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Project Yarn Circle: development and pilot evaluation of a cultural connection suicide prevention program for Aboriginal and Torres Strait Islander young people

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ABSTRACT

Background: Aboriginal and Torres Strait Islander young people experience markedly higher suicide mortality than non-Indigenous youth in Australia, yet there is little evidence of effective preventative strategies. Many are misaligned to the needs of First Nations young people due to a lack of consideration of protective factors such as community and cultural connection.

Objective: To date no research has examined whether increasing cultural connectedness may reduce Aboriginal and Torres Strait Islander youth suicidality. The current study outlines the development, implementation, and pilot evaluation of Project Yarn Circle, a school-based suicide prevention initiative utilising cultural education and connection.

Method: Project Yarn Circle was piloted by an Indigenous owned and managed youth mental health organisation, delivering 5 weekly sessions to 276 young people at 9 schools in Southeast Queensland, Australia, between 2019 and 2023. Sessions connected students to cultural knowledge and practices (stories, painting, dance, Indigenous languages) with Elders and local cultural knowledge facilitators.

Results: Pre- and post-program evaluation questionnaires completed 6–8 weeks apart found that participants had significantly lower suicidal ideation (GHQ-18-SS), pre 7.16, post 6.61, $p = .043$ higher positive ideation/reasons for living (PANSI-PI) pre 22.44, post 23.60, $p = .009$, and higher self-esteem (RSES) pre 16.55, post 23.60, $p = .005$. Analyses of cultural connectedness items co-designed for this evaluation study and validated using Exploratory Factor Analysis found that students demonstrated greater cultural identity clarity, peer cultural competence, strength from culture, salience of cultural continuity and sense of belonging.

Conclusions: These findings provide new evidence towards utilising cultural connectedness as an intervention mechanism in Indigenous youth suicide prevention.

KEY POINTS

What is already known about this topic:

- (1) Aboriginal and Torres Strait Islander youth suicide rates are persistently higher than for other young people, with little evidence of effective suicide prevention strategies.
- (2) Interventions often are misaligned to the different risk and protective factors experienced by First Nations young people.
- (3) Connection to culture is promoted as a unique protective factor to reduce suicide risk for First Nations young people.

What this topic adds:

- (1) To our knowledge this is the first published cultural engagement intervention to report significant improvement in Aboriginal and Torres Strait Islander youth suicidality, providing an example of the development and delivery of a new program approach.
- (2) This is the first study to explore increases in connection to culture in conjunction with lowered suicidal ideation and higher reasons for living.
- (3) The findings suggest that connection to culture can be used as a therapeutic mechanism to reduce suicidality.

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First Nations; suicide prevention; Culture; protective factors; Youth

The suicide rate for First Nations People in Australia is over twice that of non-Indigenous Australians, with young people at higher risk (Australian Bureau of Statistics, 2021; Leske et al., 2019). Aboriginal and Torres Strait Islander young people (18 years old or younger) in Queensland were recently found to die by suicide at a rate four times higher than their non-Indigenous counterparts and this disparity widens to over 7 times for those under 14 years old (Gibson, Stuart, Leske, Ward, & Tanton, 2021). Aboriginal and Torres Strait Islander children make up almost half of those children under 14 years who take their lives in Queensland, despite being only approximately 8% of child population (Soole et al., 2014). With the higher rates of deaths by suicide, it is not surprising that First Nations young people experience higher rates across the continuum of suicidal thoughts and behaviours (Armstrong et al., 2017; Dickson et al., 2019). Despite decades of reporting on this overrepresentation of Aboriginal and Torres Strait Islander young people in suicide mortality statistics, unfortunately, the evidence of effective suicide prevention strategies needed for this population remains limited (Harlow et al., 2014; Leske et al., 2020; Moses et al., 2022; Ridani et al., 2015). (Please note that the terminology preferred by the Elders and community members collaborating in the current study was “Aboriginal and Torres Strait Islander people” or “First Nations people”, as such these names are applied throughout this paper).

While the reasons for this gap between persistently higher rates of all suicidal thoughts and behaviours and this limited evidence is inherently complex, a key challenge is the divergent experiences, aetiology and trajectories of suicidality for Aboriginal and Torres Strait Islander young people (Dudgeon & Walker, 2015; Farrelly & Francis, 2009; Hunter & Milroy, 2006). As such, programs and policies designed from the evidence of non-Indigenous youth experiences are often misaligned to the risk and protective factors for First Nations young people (Dudgeon et al., 2017; Elliott-Farrelly, 2004; Westerman, 2010). Notably, experiences of racism and discrimination are found to have a strong associations with Indigenous suicidal behaviours (Davison et al., 2017; Jamieson et al., 2011; Thomas et al., 2010) but are absent within many current theoretical models of suicidal behaviour or risk screening frameworks (Díaz-Oliván et al., 2021; Hawgood & De Leo, 2016). While social and emotional distress remain risk factors for

suicide, First Nations young people who had died by suicide were less likely to have had mental illness diagnoses (Dickson et al., 2019; Soole et al., 2014). As mental illness symptoms are often key indicators in traditional suicide risk screening and treatment protocols, the needs of First Nations young people experiencing suicide risk may be less likely to be identified and triaged (Hawgood & De Leo, 2016; Australian Institute for Health and Welfare (AIHW), 2022), and ultimately, First Nations young people who die by suicide are less likely to have accessed or received mental health treatment (Gibson et al., 2024). There are many reasons why access is not commensurate with need, including service mistrust, culturally-unsafe care or distance-related barriers which must also be addressed (Isaacs et al., 2010; Price & Dalgliesh, 2013). Nonetheless, there is also a need for preventive strategies to intervene within community settings outside of traditional services where young peoples’ distress may be misidentified or responses misaligned. Specifically, interventions designed to enhance protective factors, build resilience against suicide within First Nations communities, and ameliorate the influence of risk factors are promoted to reduce disparities in Indigenous youth suicide rates (Dudgeon et al., 2016, 2022; National Mental Health Commission, 2017).

