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Development of the What Matters 2 Adults (WM2A) wellbeing measure for Aboriginal and Torres Strait Islander adults

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ABSTRACT

Purpose: As wellbeing is culturally bound, wellbeing measures for Aboriginal and Torres Strait Islander peoples must be culturally relevant and grounded in Aboriginal and Torres Strait Islander values and preferences. We describe the development of a nationally-relevant and culturally grounded wellbeing measure for Aboriginal and Torres Strait Islander adults: the What Matters to Adults (WM2A) measure.

Methods: We used a mixed methods approach to measure development, combining Indigenist methodologies and psychometric methods. Candidate items were derived through a large national qualitative study. Think-aloud interviews (n = 17) were conducted to assess comprehension, acceptability, and wording of candidate items. Two national surveys collected data on the item pool (n = 312, n = 354). Items were analysed using exploratory factor analysis (EFA), and item response theory (IRT) to test dimensionality, local dependence and item fit. A Collaborative Yarning approach ensured Aboriginal and Torres Strait Islander voices were privileged throughout.

Results: Fifty candidate items were developed, refined, and tested. Using EFA, an eight factor model was developed. All items met pre-specified thresholds for maximum endorsement frequencies, and floor and ceiling effects; no item redundancy was identified. Ten items did not meet thresholds for aggregate adjacent endorsement frequencies. During Collaborative Yarning, six items were removed based on low factor loadings (<0.4) and twelve due to conceptual overlap, high correlations with other items, endorsement frequencies, and/or low IRT item level information. Several items were retained for content validity. The final measure includes 32 items across 10 domains (Balance & control; Hope & resilience; Caring for others; Culture & Country; Spirit & identity; Feeling valued; Connection with others; Access; Racism & worries; Pride & strength).

Conclusions: The unique combination of Indigenist and psychometric methodologies to develop WM2A ensures a culturally and psychometrically robust measure, relevant across a range of settings and applications.

1. Introduction

Wellbeing (sometimes termed Quality of life (QOL) or subjective well-being) is a broad and multidimensional concept defined as 'an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns'.[World Health Organization, 1995, p1403] Most existing measures are grounded within Western, often biomedical, constructs such as health related quality of life (HRQOL), rather than considering broader constructs of quality of life and wellbeing [Angell et al., 2016]. Understandings of quality of life and wellbeing are culturally bound, meaning measures need to account for cultural differences in the conception and experience of wellbeing. While there has been increasing interest in developing culturally specific

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wellbeing measures, most often this has been attempted by adapting the wording, or translation, of existing instruments [Le Grande et al., 2017; Garvey et al., 2015] for culturally and linguistically diverse respondents [Crosby et al., 2003]. This approach ignores the fact that culture can impact the relevance of the instrument content [Herdman et al., 1997], and fails to address the need to capture critical dimensions of wellbeing relevant to specific populations [Traube et al., 2010; Butler et al., 2019, Gall et al., 2021].

Increasingly, clinicians, researchers and policy makers are interested in measuring wellbeing to inform policy and practice [Angell et al., 2016; Bullinger and Quitmann, 2014; Møller et al., 2020]. In Australia, health and wellbeing inequities experienced by Aboriginal and Torres Strait Islander people have persisted and, in some cases, increased [Commonwealth of Australia], with poorer health outcomes and lower life expectancy than other Australians. [Australian Institute of Health and Welfare, 2020; Australian Bureau of Statistics] These inequalities have persisted due to ongoing colonisation, and the ensuing marginalisation, social inequality, racism and the social and political circumstances experienced by Aboriginal and Torres Strait Islander Australians [Paradies, 2016; Deravin et al., 2018]. In addition, there is a gap in recognising the protective factors such as cultural identity, connection to family and access to traditional lands that can positively influence the overall health and wellbeing of Aboriginal and Torres Strait Islander peoples [Australian Bureau of Statistics; Verbunt et al., 2021; Hunter et al., 2021]. Research that addresses the deficit discourse is needed to understand the nature and impact of protective factors on Aboriginal and Torres Strait Islander wellbeing to build an evidence base that prioritises their worldviews and cultural strengths. A fundamental step is understanding wellbeing from Aboriginal and Torres Strait Islander perspectives and having a measure of wellbeing that assesses and prioritises their perspectives and values [Kite and Davy, 2015].

There is a notable absence of wellbeing measures that are holistic, valid and robust, and include concepts and dimensions that are relevant to Aboriginal and Torres Strait Islander people. Many measures used with Aboriginal and Torres Strait Islander people have simply involved an adaptation of wording of existing instruments, rather than using a ground-up development process to consider what actually matters for First Nations peoples [Garvey et al., 2016]. A global systematic review reported a lack of Indigenous specific quality of life measures and highlighted the need for such measures [Angell et al., 2016]. A small number of Australian studies, mainly conducted within discrete Aboriginal and Torres Strait Islander communities, settings or populations, have identified some important aspects of wellbeing[Doyle et al., 2013; Greiner et al., 2005; Yap and Yu, 2016; Smith et al., 2020]. The Mayi Kuwayu study is a recent survey with content based on established or modified instruments, or developed through an individual and community consultation process; it includes items on cultural practice and expression, sociodemographic factors, health and wellbeing, health behaviours, experiences and environments, and family support and connection [Jones and Thurber, 2018]. Our own study [Garvey et al., 2021a, 2021b; Howard et al., 2020] is one of the few that has developed a holistic culturally derived measure of wellbeing that combines Indigenist methodologies with psychometric approaches.

This paper describes the development of a measure of wellbeing for Aboriginal and Torres Strait Islander adults – the What Matters to Adults (WM2A) measure - utilising methodologies that are both culturally and scientifically robust to redress the enduring process of colonial disempowerment and marginalisation of Aboriginal and Torres Strait Islander people and their voices.

2. Methods

The WM2A was developed broadly following an established three-stage development and validation process [Boateng et al., 2018], considered best practice for developing and evaluating scales and patient-reported outcome measures (PROMs). The process was adapted to incorporate Indigenist methodologies, qualitative methodologies such as Think Aloud methods [Charters E, 2003; Wolcott and Lobczowski, 2021], and classical and modern psychometric approaches. Broadly, the three stages involved 1) item development and generation, 2) scale development including item modification and reduction (using exploratory factor analysis), and 3) psychometric evaluation using Item Response Theory approaches. The Stage 1 qualitative analyses and conceptual model development used indigenist and qualitative methodologies, and is reported separately [Garvey et al., 2021a, 2021b]. Stages 2 and 3 incorporated psychometric approaches rooted in Western traditions alongside an embedded process of constantly seeking advice on the results and agreement on the development decisions made from Aboriginal and Torres Strait Islander people who were included in the study in a variety of roles. Fig. 1 outlines the process.

2.1. Privileging the views, words and values of Aboriginal and Torres Strait Islander Australians

Narratives of deficit are pervasive throughout much research on the health of Aboriginal and Torres Strait Islander peoples. Deficit discourse is a 'mode of thinking' that is overly concerned with 'risk behaviours', with Aboriginal and Torres Strait Islander people being seen as 'problems to be fixed' rather than as peoples with a variety of cultural and other strengths and agency [Fforde et al., 2013, Fogarty et al., 2018, Kite and Davy, 2015; Taylor 2007; Rigney, 1999]. Deficit approaches are often deeply racialized, being perpetuated through ongoing settler-colonial discourse that privileges Western forms of knowledge and ways of living as superior to Indigenous ways of knowing and being [Bainbridge et al., 2013].

