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BMJ Open

Scoping review protocol of E-Health interventions targeting Indigenous populations

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To cite: Shah S, Monteiro SMDR, Borana R, *et al*. Scoping review protocol of E-Health interventions targeting Indigenous populations. *BMJ Open* 2026;**16**:e112683. doi:10.1136/bmjopen-2025-112683

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (https://doi.org/10.1136/bmjopen-2025-112683).

Received 21 October 2025
Accepted 12 February 2026

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ABSTRACT

Introduction Electronic health (E-Health) technologies present a valuable opportunity to enhance healthcare access and outcomes for Indigenous populations by addressing persistent, often structurally determined, health disparities. Despite increasing recognition of the potential of E-Health interventions, there remains a lack of comprehensive synthesis of their modalities, cultural appropriateness and implementation within Indigenous communities globally. This scoping review will aim to systematically map the landscape of E-Health interventions for Indigenous populations, identifying effective strategies and gaps in current research and practice. By documenting global evidence, this review will contribute to broader efforts to integrate Indigenous health considerations into policy and practice, supporting health equity and realising the United Nations Declaration on the Rights of Indigenous Peoples.

Methods and analysis This scoping review will follow the Preferred Reporting Items for Systematic Reviews and Meta-analyses Protocols (PRISMA-P) guidelines. A comprehensive search of multiple databases will be conducted to identify studies on E-Health interventions in Indigenous communities between 2013 and 2025. The review will focus on interventions targeting Indigenous populations published in English. A two-stage screening process, comprising abstract/title screening followed by full-text screening, will be independently conducted by two reviewers. A standardised data extraction template will be used, and qualitative data will be synthesised using narrative synthesis and thematic analysis. Quantitative data will be presented descriptively using graphs, diagrams or tables.

Ethics and dissemination As the study relied on publicly available research, institutional review board approval is not required. Findings will be disseminated through peer-reviewed publications and conference presentations.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ Comprehensive scope: This scoping review will encompass a broad spectrum of electronic health (E-Health) interventions, providing a holistic understanding of current practices within Indigenous communities globally.

⇒ Cultural evaluation: By examining cultural appropriateness alongside efficacy, this review will offer deeper insights into how interventions align with Indigenous values, traditions and health practices.

⇒ Framework-driven rigour: The methodology, guided by Preferred Reporting Items for Systematic Reviews and Meta-analyses Protocols (PRISMA-P) and Arksey and O'Malley's framework, ensures a systematic, transparent and reproducible research process.

⇒ Identification of barriers: In addition to highlighting effective interventions, this review will identify challenges and obstacles to the adoption of E-Health technologies, offering policymakers, health professionals and community stakeholders valuable insights.

⇒ Language restrictions and exclusion of grey literature: Limiting the review to English-language peer-reviewed publications may exclude relevant studies published in other languages and unpublished or non-peer-reviewed research, potentially underrepresenting community-based and Indigenous-led research initiatives.

INTRODUCTION

According to a report published by the International Labour Organisation in 2020, there are about 476.6 million Indigenous Peoples in the world, most of whom live in Asia and the Pacific (70.5%), Africa (16.3%), Latin America and the Caribbean (11.5%), Northern America (1.6%) and Europe and Central Asia (0.1%).[1 2] Indigenous Peoples, although comprising only 6% of the world's population, experience high rates (19%) of extreme poverty.[1 3] These statistics reflect the ongoing impact of colonial policies, including forced cultural assimilation and economic marginalisation, welfare dependency and dispossession from family, culture and land.[4–10] Despite this, Indigenous Peoples continue to demonstrate resilience and resourcefulness in preserving their cultural heritage and improving their well-being.[11]

