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# Scoping Review Protocol: What is the State of Evidence for the Use of Communication Apps with Immigrant Seniors in Long-Term Care & Community Settings?



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# Title Page

**Scoping Review Protocol: What is the State of Evidence for the Use of Communication Apps with Immigrant Seniors in Long-Term Care & Community Settings?**

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# ABSTRACT

**Scoping Review Protocol: What is the State of Evidence for the Use of Communication Apps with Immigrant Seniors in Long-Term Care & Community Settings?**

Wong JP, Yoon R, Chung-Lee L, Akbarian A, Abdulai A, Hou R, Ho M, Zinaic R, Anoushka A.

## INTRODUCTION

First language care is critical for older immigrant adults with limited English proficiency, especially in long-term care settings where most residents require staff assistance and experience complex chronic conditions, resulting in multiple communication interactions where language poses a barrier. Although there are a myriad of cultural-language translation apps and devices available, there is a gap in both research and practice on the acceptability and feasibility of these digital resources within the context of long-term care and community settings for older immigrant adults, from a cultural relevance and digital health equity perspective. Our paper outlines a scoping review protocol to examine the state of the literature on the extent to which cultural-language translation apps are used in long-term care settings and community-based elder care. We will also examine the extent in which such apps bridge or further gaps in equitable, accessible, and acceptable care for older immigrant adults with limited English language proficiency.

## METHODS & ANALYSIS

This scoping review protocol will employ an adapted five-stage framework outlined by Arksey and O'Malley guided by enhancements recommended by Levac et al. and Colquhoun et al. Using the Joanna Briggs Institute's population, concept, and context (PCC) framework, we defined the scope of the scoping review by identifying the target population, concepts for investigation, and the context within which the research is situated. We will conduct a search of the literature from 2005-2024 using five bibliographic databases from health sciences (Healthstar OVID, MEDLINE OVID, and Cumulative Index to Nursing and Allied Health Literature [CINAHL] EBSCO), engineering (Engineering Village Elsevier), and a cross-disciplinary database (Web of Science Clarivate). The research team will adopt a critical, equity-focused approach for the scoping review by integrating Richardson et al.'s Framework for Digital Health Equity into our analysis of the findings. This will ensure that health and social equity perspectives are integrated within our methodology and analytic lens. Our analysis will specifically examine selected studies for their engagement with health equity, their ability to address issues such as ageism and ableism, and the digital divide within geriatric care.

## ETHICS AND DISSEMINATION

Ethics approval is not required for this scoping review as it involves secondary analysis of published works and no primary data collection involving human subjects. Findings of the review will be shared with community partners and disseminated through publications, conferences, and peer reviewed publications.

## PATIENT AND PUBLIC INVOLVEMENT

The development of this scoping review protocol has been done in partnership with our community representative, who is a member of our research team, to bring their perspective as a caregiver as well as a member of the East Asian immigrant community in Toronto, Canada. Findings of the scoping review will be shared through community consultation and engagements with patients, family and caregivers of older immigrant adults with limited English language proficiency in community and long-term care settings in Toronto, Canada.

## ARTICLE SUMMARY: STRENGTHS AND LIMITATIONS

- This scoping review will address a critical gap in both practice and literature on the state of the evidence regarding cultural-language translation apps in supporting care provision for older immigrant adults with limited English language proficiency.
- Our protocol uses the five stage Arksey & O'Malley framework with enhancements by Levac et al. and Colquhoun et al., and the integration of a Digital Health Equity Framework by Richardson et al. into the fifth stage to address digital health equity considerations as a part of the review protocol.
- Although our team seeks to conduct a robust review of the evidence, our protocol may not sufficiently capture a comprehensive search of available evidence that is systematically reviewed considering the nascent and evolving nature of the field of cultural-language translation apps.

## KEYWORDS

scoping review, long-term care, health equity, digital health, language translation, aged, mobile applications, translation app, older immigrant adults

**Scoping Review Protocol: What is the State of Evidence for the Use of Communication Apps with Immigrant Seniors in Long-Term Care & Community Settings?**

## INTRODUCTION

The aging global population is expected to rise from 10% (2022) to 16% (2025) with a shifting age distribution comprising an increasingly larger proportion of older ages.[1] In Canada, there are 7.5 million older adults aged 65 years and older, accounting for 9.4% of the entire population in 2023.[2] This population is expected to rise from 18.5% in 2021 to 23.1% by 2043, and further to 25.9% by 2068.[3] While English and French remain the official and most prevalent languages spoken in Canadian households, the growing population is linguistically diverse, with one in four persons' first language not being English or French.[4] A rising trend has been documented in the percentage of racialized older adults over 75 years of age who were born outside of Canada, with 34% and 27%, respectively, speaking a first language that is not English or French.[5] The number of Canadians who predominantly spoke a language other than English or French at home rose to 4.6 million in 2021 and accounts for 13% of the population.[6]

While close to two-thirds of older adults living in the Greater Toronto Area, Canada are immigrants, over 80% are recent immigrants with 20 years or less living in Canada.[7] Amongst recent immigrant seniors, nearly 90% speak a first language that is not English. Disparities have been documented in health status when comparing self-reported good general health amongst seniors with an English first language versus those who do not speak English as their first language.[7] Disparate outcomes are also evident including lower sense of belonging amongst seniors whose first language is not English and poorer mental health status for older immigrant adults when compared to English speaking and non-immigrant counterparts.[7]

Communication between a patient and a healthcare provider is crucial for the provision of safe and person-centred care,[8] including the completion of assessments, obtaining informed consent, and other aspects of healthcare delivery.[9] Despite proficiency in other languages, as older adults age, many revert back to their first languages, leading to increased language barriers and inadequate care.[10, 11] Language barriers threaten patient safety and high-quality care. Yet, a prominent research gap exists in how linguistic communication barriers affect residents living in long-term care facilities.[12] These findings suggest that healthcare delivery in first languages for older immigrant adults is imperative, especially in long-term care facilities where 85% of residents require staff assistance with their activities of daily living.[13]

At the same time, the increasing use of digital health technologies has provided opportunities as well as challenges on how technological advancements can improve care and communication for older adults living in long-term care homes.[14] One important technological advancement has been in the area of spoken cultural-language translation apps, which is considered to facilitate communication for seniors who speak English as a second language. With the ongoing health human resource shortages and limited resource allocation to the long-term care sector,[15] language translation technologies like Google Translate, Microsoft Translator, and Amazon's SayHi,[17] could potentially enhance communication, overcome language barriers for older adults in care settings, and ultimately improve the quality of care and patient experience.

While there are studies investigating varying clinical outcomes in long-term care homes with analyses conducted on sociodemographic characteristics such as racialized identities and language, the specific impact of cultural and language barriers on clinical outcomes in long-term care has not been widely studied. Urgent attention is needed to narrow the gap of health disparities for the long-term care resident population, recognizing language barriers as a determinant of disparate outcomes.[12] Importantly, the expansion and popularity of mobile apps for cultural-language translation has been documented.[16] While these technologies exist, little is known about their application to older adult care in long-term care and community-based settings, and how these digital tools could be leveraged to enable improved care for the elderly, including the integration of cultural-language components into translation. We do not know the extent to which this field has been explored, especially from the perspective of reducing health inequities among racialized and older immigrant adults experiencing cultural-language barriers within a healthcare context.