Given this enduring process of colonial disempowerment and marginalisation of Aboriginal and Torres Strait Islander Australians, processes and approaches for measure development must employ Indigenist methodologies and be underpinned by a strengths-based approach [Kite and Davy, 2015; Taylor 2007; Rigney, 1999, Bryant et al., 2021]. Therefore, underpinning the three research stages, and fundamental to our development approach for this new wellbeing measure, was a commitment to privileging Aboriginal and Torres Strait Islander voices, ideas, words and conceptualisations of wellbeing [Garvey et al., 2021a, 2021b] at each stage of this process. An explicit decision was taken by the research group to embed accepted psychometric processes within an iterative Collaborative Yarning approach [Shay, 2021] that constantly reflected, cross-referenced and privileged Aboriginal and Torres Strait Islander voices and views from our earlier Yarning Circles [Garvey et al., 2021a, 2021b], including consideration of and reflection on the ideas and words used by the Yarning participants. To this end, a Collaborative Yarning approach provided complementary and contextual information to the quantitative psychometric analyses and guided item selection and domain structure to ensure Aboriginal and Torres Strait Islander voices, values and worldviews were forefront. This Collaborative Yarning approach involved the iterative interpretation, reflection, discussion and re-specification of analyses, as needed, through an Indigenous-led small sub-group of the research team, and ongoing regular discussion with the Indigenous Project Advisory Group (IPAG) and Indigenous Researcher Group (IRG).

2.2. Indigenous governance and Indigenous data Sovereignty

Our governance framework has ensured continued cultural, clinical, and research oversight to maximise real-time knowledge sharing by establishing an Indigenous Project Advisory Group (IPAG) at the WM2Adults Program inception. The IPAG consisted of representatives of key Aboriginal and Torres Strait Islander stakeholder groups and community members. The IPAG guided the overall program of work including the research methods, data stewardship and custodianship and data interpretation throughout. An Indigenous Researchers Group (IRG) was also formed and comprised Aboriginal and Torres Strait

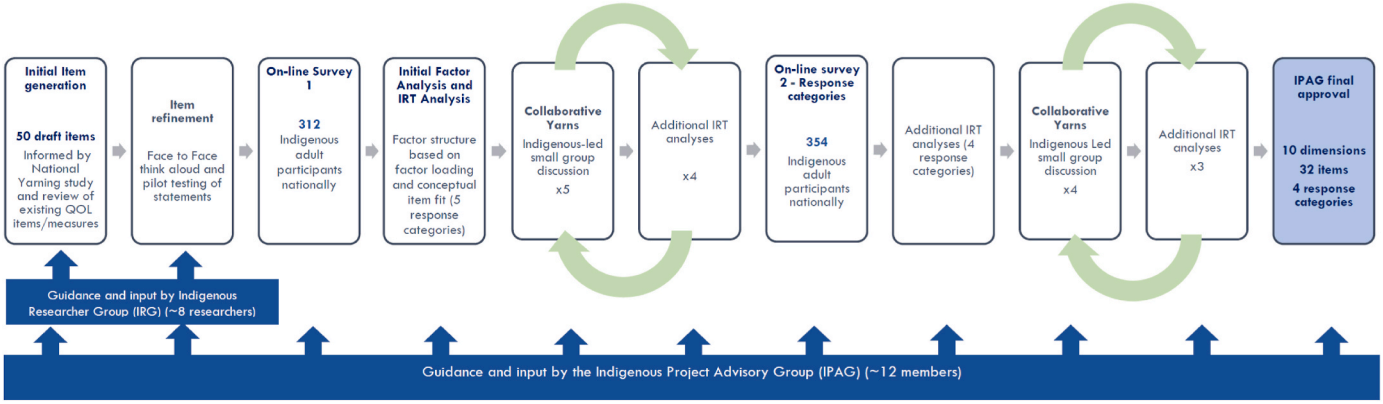

Fig. 1. Analysis approach.

Islander study investigators and research staff, who provided additional in-depth guidance with the data analysis and interpretation. [Garvey et al., 2021a, 2021b].

The IPAG and IRG were involved throughout, including candidate item development and finalisation, consideration of psychometric analysis through an Aboriginal and Torres Strait Islander lens including fit and groupings of the items and a discussion of how those grouping were derived from the initial psychometrics, including discussion of where items may have fit in multiple dimensions. Following feedback from the IPAG on the appropriate groupings of the items, the groupings were re-discussed, with the final domains and item groupings presented back to the IPAG, for confirmation of appropriateness.

2.3. Research team

Our team acknowledges the importance of reflexively considering and describing, our own backgrounds, perspectives and values that we each bring to the project [Alvesson and Skoldburg, 2000; Nilson C, 2017]. Our team is co-led by a senior Aboriginal researcher (GG) and a senior non-Indigenous researcher (KH) with extensive research experience in Aboriginal health, and members of our team include Aboriginal and Torres Strait Islander mid-career researchers (MD, LJW). Our team also brings experience and expertise in Aboriginal and Torres Strait Islander health research, including qualitative research (GG, KA, MD, AT), outcomes measurement, health economics, and preferences (KH, MH, JR, RV, BM), psychometrics (BM) and epidemiology (AC, JC, LJW).

Ethical approval

Ethics approval was obtained from relevant Ethics Committees, including: University of Sydney Human Research Ethics Committee (Ref: 2017/724 and Ref. 2019/672); Human Research Ethics Committee of the Northern Territory Department of Health and Menzies School of Health Research (Ref: 2017–2855 and Ref. 2019–3333); Central Australian Aboriginal Congress Aboriginal Corporation; Central Australian Human Research Ethics Committee; Western Australian Aboriginal Health Ethics Committee (Ref: 833); Aboriginal Health & Medical Research Council (Ref: 1340/17); Aboriginal Health Council of South Australia's Aboriginal Health Research Ethics Committee (Ref: 04-17-741); St Vincent's Hospital Melbourne Human Research Ethics Committee (Ref: 034/18); UTS Human Research Ethics Committee (Ref: ETH194460); Charles Darwin University Human Research Ethics Committee (Ref: H19059); University of Queensland (2022)/HE000809. Informed consent was obtained from all individual participants.

2.4. Conceptual framework development

The development of the conceptual framework for the WM2A measure is reported in detail elsewhere [Garvey et al., 2021a, 2021b]. Briefly, Yarning Circles were conducted with 359 Aboriginal and Torres Strait Islander adults from around Australia. Thematic analysis indicated the fundamental interconnectedness between the dimensions of 'belonging and connection', 'holistic health', 'purpose and control', 'dignity and respect', and 'basic needs' and 'family', 'community' and 'culture' for Aboriginal and Torres Strait Islander people [Garvey et al., 2021b].

