PROMOTING HEARING AND COMMUNICATION HEALTH IN LONG-TERM RESIDENTIAL CARE THROUGH THE USE OF COMMUNICATION APPS

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1 Introduction

Approximately half of seniors currently 65 years old will require long-term residential care (LTRC) at some point in their future [1], particularly when they have complex, chronic health problems. The majority of seniors living in LTRC experience some degree of sensory, language and/or cognitive impairments associated with various age-related conditions (e.g., dementia, hearing loss, stroke) [2]. Moreover, there is often considerable diversity in the language and cultural backgrounds of care staff and residents [3,4]. These functional challenges can negatively impact the quality of communication between care staff and residents [5], and ultimately quality of life [6]. While attempts to address barriers to effective communication have been made [7,8,9], the proposed solutions are often inadequate in scope and impact or are unavailable when care staff need the support [10]. As a result, older residents living with sensory, cognitive and/or language impairments become vulnerable in regard to communicating their needs and preferences, as well as in understanding those in their environment [11,12].

An emerging approach to supporting communication between care staff and residents is the use of mobile communication technology (e.g., smartphones, tablets, apps). The use of technology as a communication aide in LTRC has to date been explored primarily as a means to stimulate conversation in reminiscence and leisure activities [13,14,15] rather than supporting communication during care (e.g., eating, personal hygiene). Consequently, little is known about whether and how LTRC staff have adopted mobile technology in their care practice for the purpose of enhancing communication. This gap was the motivation for the present study, which investigated LTRC staff's usage patterns, needs, and preferences around using mobile technology and communication apps (cApps) with residents in LTRC.

2 Method

2.1 Participants

- 12 Care Staff (11 F); Mean Age = 45 (24-59); 10 = RCA/HCA, 2 = Music/Art/Rec Therapist; 7 of 12 had noticeable accent in English, the language used for care in the facility.
- 6 Residents (4 F), Mean Age = 86 (75-92); Majority had dementia and/or stroke/aphasia; Half spoke a language other than English. Although not formally assessed, most residents presented with hearing and/or vision impairments.

2.2 Design/Procedure

We used a mixed-method design by collecting data from staff via questionnaires, focus groups, and real-time observations of staff-resident interactions. In the first stage, we conducted a comprehensive search of existing cApps in order to identify which ones might be most appropriate in addressing sensory, linguistic, and cognitive barriers in LTRC. We targeted cApps that presented solutions for language-related barriers (language translation apps) and sensory-cognitive-communication barriers (Augmentative and Alternative Communication—AAC—apps). We reviewed each cApp for its features and functionality using a screening and rating process. This process yielded 4 short-listed cApps—2 AAC-type apps, and 2 language translation apps. We then introduced the 4 cApps to LTRC staff to elicit through questionnaires, observations, and focus groups: 1) their perspectives and needs around the adoption of cApps in their daily work, 2) what aspects of current cApp technology do or do not meet their needs, and 3) what usability issues (e.g., display size and quality of images/video and audio) they face when using these cApps with residents who have cognitive-linguistic, sensory, and/or physical challenges.

3 Results

Half of the care staff (N = 6) indicated that they had previously used mobile technology (e.g., smart phones, tablets) with residents, while only one said he had also used cApps with residents. No staff mentioned or were aware of cApps designed specifically for visually or hearing impaired persons (e.g., Jacoti ListenApp®). As for other communication enhancing devices, an FM system was mentioned by two care staff as being available on each floor of the facility. However, most care staff seemed unaware of this technology. Care staff indicated that all 4 cApps were simple to understand, easy to use, and had many desirable features. Staff comments in the pre-/post-Focus Groups and our observations of staff using the cApps with residents highlighted a number of cApp features that were preferred by staff, as well as some challenges to using them:

Preferred cApp Features mentioned by care staff and/or observed while they used cApps with residents:

- Easy navigation that allows combinations of pictures/images/text/braille with speech in order to provide multi-modality input/output to accommodate challenges associated with hearing/vision loss, aphasia, dementia, and/or language differences/accent
- Customizable to support adding resident's personal photos, videos, music etc.—will help facilitate meaningful social interaction, agency, and improve mood. For example, a scene photo of the resident's

wardrobe would allow resident to choose what to wear simply by pointing.

- Interfaces with headset/ear buds so that residents with hearing loss can adjust sound level
- Large display/images/font, and strong and clear audio capability (especially for translation)
- Ability to record, store, and play back native spoken language phrases for translation and accent accommodation; translation that can deal with accents and variations in voice quality
- Female (vs. male) voice—softer, more calm, more acceptable to residents; use of familiar voice may appeal to residents [and reduce cognitive load on perception]
- Sensors that allow object or text detection/scanning/tracking/conversion to speech for the visually impaired
- Pain and feelings scales that allow resident to communicate location and severity of pain, or current mood, using touchscreen

Challenges mentioned by care staff and/or observed while they used cApps with residents:

- Residents are often not familiar with mobile technology (e.g., tablets), and therefore, get confused/distracted when presented with the display
- Residents with hearing loss have difficulty with the relatively low audio quality on MT devices, particularly in noisy environments and when confronted with accents (staff, or canned voices)
- Device should be small/portable, yet it needs to allow for large enough display for residents
- Residents' touch of the display was often not detected or precise enough for successful operation of cApp

In the post-observation focus group, staff completed a worksheet that asked them to check off which features they would prioritize as essential for their "dream" cApp. Two of the features listed were related to the importance of accommodating to residents' vision and hearing impairments. The majority of staff (7/8) indicated that a cApp must address vision needs, whereas just over half (5/8) responded similarly for hearing needs.

4 Discussion

Care staff expressed positive perspectives on the potential of using cApps to facilitate communication with residents during daily care activities. By accommodating to the sensory, linguistic, cognitive, and social needs of residents, cApps allow interactions to progress more efficiently and in a more person-supportive manner. As one staff put it, "cApps promote an emotionally closer relationship/friendship, socializing, spending more time with resident, and having fun." Care staff's greater emphasis on vision than hearing issues may suggest a need to educate staff about the prevalence of hearing related challenges to communication in LTRC. However, it may also be an indication of the relatively greater salience of and dependence on visual than auditory functions when using AAC-type apps (e.g., visuals compensating for hearing loss).

5 Conclusion

Future advances in technology should enable integration of the best devices (e.g., FM system, smartphones, Google Glasses®) and cApps (AAC, translation, amplification) in order to provide users with one versatile portable platform that can address residents' sensory, motor, linguistic, and cognitive communication challenges. Wireless technology is now at a point where such integration would enable users to employ the device and accessories (e.g., hearing aids, remote microphone) without attaching cables and in any location [16,17]. A key factor, however, will continue to be achieving a balance between the need for portability (weight and size of device) and the requirement that features of the device and app support age-related functional changes. Given residents' variable health status and their complex care and communication environment, the usefulness of cApps will necessarily vary from resident to resident, across interactions and tasks, and from day to day. As with any technology designed for enhancing interpersonal interactions, its ultimate effectiveness depends on the users' awareness and appreciation of each other's needs and of how technology is just one ingredient in a tool bag of communication strategies [11,18].

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