Towards a best practice framework for eHealth with Aboriginal and Torres Strait Islander peoples — important characteristics of eHealth interventions: a narrative review

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There is increasing evidence for the benefits and clinical effectiveness of electronic health (eHealth) interventions,[1-6] including those with a focus on First Nations populations globally.[7-9] In Australia, positive outcomes are reported for eHealth interventions with Aboriginal and Torres Strait Islander peoples, including for mental health challenges,[10,11] support for new fathers,[12] upskilling health care staff,[13] cultural connections,[14] and specialist access for rural and remote areas.[5,15] These and other eHealth interventions have been led by, and/or deployed in partnership with, Aboriginal Community Controlled Health Organisations (ACCHOs).[16,17] Broader population use of digital devices and technology has also affected health care so that eHealth is no longer an add-on, but almost an integral part of daily life for all Australians, including Aboriginal and Torres Strait Islander people.[6,16-18] However, there remains a lack of guidance for culturally safe eHealth with Aboriginal and Torres Strait Islander people. A research program to develop a best practice framework for eHealth with Aboriginal and Torres Strait Islander people was established in 2022.[16] Governance is held by a multi-agency partnership (the Collaboration), which focuses on promoting an evidence base for eHealth that is specific to the interests and priorities of Aboriginal and Torres Strait Islander people. This narrative review contributes to the Collaboration's foundational work to better understand the characteristics of the intervention process that are important to Aboriginal and Torres Strait Islander people. Research has explored aspects of cultural safety and co-design in single studies,[11,19,20] for specific modalities such as mobile health (mHealth),[8,17] or alongside the significance of cultural safety with other First Nation populations.[7,9,21] The aim of this narrative review was to identify the important characteristics of eHealth interventions, and critique the cultural quality of eHealth research with Aboriginal and Torres Strait Islander peoples.

The eHealth modalities deployed within this review include mHealth, telehealth, and mobile diagnostic tools. Further definitions for key phrases are provided in the Supporting information, appendix 1 (eg, eHealth, Aboriginal and Torres Strait Islander people, ACCHOs, and cultural safety).

Our authorship reflects a diversity of background, career stage, gender and race. Specific to the focus of this article, Ray Mahoney and Andrew Goodman are Aboriginal, and Georgina Chelberg, Charankarthi Musuwadi, Liam Caffery and Sheleigh Lawler are non-Indigenous.

Summary

- This narrative review discusses the important characteristics of electronic health (eHealth) interventions and critiques the cultural quality of eHealth research with Aboriginal and Torres Strait Islander peoples.
- Thirty-nine publications reporting on a variety of eHealth modalities to address health challenges with Aboriginal and Torres Strait Islander people were identified.
- Content analysis signified authentic co-design, governance and strong partnerships as foundational qualities of eHealth interventions that are culturally safe and sustainable.
- The pragmatics of eHealth setting, content and engagement must be underscored by trust, responsiveness and cultural values.
- The application of the Aboriginal and Torres Strait Islander Quality Appraisal Tool (QAT) revealed higher scores for studies with two or more Aboriginal and Torres Strait Islander authors.
- This narrative review is fundamental to the development of a best practice framework for eHealth interventions with Aboriginal and Torres Strait Islander people that are culturally safe, sustainable and effective.
- With a foundation of Aboriginal and Torres Strait Islander governance with strong partnerships for authentic co-design, eHealth interventions are more likely to meet the priorities and values of the Aboriginal and Torres Strait Islander communities for which they are intended.

Methods

We conducted searches directly via electronic databases or Web of Science and EBSCOhost platforms (PubMed, Embase, Scopus, PsycInfo, Cochrane, CINAHL) to 2 December 2022, with no limit to publication year. The protocol was registered as a systematic review (PROSPERO 380254), but subsequently reported as a narrative review, retaining the PRISMA structure.[22] Preliminary searches refined the strategy (Supporting information, appendix 2), with two themes: "Aboriginal and Torres Strait Islander" and "eHealth". The Lowitja Institute's LIt.Search tool was also employed.[23]

Eligible studies were full text, published in English in peer-reviewed scientific journals, and included narrative data regarding eHealth interventions with Aboriginal and Torres Strait Islander people using experimental, observational, mixed methods and qualitative designs. Exclusion was based on study design, technology type, and data aspects. Participants of eligible studies were either Aboriginal and

Torres Strait Islander people or health staff (including non-Indigenous people) who work with Aboriginal and Torres Strait Islander people. If study participants were culturally diverse, only outcomes relating to Aboriginal and Torres Strait Islander people were extracted.

Screening and data extraction were completed using Endnote (Clarivate) and Covidence (Veritas Health Innovation). Two authors (GC, CM) independently screened title and abstracts, then full text, and reached consensus with a third author (LC), noting reasons for exclusion.

Characteristics of final studies were collated and cross-checked by two authors (CM, GC), with data extraction embedded in the data analysis phase, discussed below.