## RATIONALE FOR A SCOPING REVIEW

There is scant empirical literature on using cultural-language translation apps to facilitate communication between long-term care home residents and healthcare providers, particularly with respect to the reduction of cultural-language barriers. Wilson et al.[16] found that the use of translation apps in long-term care settings would benefit from apps with more person-centred features, and research is needed to understand how these apps could facilitate improvement in care. Discussions with frontline practitioners working in long-term care suggest that a practice gap of using cultural-language apps exists. Translation apps may be a potential solution to alleviate the shortage of interpretation services in long-term care settings, where residents or their caregivers with limited English proficiency rely on bilingual staff members or patient relatives to overcome language barriers.[17] This approach can bridge communication gaps efficiently in environments with a high percentage of immigrant workers and older adults.

## STUDY PURPOSE & OBJECTIVES

The purpose of this scoping review is to explore the state of the literature on the extent to which cultural-language translation apps are used in long-term care settings and community-based elder care, and the extent to which such apps bridge or further gaps to equitable, accessible, and acceptable care for older immigrant adults with limited English language proficiency.

Specific objectives of this scoping study include:

1) To examine the evidence for use of cultural-language translation apps to support care provision for older adults in long-term care or community settings.

2) To examine the evidence on the acceptability, accessibility and utility of cultural-language translation apps to support care provision for older adults in long-term care or community settings.

3) To integrate the Framework for Digital Health Equity[21] into the analysis of the findings with a critical lens on the digital determinants of health and outcomes associated with using cultural-language translation apps in long-term care or community settings.

## PROTOCOL DESIGN

The research team will follow the framework outlined by Arksey and O'Malley[18] while also being guided by enhancements recommended by Levac et al.[19] and Colquhoun et al. [20] We will also use the Framework for Digital Health Equity[21] to support the analysis of data. While we are drawing on the Arksey and O'Malley[18] framework to inform our methods, we have strategically chosen to use the population, concept, and context (PCC) Framework[22] from the Joanna Briggs Institute to help us formulate our research questions. Using PCC, the review's scope will be delineated by identifying the target population, concepts for investigation, and the context within which the research is situated. This methodical approach guarantees a literature review with a clear focus, aiding in the identification, mapping of essential concepts pertinent to the research questions, and the formulation of both the search query and strategy. Table 1 presents the PCC criteria for the scoping study. The main concepts surrounding this review are summarized in Table 2.

**Table 1. PCC Framework**

| | |
|---|---|
| **Population** | Seniors, elderly, older adults |
| **Concept(s)** | Communication apps for cultural-language translation to achieve:<br>• Enhanced communication<br>• Person-centred care<br>• Improved quality of care<br>• Equitable care |
| **Context** | Long-term care or community-based elder care |

**Table 2. Main Concepts**

| | |
|---|---|
| **Concept 1** | Digital apps/technology-enabled platforms |
| **Concept 2** | Digital cultural-language translation/interpretation |
| **Concept 3** | Long-term care residents or seniors or older adults |

### Stage 1: Identify the Research Question

Research questions for this scoping study include:

1) How does the use of apps for cultural-language translation enhance communication between healthcare providers and older adults experiencing language barriers?

2) What are the various settings in which apps for cultural-language translation are used to support care for older adults?

3) What are key digital health equity considerations in the use of cultural-language translation apps to facilitate care for older adults experiencing language barriers in long-term care and community settings?

## Stage 2: Identifying Relevant Studies

Search Strategy

The research team consulted three subject librarian experts in health sciences, sociology, and engineering to develop the search strategy. The rationale behind seeking advice from the sociology, engineering, and health sciences librarians was to: (1) ensure a multidisciplinary lens in the search strategy, (2) leverage their expertise in using the non-health science bibliographic databases, and (3) account for the variation in terminology used across disciplines and praxis.

To establish a comprehensive exploration and multidisciplinary perspective, the formal search strategy will involve searching five bibliographic databases from health sciences (Healthstar OVID, MEDLINE OVID, Cumulated Index to Nursing and Allied Health Literature (CINAHL EBSCO), engineering (Engineering Village), and a cross-disciplinary database (Web of Science). Keywords will be customized for each database in recognition of the differences in indexing across databases. However, the selection of keywords will represent the concepts being investigated. To ensure a wide range of keywords to cover the concepts of interest, a number of synonyms will be used with the Boolean operator OR to represent each of the concepts. Table 3 summarizes the limiters and expanders. In addition to bibliographic databases, Google and Google Scholar will be used to identify potential relevant articles. Furthermore, we will conduct hand searching of reference lists of relevant articles. Although systematic reviews, scoping reviews, and meta analyses will be excluded from this scoping study (see Inclusion and Exclusion criteria section), reference lists of these sources will be manually searched for additional relevant articles. Journals with a special focus on gerontology and digital health will be searched as well as the Search function on the journal websites; however, this will depend on their indexing and relevance. Depending on the yield and following the completion of two levels of screening, our search may expand to grey literature. All identified articles in the yield and the subsequent screening will be managed in Covidence,[23] a web-based collaboration software platform. Table 4 provides an overview of the inclusion and exclusion criteria.

**Table 3. Delimiters**

| Item | Delimiters |
|---|---|
| **Language** | English |
| **Years** | 2005-2024 |

**Note:** Year 2007 is notable because it marks the introduction of the first iPhone, a cornerstone event in smartphone history, significantly boosting mobile internet usage and app development. Following this, cultural-language translation technologies, especially in handheld devices, saw rapid development, benefiting from the widespread adoption of smartphones and advances in machine learning and AI technologies.

**Table 4. Overview of Inclusion/Exclusion Criteria for the Search Strategy**

| Inclusion | Exclusion |
|---|---|
| Long-term care, community, home setting | Hospital, acute care, in-patient settings |
| iOS, Android, web-based, or custom-built apps | |
| > 65 years | |
| Research articles: peer-reviewed journal articles, grey literature, case reports, theses and dissertations | Commentaries, letters to editor, editorials, conference articles and proceedings |

### Stage 3: Study Selection

Following the identification of relevant studies, the articles will be screened by two researchers independently. This first level of screening of the titles and abstracts will require meetings between the two researchers to discuss the applicability of the initial inclusion and exclusion criteria. As per Levac et al.[19] and Colquhoun et al.[20] 's recommendations, two researchers will independently review full-text articles for inclusion or exclusion in the scoping study. Meetings will be held prior to screening to ensure reviewers have the same understanding of the approach at the midpoint, as well as at the final stages of screening. When we receive conflicting screening results, that is, disagreement on whether to include a source or not, the team will be consulted to "break the tie" through a conversational dialogue. This approach to decision-making for study selection is consistent with that recommended by Levac et al.[19] Table 5 outlines the level 1 and level 2 screening criteria. Although the general inclusion and exclusion criteria apply to both levels of screening, more targeted screening questions will be used to account for the context of our research objectives.

