, if eligible, book a suitable time to complete the telephone survey. Services displayed postcards in the waiting room where there were other health promotional pamphlets and booklets. Other recruitment strategies included placing a one-page advertisement in a community publication for injecting drug users and one-page poster in a newsletter for drug and alcohol workers. To participate in the research, individuals had to be over 18 years old, identify as Aboriginal or Torres Strait Islander and report currently living with HCV, undertaking treatment or recently clearing the virus naturally or through treatment.

### *Procedure*

Potential participants called the toll-free number and spoke with the Aboriginal Liaison Officer. The Aboriginal Liaison Officer informed participants about the study aims, assessed their eligibility and assured them of the confidentiality of the survey. Informed consent was obtained from participants by them verbally agreeing to complete the survey. The survey was conducted telephonically and participants were offered the opportunity to be surveyed by either an Aboriginal or non-Aboriginal researcher. Participants' responses were entered into a computer software programme. The survey took on average 30–40 minutes to complete. The research team also visited some mainstream and Aboriginal services to complete surveys with clients in person. These surveys were administered in hard copy by an interviewer to ensure uniformity in survey administration. Hard copies of the survey were then entered into the computer manually. Survey participants were reimbursed AUD30. The study was approved by the Human Research Ethics Committees of the Aboriginal Health and Medical Research Council, UNSW Australia and relevant health authorities.

### *Measures*

The broader survey examined participants' quality of care in relation to HCV, engagement with HCV-related services, management of HCV and choices around HCV treatment. The survey also investigated knowledge of HCV, contact with HCV health promotion, quality of life, resilience and experiences of stigma and discrimination. A number of pre-existing measures were used to examine these focal areas, some of which have previously been used in research with Aboriginal people. Pre-testing was undertaken to identify problems with question content, misinterpretation of individual terms or concepts and problems with the survey design. Items used specifically for this analysis are outlined below.

**Aboriginal community attachment.** A measure of attachment to an Aboriginal community was developed based on three items assessing how much the respondent felt they belonged to their Aboriginal community, how much they felt they had in common with their Aboriginal community and how much they interacted with their Aboriginal community. These items were similar to those used in Brener et al. (2013) assessing the group-based attachment of people living with HIV. Responses were scored on 4-point scale from 'not much' to 'a lot', with higher scores indicative of a greater sense of Aboriginal community attachment. The items were summed to create an Aboriginal community attachment scale ( $\alpha = .86$ ).

**Stigma measures.** A modified version of the Group-Based Medical Mistrust Scale (Thompson et al., 2004) was used to investigate racially based stigma and discrimination in healthcare. This scale consisted of 12 items and the face validity of the items was assessed by the research team which included three Aboriginal researchers. Additionally, the term 'Aboriginal' was substituted for the term 'people of my ethnic group' (e.g. 'I feel that Aboriginal people are not treated the same as people of other groups by doctors and healthcare workers'). Items were scored on a 5-point scale from 'very dissatisfied' to 'very satisfied', where higher scores reflected greater perceived cultural stigma and discrimination ( $\alpha = .92$ ).

Perceived hepatitis C stigma was measured using an 18-item scale based on previous scales used to measure stigma perceived to be associated with HIV (e.g. 'Most people believe I am dirty because I have hepatitis C'; Brener and Von Hippel, 2008). Items were scored on a 5-point scale from 'strongly disagree' to 'strongly agree' with higher scores indicative of greater experiences of perceived HCV-related stigma ( $\alpha = .92$ ).

Perceived HCV-related discrimination and exclusion in the healthcare sector was examined using items modified from previous research (Brener et al., 2013). The scale consisted of eight items assessing participants' experience with healthcare workers in relation to their HCV (e.g. 'they are careful not to touch me'). Items were scored on a 5-point scale from 'not at all' to 'an extreme amount' ( $\alpha = .89$ ), with higher scores indicating greater perceived discrimination from health workers in relation to HCV.

**HCV knowledge.** As individuals living with HCV need to have knowledge about their illness in order to understand the benefits of making positive lifestyle changes, it was important to assess participants' HCV knowledge. Participants responded to 16 items regarding the natural history, transmission, testing and treatment of HCV. Items were either multiple-choice or true/false questions. Participants' correct responses were summed together to create a knowledge score that ranged from 0 to 16, where a higher score represented greater HCV knowledge.