Although not standard for narrative reviews, quality assessments of the studies were completed using a hybrid approach. The Joanna Briggs Institute Levels of Evidence (JBI LoE) for effectiveness and meaningfulness were applied, based on study design, with lower scores indicating a more rigorous design.[24,25] Two authors (GC, LC) independently scored studies against the JBI LoE with an average used as the final score. The Aboriginal and Torres Strait Islander Quality Appraisal Tool (the QAT)[26,27] was applied to assess the studies' cultural quality. Three authors (GC, AG, SL) worked collaboratively to appraise one study, and then independently appraised 13 articles each. To complement the QAT process for each study, authors' positionality was sought using publicly available statements.

Two authors independently completed extraction of qualitative data segments in Excel (Microsoft), including direct quotes, statements and descriptions about the eHealth interventions from final studies (AG, $n = 19$; GC, $n = 20$). Iterative content analysis to develop codes and themes followed Bengtsson's approach to authentically represent the literature.[28] One author (GC) systematically reviewed proposed themes by revisiting the full text articles. Consensus on final themes, subthemes and factors was established in discussion among three authors (AG, GC, SL). An odds ratio was calculated to determine the association between the number of Aboriginal and Torres Strait Islander authors and the QAT scores.

This review is considered exempt from ethics approval as it reports on non-identifiable, publicly available data and is of negligible risk. The conduct of this review was informed by the Consolidated criteria for strengthening the reporting of health research involving Indigenous Peoples (CONSIDER) statement[29] (Supporting information, appendix 3).

1 PRISMA flowchart

Source: Page et al.[22] ◆
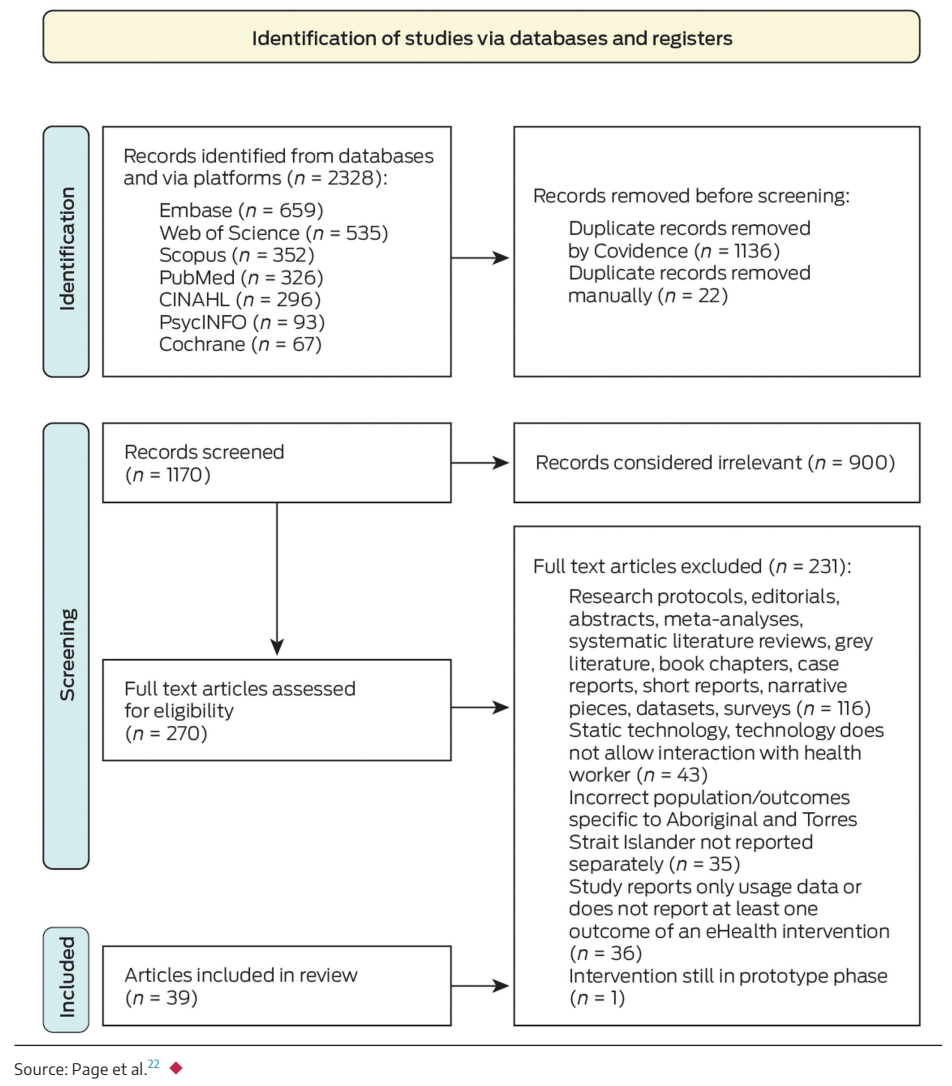
Study characteristics