Cultural connectedness

Current suicide disparities are widely acknowledged to be a result of actions of colonial violence such as dispossession and continued discrimination (Dudgeon et al., 2017; Paradies, 2016; Sherwood, 2013). In response, cultural connection is therefore promoted to ameliorate these harms caused by colonisation to reduce suicide mortality and protect against the unique colonial impacts Indigenous youth face today (Dudgeon et al., 2017; Snowshoe et al., 2015; Ungar, 2013). Connection to culture is understood as a key protective factor for health wellbeing as well as a critical component of positive, adaptive development for Aboriginal and Torres Strait Islander young people (AIHW, 2022; De Maio et al., 2005; Dudgeon et al., 2016). Indicators of cultural connectedness, such as positive cultural identity, have been found to buffer the effect of racism and discrimination on mental ill health and other emotional and behavioural difficulties for First Peoples in Australia and globally (Macedo et al., 2019; Whitbeck et al., 2002). Furthermore, experiences

of racism and discrimination are known to be associated with increased suicidal thoughts and behaviours for Aboriginal and Torres Strait Islander peoples (Davison et al., 2017; Gibson, Stuart, Leske, Ward, & Tanton, 2021; Jamieson et al., 2011; Thomas et al., 2010). There has been no evaluation to date of the impact of increasing cultural connection and engagement as a potential mechanism to reduce suicide-related outcomes for Aboriginal and Torres Strait Islander young people.

Project Yarn Circle initiative

Project Yarn Circle, was created and delivered by the Indigenous-owned and managed youth mental health organisation, Youth2Knowledge, and piloted with Aboriginal and Torres Strait Islander students in nine schools in southern Queensland, Australia. The program included five in-person sessions run within schools that sought to reduce Indigenous youth suicide through two primary mechanisms: 1) Increasing young peoples' resilience to suicide through increased connection to culture and thereby raising self-esteem and

hope for the future; and 2) Increasing young peoples' help-seeking through reducing stigma and building connections, "vouching" relationships, and referral pathways to support services. program content and delivery was developed in collaboration with Youth2Knowledge staff, community members, Elders, Indigenous community services, representatives from the local primary health network (PHN), and other members from the Community Implementation team. The broad program outline is described in Table 1.

The program was based around using yarning circles, a cultural practice and model that has facilitated exchanges of knowledge by Aboriginal and Torres Strait Islander communities in the lands this project was delivered on for thousands of years (Bessarab & Ng'andu, 2010; Burke et al., 2022). Distilling the concept of "yarning" to a definition that fits neatly within Western academic paradigms is inherently limiting as the recency of references fail to reflect the ancientness of knowledge and understanding or the differing applications across First Nations communities (Dean, 2010; Walker et al., 2014). Broadly speaking, in the context of this program "yarning" was conceptualised as an Indigenous cultural communication process

Table 1. Project yarn circle program content and delivery overview.

Session	Goal	Activities
1	<i>Cultural identity:</i> This session aims to build cultural knowledge and pride.	<ul style="list-style-type: none"> • Smoking ceremony and Acknowledgement of Country with Elders. • Learning about different Tribes and Nations around Australia via a "Mob Map". • Women's and men's business, digeridoo playing for males and jewellery making for females. • Sharing bush tucker • Ochre and face painting.
2	<i>Cultural education and introduction to mental health:</i> This session aims to explore the basics of mental health and identify the signs that someone may need help and where to seek assistance if needed.	<ul style="list-style-type: none"> • Physical activity education and promotion with traditional Aboriginal games. • Discussion on general mental wellbeing, self-esteem, respect, sharing within community (co-presented by Kids Help Line/Your Town) • Painting boomerangs and claps sticks. Learning some Aboriginal song.
3	<i>Mental health and getting help:</i> This session aims to build upon introductory information in the previous session to understand personal indicators of mental wellbeing or ill health and reduce stigma around seeking help.	<ul style="list-style-type: none"> • Discussion on strategies and practices to maintain personal mental wellbeing and knowing how and where to get support if needed (co-presented by local headspace or local First Nations health/ community centres). • Learning traditional dances. • Vital role of nutrition (native herbs and bush tucker) in mental and physical health
4	<i>Links between wellbeing, nutrition, substance awareness and building resilience:</i> This session is designed to explore goal setting and healthy lifestyles, while also raising awareness of adverse impacts of substances on wellbeing and achieving personal goals about the dangers of substances.	<ul style="list-style-type: none"> • Using 3D computer software, students learn how neurotoxins (from substances) damage the brain and how this can affect individuals and communities. • Traditional cultural story telling by Elders.
5	<i>Culture, leadership and knowledge sharing:</i> This session seeks to instil pride and confidence in continued cultural knowledge learning, leadership abilities within young peoples communities as well as goal setting.	<ul style="list-style-type: none"> • Elders invite students to share reflections, cultural knowledge they have gained, future goals (and anything else). • Opportunity to talk with students to identify who may need extra support and referred to local health community groups, and provide opportunity to stay in contact with PYC facilitators • Bush Tucker

that uses story-telling to impart important messages and collaboratively making meaning (Burke et al., 2022; Lin et al., 2016).