2.5. Item generation and pretesting

The Yarning Circle data [Garvey et al., 2021a, 2021b] and our systematic review [Butler et al., 2019], informed the initial pool of items. To counteract the pervasive deficit discourse, we deliberately took a strengths-based approach to the phrasing of items, using participants' own words and phrases to ensure the content validity of the items. The initial candidate items were generated by a small Indigenous-led subgroup of the research team (GG, KA, KH) and reviewed and modified by the IPAG and IRG. Based on the thematic analysis of the Yarning circle transcripts [Garvey et al., 2021a], and the conceptual model (Garvey et al., 2021b), statements were developed, based on the themes, to capture the intersections of the concepts and context (Family, community, culture) of the conceptual model (see Garvey et al., 2021b).

We also examined a range of adult multi-attribute utility measures and quality of life and social care measures including those that have previously been used with Aboriginal and Torres Strait Islander adults (including the EQ5D, SF-36/SF6D, AQOL, ASCOT, ICECAP-O) to cross-check the wording and phrasing of candidate items. The pool of candidate items was presented and discussed with the IRG and the IPAG, to ensure Aboriginal and Torres Strait Islander voices remained dominant.

Think Aloud interviews (a form of cognitive interviewing [Charters E, 2003; Wolcott and Lobczowski, 2021],) were conducted with Aboriginal and Torres Strait Islander adults to test the wording, interpretation and understanding of the initial items [Gall, 2022]. Respondents provided feedback on their understanding of the items and the response categories, including suggestions for wording refinement.

2.6. Scale development

Two national surveys were conducted to allow for the conduct of psychometric analyses including exploratory factor analysis (EFA), and item response theory analyses (IRT). Respondents included Aboriginal and Torres Strait Islander adults, aged 18 or over, and were recruited via online panel provider, Dynata, and via existing investigator networks. Given the focus of the instrument, and the challenges of collecting online data in Aboriginal and Torres Strait Islander communities, we aimed for inclusivity, and therefore did not exclude any full completers of the survey.

Survey 1: During October and November 2019, Aboriginal and Torres Strait Islander adults were invited to complete an online questionnaire consisting of the pool of candidate items with five response categories (Always, Mostly, Sometimes, Hardly ever, Never) and a sixth category of 'Not relevant to me'. The survey also included a visual analog scale (0–100 thermometer) of overall wellbeing, two instruments grounded in a Westernised conception of health (EQ5D-5L [Herdman et al., 2011] and AQOL4D [Hawthorne et al., 1999, 2001] and the Growth and Empowerment Measure (GEM) [Haswell et al., 2010] which assesses empowerment as described by Aboriginal Australians. Socio-demographic questions were also included.

Survey 2: Following investigator discussion and Collaborative Yarning about item wording, and response category refinement, a second survey was conducted to compare a 4 with a 5 category response scale. A second online national survey was conducted over August–September 2020. Participants were randomised to receive either the five-response category version, or a four-response category version (Always, Mostly, Sometimes, Never). To facilitate the assessment of convergence and divergence of the constructs measured with existing instruments, respondents also completed the wellbeing VAS, the AQOL4D and sociodemographic questions. These data will be reported elsewhere.

2.7. Statistical analysis

Descriptive statistics were calculated for both survey samples. The overall aims of the statistical analysis were to: (1) assess the dimensionality of the WM2A item pool using factor analysis methods, compare this to the initial conceptual framework, and generate a dimension structure informed by both sources; (2) assess the psychometric performance of the WM2A item pool at both the individual item and dimension level using classical test theory; (3) assess the performance of the items using Item Response Theory (IRT); and (4) triangulate evidence from the quantitative assessment and Indigenist methodologies to remove poorly performing items, and develop a draft instrument. Additional IRT analyses were conducted on Survey 2 to compare the item performance of the five and four category response versions, and to finalise the dimension structure and items in the draft instrument, which was (5) reviewed and subsequently approved by the IPAG.

We made an explicit decision to privilege Aboriginal and Torres Strait Islander voices, ideas, words and conceptualisations of wellbeing in making decisions about item relevance, inclusion and dimensionality. It is important to note that to meet Aim 4, the EFA and CFA analyses guided, rather than determined, dimensionality and classification system development. We also used a Collaborative Yarning approach with a small sub-group of the research team. The small sub-group included Aboriginal and Torres Strait Islander and non-Indigenous researchers (KH, GG, KA, MD, RV, JR, MH, BM) to discuss, consider and sometimes prioritise other relevant information relating to items and dimensions, including Yarning Circle data, and researcher perspectives around the interpretation, and importance (including face validity) of items, as well as input from the IPAG and the IRG.

2.7.1. Dimensionality of the WM2A item pool, and comparison to the initial conceptual framework

Exploratory Factor Analysis (EFA) was initially used to examine the dimensionality of the WM2A item pool. EFA tests the dimensionality, or latent structure, of groups of items without imposing a pre-specified factor structure. It has been used to estimate the dimension structure of many instruments measuring QoL [Mulhern et al., 2013; Finch et al., 2017; Peasgood et al., 2022]. EFA allows for the prior specification of a range of factor structures, with the number of Eigenvalues >1 used as a guide to how many factors to extract as an eigenvalue ≥1 explains more variance than a single observed variable (or item). Different model specifications, including both oblique and orthogonal rotation, were used to extract factors. Oblique rotation assumes correlations between the factors, where orthogonal rotation assumes independence. Items with a low factor loading across all factors (at both <0.3 and < 0.4) were considered for removal, also taking into account other information, as above, to inform the decision-making process. The models produced were then compared to the Fabric of Wellbeing conceptual model [Garvey et al., 2021b]. All analyses were conducted using Stata and IRTPro [Paek and Han, 2012].

2.7.2. Psychometric performance of the WM2A item pool

Classical psychometrics at the item, dimension and measure comparison level were used to assess a number of item characteristics. This included assessing item acceptability using established indicators including: missing data or "not relevant" responses (<5% preferred); maximum endorsement frequencies and floor/ceiling effects (<80% for any one response category preferred); aggregate adjacent endorsement frequencies (>10% response across adjacent categories preferred); and no item redundancy (inter item correlation <0.75 preferred).

2.7.3. Assessing the items using Item Response Theory

Following the assessment of dimensionality, and classical psychometric indicators, Item Response Theory G(IRT) methods [Fayers, 2016; Edelen and Reeve, 2007] were used to examine item performance, and guide selection. IRT includes generalised linear models that link observed responses to a respondent's location on a latent trait (or 'theta' (θ) scale). In the case of WM2A theta represents the dimension of wellbeing measured by a set of items. The dimensionality established from the triangulation process described above was used to guide the items included in each IRT model. IRT was explored for a range of dimensions identified, and used as a guide to item exclusion and selection alongside the input of Aboriginal and Torres Strait Islander voices. Less weight was placed on the results based on models including only two items due to difficulties in estimating the latent trait.

In this study, a two-parameter graded response IRT model was used [Samejima 1997]. The model estimates two parameters, an item threshold parameter, and an item discrimination parameter. The threshold parameter describes the severity level necessary to transition between item response levels. Discrimination parameters provide a single figure estimate of how particular items discriminate across the latent trait.