**Quality of life.** To establish participant feelings about the quality of their life, they were asked a single-item question, 'How would you rate your quality of life' and answered on a 5-point scale from very poor to very good.

**Resilience.** Psychological resilience was measured using the 10-item Connor–Davidson Resilience Scale (e.g. 'I believe coping with stress strengthens me'; Connor and Davidson, 2003). Items were scored from 'not true at all' to 'true nearly all of the time' with higher scores indicative of greater resilience ( $\alpha = .92$ ).

**Treatment intent.** Treatment intentions were measured by asking participants whether they were planning to go on HCV treatment in the future. Participants chose from one of four response categories including, in the next 12 months, in the next 1–2 years, not for at least 2 years and that they never intended to undergo treatment. Higher scores on this item indicated that participants were less inclined to show intent to go on treatment in the near future, with the highest score of 4 indicating no treatment intent.

**Health lifestyle changes as a result of HCV diagnosis.** Participants were asked whether they had made particular lifestyle changes as a result of finding out that they were HCV positive (Horwitz et al., 2012). The list consisted of six behavioural changes all important in the management of HCV (i.e. changed your diet, reduced or cut out alcohol, increased exercise, had more regular HCV check-ups, reduced or cut out illicit drug use, accessed information about HCV care and treatment). Responses to these items were 1 'yes' and 0 'no'. The items were summed together to form a behaviour change scale, whereby a higher score represented greater behavioural change.

**Demographics.** Participants were asked a range of demographic questions including whether they were of Aboriginal or Torres Strait Islander background, where their community was from, age, gender, living arrangements, education, employment, history of incarceration and sexuality.

### Sample demographics

A total of 203 respondents who self-reported currently living with HCV, undertaking treatment or recently clearing the virus naturally or through treatment participated in this study. Just over half of the sample was male with one participant identifying as transgender (Table 1). The majority of the sample identified as Aboriginal, seven participants stated they were of both Aboriginal and Torres Strait Islander background. The mean age of the sample was 28 years (standard deviation (SD)=9.6 years). Of the total sample, 88 per cent were receiving government financials or assistance and just over 80 per cent of the sample had ever been in prison. See Table 1 for additional demographics.

**Table 1.** Demographics.

	<i>n</i> (%)
Gender	
Male	117 (57.6)
Female	84 (41.4)
Transgender	1 (.5)
Cultural identity	
Aboriginal	195 (96.1)
Torres strait islander	0 (.0)
Both Aboriginal and Torres Strait Islander	7 (3.4)
Age (years) ( <i>M</i> ( <i>SD</i> ))	38.1 (9.6)
Education	
≤Year 10	176 (86.6)
>Year 10	26 (12.7)
Employment	
Full/part time	18 (8.8)
Centrelink/government financial assistance	179 (88.2)
Other	6 (3.0)
Ever been in prison	163 (80.3)

SD: standard deviation.

**Table 2.** Means, SDs and inter-quartile range of scales.

Scales	<i>N</i>	<i>M</i>	<i>SD</i>	Range (IQR)	$\alpha$
Aboriginal community attachment scale	201	8.69	2.90	9 (3–12)	.86
Lifestyle changes	203	3.03	1.72	6 (2–4)	NA
Resilience	199	2.72	.96	3.6 (2–3.6)	.92
Group-based medical mistrust	199	3.23	.85	4 (2.58–3.83)	.92
Perceived HCV stigma	196	3.14	.92	4 (2.44–3.78)	.92
HCV-related discrimination and exclusion	194	.55	.73	3.38 (0–.78)	.89
Quality of life	203	3.55	1.04	4 (3–4)	NA
HCV knowledge	202	11.4	2.5	15 (10–13)	NA

SD: standard deviation; IQR: interquartile range; HCV: hepatitis C.

## Results

The means, standard deviation, inter-quartile range and Cronbach's alpha of all scaled items are reported in Table 2. Pearson's product moment correlation was used to determine whether an association existed between Aboriginal group belonging and HCV knowledge, group-based Medical mistrust, perceived HCV stigma, perceived HCV-related discrimination and exclusion, quality of life, resilience, HCV-related behavioural lifestyle changes and HCV treatment intentions. As can be seen in Table 3, Aboriginal community attachment was associated with a range of outcome variables. Those who perceived themselves as being more attached to their Aboriginal community reported less perceived HCV stigma and less perceived HCV-related discrimination and exclusion from healthcare workers. Furthermore, they showed greater resilience and reported greater quality of life. Greater attachment to an Aboriginal

community was also associated with increased lifestyle changes after their HCV diagnosis. On the other hand, HCV knowledge, HCV treatment intentions, age, education and gender were not associated with attachment to an Aboriginal community.