The pilot Project Yarn Circle sought to take the practice of yarning circles into schools by bringing together Aboriginal and Torres Strait Islander cultural knowledge keepers, facilitators, Elders and community workers with students in a culturally-safe and respectful environment. Critical to the yarning circle practice was the two-directional learning and sharing between students, Elders and Indigenous cultural and program facilitators (Lin et al., 2016). This was seen as a culturally-appropriate and safe model for health promotion among First Nations young people as opposed to one-way teaching or speaking “to” or even “at” young people. In particular, sharing with young people knowledge about health and supporting young people to connect with positive visions for themselves and their future roles in community rather than telling young people what not to do or simply warning about potential harms (McPhail-Bell et al., 2015). Elders co-facilitated or attended all sessions to provide continued cultural oversight and to maintain validity and integrity of the yarning practice in this school-based model. Critical to the model was connecting different service providers, community members, cultural educators and Elders for each of the schools participating. It was important that young people were connecting with people from the specific local services which they could contact again. To consistently apply two-directional learning and sharing in this program, during the final sessions young people were invited to share their experiences and feedback from the program which were incorporated into future iterations.

Aims

The aims of this study are the development and application of an evaluation methodology to examine the effectiveness of the pilot delivery of the Project Yarn Circle initiative to reduce suicidality and increase cultural connectedness for Aboriginal and Torres Strait Islander students.

Materials and methods

Context

The five-session program was delivered 15 times at nine schools in the Youth2Knowledge area between March 2019 and November 2023 with 4

schools receiving the program more than once with different students. Schools were primarily identified and prioritised from the Elders and community members’ direction. All Aboriginal and Torres Strait Islander students across the schools were invited to participate in 1 ½ hour weekly sessions. 12–30 students attended each session which were predominantly delivered in school class times.

Governance

This initiative was funded under the National Suicide Prevention Trial (NSPT) and commissioned as part the Brisbane North PHN localised NSPT activities. The primary cultural governance mechanism throughout the program delivery and evaluation was the Aboriginal and Torres Strait Islander Community Implementation team, which included Elders, providers delivering First Nations specific suicide prevention services, and representatives from the PHN. It was throughout this process, that Aboriginal and Torres Strait Islander community members, Elders, and service providers identified the need for programs to promote connection to culture as a protector against suicidality for First Nations young people. The Community Implementation team met monthly throughout the development and implementation of these activities to guide and review progress, raise and address community concerns, make collective decisions, and to ensure cultural accountability to the broader community. The pilot delivery of *Project Yarn Circle* was evaluated by Researchers from the Australian Institute for Suicide Research and Prevention (AISRAP, Griffith University). Researchers attended Community Implementation Team meetings throughout the project to provide ongoing opportunities for cultural and community accountability of research practices. Direction at this level guided key constructs to be measured, wording of evaluation questionnaire items, consent procedures, as well as the interpretation of the data, and in which schools programs were delivered. The research team included a senior Aboriginal Researcher who provided additional oversight of research practices and outputs. Schools selection was initially in response to Elders’ and community members’ knowledge of young people at the schools who would benefit, although as the program continued word of mouth spread to other schools who contacted Youth2Knowledge. Further explanation of the

governance processes and decisions made to support responsible research practice is included in the CONSIDER Statement supplementary materials.

Development of an evaluation protocol

Measuring connection to culture

A key requirement to address the aims of this evaluation study was measuring young peoples' changes in connection to culture through participating in the suicide prevention program. Unfortunately, at the time of the evaluation co-design, no cultural connection measures developed and validated for Aboriginal and Torres Strait Islander youth were found. As such, an ongoing iterative process was undertaken with local Elders, community members, cultural knowledge holders and program staff to identify components of cultural connectedness salient to the local Aboriginal and Torres Strait Islander community and collaboratively develop indicators and measures to elucidate these components to be used in the evaluation questionnaire (outlined in Figure 1). Firstly, a pool of items was developed of items from related measures of cultural identity and engagement from other international

Indigenous or general youth populations. The initial pool served as a discussion framework, from which Elders and community members shared and discussed what it meant to them to be an Aboriginal or Torres Strait Islander person, what indicators or constructs changing would demonstrate that young people feel more connected to their culture, and what aspects of feeling connected to culture would be protective or promote wellbeing. As the items from the pool were reviewed and discussed to select the most salient components of cultural connectedness for Aboriginal and Torres Strait Islander contexts, additional components and items were suggested where existing items were not seen to address critical constructs for measuring connection to culture in this community.

As the program sought to increase individual-level cultural connection, community members advised that concepts and items related to young people's personal perceptions (i.e., "gaining strength from culture") should be prioritised rather than outwardly observable indicators (i.e., "living on country" or "knowing your language"), as young people may have less capacity to change these outward indicators without means of transport or access to language speakers.

