

Counting what counts: A systematic scoping review of instruments used in primary healthcare services to measure the wellbeing of Indigenous children and youth

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Abstract

Background

Primary healthcare services have principal responsibility for providing child and youth wellbeing and mental health services, but they have lacked appropriate measurement instruments to assess the wellbeing of Indigenous children and youth or to evaluate the effectiveness of programs and health service initiatives designed to address their needs. This literature review was conceived and conducted to respond to this identified need by assessing the availability and characteristics of measurement instruments that have been applied in primary healthcare services in Canada, Australia, New Zealand, Norway, and the United States (CANNZUS countries) to assess the wellbeing of Indigenous children and youth. Wellbeing was defined as a relational phenomenon encompassing individual, collective, cultural and spiritual domains.

Method

15 databases and 12 websites were searched in December 2017 and again in October 2021. Pre-defined search terms pertained to Indigenous children and youth, CANNZUS country names, wellbeing measurement, and primary healthcare services. PRISMA guidelines were followed, with eligibility criteria guiding screening of titles and abstracts, and selected full-text papers. Documented measurement instruments were then categorised according to four criteria that were deemed most likely to represent Indigenous child and youth experiences of wellbeing: adherence to relational strength-based constructs of Indigenous wellbeing, development for Indigenous populations, administration by child/youth self-report, and reliability and validity.

Results

17 publications (nine studies) were found, that described the development and/or use by primary healthcare services of 14 measurement instruments, employed across 27 applications. Four/14 measurement instruments focused solely on strength-based wellbeing concepts but none included all Indigenous wellbeing domains, four were developed specifically for Indigenous populations, six were administered through child/youth self-report, and 11 were reliable and valid.

Discussion

The measurement instrument that most closely adhered to our desirability criteria was the Canadian Aboriginal Children's Health and Well-Being Measure (ACHWM). Other measurement instruments rated with 2–3 desirability criteria were the Children's Global Assessment Scale (C-GAS), Outcome Rating Scale (ORS), Session Rating Scale (SRS), Strong Souls, Westerman Aboriginal Symptoms Checklist Youth (WASC-Y) and the YouthCHAT. This review supports several Australian research studies that are currently underway to develop measures/ screening tools to assess the wellbeing of Indigenous adolescents.

Background

How is wellbeing conceptualised, why is the wellbeing of Indigenous children and youth measured, by what process are the wellbeing measures decided, and who makes those decisions? These are critical questions being raised within the primary healthcare service delivery sector, and particularly by Aboriginal Community Controlled Health Organisations (ACCHOs). These questions speak to the values that underpin what counts in evaluations of services and programs for and with Indigenous children and youth.

The World Health Organization (WHO) recommended that the primary responsibility for child and youth wellbeing and mental health services lies with primary health care (rather than specialist) level, close to communities and with young peoples' active engagement in care [1]. Primary healthcare services provide and facilitate access to a spectrum of programs and services from mental health promotion, screening and early identification and diagnosis to treatment of mental disorders [2]. However, they have lacked appropriate measurement instruments to assess the wellbeing of Indigenous children and youth or to evaluate the effectiveness of programs and health service initiatives designed to address their needs.

It is well established that the school-aged years of childhood (defined in this review as 5–11 years old) and youth (defined as those aged 12–18 years old) are critical for fostering wellbeing, preventing mental illness and intervening early to improve life outcomes, since 75% mental illness globally starts by age 25 years Kessler, Berglund [3]. The World Health Organization recommended that youth mental health services are best provided at the primary health care (rather than specialist) level, close to communities and with young peoples' active

engagement in care [1]. Primary healthcare services provide and facilitate access to a spectrum of programs and services from mental health promotion, screening and early identification and diagnosis to treatment of mental disorders [2].

Furthermore, youth wellbeing is increasingly important in view of the global disruption caused by the COVID-19 pandemic to children's and youth education and wellbeing [4, 5]. At the peak of the COVID-19 pandemic, more than 90% of the world's students were locked out of their classrooms [6]. In Australia, a majority of parents/carers also reported a negative mental health impact of COVID-19 on child mental health and service barriers for Australian children aged 5–18 years, with higher proportions reporting this for older children [7]. In Canada, despite an initial expected increase in mental health service use through COVID-19 by children and youth, there was a general decline in service access, particularly within low-income neighborhoods [8], leading to concern that COVID-19 might exacerbate preexisting inequalities in access to health care.

Survey data from Australia suggest that the COVID-19 pandemic decreased the wellbeing and quality of life of Aboriginal and Torres Strait Islander (hereafter respectfully termed Indigenous Australian) adults, with those who were financially unstable or had elevated comorbidity being most affected [9]. An increased proportion of Indigenous Australian youth (aged 15–19 years) reported mental health as one of their top three personal issues of concern (2019 31.5%; 2020 33.7%; 2021 39.2%) [10–12]. A national survey did not measure levels of happiness, unfair treatment or stress in 2019, but found fewer Indigenous Australian youth reported that they were 'very happy' with their lives in 2021 (42%) than 2020 (45%); a higher proportion reported unfair treatment in 2021 (47%) than 2020 (39%), and a similar proportion reported high levels of stress in the previous 4 weeks in 2021 (43%) and 2020 (44%) [10–12]. However, Australian primary healthcare services have struggled to screen and support young Indigenous Australian clients: 73% of clients were not screened, no further action was taken for 25% for whom a social and emotional wellbeing (SEWB) concern was identified, and there was no follow up for just under half of those for whom action was taken [13]. Furthermore, another survey found that 77% of Indigenous Australian young people (18–24 years) with high levels of distress reported that they did not even see a primary healthcare professional [14]. Hence, the needs of Indigenous children and youth for mental health care services are often unmet [15]. This gap is recognised by Indigenous Australian primary healthcare services; in 2016–17, 63% reported their top service gap as a lack of mental health/SEWB services and 56% also reported youth services as a key service gap [16]. In part, this gap is exacerbated by a lack of reliable and feasible measurement instruments for screening Indigenous children and youth.

The wellbeing of Indigenous youth internationally, has often been measured using measurement tools designed for non-Indigenous populations [17, 18]. While the use of measurement tools validated with non-Indigenous populations allows comparison with other data sets and populations, most are inappropriate in terms of the way wellbeing is conceptualised, the language used to describe wellbeing, and the framing of norms of behaviour and emotional expression [17, 19]. Other options are to utilise Indigenous-specific measurement instruments - or to determine the validity of mainstream measures with Indigenous populations [20]. This paper reviews the literature to determine the evidence regarding the availability and characteristics of measurement tools that have been applied in primary healthcare services in Canada, Australia, New Zealand, Norway or the United States (CANNZUS countries) to measure the wellbeing of Indigenous children and youth (5–18 years).