IRT was used to understand the performance of an item within each underlying dimension by assessing key parameters. Local independence between items was assessed. This specifies that item responses should be independent of each other after controlling for the underlying construct. To test local independence, Standardised Chi Square values for each item pair were calculated, with values greater than ten considered potentially large. The wording of these item pairs was also assessed for qualitative redundancy [Toland 2013].

Item level information was also assessed by comparing the slope parameter magnitudes across items. The individual item information curves were assessed to understand the characteristics of the information provided by each item. This is because these curves help understand where each item is contributing information (and therefore more sensitive measurement abilities) at different points of theta.

We also tested functional form and model-data fit. Functional form implies that all threshold parameters are ordered. Model-data fit at the item level was tested, and model fit statistics were used to compare the relative fit of the overall model. Item level fit was assessed by examining the S-χ2 diagnostic fit statistic [Orlando and Thissen 2003]. This statistic assesses the degree of similarity between the predicted and observed response frequencies for each item. A statistically significant item value ($p < 0.01$) indicates that the item does not fit the model [Toland, 2013]. A range of overall model level fit statistics, which compare the relative fit of the model to the data, were tested [Toland 2013]. These included the AIC [Akaike, 1974] and the BIC [Stone, 1979] that are based on in-sample fit and estimate model performance. The M_2 is a goodness-of-fit indicator that measures the fit of the model to the data.

This produces a significance estimate with non-significance preferred. The Root Mean Square Error of Approximation (RMSEA), which provides an indicator of fit whilst controlling for sample size, was also estimated. The RMSEA ranges from 0 to 1, with smaller values indicative of better fit.

2.7.4. Triangulating evidence and 2.7.5. Draft instrument development

As indicated, we explicitly privileged Aboriginal and Torres Strait Islander voices, ideas, words and conceptualisations of wellbeing in making decisions about item relevance, inclusion and dimensionality. The iterative and reflective process of Collaborative Yarning undertaken by the team, and ongoing IPAG input, necessarily meant the analyses conducted guided, rather than determined, dimensionality and classification system development.

2.8. Collaborative Yarning

Our Collaborative Yarning approach considered, and discussed the interpretation of the psychometric analyses, including the IRT for each item and factor identified from the psychometric analyses. As described in Fig. 1, this process involved a series of Aboriginal and Torres Strait Islander-led small sub-group meetings of study researchers, where the psychometric analysis of items and factor structure were discussed, interpreted, and framed to ensure the items and inter-relationships stayed true to the Yarning data, and to Aboriginal and Torres Strait Islander views, values and wellbeing conceptualisations.

Broadly, the iterative steps included: (1) small group discussion of items with factor loading <0.4, including consideration of item and dimension level IRT analyses; (2) consider factor placement for items loading on more than one factor; (3) rerun IRT after moving or removing items; (4) consider item interpretation, conceptual fit, fit with Yarning data for each item within each dimension and rerun IRT analyses after dimension/item changes; (5) reconsider item and dimension interpretation and re-specified IRT analyses for each change. Following these iterative steps, a draft measure was presented and discussed with the IPAG.

3. Results

3.1. Item generation and pre-testing

Initial candidate items (n = 60) were developed from the Yarning Circle participants' own words and phrases, ensuring the content validity of the items. The conceptual framework [Garvey et al., 2021b] and the draft items were shared and discussed at length with the IRG and the IPAG to ensure Aboriginal and Torres Strait Islander voices were reflected in the item wording, improve clarity of language and to remove duplication and overlap of concepts (10 items), resulting in 50 candidate items remaining for inclusion in the surveys. Think Aloud interviews with 17 Aboriginal and Torres Strait Islander adults (results reported elsewhere [Gall, 2022]) indicated respondents were able to understand and complete the items. Minor adjustments to the wording of the items were suggested and incorporated to improve clarity. Response categories were also acceptable to respondents.

3.2. Survey sample

Demographic characteristics of respondents to Survey 1 (n = 312) and Survey 2 (n = 354) are presented in Table 1. Responses to items were well distributed over the response categories, with a right skew (i.e. 'Hardly ever'/'Never'), and with low levels of missing or "not relevant" responses (Supplementary Table 1). Our study respondent sample was broadly representative across many sociodemographic characteristics of the adult Aboriginal and Torres Strait Islander population, including across state and regional areas, education levels, main language spoke at home and background. Our sample had a more even age

Table 1
Demographic characteristics of the samples.

	Survey 1–50 items	Survey 2–32 items		National Census (June 2021)[a]
Total N	312	354		
	5 response categories 312 N (%)	**5 response categories 177 N (%)**	**4 response categories 177 N (%)**	
Self reported overall wellbeing (VAS, 0–100) (mean, SEM)	64.36 (1.41)	69.54(1.70)	65.82 (1.91)	
Age (mean, SEM)	44.48 (0.89)	45.06 (1.06)	45.46 (1.05)	
Age group				
18–24	35 (11.3)	11 (6.2)	15 (8.5)	17.1%
25–34	53 (17.2)	30 (17.0)	15 (8.5)	20.2%
35–44	72 (23.3)	63 (35.6)	64 (36.2)	14.7%
45–54	53 (17.2)	24 (13.6)	38 (21.5)	13.5%
55–64	60 (19.4)	29 (16.4)	26 (14.7)	10.1%
65+	36 (11.7)	20 (11.3)	19 (10.7)	5.6%
Gender				
Male	126 (40.8)	71 (40.1)	74 (41.8)	50.5%
Female	182 (58.9)	106 (59.9)	101 (57.1)	49.5%
Other	1 (0.3)	0 (0)	2 (1.1)	
Background				
Aboriginal	286 (92.6)	163 (92.1)	158 (89.3)	91.7%
Torres Strait Islander	7 (2.3)	4 (2.3)	10 (5.6)	4.0%
Aboriginal and Torres Strait Islander	16 (5.2)	10 (5.6)	9 (5.1)	4.3%
Highest education				
Y10 or below	56 (18.1)	37 (20.9%	40 (22.6)	
Y11	15 (4.9)	–	–	
Y12	38 (12.3)	27 (15.3)	19 (10.7)	
TAFE/Trade	111 (35.9)	56 (31.6)	53 (29.9)	57%
University	89 (28.8)	57 (32.2)	65 (36.7)	
How many people living at home (mean)	3.20	3.18	3.00	
State/Territory				
ACT	5 (1.6)	2 (1.1)	6 (3.4)	1.0%
New South Wales	108 (35.0)	86 (48.6)	76 (46.3)	34.5%
Queensland	83 (26.9)	46 (26.0)	40 (22.6)	26.9%
Victoria	39 (12.6)	17 (9.6)	10 (11.3)	8.0%
Tasmania	16 (5.2)	6 (3.4)	8 (4.5)	3.4%
South Australia	14 (4.5)	7 (4.0)	13 (7.3)	5.3%
Western Australia	31 (10.0)	8 (4.5)	8 (4.5)	12.2%
Northern Territory	13 (4.2)	5 (2.8)	6 (3.4)	7.8%
Region				
Metro	157 (50.8)	91 (51.4)	84 (47.5)	40.8%
Rural/regional/remote	152 (49.2)	86 (48.6)	93 (52.5)	59.2%
Marital status				
Partnered (married/de facto)	189 (61.2)	107 (60.5)	111 (62.7)	
Single	111 (35.9)	64 (36.2)	62 (35.0)	
Other	9 (2.9)	6 (3.4)	4 (2.3)	
Main language spoke at home				
Aboriginal/Torres Strait Islander language	22 (7.1)	14 (7.9)	22 (12.4)	9.5%
English	187 (92.9))	163 (92.1)	154 (87.0)	
Other	0 (0)	0 (0)	1 (0.6)	
Employment				
Employed Casual	16 (5.2)	12 (6.8)	14 (7.9)	
Employed Part-time	46 (14.9)	14 (7.9)	15 (8.5)	
Employed Full-time	112 (36.3)	72 (40.7)	66 (37.3)	

