

# “Io, Keimami Leqataka Vakalevu Na Vei Gauna Mai Muri” (“We are Worried About the Future Generation”): Experiences of Eco-Grief in Rural Indigenous Fijians

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Global Environmental Psychology, 2023, Vol. 1, Article e11447, <https://doi.org/10.5964/gep.11447>

**Received:** 2023-02-26 • **Accepted:** 2023-08-22 • **Published (VoR):** 2023-11-06

**Handling Editor:** Charles Ogunbode, University of Nottingham, Nottingham, United Kingdom

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**Related:** This article is part of the GEP Special Topic "Living with Environmental Change", Guest Editors: Charles Ogunbode & Susan Clayton, *Global Environmental Change* (2023), Vol. 1. <https://doi.org/10.5964/gep.v1>

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## Abstract

The impacts of climate change are particularly strong in Pacific Small Island Developing States. However, empirical data on mental health and well-being in the context of climate change and climate anxiety in the region remains limited. The aim of this research was to understand the emotional experiences of climate change and its impact on well-being in rural Fiji. Seventy-one Indigenous and traditional Fijian adults from seven rural villages were interviewed. Data were analyzed using an inductive latent thematic analysis. Evident was the experience of ecological grief among Indigenous and traditional Fijians. In particular, grief experiences were related to losses of species and resources, which impacted ways of life and led to the loss of culture, traditions, and customs. Anticipatory grief was also evident, relating to the loss of lifestyle for future generations, and the loss of traditional and ancestral homes through potential migration. Results provide new data from the Global South and contribute to the limited exploration of mental health in relation to climate change in the Pacific region. The results highlight the experience of ecological grief among Pacific Islanders, and underscore the significance of culture loss due to climate change and anticipatory grief.



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## Keywords

climate change, culture, South Pacific, ecological grief, solastalgia, eco-anxiety, distress

### Non-Technical Summary

#### Background

Investigations into the psychological experiences of climate change and environmental degradation have been ongoing for nearly 20 years, beginning with the concept of “solastalgia” and more recently conceptualized as ecological grief, or “eco-grief.” Both of these ideas have been developed as a way to describe the sadness and grief people can experience as a result of witnessing places that are important to them for personal and/or cultural reasons deteriorating.

#### Why was this study done?

Cunsolo and colleagues have published a number of papers investigating eco-grief and similar experiences in Indigenous groups living in the Circumpolar North, with findings suggesting significant feelings of grief and sadness associated with loss of access to culturally meaningful places and practices. However, less is known about the possible experiences of eco-grief in Indigenous peoples of the Global South, including in the Pacific Small Island Developing States (PSIDS), despite recognition that this region is especially vulnerable to the effects of climate change. We conducted this study to explore whether rural Indigenous Fijians had observed changes in their environment and, if so, how they were feeling about these changes.

#### What did the researchers do and find?

We interviewed 71 rural Indigenous and other traditional Fijians living in one of seven coastal, coastal hinterland, and river delta villages on the islands of Viti Levu and Ovalau. Interviews were conducted in the local language via an interpreter. The interviews were translated and transcribed in English, and were then analyzed using a common analytic technique that identifies patterns across the interview data. All interviewees reported having observed significant changes in weather patterns and their local environments (e.g., sea level rise), which they considered unusual and concerning. These changes, which included losses of species and resources, reduced their ability to rely on subsistence farming and contributed to significant concern about their ability to continue performing traditional cultural practices. Furthermore, worry about anticipated future losses was evident, with specific concerns related to the well-being and quality of life of future generations and potential loss of traditional lands if needing to relocate. Though migration was discussed in all villages, it was clearly an undesirable outcome, and would likely cause feelings of considerable loss and sadness.

### What do these findings mean?

To our knowledge, this is the first in-depth assessment of experiences of eco-grief in Indigenous peoples of the Global South, providing another unique perspective to the growing body of literature supporting the challenges Indigenous peoples are facing around the world with respect to climate change. Though ecological grief is not a clinical diagnosis, its experience may contribute to the development of mental ill-health in PSIDS populations, particularly as losses continue to accumulate with advancing climate change. Clinical interventions and support that are delivered in a culturally responsive and acceptable manner are urgently needed.

### Highlights

- Significant changes in the environment have been observed by all rural Fijians irrespective of whether they lived in coastal, coastal hinterland, or river delta regions.
- These changes contributed to both immediate worries related to loss of species, ways of life and, consequently, meaningful cultural practices, as well as feelings of anticipatory loss related to concern for future generations and potential migration.
- In a number of ways, the experiences of eco-grief in rural Indigenous Fijians are similar to those found in the Circumpolar North, providing a new perspective from the Global South and underscoring the critical importance of culture loss in the experience of eco-grief.

Climate change represents a growing crisis for human health (IPCC, 2022), and the predicted effects on mental health are similarly dire (Doherty & Clayton, 2011). Emerging empirical data provide support for these predictions, with recent reviews highlighting the strong relationships among extreme weather events, high temperatures, and mental ill-health and suicidality (Cianconi et al., 2020; Lawrance et al., 2021). Debate continues over whether eco-anxiety/climate change anxiety (see Clayton, 2020) and related cognitive-emotional experiences should be independently diagnosable psychopathologies in the major clinical taxonomies (Sampaio & Sequeria, 2022), though research revealing strong connections between eco-anxiety and psychological disorders is growing (see Cosh et al., manuscript submitted for publication). Irrespective of where this debate lands in the future, sub-clinical expressions of climate change-related distress (e.g., eco-anxiety and, more recently, eco-grief) can clearly impact on mental health and well-being, and thus are worthy of continued clinical and research attention.

Early efforts in conceptualizing and documenting grief reactions associated with climate change and environmental degradation come from Albrecht and colleagues' work with the Indigenous populations and farmers of Australia. They coined the term "solastalgia" to capture the experience of witnessing a valued landscape being transformed into something unrecognizable, resulting in sadness, distress, and the loss of one's sense of

identity and place (Albrecht et al., 2007). Implicit in this response is a strong sense of attachment to a particular place or places, emphasizing the intense connection people experiencing solastalgia feel to these familiar and cherished environments.