A recent review by the International Group on Indigenous Health Measurement, a network of Indigenous and allied persons working in Canada, Australia, Aotearoa/New Zealand, and the United States, reviewed Indigenous concepts of wellbeing and found that internationally, Indigenous peoples understand wellbeing as a relational and multi-levelled phenomenon [18]. Indigenous views of wellbeing encompass individual (physical, mental and emotional), collective (family, kinship/tribal and community), cultural (language, cultural knowledge and cultural practice) and spiritual (spirituality, ancestors and land) domains [18]. For example, Indigenous Australians use the term SEWB to refer to connections of the self to and interconnections between physical health, mental/emotional health, kinship, community, culture, Country, and spirituality/ancestors [21]. Inuit, Métis, and First Nations Canadians understand the wellness of a strong and healthy person as derived from connections with the distinct waters, lands and natural world. The well person lives in relational harmony with others, with community and nation, as well as with the temporal and spirit worlds [22, 23]. The Aotearoa/New Zealand Māori *Whare tapa whā* model of health is based on four interconnected elements of life: the physical, emotional, mental, and spiritual [24]. American Indian and Alaska Native peoples also focus on a wholistic and collective view of wellness as physical and mental, cultural and spiritual, and in which lands and place play a prominent role [25]. In contrast, Western concepts understand wellbeing primarily at an individual level as a positive rather than neutral state [26]. McClintock, King [18] thus called for a robust literature review and analysis of common relevant wellbeing factors across Indigenous participant samples that is guided by principles of data sovereignty to support self-determination and governance.

Other Indigenous wellbeing reviews have focussed on interventions to enhance the wellbeing of Indigenous people generally [27–31] or youth more specifically [32–34]. There are also reviews that describe or evaluate measures of Indigenous wellbeing generally [35, 36]. To the best of our knowledge however, there is only one other review focused on measures of wellbeing specifically developed for (and none with) Indigenous youth. Williamson, Andersen [17] included fifty-four studies from CANZUS nations, published from 1998 to 2008 across any

setting (primary healthcare, school, child protection, juvenile justice etc.). They found that seventy-nine mental health instruments were used, but only 14% of instruments had been validated for the relevant Indigenous population [17].

This current review forms part of a broader program of work with Indigenous Australian primary healthcare services to improve primary healthcare systems and services that are tasked to promote the wellbeing of Indigenous children and youth [37–39]. It adds to previous reviews by identifying and describing the available literature (January 1989 to October 2021) about wellbeing and mental health measurement instruments used within primary healthcare settings in Canada, Australia, New Zealand, the United States, and Norway to screen Indigenous children and youth or measure intervention effects.

Methods

This review was conducted by leaders of a SEWB research program that forms part of the Australian Centre of Research Excellence for STRENGTHENING Indigenous healthcare Equity (CRE-STRIDE). The SEWB program of CRE-STRIDE aims to co-design, develop, apply and evaluate continuous quality improvement approaches to support the SEWB of Indigenous young people in Australia. The authors are current or former program leaders, the program's post-doctoral researcher, research assistants and a general practitioner. Four co-authors identify as Indigenous to Australia, and five identify as Australians no longer indigenous to place. The authors acknowledge the significance of Country, place and land in the work we do.

A systematic search was conducted to identify relevant studies that identified and described the available evidence on measures used in primary healthcare services to assess the wellbeing of Indigenous children and youth or the effects of programs for child and youth wellbeing in CANNZUS nations. Studies were included if they reported the development or use of measures. Heeding the call from Indigenous scholars for strengths-based rather than deficit-focussed research and practice [40], we used mainly strength-based terms in our search. Although we found many studies that used measurement tools with Indigenous children and youth in schools e.g. [41, 42], child protection e.g. [43] and juvenile justice settings e.g. [44], this review pertains solely on those used in primary healthcare settings. We also found studies that focussed on organisational performance criteria for the youth wellbeing services of primary healthcare services, e.g. [45], but excluded these on the basis that they did not measure the wellbeing of Indigenous children or youth.

Search strategy

SEARCH

A) **Electronic database search:** First, an exploratory search was carried out in the following databases and selected references were downloaded: Scopus / Elsevier, PubMed Clinical Queries and the Learning Ground Indigenous Education Research / ACER databases. A comprehensive search was then completed in: Medline (including Epub Ahead of Print, In-Process & Other Non-indexed Citations) / Ovid; Embase / Ovid; PsycINFO / Ovid; EBM Reviews - Cochrane Database of Systematic Reviews / Ovid; CINAHL / Ebsco; Global Health/ Ovid; ATSIHealth / Informit; APAIS-ATSIS / Informit; AIATSIS: Indigenous Studies Bibliography/ Informit; FAMILY-ATSIS / Informit; ERIC / Proquest; A+ Education / Informit; PAIS / Proquest; Sociological Abstracts / Proquest. A search in The Campbell Library database did not retrieve any relevant studies. Searches were completed on 6, 8-10, 12-18 December 2017. Searches were updated, completed on 21 October 2021.

Search strategy: The databases were searched with the terms below (and their corresponding subject headings in each database where specialised thesauri existed):

1. Indigenous OR Aborigin* OR "Torres Strait Island"* OR Inuit OR Māori OR Iwi OR Tangata Whenua OR "First Nation"* OR Metis OR "Native American"* OR "American Indian"* OR "Native Hawaiian" OR tribal OR Sami
2. adolescen* OR youth* OR young people OR young adult* OR child* OR teen* OR juvenile*
3. wellbeing OR mental health OR wellness OR healing OR *stress
4. screen* or assess* or path* OR model OR manage* OR refer* OR tool OR measure OR indicator
5. family OR families
6. Australia OR Canada OR USA OR New Zealand OR Norway
7. 4 OR 5
8. 1 AND 2 AND 3 AND 6 AND 7.

B) Websites manually searched

- Google Scholar and Google
- **Australia:** Indigenous HealthInfoNet; Closing the Gap Clearinghouse
- **Canada:** The National Collaborating Centre for Aboriginal Health; (National Aboriginal Health Organisation was closed); Health Council of Canada: Aboriginal Health
- **New Zealand:** Māori Health; Whakauae: Research for Māori Health and Development; MAI: A New Zealand Journal for Māori Health and Development
- **USA:** American Indian Health; National Indian Health Board; Centres for American and Alaska Native Health.
- **Norway:** No relevant websites in English could be found.

Grey literature search terms

1. Indigenous OR First Nation* OR Inuit OR Metis OR Aborigin* OR Torres Strait Island* OR Māori OR Iwi OR Tangata Whenua OR Native American* OR Native Alaskan* OR Native Hawaiian* OR Indian OR tribal **AND**
2. Wellbeing OR mental health **AND**
3. Screening OR assessment OR management OR referral

Inclusion/Exclusion Criteria:

An initial literature search was conducted of peer-reviewed and grey literature published in English from January 1989 to December 2017 (PhD theses were excluded). The start date was taken to coincide with the holistic view of Indigenous health identified by the Australian National Aboriginal Health Strategy Working Party (NAHS, 1989). A second search was conducted in October 2021 to update the review from 2018-2021. Publications were included which met the following criteria:

1. Target any Indigenous population in Canada, Australia, New Zealand, the United States or Norway. Focus was placed on Australian, the USA, Canada and New Zealand because they share similar British colonial legacies and health systems and common Indigenous understandings of wellbeing as a relational and multi-levelled phenomenon [18]. Norway was included as an example of a Nordic country with Indigenous (Sami) people which has innovations in many public policy areas, including child and adolescent wellbeing;
2. Indigenous children and youth aged 5-18 in the target group; and
3. Described or evaluated the development and/or use of wellbeing and/or mental health screening measures used with Indigenous children and youth or child and youth programs.

Data extraction & analysis:

Data extracted from the full texts of studies included: publication authorship, year and type; country and target group; sample size and measurement setting; measurement type and study design; outcome measures; reported outcomes; and study quality.