The United Nations Declaration on the Rights of Indigenous Peoples asserts the right of Indigenous communities to achieve the highest possible level of physical and mental health. Yet, healthcare systems worldwide frequently do not meet this objective.[12] Indigenous Peoples frequently face significant challenges in accessing clinically appropriate and culturally safe healthcare. A majority of Indigenous Peoples globally living in geographically remote areas, with limited public investment in essential services and digital infrastructure face physical, structural and racial barriers to inclusion in the formal economy.[3] This is a prominent public policy issue that governments have attempted to address.[13–15] For example, over 66% of Indigenous Australians and 44% of Indigenous Canadians live in remote areas.[14 16 17] Indigenous health knowledge systems and voices are marginalised within mainstream healthcare systems, leading to a lack of inclusion of traditional cultural worldviews and spiritual healing methods.[18] This neglect deprives Indigenous Peoples of culturally safe and holistic healthcare and reflects a considerable deficiency in cultural sensitivity within numerous health educational environments.[4]

E-Health technologies present an opportunity to leverage the strengths and resilience of Indigenous populations in addressing health disparities. The WHO highlights that improving health service accessibility and quality through digital technologies is essential to achieving the Sustainable Development Goals.[19]

E-Health encompasses digital health interventions, web-based interventions, telehealth interventions, mobile Health (mHealth), electronic health records (EHR), telemedicine and online interventions. These technologies have the potential to improve patient outcomes, streamline the effectiveness of the healthcare systems and improve healthcare delivery, especially for historically underserved populations and those living remotely.[20–22]

While E-Health offers considerable promise, many challenges remain. Geographic remoteness and socioeconomic differences contribute to gaps in Indigenous People's digital access, creating a 'digital divide' defined as community-level disparities in access and use of online technologies. This digital divide exacerbates already-existing inequalities experienced by Indigenous Peoples in employment, healthcare, education and community development, which underpin poor health outcomes for many Indigenous Peoples.[21 23 24] Such structural conditions are illustrative of failures by government health systems to deliver culturally safe and responsive services, including health information. Combined with the broader impacts of colonialism, government system deficits contribute to increased susceptibility to diseases and lower life expectancy.[3 25] By way of example, acute rheumatic fever (ARF) is typically prevalent in countries where there is high poverty, poor hygiene and poor living standards.[26] Yet in Australia, a high-income country, 89% of new ARF and rheumatic heart disease diagnoses between 2015 and 2017 affected Aboriginal and Torres Strait Islander People under 25 years living in rural and remote communities.[27] In New Zealand, Māori and Pacific Islanders made up 93% of hospital admissions for ARF between 2002 and 2016. Localised studies from northwest Ontario in Canada, similarly, indicate comparably high and underreported rates of ARF within Indigenous communities.[27]

E-Health interventions are a viable option for strengthening accessible and culturally tailored healthcare. They could improve accessibility, enhance cultural safety and empower Indigenous Peoples to manage their health.[28] Electronic modalities, such as messaging and online chat rooms, offer anonymous social support and reduce stigma around diseases like HIV.[29] Evidence shows that E-Health provides Indigenous patients the opportunity to access private, secure healthcare via phones, offering anonymous support and avoiding unwanted in-person interactions.[30–32] These technologies also offer speed, anonymity, accessibility, affordability and convenience, reducing cultural and physical barriers to healthcare engagement.[31 33 34]

Indigenous Peoples globally have varied and distinct cultural and geographic circumstances that require customised E-Health solutions. Limited internet access in remote locations is one of the many barriers to successfully implementing E-Health programmes.[14 35] Connectivity issues hinder the efficient delivery of healthcare through electronic medical records, electronic databases for pathology testing and referral forms and health promotion and education. Integrating technological advancements with culturally sensitive health education and intervention methods is critical, but little guidance exists on how to design and implement such approaches.[36–39]