**Table 5. Level 1 and Level 2 Screening Questions**

| Level 1 Screening - Eligibility Criteria | | |
|---|---|---|
| **Question #** | **Screening Question** | **Answer** |
| 1 | Does the title or abstract address the use of apps to facilitate care by reducing cultural-language communication barriers?<br><br>Include:<br>● All handheld, digital, mobile, computer-based, and software platforms that facilitate translation between patient and provider<br><br>Exclude:<br>● Not translation or interpretation using an app (e.g., healthcare provider/staff speaks the same language, real-time online human interpretation services) | Yes - Include<br>No - Exclude<br>Unsure - Include |

| | | |
|---|---|---|
| 2 | Does the title or abstract address care for the older adult population in long-term care settings or community settings?<br><br>Include:<br>● Use of the app with the person receiving care<br>● Use of the app with the resident's family, informal caregivers and support people<br>● Use of the app for social interactions between residents?<br><br>Exclude:<br>● Provider to provider only communication<br>● Hospital care, in-patient acute care, where the person receiving care is in a place to address an acute health issue, receiving care that is different from routine care in their home environment (i.e., long-term care facility or community) | Yes - Include<br>No - Exclude<br>Unsure - Include |
| **Level 2 Screening - Eligibility Criteria** | | |
| **Question #** | **Screening Question** | **Answer** |
| 1 | Does the article address provider-machine-resident (human-machine-human) pathways of communication through the use of digital tools?<br><br>Include:<br>● iOS, Android, web-based, or custom-built apps<br>● real-time bi-directional (patient-provider) machine translation<br><br>Exclude:<br>● human interpretation services (e.g., connecting with a live human interpreter via mobile app)<br>● other human interpretation services that are non-provider-machine-resident communication | Yes - Include<br>No - Exclude<br>Unsure - Include |
| 2 | Does the article describe an empirical study?<br><br>Include:<br>● All empirical studies<br>● Theses and dissertations<br>● Case studies (n = 1)<br>● Reports<br><br>Exclude:<br>● Scoping reviews, systematic reviews, meta-analyses<br>● Editorials, letters to the editor, commentaries, conference papers and proceedings | Yes - Include<br>No - Exclude<br>Unsure - Include |

| | | |
|---|---|---|
| 3 | Does the article focus on the older adult population in long-term care or community settings?<br><br>Include:<br>● Use of the app with the resident's family and informal caregivers and support people<br>● Use of app for social interactions between residents<br><br>Exclude:<br>● Provider to provider only communication<br>● Hospital care, in-patient acute care, where the person receiving healthcare is in a place to address an acute health issue, receiving care that is different from routine care received in their home environment (i.e., long-term care facility or in community) | Yes - Include<br>No - Exclude<br>Unsure - Include |

**Stage 4: Charting the Data**

Search results will be mapped according to the template outlined in Table 6.

**Table 6. Template - Summary Table for Yield**

| Database | | Initial Yield | After Level 1 Screening | After Level 2 Screening |
|---|---|---|---|---|
| **Bibliographic Databases** | **DB 1 - Engineering Village**<br>**DB 2 - Web of Science**<br>**DB 3 - CINAHL**<br>**DB 4 - MEDLINE**<br>**DB 5 - HealthStar** | | | |
| | Total<br>Duplicates removed | | | |
| | Number of references from databases | | | |
| **Manual Identification** | **Google Scholar**<br>Number from Google Scholar removed after initial scan<br>Duplicates of bibliographic databases removed | | | |
| | Number of references from Google Scholar for screening | | | |
| | Manual Search of Reference Lists | | | |

| | | | | |
|---|---|---|---|---|
| | Number from manual search of reference lists<br>Duplicates of bibliographic databases and Google Scholar removed | | | |
| | Number of references from reference lists for screening | | | |
| | **GRAND TOTAL** | | | |

PRISMA Diagram

A PRISMA diagram will be produced using Covidence[23] to illustrate the flow of articles throughout the stages of the scoping review. This visual flowchart will clearly depict the yield, number of duplicates removed, number of articles screened at each level, and number of articles included.

Inter-rater Reliability

The inter-rater reliability will be reported, assisted by Covidence,[23], in the form of the Kappa coefficient of the screeners. Inter-rater reliability data for both level 1 screening of the title and abstract, and level 2 full text screening will be exported. Covidence[23] will provide the auto-generated calculations needed for the comparisons, which will include Cohen's Kappa coefficient.

**Stage 5: Collating, Summarising and Reporting the Results**

Data Extraction Plan

A data charting tool will be used to extract the following relevant data from the selected studies: Metadata section will include authors, title of the study and journal, year of publication and location. Study design and methods section will include study settings (nursing home, community), research design (RCT, observational), sample size, participant characteristics (age, gender, other relevant demographics), and data collection methods (survey, interviews).

Table 7 outlines the data charting tool. In alignment with the objectives of this scoping review, the included articles will be read and reviewed to gather data pertaining to independent and dependent variables: (1) the type of apps/devices used (iOS, Android, other device), (2) the digital technologies involved (portable, desktop, smartphone, iPad, etc.), (3) who used the app/device (provider, resident, caregiver), (4) the manner and nature in which the apps are used (online, offline, other), and (5) patient outcomes specific to enhanced cultural communication, patient-centredness, quality of care, and equitable care.

In addition, we are interested in investigating whether selected studies have addressed structural inequities related to ageism, ableism, racialized identities, and other intersecting social locations that long-term care residents and community-based older adults may experience. Our data extraction plan includes examining whether these studies address key structural determinants of

health necessary for achieving health equity such as the digital divide, digital literacy, digital health literacy, access to technology and support.

The included studies will be divided between two researchers for extraction, with each researcher validating the data extraction performed by the other. Finally, quality assurance will be performed by a third researcher. Initial extraction tables will be shared with the research team for feedback of potential gaps, or areas which may require further detail or clarity.

**Table 7. Data Charting Tool Template**

| COVIDENCE Ref # | Author(s) & Year | Location | Purpose | Research Design | Sample size and characteristics | Variables | | | | | | Implications for Research, Practice, and Policy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Type of app | Technology required | Who uses app | How app is used | Patient outcomes (enhanced communication, person-centred care, quality of care, equitable care) | Health Equity (Does study address structural inequities, digital divide, etc.) | |
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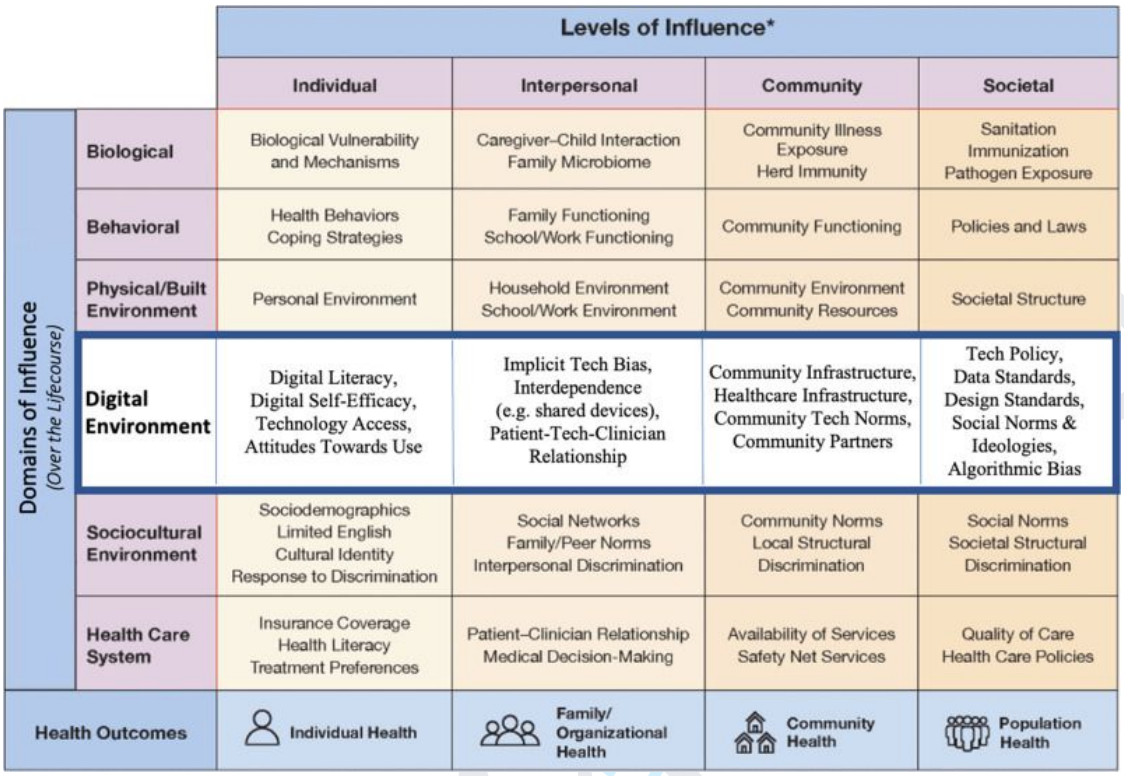
Synthesis Plan