A total of 39 full text studies reported on the use of eHealth with Aboriginal and Torres Strait Islander people in mainstream and community-controlled settings (Box 1 and Box 2).[10-12,14,15,18,30-62] Final studies used mHealth ($n = 24$; eg, mobile applications), telehealth ($n = 10$; eg, videoconferencing), mobile diagnostic tools ($n = 2$; eg, point-of-care device), other ($n = 1$; eg, social media) or multiple modalities ($n = 2$). Research partnerships and relationships were established with ACCHOs ($n = 18$) and other Aboriginal and Torres Strait Islander organisations ($n = 9$; eg, media company). The eHealth interventions addressed mental health and social emotional wellbeing ($n = 9$), chronic disease management ($n = 6$), health promotion ($n = 6$), screening ($n = 6$), health care access ($n = 5$), maternal and infant health ($n = 5$), substance use ($n = 3$), and caregiver support ($n = 1$). Participants included Aboriginal and Torres Strait Islander people who were direct or indirect consumers (patients and/or carers), as well as non-Indigenous and Aboriginal and Torres Strait Islander health professionals. Studies were conducted in a variety of urban, regional and remote settings across Queensland ($n = 12$), New South Wales ($n = 17$), Victoria ($n = 1$), Western Australia ($n = 3$), South Australia ($n = 4$) and the Northern Territory ($n = 12$).

2 Characteristics of studies that reported on eHealth interventions with Aboriginal and Torres Strait Islander people in Australia

| Study (year) | Focus of intervention | Participants | | eHealth modality | Study site* | Joanna Briggs Institute Levels of Evidence | Quality Appraisal Tool score[†] |
		Aboriginal and Torres Strait Islander	Role				
Amos (2022)[30]	Mental health and social emotional wellbeing	36	Clients	Telehealth	Far North and Central West, QLD	4	0
Ashman (2017)[31]	Maternal and infant care	8	Participants	mHealth	Tamworth and Newcastle, NSW	2	2
Bennett-Levy (2017)[‡,32]	Mental health and social emotional wellbeing	21	Health professionals (health worker, youth worker, family wellbeing coordinator)	Multiple	North NSW	3	7
Bird (2017)[33]	Mental health and social emotional wellbeing	15	Service providers	Multiple	North NSW	3	5
Caffery (2018)[‡,15]	Health care access	9	Health workers	Telehealth	Western QLD	3	0
Cashman (2016)[34]	Maternal and infant care	89	Infants and parents	Telehealth	Hunter New England, NSW	3	12[§]
Clark (2015)[‡,35]	Chronic disease management and education	5	Patients	mHealth	Ipswich, QLD	2	10[§]
Davies (2015)[‡,36]	Chronic disease management and education	27	Patients and health workers	mHealth	Arnhem Land, NT	2	9
Dingwall (2021)[37]	Mental health and social emotional wellbeing	156	Patients	mHealth	Alice Springs and Darwin, NT	1	7
Fletcher (2017)[‡,12]	Maternal and infant care	20	Patients	mHealth	Regional, NSW	4	12[§]
Kennedy (2021)[‡,38]	Maternal and infant care	35	Participants	mHealth	Newcastle, NSW	3	11[§]
Lee (2018)[‡,40]	Screening: substance use	44	Patients and health workers	mHealth	QLD, NSW, SA and VIC	4	10[§]
Lee (2021)[‡,39]	Screening: substance use	(i) 246, (ii) 5	(i) Patients, (ii) field researchers	mHealth	Regional SA and urban QLD	3	9[§]
Macniven (2019)[‡,41]	Screening: cardiac	18	ACCHO staff	Mobile diagnostic tool	Urban, regional and remote, NT, WA and NSW	3	12[§]
Martin (2017)[42]	Healthy behaviour promotion	24	Health workers	Telehealth	SA	3	6[§]
Maxwell (2021)[43]	Healthy behaviour promotion	8	Participants	mHealth	Sydney, NSW	3	4
McCallum (2014)[44]	Chronic disease management	186	Families of patients	mHealth	Darwin, NT, and Townsville, QLD	4	2[§]
McPhail-Bell (2018)[‡,14]	Healthy behaviour promotion	Unspecified	Social media users	Social media	Southeast, QLD	3	9[§]
Mooi (2012)[45]	Health care access	9	Patients	Telehealth	Townsville and remote QLD	3	0
Nagel (2022)[‡,10]	Mental health and social emotional wellbeing	147	Patients	mHealth	Alice Springs and Darwin, NT	3	12
Noble (2014)[‡,46]	Screening: health risk factors	135	Patients	mHealth	Regional NSW	4	1
Peiris (2019)[‡,47]	Healthy behaviour promotion	49	Participants	mHealth	NSW	1	9
Perkes (2022)[‡,48]	Maternal and infant care	(i) 4, (ii) 31	(i) Health professionals, (ii) carers, children, pregnant women	mHealth	Coffs Harbour, Newcastle and Inverell, NSW	4	9[§]