Numerous studies across diverse population groups have shown the growing popularity of E-Health interventions, particularly online, for addressing a range of psychosocial and physical health challenges. These include pain management,[40] substance abuse,[41] mental health,[42] sexual health,[43] heart health,[44] cancer,[45] diabetes[46] and overall health management[47] like medication compliance and encouraging physical activity.[40–42 44 45] Several online psychosocial programmes have been tailored to support the needs of families or caregivers, and several systematic reviews have evaluated the efficacy of interventions across general populations, demonstrating equivalency between e-mental health interventions and in-person therapy for conditions like depression, anxiety and trauma-related disorders.[48–51] However, not all populations are benefiting equally. The digital divide exacerbates already existing health inequalities related to race, socioeconomic, educational and age disparities.[20] Despite growing research on E-Health interventions for Indigenous communities, significant gaps remain.[52 53] Previous studies have concentrated on particular illnesses, health challenges and technological approaches without a comprehensive examination of E-Health's specific applicability to Indigenous Peoples, including its cultural appropriateness and role in therapeutic relationships.[54]

This scoping review aims to systematically explore the landscape of E-Health interventions for Indigenous populations, identifying effective strategies and gaps in current research and practice. It employs an integrated conceptual framework that situates E-Health interventions within Indigenous health equity and self-determination. We draw on four complementary frameworks to understand how E-Health may address or exacerbate barriers faced by Indigenous populations:

1. The Social Determinants of Health framework[55 56] recognises that Indigenous health inequities stem from structural factors, including geographic isolation, poverty, inadequate infrastructure, historical trauma and systemic discrimination. E-Health interventions may address some of these barriers by reducing geographic and temporal constraints on healthcare access.
2. The Digital Health Equity framework[57] emphasises that digital technologies may worsen disparities if they do not address the digital divide. This includes access to technology, internet connectivity, digital literacy and culturally appropriate design. For Indigenous populations, failure to address these factors risks widening inequities.
3. The Cultural Safety framework[58 59] requires that E-Health interventions address power imbalances, incorporate Indigenous knowledge systems and enable Indigenous self-determination. Interventions co-designed with Indigenous communities may enhance cultural safety, while those developed without Indigenous involvement may perpetuate mistrust and disengagement.
4. Finally, Indigenous Data Sovereignty principles that include OCAP (Ownership, Control, Access, Possession) and CARE Principles (Collective benefit, Authority to control, Responsibility, Ethics).[60 61] These assert that Indigenous Peoples must govern the data generated through E-Health interventions.[62] Interventions embedding these principles may strengthen community autonomy, while those extracting data without community governance perpetuate colonial practices.

This integrated framework guides our examination of how E-Health interventions may address barriers, including geographic isolation, healthcare access, cultural safety, health literacy and continuity of care, while attending to the critical conditions required for these interventions to advance rather than undermine Indigenous health equity and self-determination.

By documenting evidence of E-Health use with and for Indigenous communities globally, this study contributes to integrating Indigenous health considerations into global health initiatives and national policies in alignment with the UN Declaration on the Rights of Indigenous Peoples.[21] This work seeks to contribute to broader efforts to address health disparities and advances towards achieving health equity for all.

METHODS AND ANALYSIS

A scoping review methodology was selected to support flexibility, rigour and practicality in identifying themes relevant for researchers, policymakers, health services and Indigenous communities.[63] The method section provides an exhaustive description of the protocol for conducting a scoping review of E-Health interventions in Indigenous communities worldwide. Our scoping review protocol follows the Preferred Reporting Items for Systematic Reviews and Meta-analyses Protocols (PRISMA-P) guidelines[64] (online supplemental table 1) and the methodological approach proposed by by Joanna Briggs Institute (JBI) Manual for Evidence Synthesis,[65] the Arksey and O'Malley's methodological framework[66] and others.[67–69] The conception of this study started with several team discussions in August 2023, and we plan to finalise it by August 2026.

During the review process, the following stages will be completed:

1. Formulating the research question.
2. Search strategy and identifying relevant studies.
3. Selection of eligible studies.
4. Data extraction.
5. Collating, summarising and reporting the results.

As this paper focuses on Indigenous populations, the lived experience of Australian Aboriginal woman Tyra Yarran will guide this research. Tyra, who is from Bardi Jawi Country in Australia, has over 20 years of experience working with Aboriginal and Torres Strait Islander Health systems and health challenges in a variety of health settings. She will be involved in all the next stages of the project.