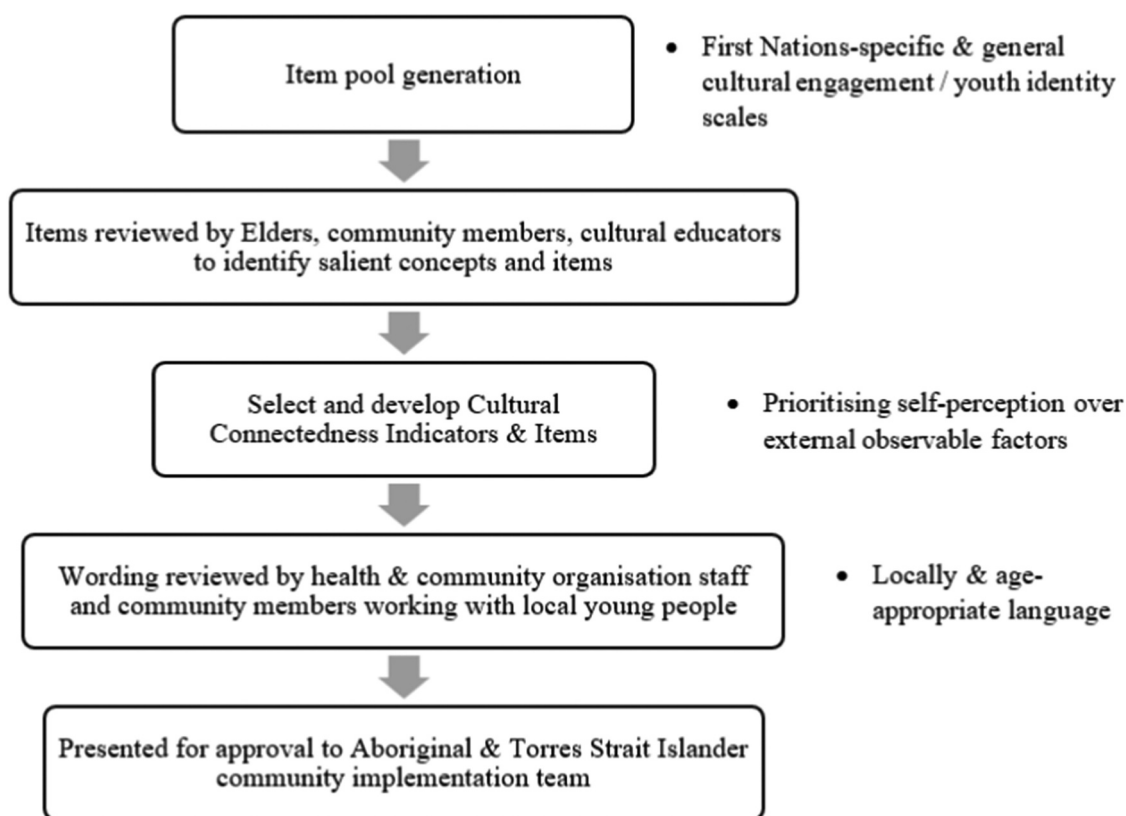


Figure 1. Cultural connectedness measure development process overview.

Importantly, this study did not seek to define Aboriginal and Torres Strait Islander culture or the specific behaviours and practices as other research has further explored (Bourke et al., 2018; Salmon et al., 2018), but rather examine the effects of young people's perceived connection to their culture. Subsequently, staff members from Indigenous health and community partner organisations, community leaders and members involved in service delivery with local First Nations young people reviewed these items to ensure wording was age and culturally appropriate for this youth population. Some items developed for other international Indigenous or general youth needed to be adapted to reflect specific Aboriginal and Torres Strait Islander language and terminology. Finally, these questionnaire items were presented for approval to the Community Implementation Team.

This process yielded seven indicators and corresponding items as seen in Table 2 and are hereafter referred to as Cultural Connectedness Indicator (CCI) items (CC11-CC17). This co-design process occurred across a period of 6 months over 12 separate meetings.

Evaluating changes in suicidality

Broadly, this project conceptualised suicidality as the thoughts, feelings and behaviours related to suicide (De Leo et al., 2021). However, throughout the co-design process to develop the evaluation protocol, community partners identified that measures examining only thoughts about wanting to die and not wanting to live were inconsistent with Indigenous conceptualisations of health (Gee et al., 2014; Swan & Raphael, 1995). For this reason, both suicidal ideation and reasons for living were used as evaluation study outcomes. As First Nations young people who die by suicide are significantly less likely to have received any treatment or psychological support, through discussions at this stage it was determined that an evaluation of an Indigenous suicide prevention program needed to also examine help-seeking. Additional items were also co-

designed to measure changes in young peoples' belief that they could get to services or people in times of crisis or suicidality.

Evaluation questionnaires

Evaluation Questionnaires were given to participants before the first session by school teachers or at the beginning of the first and then after the last session (approximately 6 weeks apart). Ethical clearance was received from the Griffith University Human Research Ethics Committee (GU HREC): GU Ref No: 2019/380, for access and analysis of de-identified participant evaluation questionnaires collected by the program facilitators.

Measures of suicidality

Suicidal ideation

General Health Questionnaire-28-Suicide Subscale (GHQ-28-SS; Watson et al., 2001) is a 4-item measure of current suicidal ideation previously used in Australian samples (Goldney et al., 2000) including with Aboriginal and Torres Strait Islander young people (Skerrett et al., 2017). Scale reliability was high in both the current pre- and post-samples ($\alpha = .92$; $\alpha = .92$). This study also followed the clinical cut-off criteria used by Goldney et al. (1989) to assess current ideation. Participants are asked how often in the previous 4 weeks they experienced suicide-related thoughts, e.g., "Felt that life was not worth living" and "Found the idea of ending your life kept coming into your mind". Items are scored on a 4-point Likert scale from "Not at all/Definitely not" to "Definitely has/Much more than usual"

Positive ideation/reasons for living

The Positive and Negative Suicide Ideation Inventory – Positive Ideation subscale (PANSI-PI; Osman et al., 1998) is a 6-item measure widely used to explore thoughts and cognitive processes that inform reasons for living as predictor of reduced suicidal ideation and intent (Osman et al., 2002, 2003). Only the Positive Ideation (PI) subscale was used for this study as the

Table 2. Cultural connectedness indicators and items.