2 Continued

| Study (year) | Focus of intervention | Participants | | eHealth modality | Study site* | Joanna Briggs Institute Levels of Evidence | Quality Appraisal Tool score[†] |
		Aboriginal and Torres Strait Islander	Role				
Phillips (2014)[49]	Health care access	53	Parents of children	mHealth	Remote NT	1	1
Povey (2016)[50]	Mental health and social emotional wellbeing	8	Community members	mHealth	Darwin, NT	3	9[§]
Quinn (2017)[‡,51]	Healthy behaviour promotion	1462	Participants	Telehealth	NSW	2	9
Raphiphatthana (2020)[‡,18]	Mental health and social emotional wellbeing	65	Health professionals from primary health care	mHealth	Darwin and Alice Springs, NT, and Adelaide, SA	3	2
Roberts (2015)[52]	Health care access	5	Participants	Telehealth	Darwin, NT	4	1
Sabesan (2012)[53]	Health care access	18	Patients	Telehealth	Townsville and Mt Isa, QLD	4	1
Shanley (2004)[54]	Caregiver support	(i) 4–6, (ii) 1	(i) Carers, (ii) health workers	Telehealth	NSW	3	0
Snijder (2021)[‡,55]	Substance use	41	Children	mHealth	NSW and QLD	4	12[§]
Spaeth (2016)[56]	Chronic disease management	> 900 patients	4 Case studies	Mobile diagnostic tool	NT	4	1
Spurling (2021)[‡,57]	Screening: auditory	(i) 50, (ii) 9	(i) Children, (ii) caregivers	mHealth	Inala, QLD	3	9
Tighe (2017)[‡,58]	Mental health and social emotional wellbeing	61	Participants	mHealth	Kimberley, WA	1	9
Tighe (2020)[‡,11]	Mental health and social emotional wellbeing	13	Participants	mHealth	Kimberley, WA	3	11
Tonkin (2017)[‡,59]	Healthy behaviour promotion	20	Participants	mHealth	Remote NT	3	6
Veinovic (2022)[‡,60]	Screening: cognitive	20	Participants	Telehealth	Urban and regional NSW	2	10[§]
Versteegh (2022)[‡,61]	Chronic disease management and education	80	Carers of children	mHealth	NT and QLD	2	10
Waller (2022)[‡,62]	Chronic disease management and education	20	Participants	mHealth	Illawarra, NSW	2	10

ACCHO = Aboriginal Community Controlled Health Organisation; mHealth = mobile health; NSW = New South Wales; NT = Northern Territory; QLD = Queensland; SA = South Australia; VIC = Victoria; WA = Western Australia. * States and regions in Australia for eHealth interventions with Aboriginal and Torres Strait Islander people. Regions were not identified in all studies. † Application of the Aboriginal and Torres Strait Islander Quality Appraisal Tool.[26,27] ‡ The study involved an Aboriginal and/or Torres Strait Islander Community Controlled Organisation. § The study included two or more Aboriginal and Torres Strait Islander authors. ◆

Quality assessment

Significant heterogeneity of study designs resulted in a range of JBI LoE categories (Box 2). Individual QAT scores (Box 2) were also notably varied, with scores from 0 to 12 out of a possible 14 (Box 3). Analysis using the composite QAT scores of the final studies (Box 4) revealed strengths in Aboriginal and Torres Strait Islander leadership and consultation with Aboriginal and Torres Strait Islander community controlled organisations. Strengths-based approaches and capacity building with Aboriginal and Torres Strait Islander people were also present. Areas for improvement were the reporting of intellectual property, cultural property, ownership and protection. There was a statistically significant association between the number of Aboriginal and Torres Strait Islander authors and higher scores on the QAT criteria ($\rho = 0.0036$). We created dichotomous variables, "Aboriginal and Torres Strait Islander authors" (< 2 or ≥ 2) and "QAT scores" (≤ 8 or ≥ 9), and found that studies with two or more Aboriginal and Torres Strait Islander authors were 12.75 times (95% confidence interval, 2.29–70.57) more likely to achieve a QAT score of 9 or more compared with articles with less than two Aboriginal and Torres Strait Islander authors (Box 5).

Content analysis

Extracted data segments contained the voices of a range of stakeholders, including Aboriginal and Torres Strait Islander and non-Indigenous people, who were health care consumers, family, community members, health care workers, health professionals, researchers and creative professionals. Content analysis of these stakeholder perspectives yielded factors, subthemes and a foundational theme that is represented in the structure of the Box 6. The significance of the foundational theme, described as

follows, is that it upholds the pragmatic subthemes of culturally safe eHealth interventions with Aboriginal and Torres Strait Islander people.

Foundational theme: authentic co-design with Aboriginal and Torres Strait Islander governance and strong partnerships

Consistent reference throughout the literature signified a foundational need for authentic co-design with Aboriginal and Torres Strait Islander people in eHealth interventions.[10-12,14,15,18,32,35,36,38,40,41,43,46-48,50,51,58,59,61,62]

Authentic co-design was understood as a process of collaborative development and trials of eHealth interventions where Aboriginal and Torres Strait Islander people were valued as instrumental leaders, reflecting the priorities and values of their communities. Sixteen articles[11,12,35-40,44,48,51,55,58,59,61,62] also referred to the significance of Aboriginal and Torres Strait Islander governance and trusted partnerships in the development and trial of eHealth interventions. Aboriginal and Torres Strait Islander governance and authentic co-design are thus considered essential for eHealth.