Assessing the appropriateness of measurement instruments

The measurement instruments were then categorised according to four desirability criteria: adherence to the relational strength-based constructs of Indigenous wellbeing, development for Indigenous populations, administration by child/youth self-report, and reliability and validity.

1. Constructs of Indigenous wellbeing

As outlined in the introduction, Indigenous views of wellbeing encompass relational and strengths-based concepts of wellbeing encompassing individual (physical, mental and emotional), collective (family, kinship/tribal and community), cultural (language, cultural knowledge and cultural practice) and spiritual (spirituality, ancestors and land) domains, whereas Western concepts understand wellbeing primarily at an individual level [18, 26]. Scales that predominantly measured mental distress or ill-being (e.g., depression, suicide ideation/risk, impulsivity and anxiety) provide little meaningful insight into wellbeing which is a positively loaded term that implies more than the absence of pathology or illness [46]. A focus of the measure on relational and strengths-based constructs was therefore considered desirable.

2. Development for Indigenous populations

Despite critiques of the development of measurement instrument specifically by or for Indigenous populations as being unable to be norm-referenced to the general population and hence potentially perpetuating unhelpful assumptions of difference and perceptions of disparity [e.g. 46], the benefits of specifically-developed Indigenous measurement tools was considered likely to encompass views of how Indigenous peoples conceptualise their wellbeing and, and useful in primary healthcare settings where benchmarking with the general population was not the priority need.

3. Administration by child/youth self-report

Administration by self-report is often considered problematic because it is commonly associated with bias; however, there *are* effective methods for controlling bias [47]. Studies with patient-reported outcomes were considered important because they incorporated ratings by the Indigenous children and/or youth themselves of their experiences or perceptions of wellbeing, including their emotions, motivations, spirituality, relationships and cultural connection [47]. Children and youth were considered to be experts about their own wellbeing [48, 49].

4. Reliability and validity

Various types of reliability and validity were documented for different instruments. Following Williamson, Andersen [17], the following definitions and scores were utilised. Reliability is the consistency of a measure. The types of reliability reported in included papers were: A) **test-retest reliability** over time (scored by Pearson product moment coefficients, with acceptable rating greater than 0.70), b) **internal consistency** across items (with acceptable alpha scores between 0.70–0.90), and c) **inter-rater reliability** across different researchers (with an acceptable score $\geq 75\%$ agreement). If any of these was recorded, the measure was considered to be reliable (see supplementary table 1).

Various types of validity were also reported. These included A) **Face/content validity**: considered present if evidence was provided that Indigenous children and youth participants had been given the opportunity to review and comment on the measures and judged the concepts to be appropriate. B) **Construct validity**: was established if there was documentation of experiments to demonstrate that the measure distinguished between people who did and did not have the measured characteristics. It included **Factorial validity**: evidence that the interrelationships between items had been examined to determine the underlying factors which account for correlations within a set of items; **Convergent validity**: evidence that there was a correlation greater than 0.40 between the scores on two instruments; and **Discriminant validity**: documentation of the extent to which scores on an instrument could distinguish between two groups. C) **Incremental validity**: documentation of the extent to which a proposed test provided unique information about a construct relative to that which was offered by other tests of the same construct (Garb, 2003; Hunsley and Meyer, 2003). D) **Criterion validity**: considered present if instrument scores were compared with a 'gold standard' e.g. clinical judgement or instrument scores predicted a relevant future outcome (predictive validity). If any of these types was reported, the measure was considered to be valid.

Results

A total of 17 papers were identified that evaluated or described wellbeing measures for Indigenous children and youth. Eight (47%) publications came from Australia, five (29%) from Canada, three (18%) from Aotearoa/New Zealand, one (6%) from the U.S.A, and none from Norway. The 17 papers represented nine studies and described the development and/or use of 14 measurement tools, employed across 27 applications. The publications are summarised in Table 1.

Table 1
Summary of the publications

Publication (yr)	Aim	Country	Measures	Target population of Indigenous children and youth		Purpose			
				General population	Specific mental health concerns	Development of Indigenous-specific tool	Trials of Western measures	Identification of wellbeing risks	Identification of wellbeing improvement
Clark 2014	✓	NZ	Children's Global Assessment Scale (C-GAS); Strengths and Difficulties Questionnaire (SDQ); Substance Abuse Choices Scale (SACS)	✓	✓				✓
Coffin 2019	✓	Aus	Strengths and Difficulties Questionnaire (SDQ)	✓			✓		
Goodyear-Smith 2016	✓✓	NZ	YouthCHAT; Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) for smoking; Generalised Anxiety Disorder 7 (GAD-7); Patient Health Questionnaire 9 (PHQ-9); Substance Abuse Choices Scale (SACS)	✓		✓			
Good-year-Smith 2017									
Harriss 2018	✓	Aus	Adapted Patient Health Questionnaire 9 (aPHQ-9)	✓					✓
Mitchell 2011	✓	USA	Kessler Distress Scale (K6+)	✓			✓	✓	
Sabbioni 2018	✓	Aus	Outcome Rating Scale (ORS); Session Rating Scale (SRS)	✓	✓		✓		✓

Publication (yr)	Aim	Country	Measures	Target population of Indigenous children and youth		Purpose			
				General population	Specific mental health concerns	Development of Indigenous-specific tool	Trials of Western measures	Identification of wellbeing risks	Identification of wellbeing improvement
Thomas 2010	✓	Aus	Strong Souls; Westerman Aboriginal Symptoms Checklist-Youth (WASC-Y); Kessler Distress Scale (K6+)	✓		✓✓		✓	
Williamson 2010	✓	Aus	Strengths and Difficulties Questionnaire (SDQ)	✓			✓		
Williamson 2014									
Williamson 2016									✓
Williamson 2018	✓	Aus	ED presentations and hospital admissions with primary mental health diagnosis		✓				
Young 2011	✓	Canada	Aboriginal Children's Health and Well-Being Measure (ACHWM)	✓		✓			
Young 2015									
Young 2015a									
Young 2016									
Young 2016a									

Type of measure, target population and purpose documented in the included publications

All 17 publications across four countries identified and described available wellbeing measurement tools [50–66]. Fourteen of the 17 publications (82%) targeted the general population of Indigenous children and youth, and three (18%) targeted Indigenous children and youth who had already reported mental health concerns [50, 62, 65].

Eight publications (three studies) described the development of an Indigenous-specific tool. Young, Wabano [56] described the co-creation with Indigenous Canadian children and youth, and other community members of the Aboriginal Children's Health and Well-Being Measure (ACHWM), and establishment of its validity [57], appropriateness [67] internal consistency and test–retest validity [68], specificity, negative predictive value, and sensitivity [58]. Thomas, Cairney [53] described the development of Strong Souls with Indigenous Australian youth; it was piloted alongside another Indigenous-specific tool, the Westerman Aboriginal Symptoms Checklist- Youth (WASC-Y). Goodyear-Smith described the acceptability and utility of the YouthCHAT, a youth-adapted version of the previously New Zealand-developed electronic Case-finding and Help Assessment Tool (e-CHAT) for primary care populations [51, 66].