More recent investigations into this kind of loss, and the grief experienced because of it, have extended the concept of solastalgia by incorporating *anticipated losses* into the overall concept of ecological grief (Cunsolo & Ellis, 2018). Eco-grief is thus understood as a grief response either to experienced or anticipated losses of the natural environment (Cunsolo & Ellis, 2018). Considered to be a type of disenfranchised grief (i.e., grief that is not publicly or openly acknowledged; Doka, 1999), eco-grief can result from the existing or anticipated loss of species, ecosystems, and meaningful lands and landscapes due to environmental change (Cunsolo & Ellis, 2018). Pihkala's (2022) taxonomy of climate emotions places eco-grief within the sadness-related eco-emotions, often associated with feelings of despair, fear, helplessness, suicidal ideation, and a loss of sense of place and identity (Bourque & Cunsolo Willox, 2014). Notably, given the anticipatory nature of these feelings as related to anxiety about future events, there is conceptual and experiential cross-over between eco-grief and Pihkala's threat-related emotions comprising fear, worry, and milder forms of anxiety and helplessness, and one might expect a range of these kinds of emotions when a valued place or way of life is threatened (Ojala et al., 2021; Soutar & Wand, 2022). The accelerating nature of climate change suggests these losses will be profound, widespread, and irreversible as the 21st century progresses.

Of particular interest to those investigating eco-grief has been the identification of at-risk groups, likely to be those who have close living and working relationships with the natural world and/or identities related to their lands and landscapes (Cunsolo & Ellis, 2018; Cunsolo et al., 2020). Support for these predictions comes from climate scientists working at the Great Barrier Reef (Conroy, 2019), and Australian farmers affected by drought and environmental degradation, who have reported increased worries about weather, disrupted notions of self-identity, and increased place-based distress (Ellis & Albrecht, 2017).

Perhaps no groups have received as much attention and concern related to eco-grief as the world's Indigenous populations. Identified as uniquely at risk for climate change-related eco-grief (Clayton, 2020; Crandon et al., 2022; Lawrance et al., 2021), Indigenous peoples face a range of challenges associated with climate change. Firstly, climate change directly threatens the integrity of land itself, so those engaged in subsistence lifestyles face physical health and financial challenges related to food production and nutrition (Vecchio et al., 2022); further, sea level rise threatening coastal areas may ultimately make lands uninhabitable, thus forcing migration (Crandon et al., 2022; Cunsolo Willox et al., 2015). Secondly, at the individual level, the strong place-based attachment evident in many Indigenous peoples may act as a unique vulnerability factor when traditional lands and landscapes are threatened by climate change, potentially resulting in negative mental health consequences (Adger et al., 2013; Crandon et al., 2022; Cunsolo Willox

et al., 2015; Lebel et al., 2022). Finally, the inability to engage in traditional cultural practices, either due to degraded landscapes that no longer support these activities or because people have been forced to migrate, also threatens cultural continuity and identity at the community level (Crandon et al., 2022; Cunsolo Willox et al., 2015), which has been associated with grief and loss (Adger et al., 2013). Thus, the potential psychosocial consequences of climate change for Indigenous peoples are profound and deserving of urgent research and culturally responsive clinical attention.

## Climate Change and Psychosocial Well-Being in the Pacific Islands

Due to the nature of its geography (Watts et al., 2018), the forecast for climate change impacts in the Pacific Small Island Developing States (PSIDS) is quite alarming. Sea level rise is already up to four times greater than the global average in parts of the western Pacific (Hayward et al., 2020) and, with at least half of the population living within 1.5 kilometers of the coast (Oxfam, 2009), few people in the region will remain unaffected. Serious concerns have been raised about PSIDS populations' health both now and moving into the future (Watts et al., 2018). There are also concerns for the long-term habitability of some islands and the sustainability of the diverse and unique cultures existing on them (e.g., Clissold et al., 2022; Foley et al., 2022), with rural locations and relatively low and remote islands having been identified as at particularly high risk (Kelman et al., 2021). Questions around social and environmental justice have been raised in consideration of the miniscule amount of greenhouse gas emissions the PSIDS have contributed to global totals, given the disproportionately significant impacts they are predicted to face (Tukuitonga & Vivili, 2021).

The peoples of the PSIDS also have other significant vulnerabilities to the psychosocial effects of climate change. Place-based attachment and identification in PSIDS peoples is traditionally very strong (Adger et al., 2013; Nunn & Kumar, 2018; Nunn et al., 2020; Pam & Henry, 2012). As noted by Tiatia-Seath et al. (2020), beyond even feelings of belonging to a particular place, many Indigenous PSIDS peoples view themselves as *embodying* a particular place—they are their lands, and their lands are them. Furthermore, subsistence living practices require a relatively predictable environment for the growing and gathering of food; when this environmental stability is disrupted and food and water security are threatened, mental health and well-being are often impacted (Middleton et al., 2020; Vecchio et al., 2022). The potential severing of the deep ties and connection to these lands through relocation or migration, particularly that which is involuntary (Farbotko & McMichael, 2019; Shultz et al., 2019), portends the possibility of distress through the loss of identity, the ability to engage in meaningful cultural practices, and loss of connection to ancestors and ancestral lands.

Investigation into the psychosocial effects of climate change in the PSIDS is in its early stages. With physical consequences of climate change being reported from around the region (Gibson et al., 2020; Leal Filho, 2020), published research has revealed a

variety of current impacts, as well as notable concerns for the future. Fear, worry, and distress have been reported by inhabitants of Solomon Islands (Asugeni et al., 2015), Fiji (Scott-Parker & Kumar, 2018), and Tuvalu (Gibson et al., 2020). Sadness and distress have been reported for tangible losses such as homes and the ability to grow food (Gibson et al., 2020), as well as more intangible losses such as culture, valued places, and place-based knowledge (Pam & Henry, 2012; Tiatia-Seath et al., 2020). Some research has attempted to tease apart whether these experiences would reach thresholds for diagnosable psychiatric disorders by correlating cultural idioms with Western understandings of perceived uncontrollability of worry and behavioral impairment (Gibson, Haslam, & Kaplan, 2019; Gibson, Barnett, Haslam, & Kaplan, 2020). Others have criticized the application of Western conceptualizations of mental illness and health to non-Western PSIDS peoples (Tiatia et al., 2023). What is clear is that, regardless of any labels used, distress is common and mental health and well-being are imperiled. With 86% of University of South Pacific students surveyed reporting climate change to be a “huge” future problem for Pacific peoples, and 99% of them agreeing that it would affect them and their future (Nunn et al., 2016), it is clear that more research on the psychosocial impacts of climate change in this region is urgently needed.