References to cultural safety were also consistent throughout the literature regarding the pragmatics of eHealth design, development and implementation with end users (subthemes 1–3).
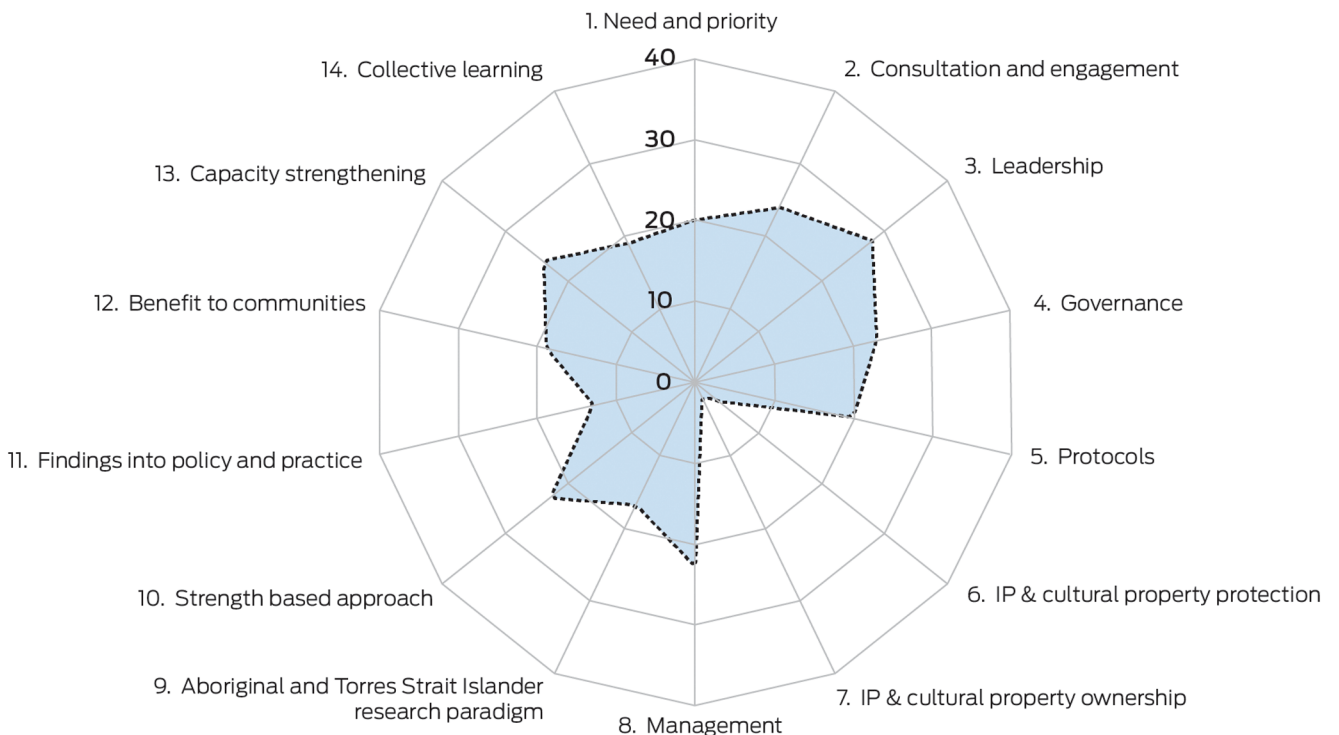
3 Aboriginal and Torres Strait Islander Quality Appraisal Tool (QAT) score[26,27] versus the number of Aboriginal and Torres Strait Islander authors for included studies
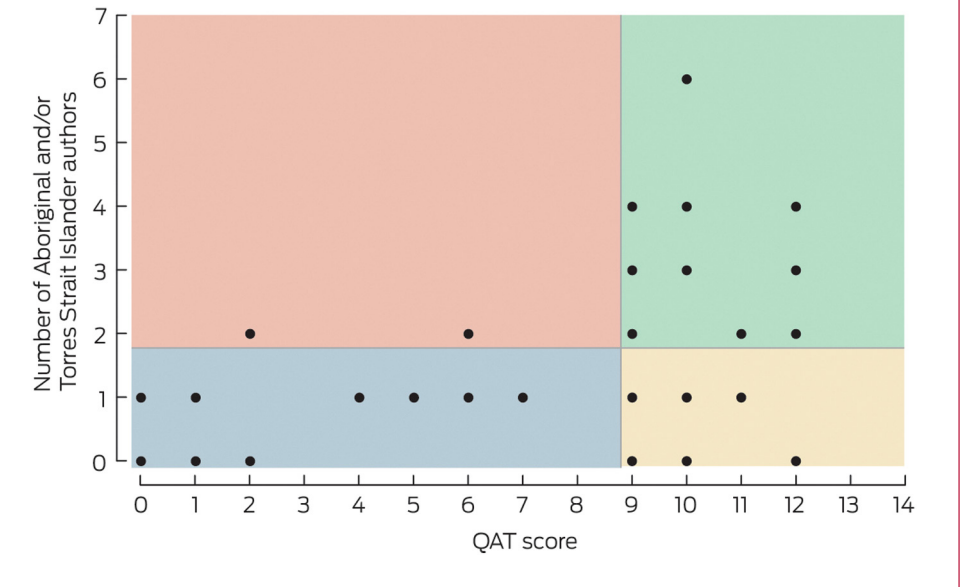
Subtheme 1: eHealth setting underscored by trust