Five publications described trials of the appropriateness and utility of standardised Western measures. Coffin [59] used the SDQ to augment observational improvements in the self-regulation, self-awareness, and socialisation skills of Indigenous Australian youth after their

participation in an equine assisted learning program. Mitchell and Beals [52] found the Kessler-6 (K-6) to be a useful complement to more traditional clinical decisions of presence or absence of disorders in native American youth. The K-6 results helped clinicians to understand the impact of psychological disorders more comprehensively, and to make more informed treatment recommendations and plans. Sabbioni, Feehan [65] trialled the Outcome Rating Scale (ORS) and Session Rating Scale (SRS) with Indigenous Australian youth and found that they were simple, brief, and appropriate, and successful in capturing clients' perspectives about their treatment progress and therapeutic bond; hence they represented a valuable alternative approach to standardised measures. Williamson, Redman [54] assessed the acceptability of the Strengths and Difficulties Questionnaire (SDQ). Indigenous Australian parents and Indigenous staff such as research assistants, youth workers, health staff and education officers reported that the SDQ was acceptable for use in Indigenous Australian Community Controlled Health Organisations, although changes were needed to the wording of some questions and the response scale to improve cultural appropriateness and clarity. A further publication from the same study, however, suggested value in limiting reliance on the peer relationships subscale and focusing instead on the SDQ total difficulties score [69].

Two publications from the same study identified wellbeing risks faced by Indigenous Australian children and youth. Williamson, D'Este [55] administered the SDQ to carers of Indigenous Australian youth clients of four ACCHOs and found that 72% were not at high risk for emotional or behavioural problems. After adjusting for demographic and health characteristics, the factors associated with good mental health were having a carer who was not highly psychologically distressed; not suffering from frequent chest, gastrointestinal or skin infections; and eating two or more servings of vegetables per day. Being raised by a foster carer and having lived in four or more homes since birth were associated with significantly lower odds of good mental health. Later, Williamson, Skinner [62] sought to inform policy and programs to reduce rates of mental illness by examining mental health-related emergency department (ED) presentations and hospitalisations of children recruited through four ACCHOs. They linked population health datasets to find that over a median of 6-year follow-up, there were 96 ED presentations affecting 62 children (10.7/1000 person-years) and 49 hospitalisations for mental health conditions affecting 34 children (5.5/1000 person-years). Presentations and admissions increased with age. Risk factors for ED presentation were living in foster care; high baseline child emotional/ behavioural problems; and caregiver chronic health conditions. Hospitalisations significantly increased when caregivers were unemployed and/or had chronic health problems.

Three publications provided evidence of youth wellbeing improvement outcomes. Clark, Johnson [50] evaluated a referral-based free counseling support service for New Zealand youth with mild to moderate mental health problems and reported significant improvements in global social and psychiatric functioning measured by C-GAS; reduced risk of clinically significant mental health concerns measured by SDQ ($p < .001$); and reduced use and impact of drugs/alcohol measured by SACS ($p < .001$). Harriss, Kyle [60] trialled a clinician-administered adapted PHQ-9 measure of depression as part of the Yarrabah Young Person's Health Check in 2016 and found that one-in-five young people had moderate–severe symptoms or self-harm ideation in the previous 2 weeks. They were referred to the mental health service and followed up by trained staff. The PHQ-9 screening process provided valuable 'space' to facilitate communication on sensitive issues and was straightforward and well accepted by staff and youth. Sabbioni, Feehan [65] documented the effectiveness of a culturally sensitive model within YouthLink, a state-wide mental health service program for young people in Western Australia. They found pre-post improvements in youth-administered ORS scores across the Western Australian YouthLink treatment period with a treatment effect size of 0.69. Overall, 65% of clients improved: 35% achieved clinical recovery and 30% achieved clinical cut-off by the final session, but 25% showed no change and 10% deteriorated. Therapeutic alliance (SRS scores) also increased between the first and last session and the final SRS correlated significantly with final ORS suggesting an association between therapeutic alliance and treatment outcome, although the difference lay just outside of statistical significance.

Fourteen measurement instruments were documented in the included publications. Their characteristics are outlined in Table 2.

Table 2
Characteristics of measurement instruments

Measurement instrument	Country	Relational strength-based constructs of Indigenous wellbeing	Developed for Indigenous children/youth	Administered through child/youth self-report	Valid and reliable
Aboriginal Children's Health and Well-Being Measure (ACHWM)	Canada	✓	✓	✓	✓
Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) for smoking	NZ	X	X	X	X
Children's Global Assessment Scale (C-GAS)	NZ	✓	X	X	✓
ED presentations and hospital admissions with a primary mental health diagnosis [62]	Aus	X	X	X	X
Generalised Anxiety Disorder 7 (GAD-7)	NZ	X	X	X	✓
Kessler Distress Scale abridged version (K6+)	Aus, USA	X	X	X	✓
Outcome Rating Scale (ORS)	Aus	✓	X	✓	✓
Patient Health Questionnaire 9 (PHQ-9 and a-PHQ-9) ¹	Aus NZ	X	X	X	✓
Session Rating Scale (SRS)	Aus	✓	X	✓	✓
Strengths and Difficulties (SDQ)	Aus NZ	~	X	X	✓
Strong Souls	Aus	~	✓	✓	✓
Substance Abuse Choices Scale (SACS)	NZ	X	X	X	✓
Westerman Aboriginal Symptoms Checklist- Youth (WASC-Y)	Aus	X	✓	✓	✓
YouthCHAT	NZ	~	✓	✓	X
1. a-PHQ 9 was adapted for use with an Australian Indigenous community[70]					

Adherence to the relational strength-based constructs of Indigenous wellbeing

Of the 14 measurement instruments, only four measured solely positive domains of wellbeing. These were the ORS (personal wellbeing, relational wellbeing, social wellbeing, and global wellbeing), SRS (elements of treatment sessions, including the therapeutic relationship, goals, topics, and global rating) [65]; ACHWM (spiritual, emotional, physical and mental health) [56, 57, 68]; and C-GAS (psychosocial functioning at home, at school, and with peers) [50]. Four measurement instruments measured a mixture of strengths and problems, including: Strong Souls (depression, anxiety, suicide risk, drug and alcohol use, impulsivity, anxiety and cultural resilience) [53]; WASC-Y (depression; suicidal behaviours; alcohol and drug usage; impulsivity, hyperactivity and agitation; anxiety; self-esteem; resilience to mental ill health)[53, 71]; SDQ (conduct problems, hyperactivity-inattention, emotional symptoms, peer problems, and prosocial behaviour) [50, 54, 55, 59, 69] and YouthCHAT (substance abuse, depression, anxiety, gambling, sexual orientation, sexual behaviour, exposure to abuse, anger control, physical inactivity, and readiness to change) [51, 66]. The other six measurement instruments focussed on identifying problems, including: the K-6 (feeling sad, nervous, restless or fidgety, hopeless, everything is an effort, or worthless) [52, 53]; SACs (substance use frequency, patterns, abuse and chemical dependency) [50, 51]; GAD (generalised anxiety) [51]; PHQ-9/a-PHQ-9 (depressive symptoms) [60]; ASSIST (smoking); and ED admissions and hospitalisations (hospitalisable mental health diagnosis) [62].