(continued on next page)

Table 1 (*continued*)

	Survey 1–50 items	Survey 2–32 items		National Census (June 2021)[a]
Not working at the moment	28 (9.1)	17 (9.6)	19 (10.7)	
Student	16 (5.2)	5 (2.8)	6 (3.4)	
Retired/Pension	55 (17.8)	27 (15.3)	31 (17.5)	
Home duties	28 (9.1)	24 (13.6)	19 (10.7)	
Other	8 (2.6)	6 (3.4)	7 (4.0)	
Financial status				
I run out of money before payday	126 (40.8)	43 (24.3)	55 (31.1)	
I have just enough money to get to the next payday	119 (38.5)	89 (50.3)	80 (45.2)	
I have more than enough money to get to the next payday	64 (20.7)	45 (25.4)	42 (23.7)	

[a] Not all characteristics are available in the National census [ABS 2021].

distribution across age categories, with a slightly lower proportion of respondents aged <35 years, and slightly higher proportion of respondents aged >55 years in our sample, compared to the National census [Australian Bureau of Statistics, 2021)].

3.3. Dimensionality of the WM2A item pool, and comparison to the initial conceptual framework

3.3.1. Exploratory factor analysis (using survey 1)

Models with five and eight factors that assumed correlations between the dimensions were extracted, and examined for consistency and meaning. This resulted in two possible structures: a six dimension structure with five dimensions aligned with the Fabric of Wellbeing conceptual framework [Garvey et al., 2021b], plus an additional 6th dimension including items that did not directly align with the Fabric model, and an eight dimension structure which resulted from extracting the number of factors with Eigenvalues >1. At a threshold of <0.3, three items about community did not load on any factor above 0.3. When the factor loading threshold was set at <0.4, nine items were considered as initial candidate items for removal.

3.3.2. Dimensionality taken forward

The preferred model for further development was the eight dimension model, including the item dimension names from the Fabric of Wellbeing conceptual model (Table 2). This model was the starting point for subsequent analyses and modifications by the Collaborative Yarning small group discussions.

Factor 1 included a number of broader concepts around both physical and mental wellbeing; factor 2 included items focusing on cultural, spiritual and country connections; factor 3 clustered items framed around 'feeling confident' that Aboriginal and Torres Strait Islander voices, culture and languages are heard and valued, and kept alive; factor 4 focused on family care and support; factor 5 focused on family and personal access to services; factor 6 focused on community access to services; factor 7 focused on experience of racism and worry about safety; factor 8 focused on feelings of pride and strength from being around other Aboriginal and Torres Strait Islander people.

3.4. Psychometric performance of the WM2A item pool

Supplementary Table 1 reports the frequency of responses to the 50 items across the five response levels. This allows for an assessment of the frequency of missing/"not relevant (NR)" data, and endorsement frequencies. Five items did not meet preferred thresholds (<5%) for NR responses. All 50 items met the pre-specified preferred thresholds for maximum endorsement frequencies (<80%), and for floor and ceiling effects and no item redundancy (inter item correlation <0.75) was identified. However, 10 items did not meet the preferred threshold for aggregate adjacent endorsement frequencies of >10% across adjacent categories. All these items had <10% response across the "Never" and "Hardly ever" categories (Supplementary Table 1). We considered this information alongside the factor loadings and IRT analyses when undertaking Collaborative Yarning about item retention or removal.

3.4.1. Collaborative Yarning approach to WM2A items and dimensionality

Our Collaborative Yarning approach considered, and discussed the interpretation of the psychometric analyses, including the IRT for items and factors identified from the eight factor model above.

The nine items with factor loading <0.4 were discussed and considered for removal from the WM2A item pool. Discussion also considered item placement for items with cross loadings. Six items were removed based on low factor loadings (<0.4) (see Table 2) After extensive discussion in the small group, an additional 12 items were removed due to conceptual overlap, NR reporting frequencies, high correlations with other items, and/or low item level information from the IRT (Table 2). These items included items 53a and 53b which were removed because of conceptual overlap and correlation with item 6, which was retained; item 5 was removed because of conceptual overlap and correlation with item 60 and item 28b, which were both retained; item 49 was removed because of overlap with item 46; item 32c was removed because of overlap with item 17a and 32b; item 32a was removed because of conceptual overlap with item 32b; item 40b was removed as a separate item, and instead item 40a was modified to include 'language' alongside the related and already included concepts of Cultural knowledge and Lore.

Several items were retained for reasons of content validity, despite factor loadings of <0.40: item 9 "I have a good balance across different parts of life", item 19 "I can get the healthcare I want close to home" and item 22 "I can get together with people to Yarn and have a laugh". After extensive discussion, these items were retained because of the prominence and importance of the words (balance and Yarn) and the importance of the underlying concepts for wellbeing identified by the participants of the Yarning Circles, the IPAG and the small sub-group.

IRT analyses were re-run after removal or retention of the items above, with additional small group Collaborative Yarning discussions around placement of items within factors. Item 39 *"My spirit is strong"* loaded on both factor 1 and factor 2; following discussion, the item was retained in Factor 2, given the conceptual links to other Factor 2 items. Similarly, the placement of item 4 *"My identity is strong"* was also considered in Factor 1 and Factor 2, given conceptual similarities to other factor 2 items, particularly items 38 and 39; IRT also indicated that Item 4 did not fit well with other items in Factor 1. After examining IRT results with Item 4 included and not included in both factor 1 and 2, a decision was made to retain Item 4 in Factor 2. Item 6 (*"I have big worries"*) was tested in both Factor 7 (with racism items) and in Factor 1, and as a separate standalone item; an initial decision was made to keep it as a single, separate item.

Following these modifications, the IRT analyses were repeated, and the items groupings presented to the IPAG for discussion and consideration of dimension names and items that appropriately reflected Aboriginal and Torres Strait Islander understandings of holistic wellbeing. The IPAG proposed 12 dimensions (Table 2).

The IRT analysis was repeated for the 12 dimensions suggested by the IPAG. Based on item level data, Item 32b (*"I have access to basic services"*) showed some mis-ordered levels when considered as a single item, as very few respondents reporting any issues with access to basic services. We therefore re-examined the Yarning Circle data and the IRT for a modified dimension about *Access*, which included item 32b, to consider whether this item would be retained. Although response levels remained disordered in the revised dimension, a decision was taken to retain the item in the final measure, given the prominence of basic

Table 2
Oblique eight factor EFA model with factor loadings <0.4 considered for exclusion (Survey 1).