Stage 1: formulating the research question

The review process commenced with an explicit delineation of the study's question, objectives and scope. We employed the epidemiological method of asking the questions of 'Who? What? And When?' to formulate a research question. Collaborative iterative discussions with subject matter experts led to the consensus that the review would answer the research question: 'In the last ten years, what research has been performed regarding E-Health Interventions in Indigenous communities across the world?' It was decided collectively to keep the research question broad in scope, avoiding specific diseases or geographic limitations. To obtain a complete grasp of the present research landscape, we did a thorough evaluation of narrative and systematic literature studies before finalising our research question. This comprehensive review aims to find literature gaps and prevent work repetition while developing our research topics. Notably, researchers like Intahchomphoo *et al*[13] and Moecke *et al*[54] were crucial in exposing recurring themes and particular difficulties experienced by these populations. Combining these evaluations' findings, we created focused research questions that address understudied facets of digital inclusion and health outcomes in Indigenous contexts.

Our scoping review addresses a critical gap in geographic representation. Previous reviews have focused primarily on Indigenous populations in four high-income Anglophone nations (the USA, Canada, Australia and New Zealand), leaving substantial knowledge gaps regarding E-Health interventions for Indigenous populations in other regions. Our review will include Indigenous Peoples globally. This expanded geographic scope will enable identification of diverse cultural adaptation strategies, implementation approaches and lessons learnt across varied socioeconomic, healthcare system and cultural contexts. This has allowed us to ensure that our contributions are unique and effectively address the gaps that have been identified. This deliberate choice was intended to collect comprehensive evidence about E-Health interventions in various Indigenous communities.

This research question guided the development of the specific study aims:

a. To identify and map the existing literature on E-Health interventions in Indigenous communities worldwide.
b. To assess the types and characteristics of E-Health interventions targeted at Indigenous communities.
c. To summarise the identified literature's key themes, findings, and research gaps.
d. To inform future research priorities and policy decisions related to E-Health interventions for Indigenous communities.

This initial stage ensured the review's focus was clear and laid the groundwork for subsequent phases.

Stage 2: search strategy and identifying relevant studies

The search strategy's design started with identifying the relevant databases and the key terms within those databases. A comprehensive search will be conducted across multiple databases, including PubMed, Scopus, Web of Science, CINAHL and Medline (Ovid). The search incorporated keywords, boolean phrases, Subject Headings and Medical Subject Headings (MeSH) terms about E-Health and Indigenous populations. The search strategy developed in Medline (table 1) will be adapted for each database to account for differences in subject headings (eg, MeSH vs Scopus vs CINAHL headings) and search functionalities. The complete process involved: (1) reviewing four peer-reviewed articles on E-Health interventions for Indigenous populations to identify commonly used key terms, (2) consulting a research librarian at James Cook University to refine and enhance the search strategy and (3) adapting the finalised strategy for each database's specific controlled vocabulary and search syntax. Each database-specific search strategy is documented in the supplementary file (online supplemental table 2). The final search strategy was drafted in consultation with the research librarian at James Cook University. The original search scope was from January 2013 to 2023. An updated search strategy will include literature up to July 2025. The search will encompass published sources.

Before uploading the finished dataset into Covidence and Rayyan for the ensuing review stages, all search results will be exported to EndNote and deduplicated by the primary reviewer. The timeframe (2013–2025) was selected because 2013 marked significant developments in mobile health technology adoption and increased global policy attention to Indigenous health equity. This