Correlational analysis was also used to establish factors associated with healthy lifestyle changes as a result of HCV diagnosis. Significant variables included HCV knowledge, HCV treatment intent, gender, education and as previously mentioned Aboriginal community attachment. Hence, having greater HCV knowledge, showing more intent to go onto HCV treatment in the future, being female, completing more education and reporting greater identification with an Aboriginal group was associated with greater lifestyle changes after HCV diagnosis. Lifestyle changes following HCV diagnosis were not associated with the three stigma items nor with resilience, quality of life or age.

Table 3. Inter-correlations between variables.

	Aboriginal community attachment	Life style changes	Resilience	Group-based medical mistrust	Perceived HCV stigma	HCV-related discrimination and exclusion	Quality of Life	HCV Knowledge	Treatment intention <sup>a</sup>	Gender <sup>a</sup>	Age	Education <sup>a</sup>
Aboriginal community attachment	1											
Lifestyle changes	.17*	1										
Resilience	.23***	.13	1									
Group-based medical mistrust	-.02	-.12	-.02	1								
Perceived HCV stigma	.17*	.07	-.28***	.16*	1							
HCV-related discrimination and exclusion	-.18**	.03	-.06	.12	.37***	1						
Quality of life	.21**	.09	.25***	-.03	-.18**	-.14	1					
HCV knowledge	.02	.29***	.08	-.15*	.07	.08	-.06	1				
Treatment intention <sup>a</sup>	.06	-.26***	.01	.01	-.08	-.12	.09	-.08	1			
Gender <sup>a</sup>	.11	.24***	.03	-.12	-.20**	-.06	-.07	.08	.05	1		
Age	.71	.07	.24***	.05	-.21**	-.02	.06	.16*	.06	.07	1	
Education <sup>a</sup>	-.13	.18*	.08	.04	-.03	-.01	.14*	.14*	-.02	-.03	.16*	1

HCV: hepatitis C.

<sup>a</sup>Spearman's rho correlation analysis.\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

**Table 4.** Multiple regression: predictors of lifestyle changes related to HCV.

	B	SE B	$\beta$	CI
<b>Step 1</b>				
Constant	1.339	.52		
Gender	.72	.25	.22**	.23–1.21
Education	.22	.12	.14	.04–.41
<b>Step 2</b>				
Constant	.46	.81		
Gender	.60	.25	.18**	.14–1.06
Education	.22	.12	.13	.02–.40
Aboriginal community attachment	.09	.04	.15*	.01–.17
Treatment intention	-.37	.11	-.26***	-.59–-.16
HCV knowledge	.11	.05	.16*	.11–.20

HCV: hepatitis C.

$R^2 = .06$  for Step 1,  $\Delta R^2 = .17$  for Step 2 ( $p < .05$ ).

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

To assess whether Aboriginal community attachment remained an independent predictor of adopting healthier lifestyle changes following an HCV diagnosis, a hierarchical linear regression was conducted. Specifically, the outcome variable, lifestyle changes following HCV diagnosis, was regressed on the predictor variables which were significantly associated with lifestyle changes in the univariate analysis (i.e. Aboriginal community attachment, HCV knowledge and HCV treatment intentions). As can be seen in the regression analysis (Table 4), after controlling for gender and education, showing future intent to go on HCV treatment and having greater HCV knowledge both predict greater lifestyle changes. Significantly, feelings of attachment to an Aboriginal community remained independently associated with healthier lifestyle changes related to HCV over and above HCV knowledge and HCV treatment intent.