None of the instruments measured all four domains of Indigenous wellbeing as specified by McClintock, King [18]. All but one instrument (the C-GAS) measured some aspects of individual wellbeing (physical, mental and emotional). However, only four instruments encompassed aspects of collective wellbeing such as family, kinship/tribal, and community domains – the C-GAS (psychosocial functioning at home, at

school, and with peers), the ORS (relational wellbeing, social wellbeing, and global wellbeing), SRS (the therapeutic relationship, global rating) and SDQ (peer problems, prosocial behaviour)[50, 54, 55, 65, 69]. Only one instrument encompassed an aspect of cultural wellbeing such as language, cultural knowledge and cultural practice domains; Strong Souls included a measure of cultural resilience [53]. Finally, only one measurement instrument encompassed an aspect of spiritual wellbeing such as spirituality, ancestors and land domains; ACHWM included a measure of spiritual health [56–58, 63, 64].

Developed for Indigenous populations

Four of the 14 wellbeing measures had been developed specifically for Indigenous populations. These were the Canadian ACHWM [56–58, 63, 64], Australian Strong Souls [53] and WASC-Y [53], and Aotearoa/New Zealand YouthCHAT [51, 66]. The other 11 were standard Western tools, two of which had been adapted for Australian Indigenous populations [59, 60], and four tools had been translated into an Indigenous (Māori) language [51, 66].

Reporting of outcomes

Eleven of the 18 publications described patient-reported-outcomes (PROs) or child or youth self-report, with one exhibiting both patient-reported and non-patient-reported outcomes. The publications that included patient-reported outcomes focussed on the development of the Indigenous-specific YouthCHAT, Strong Souls, and ACHWM [51, 53, 56–58, 66–68], or the trialling of Western wellbeing measures, the K-6, ORS and SRS, with Indigenous children and youth populations [52, 65], and the identification of actual wellbeing outcomes for Indigenous children and youth [65].

Six publications described non-patient-reported outcomes (non-PRO). Non-patient-reported outcomes included parent/carer or clinician reporting or assessment on behalf of a child/youth. The studies for which non-PRO were used either trialled the Western SDQ measure with Indigenous children and youth populations [54, 69], used the SDQ and ED admissions/ hospitalisations to identify risk [55, 62] or actual wellbeing outcomes for Indigenous children and youth [50, 60].

Reliability and validity

Of the 17 publications, 10 papers [50–55, 65, 66, 68, 69] reported the reliability of 12 measurement instruments (the ACHWM, C-Gas, GAD, K-6, ORS, PHQ9, SDQ, SRS, Strong Souls, SACS, WASC(Y) and YouthCHAT. The most tested type of reliability was internal reliability.

The validity of the measure explored was described in 11 publications [50–54, 56, 57, 65–67, 69]. There was no consistency in the types of validity reported, rendering comparison impossible. The types included content, face, convergent, incremental, criterion, construct, and discriminant validity. Some studies reported the validity of the measure used with mainstream populations, but not for the study population [e.g. 50].

Discussion

This paper reviewed the instruments used to measure the wellbeing and/or the impacts of interventions on the wellbeing of Indigenous school-aged children in Canada, Australia, Aotearoa/New Zealand, Norway, and the United States. We found 17 papers that represented nine studies and described the development and/or use of 14 measurement tools, employed across 27 applications. Only four of the 14 measurement tools incorporated solely strength-based domains, four were developed specifically for Indigenous youth, eleven included child/youth reported outcomes, ten reported the reliability of measurement instruments, and ten reported at least one type of validity.

Indigenous researchers have called for data to be conceptualised and framed through strengths-focussed values that recognise the capacities and capabilities of Indigenous peoples [72]. This review however, found only four of the 14 individual wellbeing instruments measured solely strength-based domains of wellbeing and four measured a mixture of strengths and problems. In contrast, the other six measurement instruments focussed on deficits, dubbed by Walter [40] as the five 'Ds' of data on Indigenous people: disparity, deprivation, disadvantage, dysfunction and difference. The results of these latter measurement instruments were designed to be interpreted in the context of pathology [46]. Specifically, each of these scales comprise indicators of ill-being (e.g., depression, suicide ideation/risk, impulsivity and anxiety); therefore, they provide little meaningful insight into wellbeing which is a positive concept that implies more than the absence of pathology or illness. Furthermore, none of the wellbeing measurement instruments measured all four domains of the relational, multi-levelled construct of Indigenous wellbeing defined by McClintock, King [18].

Of the 14 different measurement instruments documented, four were developed specifically for Indigenous youth, which are likely to better reflect Indigenous relational concepts of wellbeing. However, only one of the Indigenous-developed tools encompassed solely strengths-based constructs (the ACHWM); the other three included a combination of strengths- and deficit-focussed constructs. Nuanced understandings of Indigenous wellbeing across countries and places within countries, also mean that the relevance of particular

measurement instruments might need to be tested with Indigenous children and youth in different places. For example, Young et al [e.g. 56, 57, 63] assured that the test–retest validity of the ACHWM meant that Aboriginal communities across Canada could use this measure with confidence, but advised that its relevance for Indigenous children in other regions of the world would need to be assessed [64]. Ten measurement instruments were standard Western individual child and/or youth wellbeing measurement tools (some of which were adapted and/or translated into an Indigenous language) which are generally based on understandings of wellbeing at an individual level [1]. The choice of measurement tool therefore needs to be carefully considered based on the purpose of administering a wellbeing measure (e.g. screening, evaluation), the characteristics of the child/youth population to whom it is being administered (e.g. age, place), and logistics of administration (e.g. resources, setting, time).

Eleven publications described patient-reported outcomes and six publications described non-patient-reported outcomes. Patient reported outcomes were considered important because the measure promotes the voices of children and youth in understanding their own wellbeing [56]. The reporting on wellbeing measures by children's and youth directly means that they speak for themselves, rather than being spoken for. Other studies have shown that service providers perceptions about what is needed for youth wellbeing differ from the views of young people themselves [73].

Our finding that ten of the included 17 publications reported the reliability of measurement instruments and ten publications reported at least one type of validity suggests that there have been some advances in determining the reliability and validity of instruments in the last 14 years [69]. At that time, Williamson et al. [17] reported that few Indigenous youth mental health studies used measurement instruments with previously determined reliability or validity. However, 12 of the documented measures found in this review exhibited some type of both reliability and validity. These included all four Indigenous-developed measures– ACHWM, Strong Souls, WASC -Y and YouthCHAT [50, 51, 53, 57, 67, 68] and eight standard measures - C-Gas [50], GAD [51], K-6 [52], ORS [65], PHQ [60], SDQ [50, 54, 69], SACS [50] and SRS [65].

When all four of the pre-defined desirability criteria for this review were applied, the ACHWM adhered to all. The ACHWM was assessed as having a strength-based focus and adherence to the relational constructs of Indigenous wellbeing, Indigenous-developed, based on child or youth self-report and valid and reliable. The brief Outcome Rating Scale and Session Rating Scales have not yet been cross-culturally validated but was considered more culturally appropriate and aligned with an Indigenous Australian perspective than standardised measurement instruments. Other measurement instruments rated with 2–3 of the desirability criteria were the C-GAS, SRS, Strong Souls, WASC-Y and the YouthCHAT. Further Australian research studies to develop new Indigenous child and youth wellbeing measures are in process [74–76].

This review was based on a systematic review of the published and grey literature using pre-defined terms and conducted by an experience librarian. However, all authors are located in Australia, so it is possible that we missed relevant papers and reports from Canada, New Zealand, Norway and the United States. The review is led by an Indigenous researcher and contributes to identifying measurement instruments that are developed for or have been applied in primary healthcare services to measure the wellbeing of Indigenous children and youth.