To synthesize the findings across studies, the research team will engage in coding and the development of themes. The PRISMA extension for scoping reviews checklist[24] will be utilized. While we aim to follow the structure provided by PRISMA, we will additionally apply a critical lens to our synthesis plan. Meetings will be held to discuss codes and themes, and to challenge our thinking to resist the status quo from a health and social equity approach. We will employ the Digital Health Equity Framework outlined by Richardson et al.[21] to our analysis and synthesis of findings (Figure 1). Table 7 will be used to facilitate data charting and for the integration of selected articles, employing an exploratory approach in response to the emerging body of literature related to cultural translation apps usage in long-term care.

**Figure 1:** National Institute on Minority Health and Health Disparities Research Framework Expanded for Digital Health Equity.[21]




Consultation Exercise

Although consultation is optional according to the Arksey and O'Malley framework,[18] the research team will engage in a consultation exercise with community partners after the data extraction to strengthen the synthesis of the findings. The research team will strive to consult with community collaborators in long-term care and gerontology, who have knowledge and experience in this practice domain. Their expertise will be leveraged to assist with organizing and integrating the data into themes that are relevant for practice, as well as the health and wellbeing of long-term care residents and community-based older adults. Furthermore, we plan to explore the possibility of consulting with long-term care providers, resident and family advisory councils, and senior leaders in partnership with our long-term care collaborator team members.

## DISCUSSION

The research team is prepared to engage in a process that is iterative throughout the search and screening phases of this scoping review. We anticipate that refinements may be needed to continually improve the search strategy and inclusion/exclusion criteria in the process of reviewing the literature identified. The research team members are open to modifications to the protocol, and engage in a collaborative journey to achieve the research objectives.

The research team will adopt a critical, equity-informed approach for the scoping review, ensuring health and social equity perspectives are integrated within our methodology. We will establish criteria to assess digital health equity in the context of aging and elder care. Our evaluation will specifically examine selected studies for their engagement with health equity, addressing issues such as ageism, ableism, and the digital divide within geriatric care, supported by integrating the digital health equity framework as outlined by Richardson et al.[21]

## CONCLUSION

Our scoping review addresses a critical gap in understanding the current state of evidence on the acceptability and feasibility of cultural-language translation apps within the context of long-term care and community settings for older immigrant adults, from a cultural relevance and digital health equity perspective. Moreover, our protocol integrates considerations of acceptability and equity in examining the extent to which current apps bridge or exacerbate gaps in equitable, accessible, and acceptable care for older adults experiencing language barriers.

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{Josephine P. Wong, Mabel Ho, Rosanra Yoon, Abdul-Fatawu Abdulai, Rui Hou, Rade Ziniac} determined the idea and research topic for the scoping review. {Leinic Chung-Lee, Abdolreza

Akbarian, Rosanra Yoon, Abdul-Fatawu Abdulai, Josephine P. Wong, Rade, Rui Hou} designed the protocol. {Leinic Chung-Lee, Rosanra Yoon, Abdolreza Akbarian} wrote the manuscript. {Rosanra Yoon, Leinic Chung-Lee, Abdolreza Akbarian, Abdul-Fatawu Abdulai, Rade Ziniac, Mabel Ho, Josephine P. Wong, Rui Hou, Anoushka Anoushka} edited the manuscript.

## Guarantor

All authors have agreed and approved the final manuscript.

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## Conflict of Interest

The authors have no conflicts of interest to declare.

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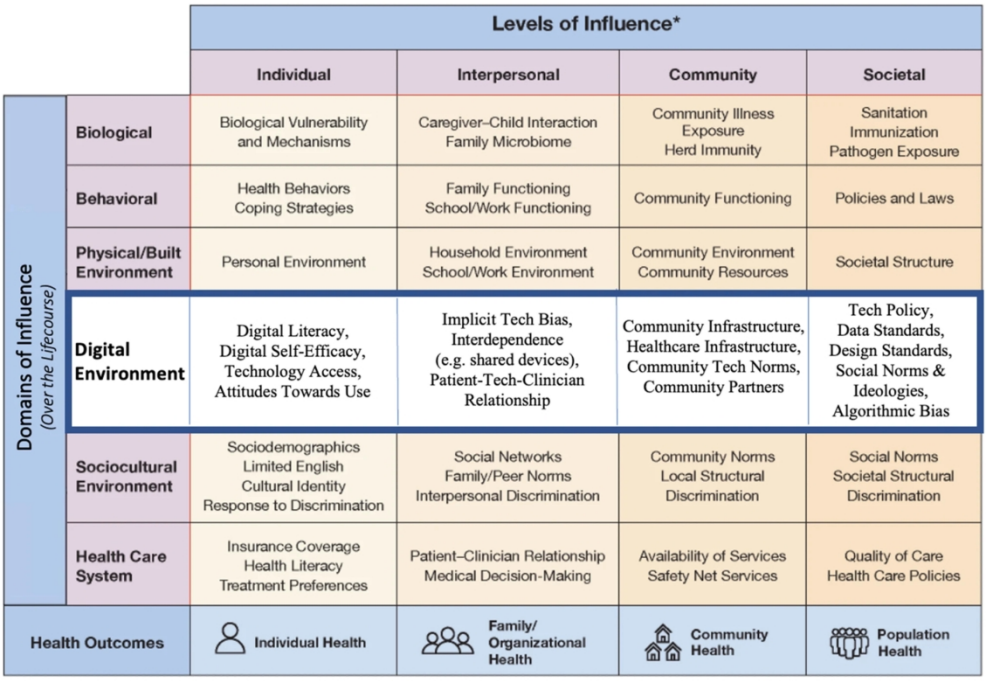


Figure 1

896x615mm (72 x 72 DPI)

**Table 1. PCC Framework**

| | |
|---|---|
| **Population** | Seniors, elderly, older adults |
| **Concept** | Communication apps for cultural-language translation to achieve:<br>• Enhanced communication<br>• Person-centred care<br>• Improved quality of care<br>• Equitable care |
| **Context** | Long-term care or community-based senior care |

**Table 2. Main Concepts**

| | |
|---|---|
| **Concept 1** | Digital apps/technology-enabled platforms |
| **Concept 2** | Digital cultural-language translation/interpretation |
| **Concept 3** | Long-term care residents or seniors or older adults |

**Table 3. Delimiters**

| Item | Delimiters & Rationale |
|---|---|
| **Language** | English |
| **Years** | 2005-2024 |

**Note:** Year 2007 is notable because it marks the introduction of the first iPhone, a cornerstone event in smartphone history, significantly boosting mobile internet usage and app development. Following this, language translation technologies, especially in handheld devices, saw rapid development, benefiting from the widespread adoption of smartphones and advances in machine learning and AI technologies.