The setting in which eHealth interventions are developed and deployed with Aboriginal and Torres Strait Islander people must engender trust through organisational factors, communication, readiness and resourcing.[12,14,15,18,31,32-34,37-47,49-52,56-59,61,62] The literature consistently referred to ACCHOs as culturally appropriate and relevant settings for eHealth.[11,15,42,44,48,51,52,54,55,57,59,61,62] Further, service providers and

4 Composite strengths and areas for improvement of final studies after application of the Aboriginal and Torres Strait Islander Quality Appraisal Tool (QAT)[26,27]

5 Frequency table for Aboriginal and Torres Strait Islander authors and Quality Appraisal Tool[26,27] scores

	Quality Appraisal Tool scores		
	≥ 9	≤ 8	Total
Number of Aboriginal and Torres Strait Islander authors			
≥ 2	12 (85.7%)	2 (14.3%)	14
< 2	8 (32%)	17 (68%)	25
Total	20 (51.3%)	19 (48.7%)	39
Odds ratio			12.749
P value			0.0036

end users need confidence that an eHealth platform is culturally safe and has capabilities appropriate to the health condition of interest. Box 6 presents a range of factors, that can help make eHealth business-as-usual so that Aboriginal and Torres Strait Islander people experience the value of innovation, such as enabling people to remain on Country, and provision of health care in a familiar, trusted environment. Health professionals and service providers must also recognise that eHealth has limitations and is not necessarily relevant with certain health conditions or settings.[11,18,30,32,42,50,54,60]

Subtheme 2: eHealth content responsive to audience

This subtheme recognises the variety of modalities deployed across the studies and considers the nature of the health information embedded within a users' experience of eHealth. For example, content viewed during user interaction with a mobile application, or shared between a service provider and end user during a telehealth appointment. The literature signalled that eHealth content must be responsive to the intended audience to aid engagement — recognising diversity across users' gender, age, culture, language, health literacy and location.[11,12,14,33,35-41,48,50,51,53-55,59,61,62] Evidence-based content was important[33-35,40,48] and some users expressed the value of a journey or storytelling approach to health content.[38,40,50,61] Additional influencers of engagement were visual elements,[12,14,36,39,49,51,59,61] goal setting,[10,59] bite-size content,[38,48] and concise, conversational language.[35,38,40,48,50,61,62] Study participants reported that eHealth can create a safe, anonymous space[11,39-41,48,50,62] for Aboriginal and Torres Strait Islander people to explore and learn more about health (encouraging agency), through strengths-based content[14,33,41,43,50,55,58,59] that was non-judgemental and culturally relevant.

Subtheme 3: eHealth user engagement underscored by cultural values

Features of the eHealth product, including imagery, design and functionality, have an impact on user engagement and re-engagement over the course of an intervention.[12,14,32,33,35,36,38-40,47-49,55,59,61] eHealth participants expected user-friendly and viable technology with offline capability, that was free of broken links, lengthy load times or glitches.[11,35,38-40,48,59,61] Visual and audio features were reported as strong influencers for user engagement where cultural safety and relevance are paramount.[12,32,33,35,36,38-40,47-49,55,59,61] User preferences included authentic Aboriginal and/or Torres Strait Islander art, flag colours, and visual characters that closely

reflect the appearance and voices of Aboriginal and Torres Strait Islander people. Interactive features (eg, chat, gamification, incentives) and layouts that mimicked other popular platforms were appealing to users.[12,14,38,39,47,48,59,61] eHealth development should include consultation with end users about modality, intervention frequency and duration.[11,38,43,47,62]

Principal findings

A literature search (to 2 December 2022) yielded 39 studies that underwent analysis of content and cultural quality to identify the important characteristics of eHealth with Aboriginal and Torres Strait Islander people. The key finding is that authentic co-design, governance and strong partnerships are foundational qualities of eHealth that is culturally safe and sustainable for impact. Without these, eHealth interventions may not meet the priorities and values of the Aboriginal and Torres Strait Islander communities for which they are intended. Three subthemes identified from factors in the literature included eHealth setting underscored by trust, eHealth content responsive to audience, and eHealth user engagement underscored by cultural values. These themes provide insight into the pragmatic aspects of eHealth interventions, where service providers and end users are confident, supported and engaged, with effective and culturally safe modalities that enable two-way health care interactions.

This review further verifies that co-design with Aboriginal and Torres Strait Islander people must move well beyond tokenistic participation to authentic participatory action research (PAR). This is an essential distinction given that a 2021 scoping review[63] reported a nominal alignment with PAR (or community engagement and leadership) in a review of chronic disease interventions (including eHealth) with Aboriginal and Torres Strait Islander populations, despite the researchers stating the importance of PAR, and implying they had incorporated PAR into their studies.