## The Current Study

Given calls for more empirical data on mental health and well-being in the context of climate change in the PSIDS (Leal Filho et al., 2023; Kelman et al., 2021), the current study aimed to investigate the experience of environmental changes in Fiji. Fiji is a relatively mountainous archipelagic nation comprised of over 330 islands. The average elevation is 662 meters above sea level, which contrasts with the low-lying atoll nations where much of the research on mental health and well-being in the PSIDS has been conducted. Fiji has been rated as “highly vulnerable” to climate change by Nunn et al. (2016) on the Environmental Vulnerability Index (Kaly et al., 2004). Crucially, some of Fiji’s islands and coastal communities are already facing rising sea levels that are impacting the safety and security of these locations, and several dozen traditional Fijian villages and communities have been identified for possible relocation (Hino et al., 2017; McMichael et al., 2019). As well, climate change adaptation efforts are actively underway in the region (Lykins et al., *in press*). The major aim of this research was to understand the experiences of traditional Fijian communities with respect to climate change, and how this related to mental health and well-being.

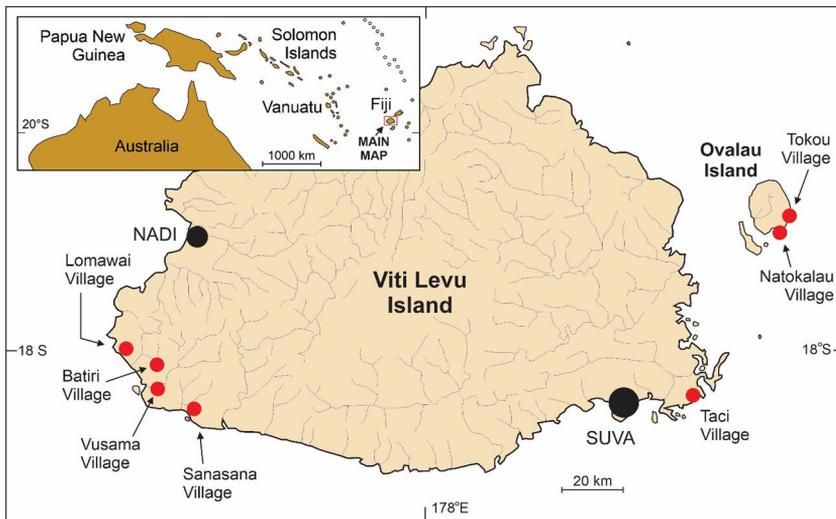
## Method

### Participants

Fijians residing in a range of rural villages took part in the study. Village selection was guided by a combination of the aims of the research and the research team's pre-existing relationships with these communities, without which we would not have been granted access. To obtain a broad range of experiences and perspectives, the research team visited five villages on the main island of Viti Levu and two villages on Ovalau, a smaller island off the eastern coast of Viti Levu (see Figure 1). Four villages were located on the coast (Lomawai, Natokalau, Sanasana, Tokou), two villages were located in the coastal hinterland (Batiri, Vusama), and one was located in the Rewa river delta region (Taci). Interviews were conducted over a period of 10 days.

**Figure 1**

*Map of Fiji*



Inclusion criteria required that participants be 18 years of age or older, and to have been living in the local village at the time of the interview. Across 14 interviews, 71 Indigenous and other traditional Fijian adults across the seven villages were interviewed ( $M_{\text{age}} = 49.15$ ,  $SD = 16.15$ , range = 22 to 82): 33 women ( $M_{\text{age}} = 45.00$ ,  $SD = 16.57$ ) and 38 men ( $M_{\text{age}} = 52.03$ ,  $SD = 14.95$ ). Age data were not provided by eight women and two men; no other demographic data were collected (see Table 1 for more details). Most residents of the villages visited were engaged in subsistence livelihood activities in much the same way as their ancestors have been for hundreds of years (e.g., their use of

traditional lands and ocean areas, their deployment of traditional practices, and their understanding—through oral traditions—of their geographical and historical contexts) (see Nunn, 2007).

**Table 1**

*Demographic Information for Target Regions, Villages, and Interviewees*

Survey Category	Description
<b>Western Division, Nadroga/Navosa province: Villages of Batiri, Lomawai, Sanasana, and Vusama</b>	
<b>Educational level</b>	Most residents left school in Year 5.
<b>Employment status</b>	On average, fewer than 10% of adult residents are in wage employment (part- or full-time), though Sanasana has around 25% employment due to nearby hotel.
<b>Food and water supply</b>	Food obtained locally (subsistence economy), water typically obtained from rainwater roof-catchment systems and wells (though Sanasana has piped water).
<u>Batiri</u>	
Population	136 people (75 male, 61 female; 48% in 25 – 64 age range).
Interviewees	a) Interview 1: 6 men (age range 55 – 78, $M = 62.00$ , $SD = 9.19$ ). b) Interview 2: 4 women (age range 29 – 67, $M = 44.00$ , $SD = 17.47$ ).
<u>Lomawai</u>	
Population	220 people (105 male, 115 female; 51% in 25 – 64 age range).
Interviewees	a) Interview 1: 6 men (age range 45 – 72, $M = 56.33$ , $SD = 9.37$ ). b) Interview 2: 3 women (age range 50 – 70, $M = 59.00$ , $SD = 10.15$ ).
<u>Sanasana</u>	
Population	463 people (239 male, 224 female; 43% in 25 – 64 age range).
Interviewees	a) Interview 1: 2 men, aged 43 and 56. b) Interview 2: 1 woman, aged 76
<u>Vusama</u>	
Population	208 people (117 male, 91 female; 39% in 25 – 64 age range).
Interviewees	a) Interview 1: 1 man, aged 65. b) Interview 2: 8 women, ages unavailable. c) Interview 3: 6 men (age range 42 – 82, $M = 64.60$ , $SD = 18.06$ ), 8 women (age range 28 – 68, $M = 37.63$ , $SD = 12.86$ ).
<b>Central Division, Rewa province: Village of Taci</b>	
<b>Educational level</b>	Most residents left school in Year 7.
<b>Employment status</b>	On average, fewer than 5% of adult residents are in wage employment (part- or full-time).
<b>Food and water supply</b>	Food is obtained locally (subsistence economy), water typically obtained from rainwater roof-catchment systems and wells.