Conclusions

This review documents the state of evidence for the development and application of wellbeing measures applied in primary healthcare settings to measure the wellbeing of Indigenous children and youth. It was conducted at a point in time, in response to the concerns by Indigenous Australian primary healthcare services about the effects of COVID-19 on youth wellbeing, and the call by the International Group on Indigenous Health Measurement for a robust literature review of relevant wellbeing factors across Indigenous participant samples [18]. The review found that the measure that best adhered to the review's pre-defined desirability criteria, that is, having a strength-based focus and adherence to the relational constructs of Indigenous wellbeing, Indigenous-developed, based on child or youth self-report and valid and reliable, was the ACHWM. Other measurement instruments rated with 2–3 desirability criteria were the C-GAS, ORS, SRS, Strong Souls, WASC-Y and the YouthCHAT. This review supports several Australian research studies that are currently underway to develop measures/ screening tools to assess the wellbeing of Indigenous children and youth [74–76].

List Of Abbreviations

ACCHO Aboriginal Community Controlled Health Organisation

ACHWM Aboriginal Children's Health and Well-Being Measure

ASSIST Alcohol, Smoking and Substance Involvement Screening Test

CANNZUS Canada, Australia, New Zealand, Norway, and the United States

C-GAS Children's Global Assessment Scale,

e-CHAT electronic Case-finding and Help Assessment Tool

ED Emergency Department

GAD-7 Generalised Anxiety Disorder 7

K-6 Kessler Distress Scale

NAHS National Aboriginal Health Strategy Working Party

non-PRO non-patient-reported outcomes

ORS Outcome Rating Scale

PHQ-9 Patient Health Questionnaire 9

PROs patient-reported-outcomes

SACS Substance Abuse Choices Scale

SDQ Strengths and Difficulties Questionnaire

SEWB social and emotional wellbeing

SRS Session Rating Scale

WASC-Y Westerman Aboriginal Symptoms Checklist Youth

youthCHAT Youth Case-finding and Help Assessment Tool

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data and materials

All data generated or analysed during this study are included in this published article [and its supplementary information files].

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

VS and JM conceptualised the review; ST searched the grey literature; VS, JM, SC, DA, CA, CJ and GS screened publications for inclusion; CJ and ST extracted data from the included publications; VS, JM, SC, DA and CJ interpreted data; VS and JM drafted the work; all authors reviewed and revised the manuscript; all authors approved the submitted version; all authors agreed to be accountable for the manuscript.

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Authors' information

The authors are five current or former program leaders (JM, SC, DA, CA, YCJ) of the Centre for Research Excellence in Strengthening Systems for Indigenous Healthcare Equity's social and emotional wellbeing program of research and the program's post-doctoral researcher (VS), two research assistants (ST and CJ) and a general practitioner (GS). Four co-authors identify as Indigenous to Australia (VS, SC, CA, YCJ), and five identify as Australians no longer indigenous to place (JM, DA, CJ, ST, GS).

References

1. World Health Organization and Wonca, *Integrating mental health into primary care: a global perspective*, W.H.O.a.a.W.O.o.F.D. (Wonca), Editor. 2008, WHO: Singapore.
2. Servili, C., *An international perspective on youth mental health: The role of primary health care and collaborative care models*. Journal of the Canadian Academy Child and Adolescent Psychiatry, 2012. **21**(2): p. 127–129.
3. Kessler, R.C., et al., *Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication*. Arch Gen Psychiatry, 2005. **62**(6): p. 593–602.
4. United Nations Educational, S. and C. Organization, *Global education monitoring report 2020: inclusion and education: all means all*. 2020, UNESCO: Paris. p. [436] p.
5. Lee, J., *Mental health effects of school closures during COVID-19*. Lancet Child Adolesc Health, 2020. **4**(6): p. 421.
6. OECD *The impact of Covid-19 on student equity and inclusion*. Tackling Coronavirus (Covid-19): Contribution to a global effort, 2020.
7. Biddle, N. and M. Gray, *Tracking wellbeing outcomes during the COVID-19 pandemic (January 2022): riding the Omicron wave*. 2022: Centre for Social Research and Methods (ANU).
8. Stewart, S.L., et al., *Following the Epidemic Waves: Child and Youth Mental Health Assessments in Ontario Through Multiple Pandemic Waves*. Frontiers in Psychiatry, 2021. **12**.
9. Gall, A., et al., *Self-reported wellbeing and health-related quality of life of Aboriginal and Torres Strait Islander people pre and post the first wave of the COVID-19 2020 pandemic*. Australian and New Zealand Journal of Public Health, 2022. **46**(2): p. 170–176.
10. Tiller, E., et al., *Youth Survey Report 2021*, Mission Australia: Sydney, NSW.
11. Tiller, E., et al., *Youth Survey Report 2020*. 2020, Mission Australia: Sydney, NSW.
12. Carlisle, E., et al., *Youth Survey Report 2019*. 2019, Mission Australia: Sydney, NSW.
13. Langham, E., et al., *Social and Emotional Wellbeing Screening for Aboriginal and Torres Strait Islanders within Primary Health Care: A Series of Missed Opportunities?* Frontiers in Public Health, 2017. **5**(159).
14. Australian Institute of Health and Welfare, *Indigenous Australians' access to and use of health services*, in *Australia's health 2018*, AIHW, Editor. 2018, AIHW: Canberra. p. 1–4.
15. Lopez-Carmen, V., et al., *Working together to improve the mental health of indigenous children: A systematic review*. Children and Youth Services Review, 2019. **104**: p. 11.
16. AIHW, *Aboriginal and Torres Strait Islander health organisations: Online Services Report*, AIHW, Editor. 2017: Canberra.
17. Williamson, A., et al., *Measuring mental health in Indigenous young people: A review of the literature from 1998–2008*. Clinical Child Psychology and Psychiatry, 2013. **19**(2).
18. McClintock, K., et al., *A collaboration to inform the development of an Indigenous wellbeing instrument*. Joournal of Indigenous wellbeing, 2021. **6**(3): p. 31–46.
19. Garvey, G., et al., *The Fabric of Aboriginal and Torres Strait Islander Wellbeing: A Conceptual Model*. International Journal of Environmental Research and Public Health, 2021. **18**(15): p. 7745.
20. Haswell, M., et al., *Challenges of Measuring the Mental Health of Indigenous Australians: Honouring Ethical Expectations and Driving Greater Accuracy*. Australasian psychiatry: bulletin of Royal Australian and New Zealand College of Psychiatrists, 2007. **15** Suppl 1: p. S29-33.
21. Gee, G., et al., *Aboriginal and Torres Strait Islander social and emotional wellbeing*, in *Working Together: Aboriginal and Torres Strait Islander Mental Health and Wellbeing Principles and Practice*, H.M.R.W. P. Dudgeon, Editor. 2014, Commonwealth of Australia: Canberra. p. 55–68.