Table 1 Example of search strategy

Serial number	Medline terms	Results
Indigenous		
1	exp Indigenous peoples/ or exp "american indian or alaska native"/ or exp "australian aboriginal and torres strait islander peoples"/ or exp maori people/ or exp "native hawaiian or other pacific islander"/	36 465
2	exp Health Services, Indigenous/	4155
3	exp Indigenous Canadians/ or exp Inuit/ or exp Indians, North American/	18 346
4	Indigenous health services.mp.	137
5	(indigen* or aborigin* or tribe* or "first nation*" or "native born*" or "native people*" or native* or "health Indigenous service*" or "Indigenous health service*" or "native hawaiian*" or "native hawaiian or other pacific islander*" or "pacific island american*" or Maori* or "australian aborigin*" or "australian race*" or "australoid race*" or "torres strait islander*" or "North American Indian*" or "Alaskan Native*" or Navajo* or Pima* or " South American Indian*" or "Central American Indian*" or "central american amerind*" or "central american indian*" or "north american amerind*" or "north american indian*" or "south american amerind*" or "south american indian*" or "metis canadian*" or "alaska Indigenous people*" or "alaska native*" or "alaska's Indigenous people*" or "alaskan native*" or "naabeeho*" or "navaho*" or "akimel o'odham*" or "akimel o'otham*" or inuit*).mp.(mp=title, book title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms, population supplementary concept word, anatomy supplementary concept word)	302 008
6	1 or 2 or 3 or 4 or 5	310 450
E-Health		
7	exp telemedicine/ or exp telepathology/ or exp teleradiology/ or exp telerehabilitation/	45 430
8	exp Mobile Applications/ or exp Cell Phone/	30 467
9	Gamification/ or Mobile Applications/	11 834

Continued

Table 1 Continued

Serial number	Medline terms	Results
10	(Telemedicine* or "mobile health*" or "mobileHealth*" or "tele-referral*" or telehealth* or "virtual medicine" or "virtual-medicine" or ehealth or mhealth or "eHealth*" or "m-health*" or "mobile app*" or "portable electronic app*" or "portable software app*" or "smartphone app*" or "software app*" or cellphone* or "cell phone*" or "mobile phone*" or "mobile-phone*" or "tele health*" or "electronic health*" or "electronic-health*").mp.(mp=title, book title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms, population supplementary concept word, anatomy supplementary concept word)	121 550
11	(smartphone* or "smart-phone*"). mp.(mp=title, book title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept) word, rare disease supplementary concept word, unique identifier, synonyms, population supplementary concept word, anatomy supplementary concept word)	18 620
12	7 or 8 or 9 or 10 or 11	137 466
13	6 and 12	1134
14	limit 15 to yr="2013 - 2023"	890
15	limit 15 to yr="2018 - 2023"	630

timeframe captures the modern era of digital health while remaining manageable in scope.[70]

Stage 3: selection of eligible studies

After exporting the data to Covidence, the team will begin the screening process (first abstracts/titles, then full-text screening). Studies included in this scoping review will follow the eligibility criteria outlined in table 2. These criteria will be circulated among all the reviewers (SS, SM, RB, MEC, TY, SMT).

To ensure alignment on the scope of articles to be included, the primary reviewer will assign each reviewer 50 of the total articles for a pilot screening. The team will meet to address any discrepancies within those 50 and to consolidate the inclusion and exclusion criteria. After the primary debrief, two teams of reviewers (SS, RB and SM) will independently screen all the papers. A neutral reviewer will be involved in the decision-making of the conflicts (MEC). To ensure consistency across reviewers and transparent decision-making, we will develop comprehensive screening tools (abstract/title and full-text screening) that operationalise our inclusion/exclusion criteria, following the methodology proposed by Polanin *et al.* [71] Both reviewers will use these tools throughout the screening process, and any unclear cases will be flagged for discussion with a third reviewer to reach a consensus.