A secondary analysis of a randomised clinical trial[64] also emphasised the need for research processes that account for the greater cultural context of a technological innovation.[64] The authors noted a scarcity of relevant literature and reported their retrospective analysis of qualitative data collated during a five-year randomised controlled mHealth trial with six diverse First Nations communities in Canada. Based on their findings and reflective practice, the authors proposed a set of "wise practices" for culturally safe eHealth research that included building and maintaining respectful relationships, as well as commitment to co-designing the innovation.[64] Authentic co-design places people most affected by an intervention or service at the centre of that process, and is guided by their voices, values and experiences.[65] Further, in a 2022 editorial,[66] the authors assert that "… the engagement, involvement, and leadership of Indigenous and Tribal people is an essential requirement for ensuring that research is consistent with the rights of Indigenous and Tribal peoples (including the right to self-determination)".

Although previous reviews have offered global evidence about the value of collaborative approaches, authentic relationship building and co-design with First Nations peoples,[7,8,17,64] this narrative review positions authentic co-design as a foundational approach — specific to Aboriginal and Torres Strait Islander people. This foundation of co-design, encapsulating Aboriginal and Torres Strait Islander governance and strong partnerships, determines the pragmatic plans within subsequent stages of

6 Content analysis: foundational theme, subthemes and factors with literature sources

Foundational theme	Subthemes	Factors	Literature sources
CO-DESIGN + GOVERNANCE + STRONG PARTNERSHIPS for cultural safety + sustainability + impact	**eHealth setting underscored by trust**	Service provider readiness + championship	• Organisational factors strongly influence uptake and engagement[14,18,31,42,43,45,56] • ACCHO or culturally safe setting facilitates engagement[11,15,42,44,48,51,52,54,55,57,59,61,62] • eHealth must complement existing roles and responsibilities for health workers[18,33,39,41,61] • Hardware must be maintained[14,39,43,47,58]
		Interface of eHealth	• Human interaction supports eHealth adoption and health conversations[12,14,15,32,34,37,41-47,50,51,57,62] • Use devices that are familiar to people for social connection[11,32,47,59,57] • eHealth can be a health partnership tool for social and health connections[12,14,15,32,33,38,43,47,49,59,62] • Technology is not always relevant and has its limitations[11,18,30,32,42,50,54,60] • Consideration of logistics must include access, costs, user privacy, data security, and offline capability[40,42,45,50]
		Communication	• Communication of eHealth to end users[41,44,47,49,52] • Communication within health sites and across health system tiers[45,50]
		Cultural safety	• Aboriginal and Torres Strait Islander community-controlled setting facilitates cultural safety[15,51,52,54,57-59,61,62] • Human interaction with health worker facilitates cultural safety[15,42,45,57] • Acknowledgement of diversity and respect for individuals and communities facilitates cultural safety[12,33,34,36,38,39,41,51,54,59,61]
	eHealth content responsive to audience	Local language	• Local language, local information and language options are important[40,48,50,61]
		Storytelling style	• Content that has a storytelling approach or incorporates a journey supports engagement[38,40,50,61]
		Strengths-based + safe spaces	• Strengths-based content or self-determination of how user engages can encourage agency[14,18,33,41,43,50,55,58,59] • Goal setting is valuable[10,59] • eHealth content should be sensitive to diversity and individual experience, where users do not feel judged[11,12,31,40,43,45,47,48,50,59] • eHealth can create a safe space and therapeutic benefit – avoidance of shame job and opportunity to connect with health support[11,39-41,48,50,62] • eHealth content can inform and educate[11,32,33,35,36,38,39,41,43,48,50,55,58,59,62]
		Evidence-based	• eHealth content should be evidence-based, trustworthy[33-35,40,48]
		Literacy + comprehension	• Bite-size content for engagement and literacy[38,48] • Style of eHealth language can aid comprehension (eg, clear, concise and conversational)[35,38,40,48,50,61,62] • Style of eHealth language can aid health conversations with health professionals[40,62] • Variety of content that is relevant to intended audience[11,12,38,48,55,62] • Visual elements support engagement and comprehension[12,14,36,39,49,51,59,61]
		Holistic, dynamic +collective health	• eHealth content and the supporting model of care should exemplify health as holistic, dynamic and collective[15,35,48,51,53,59]
		Cultural safety	• Content must be responsive to intended audience recognising diversity across locations, genders and consider language, content, variety and engagement[11,12,14,33,35-41,48,51,53-55,59,61,62]
	eHealth user engagement underscored by cultural values	Format + function	• Format, structure and interface of eHealth is significant for engagement (eg, user-friendly, functional, offline capability)[11,35,38-40,48,59,61]
		Visuals, media, colours, fonts, audio, text	• Visual mediums are significant for engagement and cultural safety[12,32,33,35,36,38,39,47,49,55,59,61] • Audio is significant for engagement[39,59,61] • Bite-size content is important[38,48] • Design, colours, and imagery are significant for comprehension, engagement and health conversations or help seeking[11,35-38,40,48,50,55,59,61] • Use of Aboriginal and Torres Strait Islander artists is important[38,40,55] • Characters in audio visuals should reflect or represent Aboriginal and Torres Strait Islander people and genders[35,40,48,55]
		Engaging + interactive features	• Modality is important for engagement[11,60] • Social media style design and interactivity is well received[14,38,47,48] • Interactive features are important (eg, chat, gamification, incentives, messaging)[14,38,39,47,48,59,61] • Users need to have input to frequency and duration of eHealth intervention[11,38,43,47,62]
		Cultural safety	• Visual elements significant for engagement and cultural safety[12,32,33,35,36,38,39,47,49,55,59,61] • Use of Aboriginal and Torres Strait Islander artists is important[38,40,55] • Characters in audio visuals should reflect or represent Aboriginal and Torres Strait Islander people and genders[35,40,48,55]