Survey Category	Description
<u>Taci</u>	
Population	126 people (56 male, 70 female; 37% in 25 – 64 age range).
Interviewees	a) Interview 1: 7 men (age range 37 – 57, $M = 48.43$ , $SD = 12.15$ ). b) Interview 2: 5 women (age range 45 – 74, $M = 55.60$ , $SD = 11.72$ ).
<b>Eastern Division, Lomaiviti province: Villages of Natokalau and Tokou</b>	
<b>Educational level</b>	Most residents left school in Year 7.
<b>Employment status</b>	On average, fewer than 15% of adult residents are in wage employment (part- or full-time); this is slightly higher than many other villages on Ovalau due to the proximity of the fish factory in Levuka.
<b>Food and water supply</b>	Food is obtained locally (subsistence economy), water typically obtained from rainwater roof-catchment systems and wells.
<u>Natokalau</u>	
Population	378 people (192 male, 186 female; 42% in 25 – 64 age range).
Interviewees	a) Interview 1: 1 man, aged 49; 2 women, aged 27 and 48. b) Interview 2: 8 men (age range 23 – 40, $M = 32.14$ , $SD = 6.36$ ), 2 women aged 20 and 22.
<u>Tokou</u>	
Population	426 people (232 male, 194 female; 42% in 25 – 64 age range).
Interviewee	Interview: 1 man, aged 63.

*Note:* Descriptive data for villages and regions obtained from *2017 Fiji Population & Housing Census* (Fiji Bureau of Statistics, 2018).

## Procedure

Following admittance into the village, the research team met with the local chief and/or headman to explain the purpose of our visit. In most cases, we were then taken into the local village meeting hall. As per village protocols, we partook in a traditional *yaqona* (kava) ceremony with village leaders and any interested local community members, and were thus officially welcomed into the village (for more detail on the research team's culturally responsive research practice, see Lykins et al., 2023). Via the interpreter, the research team then introduced themselves to the villagers and explained the purpose of our visit. We reviewed the *Information Sheet for Participants* and welcomed questions. Once all questions were answered, interested community members were invited to sign the consent form. They were reminded that participation was entirely voluntary, that any quoting would be done in an anonymized manner, and that they were welcome to leave at any time without needing to provide a reason. No incentives were offered for participation.

Interviews were conducted in the local language and mainly in groups, with the exception of several one-on-one interviews with community members of particular

prominence (e.g., village chief or headman). The interpreter led the interviews, but also provided opportunities for the rest of the research team to ask follow-up questions based on the translated responses from the villagers. Group interviews were conducted in either mixed- or single-sex groups depending on the preferences of the community members. Most interviews lasted approximately one hour. Once data collection was completed, recordings of the interviews were translated and transcribed by an Indigenous Fijian research affiliate who is fluent in both English and Indigenous Fijian (iTaukei) languages. A second Indigenous Fijian research affiliate provided transcriptions of the quotes used in the Bauan Fijian language (see Table 2).

**Table 2**

*Quotes Outlining Observed Changes Due to Climate Change.*

Quote in English	Quote in Bauan Fijian	Village	Speaker
<b>Observed changes in weather and oceans</b>			
Now it is like we are having the hot season throughout. Now we are experiencing the abnormal changes in the weather like never before.	na gauna qo (segai) sa katakata tu ga. Qo na veiveisau ni drake.	Batiri	male
Before the water level was low, now it is high.	Sa toso sara tikoga mai na uwa levu.	Lomawai	male
sea grapes have died and the sea weeds are gone, they can't be found again.	Na lumi e mate na nama sa yali saraga.	Vusama	male
now there are hardly any kavika [type of fruits]	ia qo sa sega soti ni levu na kavika.	Batiri	male
<b>Distress regarding changes due to climate change</b>			
We are disappointed and frustrated about the current climate change we are experiencing. We are not happy about it.	Keimami rarawataka ka sega ni taleitaka na veiveisau ni draki koya sa lako tiko qo.	Vusama	female
When I'm sleeping and listening to the sound of the waves, it makes me frightened.	au rogoca ni sa vatugu tu na ua, au sa sega ni rawa ni moce, au sa yadra saraga.	Natokalau	female
Sea level is not where it used to be since it is moving into the village especially when it is high tides. We are really worried and concerned.	Levu na vanua e sega ni curuma na uwa levu sa luvu tiko qo.	Lomawai	male
We are really worried and concerned about the rise in sea level.	Sa veisau tiko nai yalayala ni wai.	Tokou	male
Gone are the good old days	Na veigauna sa oti, e gauna vinaka.	Sanasana	male

## Interview

The interview was designed in a semi-structured format. Questions were developed collaboratively across the research team (i.e., authors and the locally-based Indigenous Fijian interpreter) based on members' respective areas of expertise in mental health and climate change, as well as specific knowledge and cultural sensitivities to members of traditional rural Fijian communities. The same interview schedule was used for all interviews (see Lykins et al., 2023). The interview schedule began with general introductory questions about the local village and proceeded to cover a broad range of topics, including observed environmental changes, adaptation efforts undertaken and challenges associated with these activities (findings reported in Lykins et al., in press), and the emotional experiences of villagers in relation to these changes.

## Data Analysis

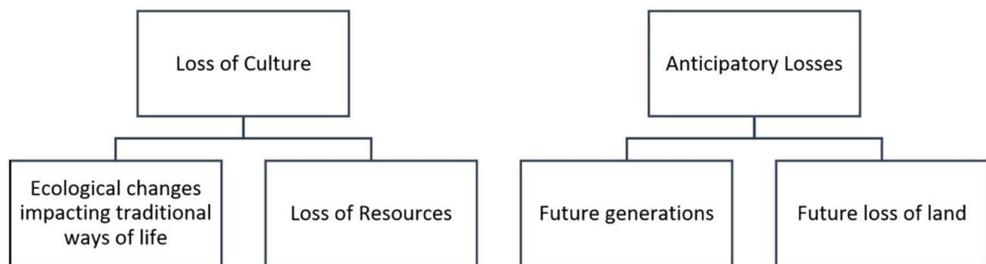
Data were analyzed using an exploratory inductive reflexive thematic analysis at the latent level from a critical realist epistemology (Braun & Clarke, 2013), thus analysis aimed to understand meanings with consideration of broader social influences (see Lykins et al., 2023 for further methodological details provided in COREQ checklist responses; Tong et al., 2007). The focus of analysis was on how the villagers described and made sense of their experiences of climate change and its impacts. Specifically, we were interested to understand how rural community members were feeling about the environmental changes they had observed, what their concerns were for their local villages and livelihoods, and how they felt they would cope if environmental changes attributable to climate change (e.g., unpredictable weather for planting crops, sea level rise) worsened over time. Initially, a semantic level coding was conducted across the dataset, with codes generated and then reviewed by a second coder. The initial codes related to emotional impacts of climate change were then reviewed alongside the data by a third reviewer, who examined the underlying meanings and patterns in the data and refined the codes. In the next stage of analysis, data for each emotional impact code were collated and reviewed in depth, with a view to exploring patterns and themes in the data. Preliminary themes were identified, and then reviewed by an additional author. In an iterative process, the themes were further reviewed and refined in order to ensure coherence, distinctiveness, that they accurately reflected the data, and to ensure the rigor and truth value of the analysis (Noble & Smith, 2015). From the identified themes, overarching and subthemes were identified. Throughout analysis, ongoing discussion among the authors was also used to consider and manage researcher biases (Braun & Clarke, 2019), with researchers coming from diverse positions (see Lykins et al., 2023).