	Item	Dimension from Fabric model	Factor loading (8 factor EFA)	Collaborative Yarning discussion points and decision	Preliminary IPAG suggested dimension
	Factor 1				
17a	I have enough money to support myself	Basic needs	0.907	Removed; discussed importance of self vs helping others; substantive overlap with 17b	
7b	I am healthy enough to look after people who are important to me	Holistic health	0.759	Retained	Caring for others
51	I feel calm even when there is a lot going on		0.752	Retained	Balance & control
52	I feel settled and secure and can face whatever challenges come up		0.740	Retained	Moving forward
58	I can do the things that I value and enjoy		0.706	Retained	Balance & control
7a	I am healthy enough to look after myself	Holistic health	0.705	Removed; discussed importance of self vs helping others; substantive overlap with 7b	
17b	I have enough money to help out the people who are important to me	Basic needs	0.704	Retained	Caring for others
60	I feel happy		0.688	Retained	Balance & control
57	I have enough control over my life		0.546	Retained	Balance & control
54	I feel hopeful about the future		0.536	Retained	Moving forward
55	I feel able to move forward from painful feelings and past events		0.510	Retained	Moving forward
39	My Spirit is strong	Holistic health	0.413 (F2 = 0.381)	Retained; moved to F2, given conceptual links to other items in Factor 2, partic. item 38	Spirit & identity
4	My Identity is strong	Holistic health	0.402	Retained; moved to F2, given conceptual links to other items in Factor 2, partic. items 38 and 39; IRT indicates lack of fit with other F1 items	Spirit & identity
	Factor 2				
42	I have opportunities to connect with my culture	Purpose & control	0.722	Retained	Culture & Country
36	I can share knowledge about culture with others	Belonging & connection	0.635	Retained	Culture & Country
38	My Spiritual connections keep me strong	Holistic health	0.588	Retained	Spirit & identity
44	My culture is valued and respected by the people around me	Dignity & respect	0.548	Retained	Culture & Country
50	I have opportunities to connect with Country	Basic needs	0.515	Retained	Culture & Country
37	I can access bush tucker, bush medicines and healers if I want to	Holistic health	0.503 (F5 = 0.357)	Removed: Discussed placement in F2 and F5; IRT re-run for F2 and F5 ± this item; decision made to remove: concepts covered in items 42 and 50, ~high % NR; IRT information and threshold curves indicated low item level information	
	Factor 3				
45b	I feel confident that Aboriginal and Torres Strait Islander voices are heard and valued	Dignity & respect	0.789	Retained	Feeling valued
46	My culture is valued and respected by Australian society	Dignity & respect	0.679	Retained	Feeling valued
40a	I feel confident that cultural knowledge and Lore are being passed on	Purpose & control	0.627	Retained but modified; discussed potential content overlap with 40b; IRT indicates better item level information for 40a vs 40b; Item 40a modified to also include 'language' and 'kept alive' instead of passed on	Feeling valued
40b	I feel confident that Aboriginal and Torres Strait Islander languages are being kept alive	Purpose & control	0.600	Removed; 'language' moved to item 40a	
49	I feel confident that the environment and Country are being protected	Basic needs	0.406	Removed: 'environment and Country' overlaps substantially with 'culture'	
	Factor 4				
3	My family supports and cares for me	Belonging & connection	0.814	Removed; Family is covered by 'people in my life' in item 56	
5	My family makes me feel happy and strong	Holistic health	0.751	Removed; overlap with items 60 and 28b	
56	I feel supported and cared for by the people in my life		0.650	Retained	Connection & support
1	I feel connected with the people who are important to me	Belonging & connection	0.570	Retained	Connection & support
	Factor 5				
12b	My family can access work, education or training options if they want to	Purpose & control	0.621	Removed; given meaning of 'family', item too broad for an individual to assess to full family; IRT: relatively low item level information	
48	I can access services that are respectful of my culture and language (e.g. healthcare, housing, education and training, social services)	Basic needs	0.534	Retained	Access
12a	I can access work, education or training options if I want to	Purpose & control	0.458	Retained	Access
32c	I have access to affordable transport to get where I need to go	Basic needs	0.434	Removed; conceptual overlap with 17a and 32b; highly correlated with 17a	
	Factor 6				

(*continued on next page*)

Table 2 (*continued*)

	Item	Dimension from Fabric model	Factor loading (8 factor EFA)	Collaborative Yarning discussion points and decision	Preliminary IPAG suggested dimension
	Factor 1				
32a	The community I live in has access to basic services	Basic needs	0.680	Removed; overlap with 32b	
32b	I have access to basic services (e.g. water, power, phone)	Basic needs	0.654	Retained	Basic needs
	Factor 7				
47	I experience racist words or actions	Dignity & respect	0.599	Retained	Racism
59	I feel strongly affected by racism		0.510	Retained	Racism
53a	I feel worried about my safety		0.502	Removed: covered by item 6 "I have big worries"	
6	I have big worries	Holistic health	0.494 (F1 = −0.401)	Retained	Worries
53b	I feel worried about the safety of the people who are important to me		0.434	Removed: covered by item 6 "I have big worries"	
	Factor 8				
28a	I get a sense of pride from being around other Aboriginal and Torres Strait Islander people	Dignity & respect	0.824	Retained	Pride & strength
28b	I draw strength from being around other Aboriginal and Torres Strait Islander people	Dignity & respect	0.682	Retained	Pride & strength
	Factor loading <0.40				
22	I can get together with people to yarn and have a laugh	Belonging & connection	0.381 (F1)	Retained: Given importance of Yarning to Aboriginal and Torres Strait Islander wellbeing	Balance & control
25	I feel supported to reach my goals and aspirations	Purpose & control	0.380 (F1)	Removed	
19	I can get the health care I want close to home	Basic needs	0.373 (F5)	Retained; discussed and decision to keep	Access
16	My housing meets my needs	Basic needs	0.353 (F1)	Removed	
9	I have a good balance across different parts of life (e.g. work, cultural and community responsibilities, family, study, sport, relaxing)	Holistic health	0.347 (F1) (F5 = 0.320)	Retained: decision to keep in F1, given importance of balance from Yarning data	Balance & control
45a	I can participate in decisions that are important to me if I want to	Dignity & respect	0.311 (F1)	Removed	
27	I feel valued and respected within the communities I belong to	Dignity & respect	<0.30	Removed	
24	I feel like I can give back to the communities I belong to	Purpose & control	<0.30	Removed	
31	The community I live in is a safe place	Basic needs	<0.30	Removed	

services in Yarning Circle data, and the belief that access to basic services is a fundamental human right. The IRT indicated that the other dimensions suggested by the IPAG largely performed appropriately.