Table 2 Inclusion and exclusion criteria

Component	Inclusion criteria	Exclusion criteria
Study focus	Studies focusing on E-Health interventions in Indigenous communities across the world.	Studies not directly related to E-Health interventions. Studies with insufficient information or methodology.
Population	Indigenous communities	Non-Indigenous communities
Setting	Worldwide	—
Language	English	Non-English
Type study	Primary research articles, systematic reviews and technical reports.	Grey literature, editorial, opinion pieces, book chapters and protocols.
Year or publication	January 2013–July 2025	Published before January 2013

These tools will provide detailed guidance on:

- E-Health intervention definition: Digital health interventions, web-based programmes, telehealth/telemedicine, mHealth applications, online interventions, population-based E-Health interventions and digital health systems. Studies must describe actual health interventions; purely theoretical frameworks, EHRs used only for data collection, or online data collection tools without health intervention components will be excluded.
- Indigenous population criteria: Studies will be included if they explicitly describe interventions for, with, or involving Indigenous Peoples as the primary focus. For studies with mixed populations, we will include only those that provide subgroup analysis specifically examining intervention use or outcomes in Indigenous communities (these will be labelled 'Target Group: Indigenous Sub-Group' for tracking purposes).
- Study type inclusion: Primary research studies (quantitative, qualitative, mixed methods), systematic reviews, scoping reviews, narrative reviews and technical reports will be included. Protocols, grey literature, dissertations, conference abstracts, editorials, opinion pieces, commentaries and book chapters will be excluded.

The screening tools include decision trees for both title/abstract screening and full-text review, with specific examples and standardised exclusion codes to maintain consistency. Both reviewers will use these tools throughout the screening process, and any unclear cases will be flagged for discussion with a third reviewer to reach a consensus.

Studies that fit the potential inclusion criteria will be retrieved in full text during this screening phase. During the full-text screening, any study that does not meet the inclusion criteria will be excluded, and the final report will include the primary justification for this decision. The final report will contain comprehensive documentation of the search results and a PRISMA flow diagram to visualise them.

Stage 4: data extraction

The full text of each included manuscript will be reviewed to extract data on intervention characteristics, design and implementation processes, and expected or measured outcomes. All included articles will be categorised by study type (interventional, exploratory, review and non-experimental), and data extraction templates will be developed for each category based on the type of data available in the final inclusions. A comprehensive data extraction template will be designed to systematically capture information across multiple domains for interventional studies.

The template will include fields for study characteristics and methodology, Indigenous community demographics and target populations, E-Health intervention specifications, study outcomes and Indigenous focus elements. Particular attention will be paid to cultural safety indicators, including co-design with Indigenous communities, Indigenous-specific recruitment and community involvement in intervention development. The template will capture how Indigenous perspectives are addressed throughout each study (background, methods, results and discussion sections) and document respect for Indigenous sovereignty, cultural values and the historical context of healthcare experiences. This template will be modified and adapted for non-intervention study types (exploratory, review and non-experimental studies) as deemed appropriate based on the available data.

The cultural safety concepts will be supported by the Aboriginal author, TY. To ensure the process is validated, the data extraction template will be piloted in a random sample of five studies and then discussed within the team of authors. Edits will be made according to their suggestions. Independent reviewers (SS, RB, SM and MEC) will then be assigned for data extraction. Discrepancies will be resolved by consensus or, if necessary, by a third reviewer. The full-text articles to be extracted will be stored in a shared library on EndNote and Google Drive. The Excel file for data extraction will be shared on Google Drive. A code book will be maintained to track the extractions done by the two reviewers.

Risk bias assessment

The methodological quality of all included studies will be assessed using the quality assessment tool developed by Hawker *et al.*[72] This tool was specifically designed to appraise diverse study types within a single review, making it appropriate for evaluating studies employing quantitative, qualitative and mixed methods designs. The Hawker tool consists of nine domains: (1) abstract and title, (2) introduction and aims, (3) method and data, (4) sampling, (5) data analysis, (6) ethics and bias, (7) results, (8) transferability/generalisability and (9) implications and usefulness. Each domain will be scored on a four-point scale: good (4 points), fair (3 points), poor (2 points) or very poor (1 point), yielding a maximum total score of 36 points per study. One reviewer will assess each included study using the Hawker tool, with queries resolved through discussion or consultation with a second reviewer. The quality scores will be used to identify the methodological strengths and limitations of the included evidence and to contextualise the findings in the final synthesis. Studies will not be excluded based on quality scores; however, the quality assessment will inform the interpretation of results and the confidence placed in the evidence from individual studies.