	Cultural connectedness indicator	Item
1	Sense of belonging	<i>"I feel I belong to my mob/community"</i>
2	Cultural identity clarity	<i>"I have a clear sense of my culture and what it means for me"</i>
3	Saliency of cultural knowledge	<i>"It is important to me to learn more about my culture"</i>
4	Collective self-esteem	<i>"I have a lot of pride in being Aboriginal or Torres Strait Islander and our strength and resilience"</i>
5	Peer cultural competence	<i>"I know I fit in with other young people in my community/mob"</i>
6	Drawing strength from culture	<i>"I get a lot of strength from my culture"</i>
7	Saliency of cultural continuity	<i>"It is important to me to support my mob when I'm older (like becoming a leader or Elder)"</i>

GHQ-28-SS items were selected as more culturally-appropriate and were previously used with First Peoples. Independently, PANSI-PI scores have been found to have good sensitivity and specificity in identifying people experiencing suicidal ideation (Sinniah et al., 2015) and had good reliability in the current samples at both pre- and post- data collection periods ($\alpha = .83$; $\alpha = .91$). Participants are asked to rate on a 5-point Likert scale, from “None of the time” to “All the time”, how often in the previous fortnight they experienced feelings related to wanting to live and hope for the future, ie., “Felt that life was worth living” and “Felt confident about your plans for the future”

Self-esteem

The Rosenberg Self Esteem Scale (RSES; Rosenberg, 1965) is one of the most widely used self-esteem scales. It has been previously used with Indigenous and non-Indigenous youth in Australia (Faulkner et al., 2012; Skerrett et al., 2017). The current study used the shortened 6 item version which has been used with other First Nations young people internationally (Whitesell et al., 2009) and had adequate reliability in this sample ($\alpha = .79$; $\alpha = .83$). Respondents are asked to rate their agreement with a series of statements about themselves eg., “I feel I have a number of good qualities”. Items are scored on a 4-point Likert scale from “Strongly” agree’ to “Strongly disagree”

Cultural connectedness

The seven Cultural Connectedness Indicator (CCI) items (CCI1-CCI7) developed for this evaluation study (seen in Table 3) were scored on a 5-point Likert scale from 5 = “Strongly agree” to 1 = “Strongly disagree”. Pre- and post- aggregated scores of total cultural connectedness scores were found to have adequate internal validity ($\alpha = .77$ and $\alpha = .82$ at pre- and post- time periods, respectively).

Help-seeking

Two additional items were created to assess young people’s confidence that they could get help from people or from services during crises or suicidal thinking, ie, “Could you get to a safe person if you were having thoughts of wishing you could disappear? Both items were scored on a 5-point Likert scale from 1 = “Not confident at all’ to 5 = “Very confident”.

Data analysis

Exploratory factor analysis (EFA) was first performed to understand the underlying factorial structure of the items to determine if total cultural connectedness scores (in addition to item scores) could be used as a scale in evaluation analyses. Paired *t*-tests and cohen’s *d* effect sizes were then conducted to examine changes in study outcome variables after participation in the Project Yarn Circle pilot. Exact McNemar’s test was used to compare the percentage of individuals reporting current suicidal ideation at the pre- and post- program time-points. Analyses were conducted using SPSS 29.

Results

Participants

As seen in Figure 2, a total of 276 young people attended the Project Yarn Circle sessions during the pilot period with 12–30 at each session. A total of 167 young people completed the pre-program questionnaires and 127 young people completed the post-program questionnaires. It was possible to match 111 pre-and post-evaluation questionnaires although 195 individual students completed the evaluation questionnaire across both data collection time points. Eighty-one (81)

Table 3. Participant demographics.

<i>Participant demographics</i>	All young people (<i>n</i> = 195)	Matched questionnaires (<i>n</i> = 111)
Mean Age (years)	13.48 (<i>SD</i> = 1.72)	13.46 (<i>SD</i> = 1.71)
Indigenous identification		
Aboriginal young people	163 (83.6%)	95 (85.6%)
Torres Strait Islander young people	10 (5.1%)	4 (3.6%)
Both Aboriginal & Torres Strait Islander young people	21 (10.8%)	11 (9.8%)
Indigenous but no further information	1 (0.5%)	1 (0.9%)
Gender identification		
Male	96 (49.2%)	49 (44.1%)
Female	97 (49.7%)	61 (55.0%)
Non-binary	1 (0.5%)	0
No gender information	1 (0.5%)	1 (0.9%)