3.4.2. *Response categories*

Based on feedback received from the IPAG about possible interpretation issues with respect to the similarity around the 'Sometimes' and 'Hardly ever' response categories, consideration was given to modification of the response categories. A second national survey of the 32 retained items was conducted with 354 Aboriginal and Torres Strait Islander adults where respondents were randomised to complete either the five response category version or the four response category version that excluded the 'Hardly ever' response. Respondent characteristics are shown in Table 1. Frequency of response endorsement is shown in Supplementary Table 2. Results suggested that the use of the four response category version addressed issues with adjacent endorsement frequencies. The comparison of response distributions suggested 'Hardly ever' was redistributed to either the 'Never' or 'Sometimes' categories as might be expected. Results also suggested that the removal of 'Hardly ever' did not have a large impact on the response patterns across other categories. IRT analyses also indicated that there was no loss of item or dimension level information in moving to four response categories. Following small group discussion, the decision was therefore made to use a four response category version.

Several additional changes were made to dimension names, which were discussed and supported by the IPAG. Dimension 2 *"Moving forward"* was renamed *"Hope & resilience"* and Dimension 7 *"Connection & support"* was renamed *"Connection with others"*. Some changes were also made to item placement to better reflect underlying domain concepts, for which the IRT modelling was rerun and evaluated. The small group discussion decided Item 22 "I can get together with people to Yarn and have a laugh" was better aligned with Dimension 7- *"Connection with others"* because Yarning was about connection; Item 32b "I have access to basic services" was included in Dimension 8, *"Access"* and item 6 "I have big worries" was grouped with the items relating to racism in a dimension now called "*Racism & worries*". The IRT analyses were evaluated for these changes; the final items and 10-dimension structure are shown in Table 3. Supplementary Table 3 reports Spearman's correlations between the ten dimension structure using the four response category data from Survey 2. Racism and Worries, and Pride and Strength, generally have lower correlations with the other dimensions.

3.5. *Performance of the final items using Item Response Theory*

Table 3 (and Supplementary Fig. 1) show the results of model fit and item parameters for the final ten dimension structure. One dimension *"Caring for others"* exhibited misfitting items based on the $p < 0.01$ threshold for item level fit [Toland 2013]. However, this dimension (along with *"Pride and Strength"*) only included two items, so low weight was placed on the IRT results from these dimensions. No items with significant local dependence were identified. Considering the other eight dimensions, items in six of these (*"Balance and Control", "Hope and Resilience", "Spirit and Identity", Feeling valued, "Connection with others",* and *"Access"* display similar relative information and discriminative ability within dimensions. Both of the remaining two dimensions, "*Culture and Country*" and *"Racism and worries*" include an item with a

Table 3
Final 32 items and dimension structure.

	Item	Final Dimension after Collaborative Yarning	Item level fit			Item parameters			
			S-χ2	*d. f.*	*p*	*a*	*b1*	*b2*	*b3*
9	I have a good balance across different parts of life (e.g. work, cultural and community responsibilities, family, study, sport, relaxing)	1. Balance & control	20.06	19	0.39	2.08	−1.00	0.26	1.72
51	I feel calm even when there is a lot going on	1. Balance & control	34.00	22	0.05	1.60	−1.57	0.07	1.64
57	I have enough control over my life	1. Balance & control	23.22	21	0.33	1.93	−0.89	0.64	1.94
58	I can do the things that I value and enjoy	1. Balance & control	13.07	17	0.73	2.13	−0.76	0.53	2.19
60	I feel happy	1. Balance & control	10.51	17	0.88	2.48	−1.04	0.53	1.71
52	I feel settled and secure and can face whatever challenges come up	2. Hope & resilience	15.23	12	0.23	2.25	−1.00	0.46	1.70
54	I feel hopeful about the future	2. Hope & resilience	18.09	11	0.08	2.17	−0.94	0.44	1.64
55	I feel able to move forward from painful feelings and past events	2. Hope & resilience	21.64	11	0.03	2.22	−0.94	0.26	1.37
7b	I am healthy enough to look after people who are important to me	3. Caring for others	22.22	6	0.0011	6.91	−0.24	0.76	1.64
17b	I have enough money to help out the people who are important to me	3. Caring for others	21.94	6	0.0012	1.07	−1.53	−0.25	1.51
36	I can share knowledge about culture with others	4. Culture & Country	15.58	19	0.69	1.62	−0.95	0.15	1.68
42	I have opportunities to connect with my culture	4. Culture & Country	24.30	14	0.049	4.33	−0.77	−0.02	1.21
44	My culture is valued and respected by the people around me	4. Culture & Country	24.33	18	0.149	1.93	−0.95	0.48	1.54
50	I have opportunities to connect with Country	4. Culture & Country	16.86	18	0.53	2.00	−0.89	0.04	1.37
4	My Identity is strong	5. Spirit & identity	10.11	11	0.52	2.49	−0.47	0.62	1.75
38	My Spiritual connections keep me strong	5. Spirit & identity	5.75	12	0.93	1.79	−0.67	0.40	1.54
39	My Spirit is strong	5. Spirit & identity	6.64	10	0.76	3.46	−0.45	0.55	1.81
40a	I feel confident that cultural knowledge and Lore and languages are being kept alive	6. Feeling valued	14.15	10	0.17	2.43	−1.35	−0.12	1.37
45b	I feel confident that Aboriginal and Torres Strait Islander voices are heard and valued	6. Feeling valued	14.87	11	0.19	2.40	−1.31	−0.32	1.06
46	My culture is valued and respected by Australian society	6. Feeling valued	14.61	9	0.10	3.05	−1.38	−0.08	1.08
1	I feel connected with the people who are important to me	7. Connection with others	25.66	11	0.01	2.17	−0.17	0.86	1.89
22	I can get together with people to yarn and have a laugh	7. Connection with others	10.06	13	0.69	1.56	−0.80	0.51	2.12
56	I feel supported and cared for by the people in my life	7. Connection with others	13.85	12	0.31	2.29	−0.44	0.81	1.90
12a	I can access work, education or training options if I want to	8. Access	13.13	15	0.59	2.00	−0.55	0.63	1.83
19	I can get the health care I want close to home	8. Access	8.08	13	0.84	2.49	−0.39	0.74	1.83
32b	I have access to basic services (e.g. water, power, phone)	8. Access	13.91	13	0.38	1.95	0.67	1.68	2.20
48	I can access services that are respectful of my culture and language (e.g. healthcare, housing, education and training, social services)	8. Access	16.13	18	0.58	1.49	−0.75	0.64	2.09
47[a]	I experience racist words or actions	9. Racism & worries	12.33	12	0.42	18.32	−1.09	−0.65	0.69
59[a]	I feel strongly affected by racism	9. Racism & worries	11.68	12	0.47	1.88	−1.50	−0.66	0.75
6[a]	I have big worries	9. Racism & worries	12.63	16	0.70	0.36	−4.44	−0.72	5.33
28a	I get a sense of pride from being around other Aboriginal and Torres Strait Islander people	10. Pride & strength	11.16	6	0.08	2.06	−0.25	0.85	1.79
28b	I draw strength from being around other Aboriginal and Torres Strait Islander people	10. Pride & strength	14.88	6	0.02	30.30	−0.35	0.30	1.22

[a] To note: racism and worries depart from the positive framing of other items; a deliberate choice was made to keep these three items framed in the negative to ensure that we stayed true to the voices and views of Aboriginal and Torres Strait Islander people about the negative impact of these factors on wellbeing.

relatively higher discrimination parameter ("I have opportunities to connect with my culture", and "I experience racist words and actions" respectively.