Stage 5: collating, summarising and reporting the results

A narrative synthesis of the extracted data will be undertaken rather than a meta-analysis due to substantial heterogeneity among the included studies. Quantitative findings will be summarised using descriptive statistics, while qualitative data will be independently coded. The data will be presented graphically, diagrammatically or in tabular form. A thematic analysis of interventional studies will be conducted by two researchers (SM and SS) to derive coherent themes, using Braun and Clarke's reflexive thematic analysis approach.[73] The analysis will proceed through six phases: familiarisation with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and producing the report. Themes will be identified inductively from extracted data on cultural adaptations, implementation experiences and reported outcomes. An independent team member will review the coding framework and theme development to ensure trustworthiness.

We will conduct separate analyses for:

1. Different types of E-Health interventions (mHealth, telemedicine, web-based programmes, etc).
2. Different health conditions or focus areas.
3. Different geographic regions or Indigenous populations where sufficient data exist.

The person with lived experience will review preliminary themes to validate cultural appropriateness and interpretation.

A narrative summary of exploratory, review and non-experimental study types will be given. This narrative summary will describe how the findings relate to the study research question and objectives. The narrative review results will be reported following the Preferred

Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) guidelines.

Descriptive statistics, if any, will be analysed using statistical software (SAS, R/R Studio) or Excel. Data visualisation and graphs will be done using R/R Studio, Excel or PowerPoint.

Patient and public involvement

To ensure the cultural appropriateness and relevance of the findings, we will seek consultation and input from Indigenous communities, organisations or experts in the field.

Lived experience involvement: Tyra Yarran (nee Thomas), from Bardi Jawi Country, is an Aboriginal Health Manager in Western Australia (WA) Health with 20 years of experience in various health settings. Tyra has kindly guided the research team with her lived expertise, skills and knowledge gained during her career in health. Tyra will be involved in all the stages of the project. Their input has and will specifically shape:

- The research question to ensure community relevance.
- Inclusion criteria to capture culturally meaningful interventions and design screening guides.
- Data extraction elements related to cultural adaptation and community involvement.
- Interpretation frameworks that honour Indigenous knowledge systems.

Ongoing consultation: We will hold periodic meetings with our Indigenous team member throughout the review process to:

- Review preliminary findings and ensure culturally appropriate interpretation.
- Validate themes emerging from qualitative synthesis.
- Guide the framing of recommendations for different stakeholder groups.

Community validation: We are establishing an advisory relationship with Tyra Yarran to review our findings before publication and ensure recommendations are meaningful and actionable for Indigenous communities. In addition, Dr Stephanie Topp, Dr María Eugenia (Maru) Castellanos Reynosa and Dr Sarojini MDR Monterio have been instrumental in the development and success of this paper. Dr Topp, a Professor of Global Health at James Cook University, specialises in health systems research and policy, with a focus on addressing healthcare inequities in low-resource settings. Dr Castellanos Reynosa, a Senior Lecturer in Epidemiology and Communicable Disease Control, brings over 15 years of experience in infectious diseases research, particularly on tuberculosis, malaria and HIV, with expertise in conducting epidemiological studies in Africa and Latin America. Dr Monterio, with over 20 years of experience in change and transformation projects across Australia, the USA, India and Colombia, focuses on helping organisations plan and implement sustainable change initiatives using evidence-based models and data analytics.

Ethics and dissemination

As the study relied on publicly available research, IRB approval was not required. For questions regarding research integrity, please contact the Research Integrity Office at researchintegrity@jcu.edu.au.

This protocol is registered on medRxiv (URL: https://www.medrxiv.org/content/10.1101/2025.10.16.25338190v1).

Findings will be disseminated through peer-reviewed publications and conference presentations. Beyond academic publications, we endeavour to:

- Creating plain-language summaries suitable for community distribution.
- Developing visual infographics highlighting key findings.
- Presenting findings at least at one Indigenous health conference/community forums.
- Sharing results through Indigenous health organisations and author networks.
- Publishing open access to ensure unrestricted community access.