22. King, M., A. Smith, and M. Gracey, *Indigenous health part 2: the underlying causes of the health gap*. Lancet, 2009. **374**(9683): p. 76–85.
23. Wilson, K., *Therapeutic landscapes and First Nations peoples: an exploration of culture, health and place*. Health Place, 2003. **9**(2): p. 83–93.
24. Durie, M.H., *A Maori perspective of health*. Soc Sci Med, 1985. **20**(5): p. 483–6.
25. Connolly, M., *Issues in counting American Indians and measuring Indigenous wellness and resiliency in the United States: Tribal, community and individual factors in The International Group for Indigenous Health Measurement*. 2017: Atlanta Georgia.
26. World Health Organization, *Investing in mental health*, Department of Mental Health and Substance Dependence, Editor. 2003, WHO: Geneva, Switzerland.
27. Garvey, D., *A review of the social and emotional wellbeing of Indigenous Australian peoples – considerations, challenges and opportunities*. 2008, Australian Indigenous Health InfoNet: Perth.
28. Day, A. and A. Francisco, *Social and emotional wellbeing in Indigenous Australians: identifying promising interventions*. Australian and New Zealand Journal of Public Health, 2013. **37**(4): p. 350–355.
29. Bainbridge, R., et al., *Evidence Check: Improving social and emotional wellbeing for Aboriginal and Torres Strait Islander people*. 2018, Sax Institute and Beyond Blue: Sydney.
30. Stevens, A., *Aboriginal Social and Emotional Wellbeing Models of Care* 2018, Mental Health Commission of New South Wales: Sydney.
31. Kisely, S., et al., *The prevalence of depression and anxiety disorders in indigenous people of the Americas: A systematic review and meta-analysis*. Journal of Psychiatric Research, 2017. **84**: p. 137–152.
32. Haswell, M., et al., *The social and emotional wellbeing of indigenous youth. Reviewing and extending the evidence and examining its implications for policy and practice*. 2013, Muru Marri Indigenous Health Unit, University of New South Wales: Sydney.
33. Jongen, C., et al., *Instruments for Measuring the Resilience of Indigenous Adolescents: An Exploratory Review*. Frontiers in public health, 2019. **7**: p. 194–194.
34. Gupta, H., et al., *A scoping review about social and emotional wellbeing programs and services targeting Aboriginal and Torres Strait Islander young people in Australia: understanding the principles guiding promising practice*. BMC Public Health, 2020. **20**(1): p. 1625.
35. Newton, D., et al., *A review of Evidence-Based Evaluation of Measures for Assessing Social and Emotional Well-Being in Indigenous Australians*. Australian Psychologist, 2015. **50**(1): p. 40–50.
36. Le Grande, M. and e. al, *Social and emotional wellbeing assessment instruments for use with Indigenous Australians: A critical review*. Social Science and Medicine, 2017. **187**: p. 164–173.
37. McCalman, J., et al., *Continuous quality improvement and comprehensive primary healthcare: a systems framework to improve service quality and health outcomes*. Frontiers in Public Health, 2018.
38. McCalman, J., et al., *Systems integration to promote the mental health of Aboriginal and Torres Strait Islander children: protocol for a community-driven continuous quality improvement approach*. BMC Public Health, 2020. **20**(1): p. 1810.
39. McCalman, J., et al., *Integrating healthcare services for Indigenous Australian students at boarding schools: A mixed-methods sequential explanatory study*. International Journal of Integrated Care, 2020. **20**(8): p. 1–16.
40. Walter, M., *Data politics and Indigenous representation in Australian statistics*. 2016.
41. Tomy, A.J., M.D. Fuller Tyszkiewicz, and J.M. Norrish, *The Psychometric Equivalence of the Personal Wellbeing Index School-Children for Indigenous and Non-Indigenous Australian Adolescents*. Journal of Happiness Studies, 2014. **15**(1): p. 43–56.
42. Tomy, A.J., J.M. Norrish, and R.A. Cummins, *The Subjective Wellbeing of Indigenous Australian Adolescents: Validating the Personal Wellbeing Index-School Children*. Social Indicators Research, 2013. **110**(3): p. 1013–1031.
43. Gilgun, J.F., *The 4-D: Strengths-Based Assessment Instruments for Youth, Their Families, and Communities*. Journal of Human Behavior in the Social Environment, 2004. **10**(4): p. 51–73.
44. Stathis, S.L., et al., *Use of the Westerman Aboriginal Symptoms Checklist - Youth (WASC-Y) to screen for mental health problems in Indigenous youth in custody*. Advances in Mental Health, 2012. **10**(3).
45. Oostermeijer, S., et al., *Implementing child and youth mental health services: early lessons from the Australian Primary Health Network Lead Site Project*. International Journal of Mental Health Systems, 2021. **15**(1) (no pagination).
46. Tomy, A.J. and R.A. Cummins, *The subjective wellbeing of high-school students: validating the personal wellbeing index–school children*. Social indicators research: an international and interdisciplinary journal for quality of life measurement, 2011. **101**: p. 405–418.
47. Cook, C., *Mode of administration bias*. The Journal of manual & manipulative therapy, 2010. **18**(2): p. 61–63.
48. Wyatt, Z. and L. Oliver, *Y-Change: Young People as Experts and Collaborators*. Journal of social work education, 2016.