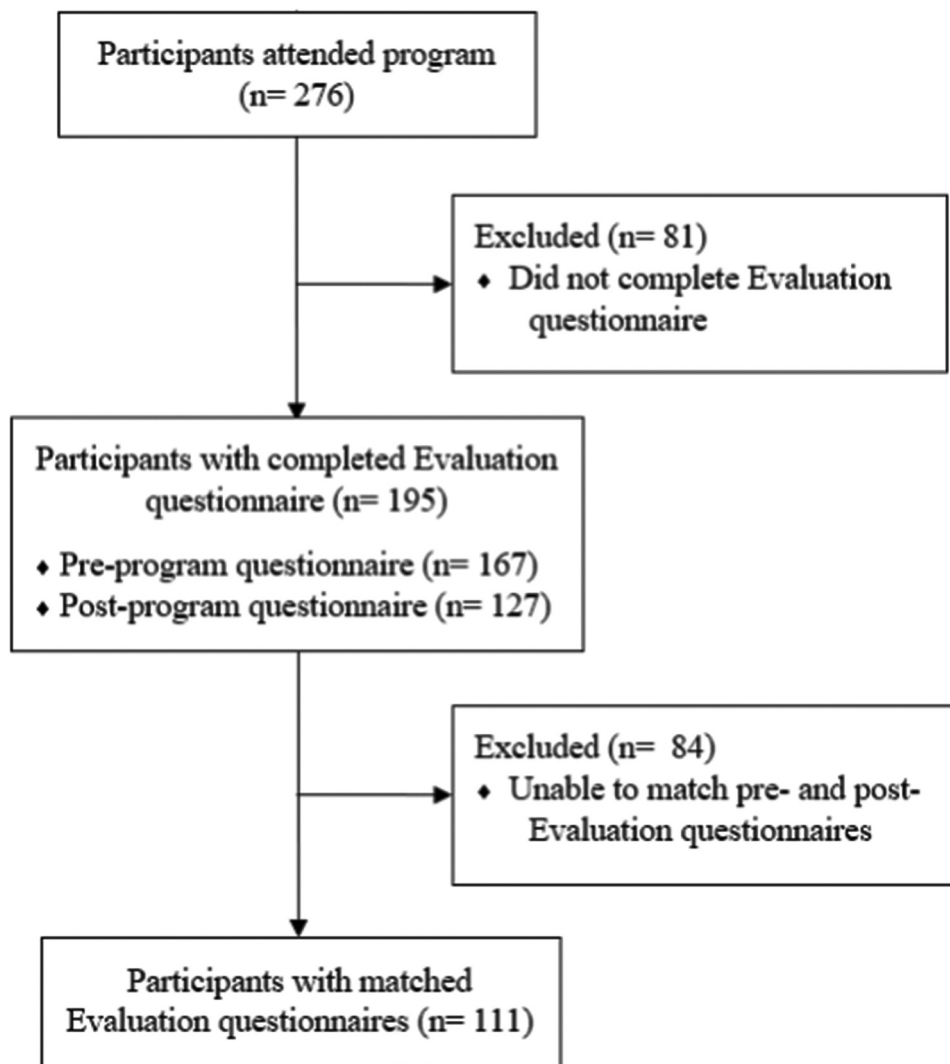


Figure 2. Project yarn circle participant CONSORT diagram.

young people did not complete an evaluation questionnaire due to missing the initial session or leaving early from the last sessions. For sample under investigation (111 young people with matched pre- and post-evaluation questionnaires) the mean age was 13.46 ($SD = 1.71$) and 55% were female and 44.1% were male, and one student elected not to provide gender identify information. Aboriginal students comprised 85.6% of these students. Four of these students identified as Torres Strait Islander people with eleven identifying as both Aboriginal and Torres Strait Islander people. One person identified as First Nations but did not provide further information.

There were a number of difficulties in collecting and matching pre- and post- evaluation questionnaires for analyses. As many of the final sessions was delivered close to the end of the school term many students had conflicting academic or sporting

commitments and only completed the pre-program questionnaire, while many other young people started participating in the program after the first sessions as a result of the word-of-mouth vouching about the program throughout the school and completed only post-intervention evaluation questionnaires.

The 111 – did not vary considerably compared to the total 195 young people who participated in the evaluation – in terms of age and First Nations identification; the mean age was 13.48 years ($SD = 1.72$), and the majority of students identified as Aboriginal (163; 83.6%), with 5.1% (10) identifying as Torres Strait Islander persons, and 10.8% (21) identifying as both Aboriginal and Torres Strait Islander people. One person (.5%) similarly identified as First Nations but did not identify further. Fewer pre- and post- questionnaires for males were able to be matched as compared to full sample. Of the total 195 participants, 49.2% (96)

were male and 49.7% (97) were female, with one person identifying as non-binary and one choosing not to identify gender.

A number of questionnaires were incomplete as young people often ran out of time to finish the survey before the next class. As such, the CCI items at the beginning of the paper questionnaire had greater completion than other scales. Additionally, shortly before a first session one school advised that the suicide-related item were not to be included. To maximise all data collected for analyses pairwise deletion was used, resulting in different numbers available for analysis for each outcome variable (ie., 111 for cultural connectedness items, 91 for suicide ideation and 88 for self-esteem), as seen in Table 5.

Exploratory factor analysis

To examine the factorial structure of the 7 cultural connectedness items developed for this study exploratory factor analysis (EFA) was conducted using the principal axis factoring extraction method with the oblique rotation method being direct oblimin A one-factor solution was identified as the best fit for the data as the first factor explained 41.8% of the variance ($KMO = .81$, Bartlett's sphericity, $\chi^2(21) = 183.6$, $p < .001$), with only one eigenvalue exceeding one. Inter-item correlations were mostly above .3, suggesting reasonable factorability. Cronbach's alpha in the pre-program sample was high ($\alpha = .75$) and elimination of any of the items would reduce internal validity. As such, both the 7 individual cultural connectedness indicator items and the aggregate score of all cultural

connectedness items as defined by the single EFA factor (hereafter referred to as the "total cultural connectedness score") were used for the evaluation analyses.