**Table 4. Overview of Inclusion/Exclusion Criteria for the Search Strategy**

| Inclusion | Exclusion |
|---|---|
| Long-term care, community, home setting | Hospital, acute care, in-patient settings |
| iOS, Android, web-based, or custom-built apps | |
| > 65 years | |
| Research articles: peer-reviewed journal articles, grey literature, case reports, theses and dissertations | Commentaries, letters to editor, editorials, conference articles and proceedings |

**Table 5. Level 1 and Level 2 Screening Questions**

| Level 1 Screening - Eligibility Criteria | | |
|---|---|---|
| **Question #** | **Screening Question** | **Answer** |
| 1 | Does the title or abstract address the use of apps to facilitate care by reducing cultural-language communication barriers?<br><br>Include:<br>● All handheld, digital, mobile, computer-based, and software platforms that facilitate translation between patient and provider<br><br>Exclude:<br>● Not translation or interpretation using an app (e.g., healthcare provider/staff speaks the same language, real-time online human interpretation services) | Yes - Include<br>No - Exclude<br>Unsure - Include |
| 2 | Does the title or abstract address care for the older adult population in long-term care settings or community settings?<br><br>Include:<br>● Use of app with the person receiving care<br>● Use of the app with the resident's family and informal caregivers and support people<br>● Use of the app for social interactions between residents?<br><br>Exclude:<br>● Provider to provider only communication<br>● Hospital care, in-patient acute care, where the person receiving care is in a place to address an acute health issue, receiving care that is different from routine care in their home environment (i.e., long-term care facility or community)<br>*Rationale*: Being in acute care often indicates deterioration in older adults' medical or cognitive conditions, possibly hindering their ability to use translation apps | Yes - Include<br>No - Exclude<br>Unsure - Include |
| **Level 2 Screening - Eligibility Criteria** | | |
| **Question #** | **Screening Question** | **Answer** |

| | | |
|---|---|---|
| 1 | Does the article address provider-machine-resident (human-machine-human) pathways of communication through the use of digital tools?<br><br>Include:<br>• iOS, Android, web-based, or custom-built apps<br>• real-time bi-directional (patient-provider) machine translation<br><br>Exclude:<br>• human interpretation services (e.g., connecting with a live human interpreter via mobile app)<br>• other human interpretation services that are non-provider-machine-resident communication | Yes - Include<br>No - Exclude<br>Unsure - Include |
| 2 | Does the article describe an empirical study?<br><br>Include:<br>• All empirical studies<br>• Theses and dissertations<br>• Case studies (n = 1)<br>• Reports<br><br>Exclude:<br>• Scoping reviews, systematic reviews, meta-analyses<br>• Editorials, letters to the editor, commentaries, conference papers and proceedings | Yes - Include<br>No - Exclude<br>Unsure - Include |
| 3 | Does the article focus on the older adult population in long-term care settings or community settings?<br><br>Include:<br>• Use of the app with the resident's family and informal caregivers and support people<br>• Use of app for social interactions between residents<br><br>Exclude:<br>• Provider to provider only communication<br>• Hospital care, in-patient acute care, where the person receiving healthcare is in a place to address an acute health issue, receiving care that is different from routine care received in their home environment (i.e., long-term care facility or in community) | Yes - Include<br>No - Exclude<br>Unsure - Include |

| | | |
|---|---|---|
| | *Rationale:* Being in acute care often indicates deterioration in older adults' medical or cognitive conditions, possibly hindering their ability to use translation apps | |

**Table 6. Template - Summary Table for Yield**

| Database | | Initial Yield | After Level 1 Screening | After Level 2 Screening |
|---|---|---|---|---|
| **Bibliographic Databases** | **DB 1 - Engineering Village**<br>**DB 2 - Web of Science**<br>**DB 3 - CINAHL**<br>**DB 4 - Medline**<br>**DB 5 - HealthStar** | | | |
| | Total<br>Duplicates removed | | | |
| | Number of references from databases | | | |
| **Manual Identification** | **Google Scholar**<br>Number from Google Scholar removed after initial scan<br>Duplicates of bibliographic databases removed | | | |
| | Number of references from Google Scholar for screening | | | |
| | **Manual Search of Reference Lists**<br>Number from manual search of reference lists<br>Duplicates of bibliographic databases and Google Scholar removed<br>Number of references from reference lists for screening | | | |
| | **GRAND TOTAL** | | | |

**Table 7. Data Charting Template**

| COVIDENCE Ref # | Author(s) & Year | Location | Purpose | Research Design | Sample size and characteristics | Variables | | | | | | Implications for Research, Practice, and Policy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Type of app | Technology required | Who uses app | How app is used | Patient outcomes (enhanced communication, person-centred care, quality of care, equitable care) | Health Equity (Does study address structural inequities, digital divide, etc.) | |
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BMJ Open

# Scoping Review Protocol: What is the State of Evidence for the Use of Communication Apps with Immigrant Seniors in Long-Term Care & Community Settings?

| | |
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| | |

# Title Page

**Scoping Review Protocol: What is the State of Evidence for the Use of Communication Apps with Immigrant Seniors in Long-Term Care & Community Settings?**

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# ABSTRACT

## INTRODUCTION

First language care is critical for older immigrant adults with limited English proficiency, especially in long-term care settings where most residents require staff assistance and experience complex chronic conditions, resulting in multiple communication interactions where language poses a barrier. Although there are a myriad of cultural-language translation apps and devices available, there is a gap in both research and practice on the acceptability and feasibility of these digital resources within the context of long-term care and community settings for older immigrant adults, from a cultural relevance and digital health equity perspective. Our paper outlines a scoping review protocol to examine the state of the literature on the extent to which cultural-language translation apps are used in long-term care settings and community-based elder care. We will also examine the extent in which such apps bridge or further gaps in equitable, accessible, and acceptable care for older immigrant adults with limited English language proficiency.

## METHODS & ANALYSIS

This scoping review protocol will employ an adapted five-stage framework outlined by Arksey and O'Malley guided by enhancements recommended by Levac et al. and Colquhoun et al. Using the Joanna Briggs Institute's population, concept, and context (PCC) framework, we defined the scope of the scoping review by identifying the target population, concepts for investigation, and the context within which the research is situated. We will conduct a search of the literature from 2005-2024 using five bibliographic databases from health sciences (Healthstar OVID, MEDLINE OVID, and Cumulative Index to Nursing and Allied Health Literature [CINAHL] EBSCO), engineering (Engineering Village Elsevier), and a cross-disciplinary database (Web of Science Clarivate). The research team will adopt a critical, equity-focused approach for the scoping review by integrating Richardson et al.'s Framework for Digital Health Equity into our analysis of the findings. This will ensure that health and social equity perspectives are integrated within our methodology and analytic lens. Our analysis will specifically examine selected studies for their engagement with health equity, their ability to address issues such as ageism, ableism, and the digital divide within geriatric care.

## ETHICS AND DISSEMINATION

Ethics approval is not required for this scoping review as it involves secondary analysis of published works and no primary data collection involving human subjects. Findings of the review will be shared with community partners and disseminated through publications, conferences, and peer reviewed publications.