49. Lopez-Carmen, V., et al., *Working together to improve the mental health of indigenous children: A systematic review*. Children and Youth Services Review, 2019. **104**: p. 104408.
50. Clark, T.C., et al., *Facilitating access to effective and appropriate care for youth with mild to moderate mental health concerns in new zealand*. Journal of Child & Adolescent Psychiatric Nursing, 2014. **27**(4): p. 190–200.
51. Goodyear-Smith, F., A. Corter, and H. Suh, *Electronic screening for lifestyle issues and mental health in youth: a community-based participatory research approach*. BMC Medical Informatics & Decision Making, 2016. **16**(1): p. 140.
52. Mitchell, C.M. and J. Beals, *The utility of the Kessler Screening Scale for Psychological Distress (K6) in two American Indian communities*. Psychological Assessment, 2011. **23**(3): p. 752–61.
53. Thomas, A., et al., *Strong Souls: Development and validation of a culturally appropriate tool for assessment of social and emotional well-being in Indigenous youth*. Australian and New Zealand Journal of Psychiatry, 2010. **44**(1): p. 40–48.
54. Williamson, A., et al., *Acceptability of an emotional and behavioural screening tool for children in Aboriginal Community Controlled Health Services in urban NSW*. Australian and New Zealand Journal of Psychiatry, 2010. **44**(10): p. 894–900.
55. Williamson, A., et al., *What are the factors associated with good mental health among Aboriginal children in urban New South Wales, Australia? Phase I findings from the Study of Environment on Aboriginal Resilience and Child Health (SEARCH)*. BMJ Open, 2016. **6**(7): p. e011182.
56. Young, N.L., et al., *Process for creating the Aboriginal Children's Health and Well-being Measure (ACHWM)*. Canadian Journal of Public Health, 2013. **104**(2): p. e136-e141.
57. Young, N.L., et al., *Validity of the Aboriginal children's health and well-being measure: Aaniish Naa Gegii?* Health & Quality of Life Outcomes, 2015. **13**: p. 148.
58. Young, N.L., et al., *A screening mechanism to recognize and support At-Risk aboriginal children*. Canadian Journal of Public Health, 2016. **107**(4–5): p. e399-e403.
59. Coffin, J., *The Nguudu Barndimanmanha Project-Improving Social and Emotional Wellbeing in Aboriginal Youth Through Equine Assisted Learning*. Front Public Health, 2019. **7**: p. 278.
60. Harriss, L.R., et al., *Screening for depression in young Indigenous people: Building on a unique community initiative*. Australian Journal of Primary Health, 2018. **24**(4): p. 343–349.
61. Williamson, A., et al., *The Construct Validity of the Strengths and Difficulties Questionnaire for Aboriginal Children Living in Urban New South Wales, Australia*. Australian Psychologist, 2014. **49**(3): p. 163–170.
62. Williamson, A., et al., *Mental health-related emergency department presentations and hospital admissions in a cohort of urban Aboriginal children and adolescents in New South Wales, Australia: findings from SEARCH*. BMJ Open, 2018. **8**(11): p. e023544.
63. Young, N.L., et al., *Assessing children's interpretations of the Aboriginal Children's Health and Well-Being Measure (ACHWM)*. Health and Quality of Life Outcomes, 2015. **13**(1): p. 105.
64. Young, N.L., et al., *Reliability of the Aboriginal Children's Health and Well-Being Measure (ACHWM)*. SpringerPlus, 2016. **5**(1): p. 2082–2082.
65. Sabbioni, D., et al., *Providing culturally informed mental health services to aboriginal youth: The youthlink model in western australia*. Early Intervention in Psychiatry, 2018. **12**(5): p. 987–994.
66. Goodyear-Smith, F., et al., *Screening for risky behaviour and mental health in young people: the YouthCHAT programme*. Public Health Reviews, 2017. **38**(1): p. 20.
67. Young, N.L., et al., *Assessing children's interpretations of the Aboriginal Children's Health and Well-Being Measure (ACHWM)*. Health and quality of life outcomes, 2015. **13**(1): p. 105.
68. Young, N.L., et al., *Reliability of the Aboriginal Children's Health and Well-Being Measure (ACHWM)*. Springer Plus, 2016. **5**(1): p. 1.
69. Williamson, A., et al., *The construct validity of the strengths and difficulties questionnaire for Aboriginal children living in urban New South Wales, Australia*. Australian Psychologist, 2014. **49**(3): p. 163–170.
70. Hackett, M., et al., *Getting it Right: validating a culturally specific screening tool for depression (aPHQ-9) in Aboriginal and Torres Strait Islander Australians*. Medical Journal of Australia, 2019. **211**: p. 24–30.
71. Little, J., *Confirmatory Factor Analysis of the Westerman Aboriginal Symptom Checklist, Youth (aged 13–17 years)*, in *The WASC-Y manual. The cultural and clinical validation guidelines for the administration of the WASCY*, T.G. Westerman, Editor. 2007, IPS: Perth.
72. Bryant, J., et al., *Beyond deficit: 'strengths-based approaches' in Indigenous health research*. Sociology of Health & Illness, 2021. **43**(6): p. 1405–1421.

73. McCalman, J., et al., *The availability, appropriateness, and integration of services to promote Indigenous Australian youth wellbeing and mental health: Indigenous youth and service provider perspectives* in press.
74. Bainbridge, R., et al., *Strengthening Indigenous adolescent mental health and wellbeing*. 2019, Australia Research Council.
75. Spurling, G., *Co-creation of evidence-based systematic detection of social and emotional wellbeing concerns for Aboriginal and Torres Strait Islander young people in primary care with a view to testing a health assessment with national application*. 2019, NHMRC.
76. Howard, K., et al., *Development and validation of an Indigenous Quality of life and Wellbeing Index (IQWI) for health decision-making*. 2016, National Health and Medical Research Council

Figures

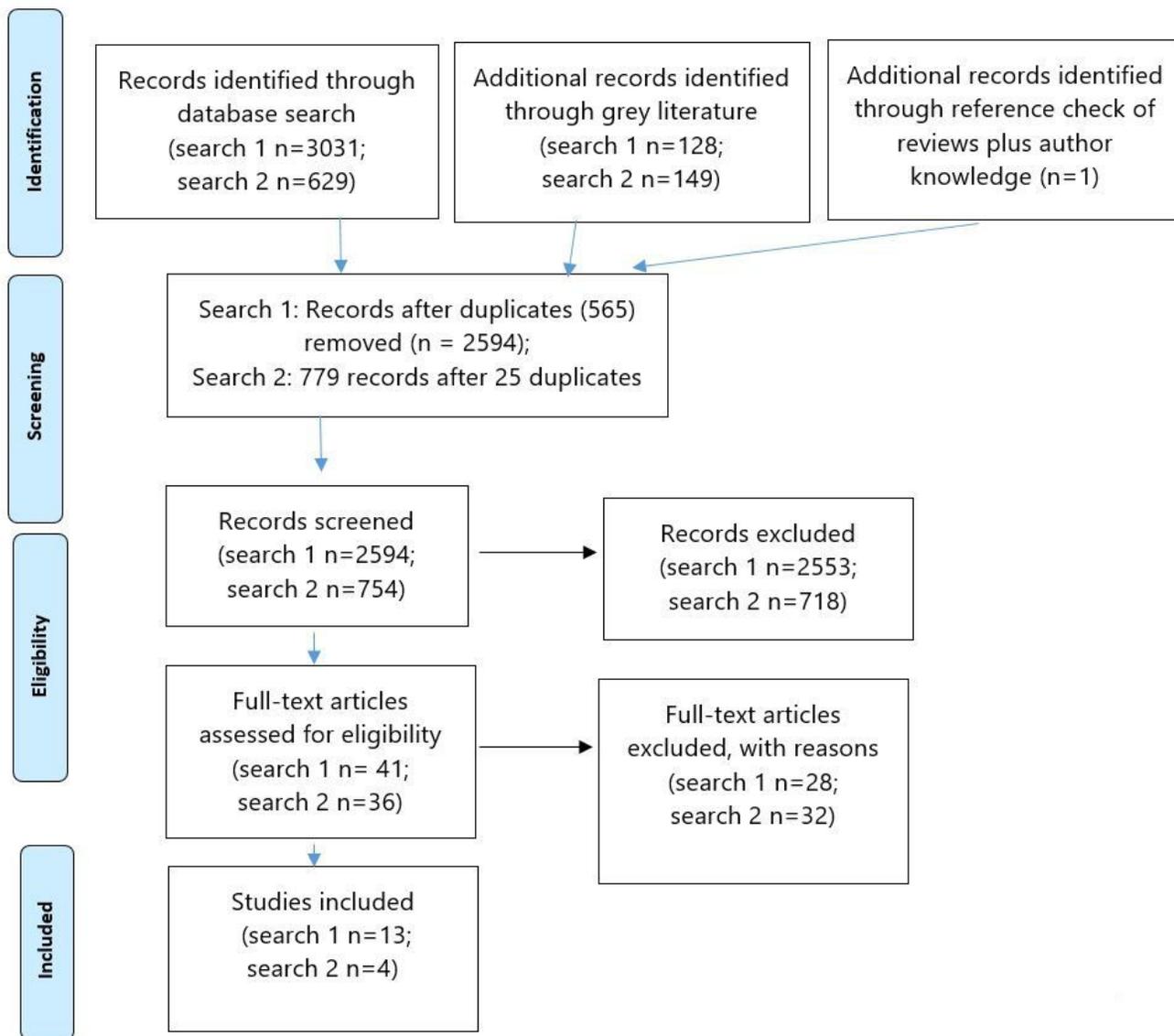


Figure 1

PRISMA flow diagram of search strategy search 1

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