## Results

All interviewees described having observed changes in weather patterns in their villages, including changes in seasons, rainfall, temperature, and to the oceans (see Table 2 for supporting quotes). These observed changes had also led to a range of ecological losses. In describing such changes, interviewees repeatedly oriented to their sense of distress and concerns around climate change and its impact on their local village environment. Consequently, evident throughout the interviews was a sense of sadness as well as worry and anxiety about current and future changes. These varied emotions resulted in a sense of ecological grief that was being experienced in response to the changes and losses stemming from climate change (*Gone are the good old days*). In particular, two key themes around emotional experiences and related grief due to climate change impacts were identified: loss of culture, and anticipatory losses (see Figure 2 for a thematic map, and Table 3 for supporting quotes). Notably, these key sources of ecological grief were reported across all villages, with themes consistently identified across interviews.

**Figure 2**

*Thematic Map Showing Overview of Overarching and Subthemes*



**Table 3**

*Supporting Quotes for Identified Themes*

Quote in English	Quote in Bauan Fijian	Village	Speaker
<b>Loss of culture</b>			
<b><i>Ecological changes impacting traditional ways of life</i></b>			
Before mangoes are always in season. For six years there have been no mangoes in the village.	maqo e vei yabaki. Dua na vuni maqo ya, oti vakadua e 6 na yabaki qai vua tale.	Lomawai	male
In the past, the fish was in abundance everywhere, but now there are hardly any fish, which is due to climate change.	E liu, se bini vakaveitalia na ika mai waitui, na gauna qo sa sega ena vukuni veisau ni draki.	Vusama	female

Quote in English	Quote in Bauan Fijian	Village	Speaker
Young boys of today cannot cultivate the land like before due to this climate change.	na veiveisau ni draki qo, oira nai tabagone era sega ni rawata.	Batiri	male
The lifestyle nowadays is different from before.	sa veisau na tuvaki ni bula nikua ni vakatauvanataki kei na bula eliu.	Vusama	male
They shall not be able to go out to sea to fish, they will not be able to do what we are doing. One of the main reasons is that there is less to get from the sea.	era sa na sega ni rawata na lako i waitui, ka ra na sega ni rawata na draki ni bula qo. Ni sa lailai na ka e rawati mai waitui.	Vusama	female
[We] used to catch crabs or go out to the sea to get sea produce which were our main source of income. There had been some changes.	keimami bula vakalevu ga e waitui, veidogo. Na qari, nai vurevure ni lavo. Na gauna qo sa veisau.	Batiri	female
Most villagers are now working at the new resort [name]. In the past the main source of income was the sugar cane farming.	So era bau cakacaka toka ena Otela. E liu na dovu, waitui kei na pine.	Lomawai	male
We worry about them [younger generation], as they are not interested in the traditional methods of fishing and learning from the adults... We feel the traditional methods of doing things are slowly fading away.	Sega ni macala oira na gone qo era na sega ni maroroya rawa na vanua...Sa cavuka tiko mai na nodai tovo.	Lomawai	male
A lot of these young ones are just buying fish from fisherman and in the future they will not know all these fishing skills.	e levu na taba marama vou era sa qai vakawati era sa voli ika ga vei ira na lai qoli. Eda leqataka tiko ni na yaco na gauana mai muri era sana sega ni kila na qoli.	Lomawai	female
They will not go out fishing and catch mud crabs, they will end up buying from town and working in town.	era sa na vakanunui ga e taoni kei na cakacaka.	Vusama	female
The traditional method is slowly fading and the villagers are not doing it the right way. Now they just take their nets and go out to fish.	era tukuna na qase, ni sa cala na kenai cakacaka, sa sega ni dau rokovi me vaka eliu. Qo era sa vakayagataka na lawa, sa sega ni caka na kenai cakacaka dina.	Sanasana	female
We worry about their future families, traditions.	Leqataki na bula ni nodra matavuvale kei nai tovo vakavanua.	Vusama	female
<b>Loss of resources</b>			
Some of the fish we get from the sea are no longer found.	So na sasalu edau kune eliu sa warai soti qo.	Taci	female
The mullet, these are big ones that are no longer seen. Before it is seen by the shore, now it is no longer there.	Na kanace lelevu sa yali tu nikau. Ra dau tu voliga e matasawa.	Sanasana	male