**KEYWORDS**

scoping review, long-term care, health equity, digital health, language translation, aged, mobile applications, translation app, older immigrant adults

## STRENGTHS AND LIMITATIONS OF THE STUDY

- Our protocol uses the five stage Arksey & O'Malley framework with enhancements by Levac et al. and Colquhoun et al.,
- The integration of a Digital Health Equity Framework by Richardson et al. into the fifth stage of the protocol seeks to address digital health equity considerations as a part of the review protocol.
- This protocol employs the population, concept, and context (PCC) Framework from the Joanna Briggs Institute to formulate research questions

## INTRODUCTION

The aging global population is expected to rise from 10% (2022) to 16% (2025) with a shifting age distribution comprising an increasingly larger proportion of older ages.[1] In Canada, there are 7.5 million older adults aged 65 years and older, accounting for 9.4% of the entire population in 2023.[2] This population is expected to rise from 18.5% in 2021 to 23.1% by 2043, and further to 25.9% by 2068.[3] While English and French remain the official and most prevalent languages spoken in Canadian households, the growing population is linguistically diverse, with one in four persons' first language not being English or French.[4] A rising trend has been documented in the percentage of racialized older adults over 75 years of age who were born outside of Canada, with 34% and 27%, respectively, speaking a first language that is not English or French.[5] The number of Canadians who predominantly spoke a language other than English or French at home rose to 4.6 million in 2021 and accounts for 13% of the population.[6] Similar patterns can be found in other OECD countries such as the United Kingdom, where larger proportions of recent migrants who are older cannot speak English proficiently at time of migration.[7] Likewise, in the United States, over 50% of older adults who were born outside of the United States speak a different language and do not speak English proficiently. [8]

While close to two-thirds of older adults living in the Greater Toronto Area, Canada are immigrants, over 80% are recent immigrants with 20 years or less living in Canada.[9] Amongst recent immigrant seniors, nearly 90% speak a first language that is not English. Disparities have been documented in health status when comparing self-reported good general health amongst seniors with an English first language versus those who do not speak English as their first language.[9] Disparate outcomes are also evident including lower sense of belonging amongst seniors whose first language is not English and poorer mental health status for older immigrant adults when compared to English speaking and non-immigrant counterparts.[9]

An integrative literature review of culturally and linguistically diverse (CALD) older adults in mainstream long-term care (LTC) facilities in the US, Sweden, and Australia revealed that CALD older adults wished to maintain their identity through their native language. The study highlighted significant communication, socialization, and language challenges, particularly noting that language misinterpretations for residents with dementia had serious clinical implications. Ethno-specific LTC facilities - where staff understood the residents' native language - reported lower prescriptions of antipsychotic medications.[10]

Communication between a patient and a healthcare provider is crucial for the provision of safe and person-centred care,[11] including the completion of assessments, obtaining informed consent, and other aspects of healthcare delivery.[12] Despite proficiency in other languages, as older adults age, many revert back to their first languages, leading to increased language barriers and inadequate care.[13, 14] Language barriers threaten patient safety and high-quality care. Yet, a prominent research gap exists in how linguistic communication barriers affect residents living in long-term care facilities.[15] These findings suggest that healthcare delivery in first languages for older immigrant adults is imperative, especially in long-term care facilities where 85% of residents require staff assistance with their activities of daily living.[10]

At the same time, the increasing use of digital health technologies has provided opportunities as

well as challenges on how technological advancements can improve care and communication for older adults living in long-term care homes.[16] One important technological advancement has been in the area of spoken cultural-language translation apps, which is considered to facilitate communication for seniors who speak English as a second language. With the ongoing health human resource shortages and limited resource allocation to the long-term care sector, [17] language translation technologies like Google Translate, Microsoft Translator, and Amazon's SayHi,[18] could potentially enhance communication, overcome language barriers for older adults in care settings, and ultimately improve quality of care and patient experience.

While there are studies investigating varying clinical outcomes in long-term care homes with analyses conducted on sociodemographic characteristics such as racialized identities and language, the specific impact of cultural and language barriers on clinical outcomes in long-term care has not been widely studied. Urgent attention is needed to narrow the gap of health disparities for the long-term care resident population, recognizing language barriers as a determinant of disparate outcomes.[15] Importantly, the expansion and popularity of mobile apps for cultural-language translation has been documented. [18] While these technologies exist, little is known about their application to older adult care in long-term care and community-based settings, and how these digital tools could be leveraged to enable improved care for the elderly, including the integration of cultural-language components into translation. We do not know the extent to which this field has been explored, especially from the perspective of reducing health inequities among racialized and older immigrant adults experiencing cultural-language barriers within a healthcare context.

## RATIONALE FOR A SCOPING REVIEW

There is scant empirical literature on using cultural-language translation apps to facilitate communication between long-term care home residents and healthcare providers, particularly with respect to the reduction of cultural-language barriers. A search of registries such as Open Science Framework and Prospero for similar or overlapping reviews did not yield any results other than our registered protocol on Open Science Framework. Wilson et al.[18] found that the use of translation apps in long-term care settings would benefit from apps with more person-centred features, and research is needed to understand how these apps could facilitate improvement in care. Discussions with frontline practitioners working in long-term care suggest that a practice gap of using cultural-language apps exists. Translation apps may be a potential solution to alleviate the shortage of interpretation services in long-term care settings, where residents or their caregivers with limited English proficiency rely on bilingual staff members or patient relatives to overcome language barriers.[19] This approach can bridge communication gaps efficiently in environments with a high percentage of immigrant workers and older adults.

## STUDY PURPOSE & OBJECTIVES

The purpose of this scoping review is to explore the state of the literature on the extent to which cultural-language translation apps are used in long-term care settings and community-based elder care, and the extent to which such apps bridge or further gaps to equitable, accessible, and acceptable care for older immigrant adults with limited English language proficiency.

Specific objectives of this scoping study include:

1) To examine the evidence on the acceptability, accessibility and utility of cultural-language translation apps to support care provision for older adults in long-term care or community settings.

2) To integrate the Framework for Digital Health Equity[20] into the analysis of the findings with a critical lens on the digital determinants of health and outcomes associated with using cultural-language translation apps in long-term care or community settings.

## METHODS: PROTOCOL DESIGN

The research team will follow the framework outlined by Arksey and O'Malley[21] while also being guided by enhancements recommended by Levac et al.[22] and Colquhoun et al. [23] We will also use the Framework for Digital Health Equity[20] to support the analysis of data. While we are drawing on the Arksey and O'Malley[21] framework to inform our methods, we have strategically chosen to use the population, concept, and context (PCC) Framework[24] from the Joanna Briggs Institute to help us formulate our research questions. Using PCC, the review's scope will be delineated by identifying the target population, concepts for investigation, and the context within which the research is situated. This methodical approach guarantees a literature review with a clear focus, aiding in the identification, mapping of essential concepts pertinent to the research questions, and the formulation of both the search query and strategy. Table 1 presents the PCC criteria for the scoping study. The main concepts surrounding this review are summarized in Table 2.

**Table 1. PCC Framework**

| | |
|---|---|
| **Population** | Seniors, elderly, older adults |
| **Concept(s)** | Communication apps for cultural-language translation to achieve:<br>● Enhanced communication<br>● Person-centred care<br>● Improved quality of care<br>● Equitable care |
| **Context** | Long-term care (referring to ongoing services provided in residential care facilities to support health or personal care needs that cannot be met in the community) or community-based elder care |

### Stage 1: Identify the Research Question

Research questions for this scoping study include:

1) How does the use of apps for cultural-language translation enhance communication between healthcare providers and older adults experiencing language barriers?

2) What are the various settings in which apps for cultural-language translation are used to support care for older adults?

3) What are key digital health equity considerations in the use of cultural-language translation apps to facilitate care for older adults experiencing language barriers in long-term care and community settings?