Through this collaborative communication, we may aspire to design and deploy E-Health solutions that are not only technologically sophisticated but also culturally sensitive and inclusive, ensuring that the advantages of digital health breakthroughs are distributed equally.

DISCUSSION

This scoping review protocol describes a comprehensive strategy to assess the breadth and depth of E-Health interventions in Indigenous communities worldwide. Recognising the unique health concerns of Indigenous populations, our research seeks to shed light on the landscape of E-Health solutions. We plan to investigate the efficacy, cultural appropriateness and potential hurdles to adopting E-Health technology among Indigenous Peoples using a carefully designed research methodology guided by PRISMA-P and inspired by several methodological frameworks.[65 66]

By emphasising the inclusion of E-Health interventions, this review aims not only to find and map current research but also to critically evaluate the qualities and effects of these studies. This review is expected to result in a greater knowledge of the types of E-Health interventions used, their effectiveness and the extent to which they embrace cultural safety and foster therapeutic interactions within Indigenous communities. By examining these factors, we hope to gain useful insights into how E-Health might be used to reduce health disparities and advance health equity among Indigenous Peoples.

By doing so, we aim to facilitate communication among researchers, healthcare practitioners, policymakers and Indigenous communities themselves.

Our findings will be synthesised into targeted recommendations for four stakeholder groups:

1. Researchers: Methodological guidance for culturally appropriate E-Health intervention design, evaluation and reporting.

2. Policymakers: Evidence on effective intervention types, implementation factors and resource requirements to inform health technology funding and policy.
3. Health services: Practical guidance on adapting and implementing E-Health interventions in ways that respect Indigenous data sovereignty and cultural protocols.
4. Indigenous communities: Accessible information about evidence-based digital health options and considerations for community-led technology adoption decisions.

Nevertheless, we acknowledge that this scoping review will have significant methodological limitations that may affect the representativeness of our findings. First, restricting to English-language publications may exclude relevant research from Latin American Indigenous populations (Spanish/Portuguese), francophone regions (French), Nordic Indigenous communities (Scandinavian languages) and Asian/Pacific contexts. Second, excluding grey literature may omit valuable information from government reports, community health programme evaluations and Indigenous health organisation documents that are not published in peer-reviewed journals. Third, we did not search Indigenous-specific databases due to a lack of institutional access to resources such as the Indigenous Studies Portal Research Tool and other specialised repositories. Together, these limitations may bias findings toward Anglophone academic perspectives and potentially underrepresent community-based and Indigenous-led research initiatives. To mitigate these limitations, we employed a comprehensive search strategy across multiple general databases. We incorporated Indigenous-specific search terms to maximise the identification of relevant studies within our accessible resources. However, these restrictions were necessary due to resource constraints for this scoping review, and future research should address these gaps through multilingual searches, targeted inclusion of grey literature and access to Indigenous-specific databases to provide a more complete picture of E-Health interventions in Indigenous communities.

Despite these limitations, this protocol sets the stage for a rigorous and meaningful exploration of E-Health interventions among Indigenous populations. It is a step towards acknowledging and addressing the digital divide, with the broader goal of ensuring that Indigenous communities worldwide can fully benefit from the advancements in healthcare technology, thereby moving closer to achieving global health equity.

Contributors Conception and design of the study: SS, MEC, SM and SMT; revision of the research question and protocol: RB and TY; design of search strategy: SS, RB, MEC, TY, SM and SMT; data extraction: SS, RB and SM; writing protocol: SS; review and edit of the manuscript: RB, TY, MEC, SM and SMT. All authors approved the final version of this protocol. SM is the guarantor of this paper.

Funding SS received the Global Field Experience Financial Award (GEFA) from the Rollins School of Public Health at Emory University. This award supported the travel and hands-on public health training that SS received in Australia to initiate the first stages of this project. No other author received a specific grant for this research. The funding bodies had no role in the study's design, data collection, analysis, interpretation or manuscript writing.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

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