Quote in English	Quote in Bauan Fijian	Village	Speaker
No longer is it [yatule] seen in Sanasana. Fishing for the yatule here in Sanasana is done traditionally... the traditional method is slowly fading.	eliu e dau vakaiwasewase ga oira era dau qalova. Sa yacova tu mai ni kua sa sega ni kune...ni sa cala na kenai cakacaka.	Sanasana	female
It's a blessing to the village. Our ancestors bring in sea water from the sea and boil it to make salt, we do the same.	era cakava mai na neimami qase. E tiko na kena tobu. Kau mai, sova kina kuro qai saqa.	Lomawai	male
Salt is for the villagers only...We do not normally sell it but some of us are selling it.	Masima e neimami ga. Qo nai yau ga ni vanua ka sega ni dau volitaki. Ia qo sa voiltaki tiko vakalailai.	Lomawai	male
<b>Anticipatory losses</b>			
<b>Future generations</b>			
We are worried about the future generation.	Io, keimami leqataka vakalevu na vei gauna mai muri.	Taci	female
As for now we are seeing dead fish and most of it are big fishes so you can imagine ... what will happen in the future.	e levu saraga na ika lelevu era ciritu (mate) sega ni wili kina na ka lalai.	Vusama	male
Animals will die and plants will die.	mate nai teitei, mate na manumanu.	Taci	female
Due to the climate change we are very concerned about our future generation. At least now we can still eat fish, we don't know what tomorrow will bring.	kemami leqataki ira vakalevu na kawa mai muri. Keimami se kana tiko qo, mai muri ra gunu waitui kece na gone (dredre ni veiwali).	Sanasana	male
We worry about the future, because in the past we had a lot of seafood, all different types in abundance, but now that has changed.	Keimami leqataka na veigauana sa bera mai, e liu se dau levu na veimataqali sasalu ni waitui, ia qo sa veisau.	Vusama	female
<b>Future loss of land</b>			
What we fear now is if it [tidal waves] happens frequently we will have to relocate.	Ke sa vaka tiko beka ga ya, sa na lakolako tiko keimami sa na vakasalataki talega me keimami toki.	Natokalau	male
This is our only land where we have lived in all our lives.	Me keitou toso tale i vei. Na neitou qele ga qo.	Vusama	male
It will be very difficult to move since this has been [villagers'] land for many years.	Ena dredre na toki ni keimami sa bula tu eke ena dua gauna balavu.	Vusama	male
[The villagers] will not follow suit [move] since they have strong ties with this place.	oira era na vagaya.	Natokalau	female
They should move and they have to be prepared to adapt to their new place as this is the only option to move to higher grounds if	a na vinakati me ra toki mera lai rawata sara, sa na sega ni rawa ni ra na tiko eke ena vuku ni dredre.	Taci	female

Quote in English	Quote in Bauan Fijian	Village	Speaker
they wish to survive then they should be prepared to face and live in the new place.			

## Loss of Culture

The loss of culture was a prominent theme, with all interviewees describing ways in which climate-related changes in the environment were contributing to the loss of the traditional ways of life and their broader cultural practices. Two subthemes representing different ways in which culture was being lost were identified: 1) ecological changes impacting traditional ways of life, where culture loss was described as occurring due to shifts away from traditional subsistence farming and fishing necessitated by climate change, and 2) loss of resources, where culture loss stemmed from the depletion of natural resources that held cultural significance.

### Ecological Changes Impacting Traditional Ways of Life

Interviewees all described a range of impacts of climate change on either agricultural yields or marine life, thereby limiting the viability of subsistence farming and fishing. As a result, there was a shift away from traditional ways of life in the villages. This shift resulted in the younger generations not gaining requisite knowledge and skills in traditional techniques and customs, leading to culture loss. For instance, the inability to grow traditional crops or rely on fishing yields limited the ability to engage in traditional practices. Further, due to reduced ability to rely on selling surplus produce and seafood as a source of income, climate change was rendering many villagers as needing to engage in paid employment, often outside the villages. The requirement to work in industries outside of fishing and agriculture compounded culture loss by limiting time, need, and motivation to learn traditional farming and fishing practices.

The loss of ability to live off of the land also meant a reliance on purchasing food, which again compounded the loss of traditions through limiting engagement in traditional practices. As a result, traditional skills and practices were being lost, leading to recurrent distress around of loss of culture (*We worry about their future families, traditions*).

### Loss of Resources

Further compounding this loss of culture was a reduction in natural resources, including animal species. Given that some of these resources were integral to local customs, resource loss also threatened traditional ways of life and culture, leading to grief. The availability of marine species had noticeably reduced, with many species that had formed the crux of traditional diets less available, thus impacting everyday practices. Additionally, species that held cultural significance were becoming less available. For example,

in a coastal village (Sanasana) with a tradition around fishing for *yatule* (yellow tail clad), it was reported that “*No longer is it [yatule] seen in Sanasana. Fishing for the yatule here in Sanasana is done traditionally... the traditional method is slowly fading.*” Accordingly, the distress around resource loss was multifaceted, with grief related to both a sense of loss due to changes in the environment, as well as being intertwined with the resultant impact on culture. Additionally, given that ecological losses saw villagers needing to generate alternative modes of income, less common but also reported was that some villages had shifted to selling products other than produce. Yet the selling of other products also led to a diminishing of culture. For example, salt reserves, which held a sacred cultural significance in one village, were being sold to generate an alternative income, leading to changes in the cultural value around salt. Thus, while grief stemmed from ecological losses, these environmental changes had a secondary impact through the loss of traditions, customs, and ultimately, culture.

## Anticipatory Losses

Due to the impacts of ecological losses and ongoing climate change, villagers routinely expressed anticipatory worry and concern about the future; with these worries resulting in grief about the anticipated losses. Two subthemes were identified reflecting key anticipated losses: 1) future generations, which encapsulated concern around future well-being and loss of quality of life of future generations in light of continuing ecological changes, and 2) future loss of land, reflecting a fear of future migration and related loss of traditional land. This worry and anxiety about future changes was routinely reported across villages and led to a sense of grief due to the expected future losses.

### Future Generations

Throughout the interviews, some villagers oriented to a concern about the impact of climate change for the younger generations, especially about what would happen to their families into the future (*We are worried about the future generation*). In light of the changes in the environment that were already being observed, villagers described their worry about the future impacts of climate change, with a repeated expectation about the worsening of conditions into the future. In particular, such worry related to a potential lack of food or ability to sustain themselves. Consequently, many interviewees described anticipatory worry around future ecological changes, leading to grief around the impacts of these on their children, families, and future generations.

### Future Loss of Land

An additional way in which climate change was a source of distress related to the potential for migration or relocation as a possible solution to rising sea levels, resulting in worries about relocation and, ultimately, grief related to the anticipated loss of land. All interviewees were aware of a potential future need to migrate, with two villages

interviewed having already been advised to do so. Potential migration was a source of concern expressed by interviewees from all villages, and those in villages not yet advised to move reported a strong fear about the potential need to relocate (*What we fear now is if it [tidal waves] happens frequently we will have to relocate*). To interviewees, migration represented a substantial anticipated loss, especially with regards to the loss of land with which villagers had a history and connection. Yet despite a reluctance to relocate, most interviewees acknowledged that it would likely be necessary in the future, at least for future generations. As a result, migration posed a source of anticipatory loss and grief, with an expected future need to relocate representing the loss of traditional, ancestral lands.