## Stage 2: Identifying Relevant Studies

Search Strategy

The research team consulted three subject librarian experts in health sciences, sociology, and engineering to develop the search strategy. The rationale behind seeking advice from the sociology, engineering, and health sciences librarians was to: (1) ensure a multidisciplinary lens in the search strategy, (2) leverage their expertise in using the non-health science bibliographic databases, and (3) account for the variation in terminology used across disciplines and praxis.

To establish a comprehensive exploration and multidisciplinary perspective, the formal search strategy will involve searching five bibliographic databases from health sciences (Healthstar OVID, MEDLINE OVID, Cumulated Index to Nursing and Allied Health Literature (CINAHL EBSCO), engineering (Engineering Village), and a cross-disciplinary database (Web of Science). Keywords will be customized for each database in recognition of the differences in indexing across databases. However, the selection of keywords will represent the concepts being investigated. To ensure a wide breadth of keywords to cover the concepts of interest, a number of synonyms will be used with the Boolean operator OR to represent each of the concepts. Table 3 summarizes the limiters and expanders and Supplementary Table 1 provides a full draft of the search strategy for MEDLINE. In addition to bibliographic databases, Google and Google Scholar will be used to identify potential relevant articles. Furthermore, we will conduct hand searching of reference lists of relevant articles. Although systematic reviews, scoping reviews, and meta analyses will be excluded from this scoping study (see Inclusion and Exclusion criteria section), reference lists of these sources will be manually searched for additional relevant articles. Journals with a special focus on gerontology and digital health will be searched as well as the Search function on the journal websites; however, this will depend on their indexing and relevance. Depending on the yield and following the completion of two levels of screening, our search may expand to grey literature. All identified articles in the yield and the subsequent screening will be managed in Covidence,[25] a web-based collaboration software platform. Table 4 provides an overview of the inclusion and exclusion criteria.

**Table 2 Delimiters**

| Item | Delimiters |
|---|---|
| **Language** | English |
| **Years** | 2005-2024 |

**Note:** While 2007 marked the introduction of the iPhone, we chose 2005 as our starting point to capture the broader landscape of machine translation and computer-based applications that emerged before Apple's device. This decision allowed us to include significant developments like Google Translate, which was officially launched in 2006. By extending our timeframe, we provided a more comprehensive overview of the technological advancements in language processing and mobile computing that set the stage for future developments in communication technologies

**Table 3 . Overview of Inclusion/Exclusion Criteria for the Search Strategy**

| Inclusion | Exclusion |
|---|---|
| Long-term care, community, home setting | Hospital, acute care, in-patient settings |
| iOS, Android, web-based, or custom-built apps | |
| > 65 years | |
| Research articles: peer-reviewed journal articles, grey literature, case reports, theses and dissertations | Commentaries, letters to editor, editorials, conference articles and proceedings |

**Stage 3: Study Selection**

Following the identification of relevant studies, the articles will be screened by two researchers independently. This first level of screening of the titles and abstracts will require meetings between the two researchers to discuss the applicability of the initial inclusion and exclusion criteria. As per Levac et al.[22] and Colquhoun et al.[23] 's recommendations, two researchers will independently review full-text articles for inclusion or exclusion in the scoping study. Meetings will be held prior to screening to ensure reviewers have the same understanding of the approach at the midpoint, as well as at the final stages of screening. When we receive conflicting screening results, that is, disagreement on whether to include a source or not, the team will be consulted to "break the tie" through a conversational dialogue. This approach to decision-making for study selection is consistent with that recommended by Levac et al.[22] Table 5 outlines the level 1 and level 2 screening criteria. Although the general inclusion and exclusion criteria apply to both levels of screening, more targeted screening questions will be used to account for the context of our research objectives.

**Table 4 . Level 1 and Level 2 Screening Questions**

| Level 1 Screening - Eligibility Criteria | | |
|---|---|---|
| **Question #** | **Screening Question** | **Answer** |
| 1<br>Concept | Does the title or abstract address the use of apps to facilitate care by reducing cultural-language communication barriers? (Concept in PCC Framework)<br><br>Include: | Yes - Include<br>No - Exclude<br>Unsure - Include |

| | | |
|---|---|---|
| | • All handheld, digital, mobile, computer-based, and software platforms that facilitate translation between patient and provider<br>• Use of technology for cultural-language translation purposes<br><br>Exclude:<br>• Not translation or interpretation using an app (e.g., healthcare provider/staff speaks the same language, real-time online human interpretation services) | |
| 2<br>Population & Context | Does the title or abstract address care for the older adult population in long-term care settings or community settings? (Population and Context in PCC Framework)<br><br>Include:<br>• Population is older adults<br>• Use of the app with the person receiving care<br>• Use of the app with the resident's family, informal caregivers and support people<br>• Use of the app for social interactions between residents<br><br>Exclude:<br>• Population of interest is not older adults<br>• Provider to provider only communication<br>• Hospital care, in-patient acute care, where the person receiving care is in a place to address an acute health issue, receiving care that is different from routine care in their home environment (i.e., long-term care facility or community) | Yes - Include<br>No - Exclude<br>Unsure - Include |
| **Level 2 Screening - Eligibility Criteria** | | |
| **Question #** | **Screening Question** | **Answer** |
| 1<br>Concept | Does the article address provider-machine-resident (human-machine-human) pathways of communication through the use of digital tools? (Concept in PCC Framework)<br><br>Include:<br>• iOS, Android, web-based, or custom-built apps<br>• R eal-time bi-directional (patient-provider) machine translation<br>• Digital technologies for translation purposes<br><br>Exclude:<br>• H uman interpretation services (e.g., connecting with a live human interpreter via mobile app) | Yes - Include<br>No - Exclude<br>Unsure - Include |

| | | |
|---|---|---|
| | • O ther human interpretation services that are non-provider-machine-resident communication | |
| 2 | Does the article describe an empirical study? (Study Characteristics)<br><br>Include:<br>• All empirical studies<br>• Theses and dissertations<br>• Case studies (n = 1)<br>• Reports<br><br>Exclude:<br>• Scoping reviews, systematic reviews, meta-analyses<br>• Editorials, letters to the editor, commentaries, conference papers and proceedings | Yes - Include<br>No - Exclude<br>Unsure - Include |
| 3<br>Population & Context | Does the article focus on the older adult population in long-term care or community settings? (Population and Context in PCC Framework)<br><br>Include:<br>• Population is older adults<br>• Use of the app with the resident's family and informal caregivers and support people<br>• Use of app for social interactions between residents<br><br>Exclude:<br>• Provider to provider only communication<br>• Hospital care, in-patient acute care, where the person receiving healthcare is in a place to address an acute health issue, receiving care that is different from routine care received in their home environment (i.e., long-term care facility or in community) | Yes - Include<br>No - Exclude<br>Unsure - Include |

**Stage 4: Charting the Data**

Search results will be mapped according to the template outlined in Supplementary Table 2.

**Table 5 . Template - Summary Table for Yield**

| Database | | Initial Yield | After Level 1 Screening | After Level 2 Screening |
|---|---|---|---|---|
| **Bibliographic Databases** | **DB 1 - Engineering Village**<br>**DB 2 - Web of Science**<br>**DB 3 - CINAHL**<br>**DB 4 - MEDLINE**<br>**DB 5 - HealthStar** | | | |
| | Total<br>Duplicates removed | | | |
| | Number of references from databases | | | |
| **Manual Identification** | **Google Scholar**<br>Number from Google Scholar removed after initial scan<br>Duplicates of bibliographic databases removed | | | |
| | Number of references from Google Scholar for screening | | | |
| | Manual Search of Reference Lists<br>Number from manual search of reference lists<br>Duplicates of bibliographic databases and Google Scholar removed | | | |
| | Number of references from reference lists for screening | | | |
| | **GRAND TOTAL** | | | |

PRISMA Diagram

A PRISMA diagram will be produced using Covidence[25] to illustrate the flow of articles throughout the stages of the scoping review. This visual flowchart will clearly depict the yield, number of duplicates removed, number of articles screened at each level, and number of articles included.