4. Discussion

Understandings of wellbeing are culturally bound, meaning measures need to account for cultural difference in the conception and experience of wellbeing. However, most existing quality of life (QOL) or wellbeing measures are grounded within Western, often biomedical, constructs, and fail to capture more holistic conceptualisations. Traditionally QOL measurement has focussed quite narrowly on health-related QOL, rather than broader wellbeing, although there has been more recent acknowledgement of the need to move beyond health-related QOL. A number of recent initiatives doing this include the development of the EQ-HWB measure [Brazier et al., 2022; Peasgood et al., 2022] and the QOL-ACC measure [Ratcliffe et al., 2022], both of which recognise a broader understanding of QOL.

This paper describes the item and dimension development of the What Matters to Adults (WM2A) wellbeing measure for Aboriginal and Torres Strait Islander people, and the subsequent evaluation of its properties. To the best of our knowledge, the WM2A is the first national measure with the ability to measure the wellbeing of Aboriginal and Torres Strait Islander adults across a range of domains important to and valued by Aboriginal and Torres Strait Islander people. We envisage the measure being used to inform the evaluation of health, social and community programs, as well as in local and national data collection surveys to provide cross-sectional and longitudinal assessments of the wellbeing of Aboriginal and Torres Strait Islander adults.

We deliberately undertook a process that privileged the voices, values, and wellbeing conceptualisations of Aboriginal and Torres Strait Islander adults themselves, whilst simultaneously considering the statistical properties of the measure.

The establishment of an Indigenous Project Advisory Group and an Indigenous Researchers Group combined with our Collaborative Yarning approach, to iteratively cross reference and contextualise the qualitative and quantitative data, ensured that we maximized the measure's content validity, acceptability, and comprehension. From the 60 candidate items coming from our Yarning Circles, we ended up with 32 items, across 10 dimensions of wellbeing.

Our work also considers a broader conceptualisation of holistic wellbeing (we use the term wellbeing deliberately) to develop a nationally relevant measure specifically for Aboriginal and Torres Strait Islander adults. While recent measures of quality of life for older Aboriginal people have used qualitative development approaches [Smith et al., 2020], as far as we are aware, WM2A is the first wellbeing measure that explicitly combines both Indigenist and psychometric approaches (EFA, CFA and IRT), utilising iterative Collaborative Yarning

for the measure development. What is unique about our approach is the way in which different methodological approaches have been combined in the process of measure development. We bring together Indigenist methodologies, with commonly used psychometric approaches, to develop a measure that is underpinned by the voices and experiences of Aboriginal and Torres Strait Islander peoples. It goes beyond the usual approaches to the development of culturally-specific wellbeing measures, that typically rely on translation and adaptation of items or formats from existing measures [Le Grande et al., 2017; Burgess et al., 2022]. In this way we specifically acknowledge and address the shortfalls of existing instruments by directly capturing the critical dimensions of wellbeing relevant for Aboriginal and Torres Strait Islander people.

Understanding and measurement of wellbeing for Aboriginal and Torres Strait Islander people is critical to achieving health equity. Assessing wellbeing with measures that do not include wellbeing from an Aboriginal and Torres Strait Islander cultural perspective may result in misinformation about their wellbeing, misalignment of health policies and programs, and may perpetuate or exacerbate the existing poor health outcomes. A major strength of our work is the inclusion, and dominance, of Aboriginal and Torres Strait Islander voices through all stages of the development of the WM2A wellbeing measure. At every step of the development process, Aboriginal and Torres Strait Islander views and values were privileged and prioritised. This means that the WM2A measure is truly grounded in the voices of Aboriginal and Torres Strait Islander peoples.

Whilst our process and approach have many strengths, there are also some limitations. A key challenge in developing the measure was balancing the recognition that wellbeing for Aboriginal and Torres Strait Islander people is holistic and often dependent on community and family, whilst at the same time recognising that to influence policy and practice, and improve wellbeing, measurement at an individual level, that can be aggregated to populations, was also needed. The interwoven nature of wellbeing aspects also presents a challenge for traditional psychometric methods. We have attempted to address this tension by our Collaborative Yarning processes, by constantly referencing back to the words and conceptualisation of wellbeing that came from First Nations peoples themselves, and by explicitly privileging their voices. We sought frequent guidance from the IPAG and IRG to ensure overlapping concepts were considered appropriately. By ensuring we remained conceptually true to the principles of Fabric of Wellbeing model (Garvey et al., 2021b), we have ensured interconnections are captured, even with a different dimension structure.

Additionally, the use of IRT can be limited when the underlying dimension is measuring aspects of wellbeing that are challenging to interpret in a unidimensional structure. For example, the racism items produced underlying scales that were somewhat difficult to interpret, and therefore difficult to use to guide selection. However, most of the scales produced models that fitted the underlying assumptions, and therefore generated indicators that could be used to inform item selection. To date, we have not compared the WM2A instrument to other HRQOL and wellbeing instruments, as these existing measures have fundamentally different content, and conceptual bases, and direct comparison is likely to be less relevant in these circumstances. The usefulness of this common approach is an area for further consideration given the rationale for developing the WM2A measure was to ensure that Aboriginal and Torres Strait Islander voices, perspectives and understandings of wellbeing underpinned the content, which is not the case with other measures.

5. Conclusion

To improve the wellbeing of Aboriginal and Torres Strait Islander Australians, we first need to be able to identify what is important to their wellbeing and be able to measure it in a robust and culturally appropriate way. The WM2A measure is grounded in Aboriginal and Torres Strait Islander conceptualisations of wellbeing; it represents a novel and vital step towards being able to understand and assess the true impacts of policy and practice on holistic wellbeing and uses innovative methodology to ensure the voices of Aboriginal and Torres Strait Islander Australians are at its centre. The WM2A measure can be scored using summative scoring to produce a single overall score (which assumes all items carry equal weight), and research is continuing to develop a preference-based scoring algorithm for the WM2A measure to capture the relative weighting of different items and their contribution to wellbeing. Research is ongoing to implement the WM2A measure in routine patient-reported measures (PRMs) collection in health services to improve patient outcomes.

Declarations

Ethics approval and consent to participate

Ethics approvals have been obtained from relevant Ethics Committees, including: University of Sydney Human Research Ethics Committee (Ref: 2017/724 and Ref. 2019/672); Human Research Ethics Committee of the Northern Territory Department of Health and Menzies School of Health Research (Ref: 2017–2855 and Ref. 2019–3333); Central Australian Aboriginal Congress Aboriginal Corporation; Central Australian Human Research Ethics Committee; Western Australian Aboriginal Health Ethics Committee (Ref: 833); Aboriginal Health & Medical Research Council (Ref: 1340/17); Aboriginal Health Council of South Australia's Aboriginal Health Research Ethics Committee (Ref: 04-17-741); St Vincent's Hospital Melbourne Human Research Ethics Committee (Ref: 034/18); UTS Human Research Ethics Committee (Ref: ETH194460); Charles Darwin University Human Research Ethics Committee (Ref: H19059).

Consent for publication

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Declaration of competing interest

The authors declare that they have no competing interests.

Data availability

Data will be made available on request.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2024.116694.

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