## Discussion

This study explored the emotional experiences of living with climate change and highlighted the ecological grief being experienced by Indigenous and other traditional Fijians. Despite being a region that is experiencing substantial climate change impacts (Hayward et al., 2020), Pacific Islander perspectives are limited in the literature regarding climate change (Dreher & Voyer, 2015), especially in relation to well-being (Kelman et al., 2021). Our results are consistent with prior research from other PSIDS highlighting distress and sadness due to climate change (e.g., du Bray et al., 2017; Gibson et al., 2020). In particular, ecological grief was evident, and pertained to culture loss, due to changes in the local environment such as weather patterns and availability of resources, and anticipatory losses of lifestyles and lands. The present results provide new data from the Global South, thereby contributing to the emerging body of work regarding mental health and well-being in relation to climate change within PSIDS.

To date, ecological grief has predominantly been explored in Western countries, with exploration in the Pacific regions remaining scant, yet experiences of ecological grief differ based on place, culture, and geography (Ojala et al., 2021). Cunsolo and Ellis (2018) described ecological grief as an experience felt in relation to both experienced and anticipated losses of species, landscapes, and cultural systems of land-based knowledge. Within the present data, these key sources of ecological grief were identified, with such losses also crucially leading to culture loss. Anticipatory grief was also especially prominent and related to the loss of quality of life for future generations and potential loss of home and traditional lands through migration. Concerns for younger generations have also been identified in Tuvalu (Gibson et al., 2019), with worry about the future with respect to food security, also observed in the Solomon Islands (Asugeni et al., 2015), and migration proposed as a possible solution to rising sea levels in the region (Janif et al., 2016), suggesting that these anticipatory losses may be a source of grief more widely.

Our findings align with earlier results suggesting that ecological grief can emerge in response to gradual ecological changes, including due to loss of traditional ways

of life and land-based knowledge, and anticipatory loss of culture (Cunsolo & Ellis, 2018). Grief around loss of land-based knowledge, such as knowledge related to seasonal rhythms of the weather and weather conditions, has been reported in Australian farmers and Inuit communities (Cunsolo & Ellis, 2018), whereas in Fiji, the inability to pass along traditional knowledge and customs around subsisting from the land to younger generations was a key source of grief. Thus, while loss of generational knowledge around the land is routinely distressing, some variations on cultural impact and grief are noted across cultures. In the present data, grief was not reported in relation to being unable to protect their land, as has been observed elsewhere (Cunsolo & Ellis, 2018), but rather the cultural losses created by ecological changes. These differences might pertain, in part, to varied cultural understandings around climate change. Further, while in other contexts grief due to anticipatory losses was not linked to a single event, in the context of PSIDS, specific migration events appear to be a key source of ecological grief.

Notably, while Fijians have been reported to feel reassured that economic opportunities were available for the younger generations outside of the village (du Bray et al., 2017), the departure of young people from village life and resultant impact on culture also represents a source of grief. This shift away from subsistence farming has been observed in other PSIDS (e.g., Asugeni et al., 2015), suggesting that ecological grief related to loss of traditional knowledges and practices might be evident more broadly in the region. Additionally, ecological changes also led to loss of customs and culture through loss of significant resources and species, with potential migration also representing future culture loss. Thus, in line with suggestions that climate change may pose a threat to culture within Pacific Island nations (Farbotko & McMichael, 2019), culture was being impacted in multiple ways by climate change. Accordingly, intangible losses appeared to be especially pivotal in the ecological grief of interviewed Fijians, with intangible losses less readily captured by standard environmental assessment metrics (Cunsolo & Ellis, 2018). Contemporary responses to climate change tend to overlook or fail to adequately address the critical threat of climate change to culture (Adger et al., 2013), yet threats to culture impact capacity to adapt to climate change (Asugeni et al., 2015). Taken together, these findings provide further support for the need to better understand and assess the impact of climate-related changes on culture and to provide culturally informed and sensitive approaches to adaptation (e.g., McNamara et al., 2020).

While in low-lying atoll nations, migration to other countries has been suggested as a future solution to rising sea levels (Hino et al., 2017), Fiji is a mountainous nation and thus intranational migration may be feasible. Despite the lack of need to relocate to a different country, distress related to potential migration was strong, underscoring the importance of attachments to place (Tiatia-Seath et al., 2020) rather than to nation. Within Fiji, villages have strong ties to specific lands, which represent connection to ancestors, history, nature, and identity (Nolet, 2018), all of which are intertwined with mental health and well-being (Kelman et al., 2021). While a preference to remain on

traditional lands for cultural and spiritual reasons has been reported among populations in the Pacific (Farbotko & McMichael, 2019), the present study indicated that, while immobility may be preferred, many villagers also viewed migration as somewhat inevitable. As such, the data highlight that not only is potential migration a source of distress, but an expectation of future migration led to grief around future loss of home and land. For those wishing not to move, yet having no option due to inability to remain on current land, no adaptation strategy that supports mental health is currently evident (Kelman et al., 2021). Results thus align with calls that greater consideration of preferences and perspectives of Indigenous and traditional Islanders and their desire to remain on traditional lands is needed when considering migration and adaptation strategies (Farbotko & McMichael, 2019).

## Clinical Implications

Building on the limited research regarding mental health in relation to climate change in the Pacific (Kelman et al., 2021), results demonstrate that climate change was a source of distress, consistent with other examinations in PSIDS (Gibson et al., 2020; Tiatia et al., 2023). Ecological grief may leave people stuck in the grief process (Cunsolo & Ellis, 2018). Being “stuck” in grief may be especially pertinent for Pacific Islanders, where anticipatory losses were found to be key sources of grief, further highlighting ongoing mental health impacts of climate change in the region. Although there is currently a lack of data regarding national prevalence of mental disorders in Fiji (Crookes & Warren, 2022; Tiatia-Seath et al., 2020), it is estimated that there remains an over 90% treatment gap (Chang, 2016). Limited resources, and misconceptions, prejudice, and discrimination around mental health, delay help seeking (Chang, 2016; Tiatia et al., 2023). Therefore, there remains a need for strengthening mental health systems and identifying how to best support the mental health and well-being of Fijians and other Pacific Island populations (Charlson et al., 2019; Tiatia et al., 2023, especially as the impacts of climate change continue. Western frameworks may not be compatible with cultural understandings of mental health in the Pacific region (Tiatia-Seath et al., 2020), thus there also remains a need for culturally informed and appropriate approaches to assessment of and interventions for mental health, as well as more research (Gibson et al., 2019).