Evaluation analyses

Cultural connectedness

The total cultural connectedness score increased significantly from 28.49 to 30.32, $p < .001$, exhibiting a medium effect size, as seen in Table 4. While mean scores for all Cultural Connectedness Indicator items increased after the intervention, the increases were significant for five of the seven items. Mean cultural identity clarity scores increased significantly, and the effect size of this improvement was high, $p < .001$. Scores for drawing strength from culture and were also significantly higher, with a medium effect size, $p = < .001$. Mean peer cultural competence, sense of belonging and salience of cultural continuity increased significantly $p = .008$; $p = .004$; $p = .01$, though with small effect sizes. The two cultural connectedness indicators for which increases were not significant (salience of cultural knowledge and collective self-esteem) had the highest pre-program mean scores.

Suicidal ideation

After participating in Project Yarn Circle, mean GHQ-28-SS scores decreased significantly from 7.16 to 6.61, $p = .043$, with a small effect size, as seen in Table 5. An exact McNemar's test determined that

Table 4. Cultural connectedness indicator item means, standard deviations, and t-tests pre- to post-program.

Indicator items	Pre		Post		t	p	Cohen's d
	M	SD	M	SD			
Sense of belonging	3.86	.90	4.13	.85	2.93	.004**	.28
Cultural identity clarity	3.55	.90	4.07	.79	7.35	<.001**	.70
Salience of cultural knowledge	4.49	.88	4.59	.64	1.23	.222	.12
Collective self-esteem	4.63	.69	4.70	.52	.95	.345	.09
Peer cultural competence	3.91	.88	4.16	.82	2.72	.008**	.26
Drawing strength from culture	3.91	.88	4.35	.71	5.16	<.001**	.49
Salience of cultural continuity	4.14	.86	4.33	.79	2.62	.010*	.25
Total Cultural Connectedness Score	28.49	4.12	30.32	3.63	5.51	<.001**	.52

* $p < .05$. ** $p < .01$ $n = 111$.

Table 5. Means, standard deviations, and t-test pre- to post-program.

Outcome Measures	Pre		Post		t	df	p	Cohen's d
	M	SD	M	SD				
Suicidal Ideation	7.16	3.52	6.61	3.32	2.05	91	.043*	.21
Positive Ideation (Reasons for Living)	22.44	4.76	23.60	4.97	2.66	92	.009*	.28
Self-Esteem	16.55	3.89	17.39	4.01	2.88	88	.005*	.31
Confidence in Help-seeking (people)	3.89	0.97	4.07	1.00	1.63	89	.106	.17
Confidence in Help-seeking (services)	3.68	1.05	3.95	0.93	2.17	84	.033*	.24

* $p < .05$. ** $p < .01$.

the percentage of individuals reporting current suicidal ideation fell from 41.3% to 29.3% which was significant ($p = .013$).

Positive ideation/reasons for living

PANSI-PI scores increased from 22.33 to 23.60 after the program. This difference was statistically significant although of a small effect size, $p = .009$, as seen in Table 5.

Self-esteem

Mean RSES post-intervention scores were significantly higher than pre-intervention scores, 16.55 as compared to 17.39, $p = .005$, with a small effect size.

Help-seeking

After participating in Project Yarn Circle, young people reported significantly higher confidence in seeking help from services or organisations during crises, ($p = .033$). Confidence to access support from people did not increase significantly, $t(p = .106)$.

Differences between participants that did and did not complete the program

As noted, many of the Project Yarn Circle participants did not complete both pre- and post- evaluation questionnaires. The participants who complete the pre-program questionnaire but not at the post-program time point were not found to differ significantly in terms of age ($t(129) = 1.48$, $p = .14$), suicidal ideation ($t(115) = 0.38$, $p = .71$), or self-esteem ($t(115) = 0.03$, $p = .95$) than the participants who were able to complete the program. Male students were less likely to complete the program than female students, $\chi^2(1) = 5.28$, $p = .02$.

Discussion

Aboriginal and Torres Strait Islander young people who participated in the *Project Yarn Circle* pilot experienced improved suicidality in both lower suicidal ideation and increased reasons for living/positive ideation. Participants also reported increased cultural connectedness and self-esteem. This program sought to use cultural knowledge and sharing with Elders to reduce suicide risk by promoting young peoples' connection to culture and the future. These findings are consistent with

previous studies which found that participation in cultural engagement programs was associated with reduced suicidal ideation and increased reasons for living for First Nations youth in international settings (Allen et al., 2018; Harder et al., 2015; Mohatt et al., 2014). A previous study found that participation in a cultural arts program among Aboriginal and Torres Strait Islander adults was associated with lower suicide risk (as measured through a program specific risk assessment), although cultural connectedness was not evaluated as a program outcome to determine if improvements in suicide-related outcomes co-occurred with increased cultural connection (Rasmussen et al., 2018). Therefore, this provides novel understandings of mechanisms to improve First Nations young people's suicidality through increasing cultural connectedness as this is the first program evaluation to explore improvements in suicide-related outcomes co-occurring with increased cultural connection for Aboriginal and Torres Strait Islander communities.