ACCHO = Aboriginal Community Controlled Health Organisation. ◆

the eHealth intervention. This linkage strongly aligns with a key recommendation by national experts, led by Pat Dudgeon, regarding the potential for telehealth and other forms of eHealth to support mental health and wellbeing for Aboriginal and Torres Strait Islander people during the coronavirus disease 2019 (COVID-19) pandemic. "Therefore, optimism is contingent on the adoption of best practice, including Indigenous governance and culturally safe services that accommodate models of cultural healing and holistic well-being."[67]

This narrative review emphasises the strengths of ACCHOs (and other community controlled Aboriginal and Torres Strait Islander organisations) as key entities with which strong partnerships and governance must be established. Despite most of the studies that partnered with ACCHOs scoring higher in the QAT analysis for cultural quality, further research will help establish the value and potential of these collaborations for eHealth. Not only do these organisations represent the voices and priorities of the communities they service, their holistic models of care are integral to closing the gap in health and social disparities between Aboriginal and Torres Strait Islander and non-Indigenous people in Australia.[16,68,69] Consequently, ACCHOs are a critical component of the supporting ecosystem for eHealth impact with Aboriginal and Torres Strait Islander people.

While the final iteration of the best practice framework is in development, we recommend from the outset that researchers and service providers undertake early planning for any health interventions with Aboriginal and Torres Strait Islander people and apply tools such as the QAT[26,27] alongside an appropriate ethics review. Although intended as an appraisal tool, the QAT content was designed by, and with, the voices of Aboriginal and Torres Strait Islander peoples. Deeper analysis about a potential eHealth project, using the QAT prompts, will enhance the quality, relevance and benefits of intervention research to enhance community health and wellbeing.

Significantly higher cultural quality scores were achieved in studies that included more Aboriginal and Torres Strait Islander authors. This further underscores the key theme of this review. To achieve appropriate, high quality and relevant eHealth research with Aboriginal and Torres Strait Islander people, an authentic approach to governance and co-design is essential. These findings indicate a direct correlation to the influence Aboriginal and Torres Strait Islander leadership and authorship has on beneficial and quality eHealth research, countering the long history of colonising health research.[66]

Future work by the Collaboration will continue the program of research previously outlined.[16] Building on the key findings of this narrative review, modified-Delphi processes with health and community stakeholders as well as national experts are being conducted to further establish the values and priorities of Aboriginal and Torres Strait Islander people in shaping a foundational eHealth best practice framework.

Strengths and limitations

This review was conducted according to the PRISMA 2020 statement.[22] Two reviewers completed each stage of screening (GC, CM) and JBI LoE rankings (GC, LC). However, although pre-analysis discussion and cross-checks occurred, a portion of articles underwent single-author QAT analysis. Author positionality of final articles was limited to desktop research and we thus acknowledge we may have missed some authors, given that, historically, scientific publications rarely provided an opportunity for Aboriginal and Torres Strait Islander authors to identify as such. Publication bias toward effective studies may have affected the identification of articles relating to eHealth with Aboriginal and Torres Strait Islander people. Further, it should be recognised that not all eHealth interventions used in practice would necessarily result in an academic publication, potentially leading to incomplete data about best practices. Further, with the evolving nature and breadth of eHealth modalities, the research team faced challenges in determining the pragmatic application of technology within some trials. Iterative discussions with principal researchers on the authorship team were used to reach consensus. The heterogeneity of eHealth modalities identified for this study meant that some findings regarding a modality (eg, mobile diagnostic tools) may only be supported by a small subset of studies and, hence, are likely to be underpowered.

Conclusion

This narrative review is fundamental to the development of a best practice framework for eHealth interventions with Aboriginal and Torres Strait Islander people for cultural safety, sustainability and impact.[16] The need for a framework to guide researchers and service providers is driven by the ubiquitous presence of digital devices and the growth of eHealth across health settings.[7,8,17,64] Content analysis of scientific literature asserts that authentic Aboriginal and Torres Strait Islander co-design, governance and strong community partnerships are foundational qualities of culturally safe eHealth practice and research with Aboriginal and Torres Strait Islander people. With these foundations in place throughout the intervention lifespan, the pragmatics of eHealth including setting, content and user engagement, are more likely to meet the priorities and values of the Aboriginal and Torres Strait Islander people and communities for which they are intended.

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Supporting Information

Additional Supporting Information is included with the online version of this article.