## Discussion

The results of this study highlight the importance of Aboriginal community attachment as related to positive health outcomes among this sample of Aboriginal people living with HCV. As the data illustrate, those who report a stronger sense of attachment to an Aboriginal community also report a greater sense of resilience, increased quality of life and less stigma associated with both HCV and within the healthcare sector generally. A strong sense of group identity may possibly act as a buffer against the negative health consequences of being part of a group that is racially discriminated against and who also live with a stigmatised illness through positive associations with that racial or ethnic minority group (Branscombe et al., 1999; Phinney, 1996; Sellers et al., 2003; Sellers and Shelton, 2003). Indeed, Sellers and Shelton (2003) argue, it is not just group belonging but the meaning ascribed to that group that shapes how people are able to respond and can provide a

positive frame of reference for stigmatised individuals. Having a strong belief in the cultural values and ideologies of a minority group can therefore lead to positive associations with this group (Sellers and Shelton, 2003) and may provide the resources which enable the individual to both cope with stress associated with a chronic illness and make positive changes in their lifestyle to better their health (Miller and Kaiser, 2001). This possibility is further evidenced in the increase in reported resilience associated with greater Aboriginal community attachment among this sample, and personal resilience is well known to increase the ability to cope with an illness (Edward and Warelow, 2005; Farber et al., 2000; Kralik et al., 2006).

The most significant finding in relation to Aboriginal community attachment is the association with the important reported outcome of engaging in behaviours which increase healthier lifestyles after HCV diagnosis. Having the motivation to change behaviours in order to ensure a healthier lifestyle especially in relation to HCV (i.e. decreased alcohol consumption and decreased illicit drug use), as well increasing exercise and visits to the doctor, are particularly important in reducing the progression of HCV (Hickman et al., 2002; Sladden et al., 1998). In fact, within this sample, 83 per cent had not had HCV treatment. Therefore, establishing factors that increase positive changes in health behaviours in order to reduce the impact of this disease may reach a larger proportion of those affected with HCV than treatment – especially given structural constraints around HCV treatment such as long waiting lists and other deterrents like treatment side effects (Doab et al., 2005; McNally and Latham, 2009). Additionally, the association between increased lifestyle changes and treatment intentions may also suggest that those who make significant lifestyle changes have the resources and the motivation to take on HCV treatment in the future.

Literature on the impact of stigma and discrimination on health and well-being of stigmatised minority groups tends to focus on negative outcomes, particularly that stigma contributes to and exacerbates the effects of an illness (Scrambler, 2006). While this research is not suggesting that Aboriginal people with HCV do not feel stigmatised in relation to both their Aboriginal status and their HCV positive status, what it may show is that being part of a cohesive cultural/ethnic group and identifying strongly with that group may have positive health outcomes as evidenced in the increase of healthy behaviours among those who are more strongly attached to their Aboriginal community. Hence, the findings from this research appear to indicate that not only does community attachment buffer the individual from negative health consequences as can be seen in recent HIV research (Brener et al., 2013) but may actually promote the means or the motivation to engage in positive behaviour changes including less alcohol and illicit drug use, which will ultimately result in better long-term health outcomes for people living with HCV.

The study has some limitations which must be noted. While it is the largest known sample of Aboriginal people living with HCV, it is a convenience sample and the incorporation of sufficient numbers of participants from rural and remote Aboriginal communities in the state was difficult to achieve. Additionally, the results described are largely based on associations between the key outcome variables of Aboriginal community attachment and/or healthy lifestyle changes and the other predictor variables. However, the findings in this study of the significance of Aboriginal community attachment and the importance that it may have on health outcomes associated with HCV clearly indicates the need for further research in this area.

Despite the noted limitations, the findings of this study have some important implications for designing HCV health promotion interventions for Aboriginal Australians and for other Indigenous groups. The evidence of the importance of Aboriginal group belonging in promoting the health lifestyle changes suggest that health intervention strategies around HCV should focus on strategies to acknowledge, build and reinforce community attachment. A sense of community belonging is an important source of positive identification for many marginalised groups as is shown in this study. Within this framework, an understanding of the difficulties and trauma which Aboriginal people have been exposed to and the link to risk practices associated with HCV (Craib et al., 2009) should be highlighted along with the resilience which these communities have shown in maintaining their community attachments (Atkinson, 2002). Hence, HCV-integrated care and treatment models that incorporate important aspects of belonging and attachment for Aboriginal community members in this instance could be developed which include a partnership between HCV services and Aboriginal community-controlled health services, peer support or patient navigator

programmes and healthy liver programmes (including HCV testing and assessments). These should be based in Aboriginal community settings or in mainstream services that promote engagement of the target community and specifically foreground or make apparent the centrality of Aboriginal culture in service delivery. Such models are likely to be effective for many Indigenous communities in promoting best health outcomes especially in the case of a stigmatised illness such as HCV.

### Declaration of conflicting interests

The authors declare that they have no competing interests.

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