Connection to culture is proposed to reduce suicide risk by reinforcing young people's sense of connection to their own personal futures through perceived connection within a cultural lineage which stretches into the past and producing positive protections into the future (Chandler & Proulx, 2006, Gibson et al., 2021, Gone, 2013, Gooda, 2014, Snowshoe et al., 2017). As such, cultural connection may reduce suicide risk through increasing hope for and commitment to the future and preventing hopelessness for the future. This is considered particularly pertinent for Indigenous young people who may be presented with fewer images of positive Indigenous futures through the continued impacts of colonisation and discrimination. The protective directional pathways and potential buffering relationships between cultural connection, reasons for living and suicidal thinking remain unknown and require further examination to inform culturally-specific suicide prevention strategies.

While the Project Yarn Circle program content included considerable cultural education and knowledge components, participant' self-reported importance of learning about culture did not increase significantly. This may reflect that knowledge and education were seen as less pertinent than connection with facilitators, Elders, and peers to the participants, similar to other research in which the ongoing relational context and connections in which initiatives were delivered were valued over

educative content (Gibson et al., 2022). Local community members and Elders similarly advised that the program content could not be delivered as stand-alone program content because young people forming ongoing connections with community members, services, and Elders – as well as the prior organisational work to connect with local Elders, relevant cultural knowledge keepers – were critical to appropriate ways of connecting to culture and therefore the program's impact. This is consistent with reporting from other Aboriginal and Torres Strait Islander Elders and scholars in which connecting to culture was acknowledged as unable to be distilled as purely educative or informative but resting within the processes by which knowledge is shared and learning in context of building relationships and connections with community (Dudgeon et al., 2022; Gooda, 2014). This finding may also indicate that the individual components of cultural connectedness have different buffering relationships against Indigenous suicidality, which require further exploration to inform future initiatives.

The improvement in confidence to seek support from help-seeking services is a promising finding as the underservicing of First Nations people experience suicidality remains a significant barrier to reducing disparities (Soole et al., 2014; Westerman, 2010). Longitudinal follow-up is needed to determine if young people's improved confidence translates into increased help-seeking behaviours.

In utilising connection to culture as a key intervention mechanism and evaluating changes on young people's connection to culture over the program, the current study highlights the importance of applying community knowledges and theoretical models of change in suicide prevention. There is a need for further work to create culturally specific measures developed by First Nations communities to effectively evaluate community-led prevention initiatives.

Limitations

As there were no existing validated measures of cultural connectedness for Aboriginal and Torres Strait Islander young people, items needed to be created in conjunction with community members and facilitators to examine the changes of this program. While the items demonstrated good internal reliability, the items and scale were not able to be concurrently validated prior to the evaluation which limits the generalisability of the total cultural connectedness findings. As the communities that *Project Yarn Circle* were piloted within were predominantly urbanised areas,

programmatic results may be different for Aboriginal and Torres Strait Islander young people living in regional, remote, or discrete communities. In this pilot delivery, the collaborating schools have reported that they invited all Aboriginal and Torres Strait Islander students to participants. Unfortunately, the total number invited by schools – and therefore the number who declined to participate – is unknown, it is possible that there is selection bias in which young people choose to engage in a cultural knowledge and sharing program. Additionally, this limits understanding the acceptability of this initiative. Of note, fewer male students completed the post-program questionnaire which may have influenced the generalisability of the evaluation results. The sample size was limited by the difficulties matching pre- and post- questionnaires as well as number of young people who did not complete the program. Covid restrictions on school programs during this time also resulted in fewer sessions delivered and questionnaires completed than anticipated. Critically, the absence of a control group means that it is possible the changes were due to alternative occurrences beyond the program. Due to the limitations of the pilot project frames, it was not possible to follow-up with participants after the program. There is a need for further longitudinal research to determine if the findings are maintained over time. Continued delivery and evaluation is needed to examine if similar effects are observed in larger samples. As it was not possible to trial the program content with smaller groups of young people before the first delivery within the limited timeframe, there is a need for future research to explore young peoples' aspirations and needs for programs that promote cultural connectedness. A limitation of the current study is the lack of qualitative exploration of young people's experiences of the pilot program.

As with the majority of suicide prevention evaluations, suicide-related outcomes other than suicide deaths were measured (Leske et al., 2020; Mann et al., 2005; Zalsman et al., 2016), changes on which cannot be automatically presumed to translate to reduced suicidal deaths (Nock et al., 2008). Measuring changes in community suicide mortality rates require considerable time frames and scales beyond the scale of a pilot program (Gibbons, 2013; Huisman et al., 2010; Yip, 2011). However, as the effects of potentially protective emotions and cognitive processes cannot be examined on suicide mortality and can only be examined on "earlier" thoughts and behaviours on the continuum of suicidality (Sveticic & De Leo, 2012), the current findings provide important insights on both potential protective mechanisms and to guide further preventative programs.

Conclusion

The pilot evaluation results indicate that Aboriginal and Torres Strait Islander young people experienced decreased suicidal ideation and increased cultural connectedness, self-esteem and reasons for living/positive ideation after participating in the Project Yarn Circle program. This study outlines the design, implementation, and evaluation of a novel First Nations suicide prevention initiative and provides new evidence towards the potential effects of increasing cultural connectedness as a primary intervention mechanism in strategies to reduce suicide-related outcomes for Aboriginal and Torres Strait Islander young people.

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Data availability statement

Data not available – participant consent: The participants of this study did not give written consent for their data to be shared publicly, so due to the sensitive nature of the research supporting data is not available.

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