Inter-rater Reliability

The inter-rater reliability will be reported, assisted by Covidence,[25], in the form of the Kappa coefficient of the screeners. Inter-rater reliability data for both level 1 screening of the title and

abstract, and level 2 full text screening will be exported. Covidence[25] will provide the auto-generated calculations needed for the comparisons, which will include Cohen's Kappa coefficient.

**Stage 5: Collating, Summarising and Reporting the Results**

Data Extraction Plan

A data charting tool will be used to extract the following relevant data from the selected studies: Metadata section will include authors, title of the study and journal, year of publication and location. Study design and methods section will include study settings (nursing home, community), research design (RCT, observational), sample size, participant characteristics (age, gender, other relevant demographics), and data collection methods (survey, interviews).

Supplementary Table 2 outlines the data charting tool. In alignment with the objectives of this scoping review, the included articles will be read and reviewed to gather data pertaining to independent and dependent variables: (1) the type of apps/devices used (iOS, Android, other device), (2) the digital technologies involved (portable, desktop, smartphone, iPad, etc.), (3) who used the app/device (provider, resident, caregiver), (4) the manner and nature in which the apps are used (online, offline, other), and (5) patient outcomes specific to enhanced cultural communication, patient-centredness, quality of care, and equitable care.

In addition, we are interested in investigating whether selected studies have addressed structural inequities related to ageism, ableism, racialized identities, and other intersecting social locations that long-term care residents and community-based older adults may experience. Our data extraction plan includes examining whether these studies address key structural determinants of health necessary for achieving health equity such as the digital divide, digital literacy, digital health literacy, access to technology and support.

The included studies will be divided between two researchers for extraction, with each researcher validating the data extraction performed by the other. Finally, quality assurance will be performed by a third researcher. Initial extraction tables will be shared with the research team for feedback of potential gaps, or areas which may require further detail or clarity.

Synthesis Plan

To synthesize the findings across studies, the research team will engage in coding and the development of themes. The PRISMA extension for scoping reviews checklist[26] will be utilized. While we aim to follow the structure provided by PRISMA, we will additionally apply a critical lens to our synthesis plan. Meetings will be held to discuss codes and themes, and to challenge our thinking to resist the status quo from a health and social equity approach. We will employ the Digital Health Equity Framework outlined by Richardson et al.[20] to our analysis and synthesis of findings. Supplementary Table 2 will be used to facilitate data charting and for the integration of selected articles, employing an exploratory approach in response to the emerging body of literature related to cultural translation apps usage in long-term care.

Consultation Exercise

Although consultation is optional according to the Arksey and O'Malley framework,[21] the research team will engage in a consultation exercise with community partners after the data extraction to strengthen the synthesis of the findings. The research team will strive to consult with community collaborators in long-term care and gerontology, who have knowledge and experience in this practice domain. Their expertise will be leveraged to assist with organizing and integrating the data into themes that are relevant for practice, as well as the health and wellbeing of long-term care residents and community-based older adults. Furthermore, we plan to explore the possibility of consulting with long-term care providers, resident and family advisory councils, and senior leaders in partnership with our long-term care collaborator team members.

Patient and Public Involvement

The development of this scoping review protocol has been done in partnership with our community representative, who is a member of our research team, to bring their perspective as a caregiver as well as a member of the East Asian immigrant community in Toronto, Canada. Findings of the scoping review will be shared through community consultation and engagements with patients, family and caregivers of older immigrant adults with limited English language proficiency in community and long-term care settings in Toronto, Canada.

## DISCUSSION

The research team is prepared to engage in a process that is iterative throughout the search and screening phases of this scoping review. We anticipate that refinements may be needed to continually improve the search strategy and inclusion/exclusion criteria in the process of reviewing the literature identified. The research team members are open to modifications to the protocol and engage in a collaborative journey to achieve the research objectives.

The research team will adopt a critical, equity-informed approach for the scoping review, ensuring health and social equity perspectives are integrated within our methodology. We will establish criteria to assess digital health equity in the context of aging and elder care. Our evaluation will specifically examine selected studies for their engagement with health equity, addressing issues such as ageism, ableism, and the digital divide within geriatric care, supported by integrating the digital health equity framework as outlined by Richardson et al. [20]

## CONCLUSION

Our scoping review addresses a critical gap in understanding the current state of evidence on the acceptability and feasibility of cultural-language translation apps within the context of long-term care and community settings for older immigrant adults, from a cultural relevance and digital health equity perspective. Moreover, our protocol integrates considerations of acceptability and equity in examining the extent to which current apps bridge or exacerbate gaps in equitable, accessible, and acceptable care for older adults experiencing language barriers.

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{Josephine P. Wong, Mabel Ho, Rosanra Yoon, Abdul-Fatawu Abdulai, Rui Hou, Rade Ziniac} determined the idea and research topic for the scoping review. {Leinic Chung-Lee, Abdolreza Akbarian, Rosanra Yoon, Abdul-Fatawu Abdulai, Josephine P. Wong, Rade, Rui Hou} designed the protocol. {Leinic Chung-Lee, Rosanra Yoon, Abdolreza Akbarian} wrote the manuscript. {Rosanra Yoon, Leinic Chung-Lee, Abdolreza Akbarian, Abdul-Fatawu Abdulai, Rade Ziniac, Mabel Ho, Josephine P. Wong, Rui Hou, Anoushka Anoushka} edited the manuscript. {Rosanra Yoon} is the guarantor of the manuscript.

## Guarantor

All authors have agreed and approved the final manuscript.

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## Conflict of Interest

The authors have no conflicts of interest to declare.

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**Supplementary Table 1**

| Database draft search | |
|---|---|
| MEDLINE | Concept 1 (Older Adults)<br><br>Long-Term Care OR Assisted Living Facilities OR Homes for the Aged OR Nursing Homes OR Aged OR Health Services for the Aged OR Geriatrics<br><br>OR<br><br>Keywords: Elder* OR Senior* OR Older adult OR Retirement home OR Nursing home resident<br><br>AND<br><br>Concept 2 (Digital Technologies)<br><br>Mobile Applications OR Speech Recognition Software OR User-Computer Interface OR Web Browser OR Computer Systems OR Software OR Cell phone OR Smartphone OR Computers, Handheld OR Culturally Appropriate Technology OR Digital Technology<br><br>OR<br><br>Keywords: mobile app OR digital app OR real-time communication OR augmentative alternative communication OR Chatbot OR translation app<br><br>AND<br><br>Concept 3 (Translation)<br><br>Language OR Communication Barriers OR Cultural Competency OR Multilingualism OR Translations OR Translating<br><br>OR<br><br>Keywords: language barrier OR Cross-cultural<br><br>LIMITS: English Language, Publication Year 2005 to 2024 |

**Supplementary Table 2. Data Charting Template**

| COVIDENCE Ref # | Author(s) & Year | Location | Purpose | Research Design | Sample size and characteristics | Variables | | | | | | Implications for Research, Practice, and Policy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Type of app | Technology required | Who uses app | How app is used | Patient outcomes (enhanced communication, person-centred care, quality of care, equitable care) | Health Equity (Does study address structural inequities, digital divide, etc.) | |
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