Our data highlight the variety of expressions of anxiety and grief (both current and anticipated) reported by the community members of these Fijian villages related to both observed and expected future losses. As noted above, little data exist on prevalence rates of mental illness and clinically-relevant psychological distress in Fiji, and consequently, the development and availability of psychological support is lagging. Academics are increasingly calling for these gaps to be addressed (e.g., Crookes & Warren, 2022; Ramkumar et al., 2022; Tiatia et al., 2023). As such, recommendations for psychological support should be made with caution, and more research is needed (Dawes et al., 2019).

That said, we wish to highlight several important sources of strength and resilience in the Indigenous Fijian population. Firstly, on average, Indigenous Fijians are highly religious (Janif et al., 2016), and spiritual beliefs, in concert with community-based decision-making governance structures, have been found to mitigate anxiety related to observed environmental changes in rural communities (Atkinson-Nolte et al., 2021). Related to this, Scheyvens et al. (2023) recently reported on the strengthening of community cohesion and social unity related to the reinstatement of old practices (e.g., bartering), using new technology (e.g., social media), during the COVID-19 pandemic, and how this facilitated social resilience and psychological well-being. The authors noted that these practices fostered a greater sense of agency in the Indigenous Fijian population in ways that were aligned with Indigenous cultural values and beliefs; it is worth exploring the implementation of these types of activities in future research in this area. Finally, we stress that Pacific Island peoples have been coping with and adapting to climate variability and changing seascapes for millennia (Nunn, 2007; Pam & Henry, 2012). Many inhabitants of these nations, as well as their leaders, strongly reject the “environmental migrants as victims” framing of their experiences and predicted futures with respect to climate change (Ransan-Cooper et al., 2015), as this may contribute to feelings of resignation and despair, thus reducing resilience and agency (Farbotko & McMichael, 2019). Interventions and support mechanisms should endeavor to enhance agency and build upon existing sources of resiliency in ways that are culturally informed and appropriate in preparation for the future (e.g., Welton-Mitchell et al., 2018).

## Limitations

This study is presented with several limitations. The present results provide insight into the experiences of climate change and how this is impacting well-being. Future research may wish to examine levels of distress or mental health symptomatology; however, culturally sensitive measures of climate change distress and psychological distress remain limited and may reflect Western understandings of mental health (e.g., Gibson et al., 2019). Additionally, the interviewed villagers were predominantly middle-aged or older. Accordingly, findings are less reflective of the views, experiences, and concerns of the younger villagers, who may be more severely impacted by climate change and future migration, or who may be more adaptable to changes in lifestyle. Future research should aim to explore the experiences and perspectives of young Fijians. Finally, while interviews took place across a diverse range of villages, these villages were on or very near to the main island of Fiji. Thus, the perspectives of those in more remote areas and outer islands were not captured, and the experiences of these villagers would be valuable to understand in future research.

## Conclusions

This study has built on the limited explorations of climate change and mental health within the Pacific region (Kelman et al., 2021) and demonstrated the presence of ecological grief among Indigenous Fijians living in traditional villages. In particular, ecological grief stemmed from loss of culture due to environmental changes and resultant shifts away from subsistence farming and fishing, and loss of associated knowledge, as well as loss of customs and traditions. Worries and anxiety regarding anticipated losses were a key source of grief, especially pertaining to lifestyle loss of future generations. A potential need for migration was a source of worry, with an awareness of the future need to migrate representing a large source of grief around anticipated loss of land, home, and belonging. Potential migration also represented further culture loss. The present study expands our understanding of ecological grief outside of Western countries and underscores the impact of climate change on culture loss, place-based attachments and, subsequently, well-being in PSIDS communities.

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## Openness and Transparency Statements

The present article has been checked by its handling editor(s) for compliance with the journal's open science and transparency policies. The completed *Transparency Checklist* is publicly available at:

<https://doi.org/10.23668/psycharchives.13550>

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### Author Contributions.

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**Acknowledgments.** The authors would like to sincerely thank Ms. Mereoni Camailakeba for facilitating the introductions to many of the villages and for her assistance in translation during the interviews. We would also like to thank Ms. Sala Tabaka for translating and transcribing the interview recordings, and Mr. Samisoni (“Samson”) Baivucago for transcribing and translating the quotes back into Bauan Fijian. We also thank Mr. Marc Mellors for providing technical audio-visual support during the interviews, and Ms. Caroline Faucher for her assistance in coding the interviews. Finally, our sincere thanks to the community members of the villages we interviewed for their warm welcome to the research team.

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**Funding.** The authors received a small internal grant from the University of New England to support this project. The University has not interfered in any way in the research process. No other funding was received for this project.

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**Competing Interests.** The authors have declared that no competing interests exist.

**Ethics Statement.** This study was approved by the Human Research Ethics Committee of the University of New England (HE15-023).

**Diversity Statement.** In the list below, the check mark (☑) indicates which steps were taken to increase diversity within the context of this paper. Steps that were not taken or did not apply are unmarked (☐).

- Ethnically or otherwise diverse sample(s)
- Gender balanced sample(s)
- Inclusive gender measure
- Inclusive materials
- Sampling justification
- Extensive sample description
- Discussion of generalizability
- Diverse reference list
- Underprivileged / minority author(s)
- Early career author(s)
- Degree of privilege/marginalization considered in authorship order
- Author(s) from sampled population (avoiding 'helicopter science')

**Supplementary Materials.** The following table provides an overview of the accessibility of supplementary materials (if any) for this paper.

Type of supplementary material	Availability/Access
<b>Data</b>	
Interview Transcriptions.	Data was not made publicly available in order to preserve the confidentiality of the participants.
<b>Code</b>	
No code was involved in the study.	—
<b>Material</b>	
a) Methods to Integrate Indigenous Principles.	Lykins et al., 2023
b) Interview Protocol.	Lykins et al., 2023
c) Consolidated Criteria for Reporting Qualitative Studies.	Lykins et al., 2023
d) Reflexive Statement.	Lykins et al., 2023
<b>Study/Analysis preregistration</b>	
The study was not preregistered.	—

**Badges for Good Research Practices.**

Open data: NO.

Open code: NO.

Open materials: YES.

Preregistration: NO.

Diversity statement: YES.

Note: YES = the present article meets the criteria for awarding the badge. NO = the present article does not meet the criteria for awarding the badge or the criteria are not applicable.

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