Use of mHealth Technologies by People with Vision Impairment

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Abstract

Analysis of qualitative data from focus groups with blind and low vision individuals on use of

mHealth technologies and mobile apps.

Keywords

Information and communications technology, blind, low vision, mobile health, mobile apps

Introduction

Significant health disparities exist between the general population and people with disabilities,

particularly with respect to chronic health conditions. Mobile healthcare (mHealth) – medical

and public health practice supported by mobile devices, such as mobile phones, patient

monitoring devices, personal digital assistants, and other wireless devices (World Health Oerganization, 2011) – offers considerable potential to help reduce those disparities by facilitating interaction with healthcare professionals and by supporting personal engagement in health data collection, goal setting and healthy lifestyles.

Consumers, healthcare providers and payers have expressed considerable interest and high expectations for mHealth (Zweig, Shen, & Jug, 2018). About half of patients recently surveyed predict that mHealth technologies will improve the convenience, cost and quality of healthcare in the next three years (Price Waterhouse & Coopers, 2013), and 96% of current mHealth app users believe the apps help improve their quality of life (Research Now, 2015a). Six in 10 doctors and payers believe that its widespread adoption is inevitable, and 7 in 10 believe health apps will encourage patients to take more responsibility for their health (Research Now, 2015b).

Little is known about the mHealth experiences of people with disabilities, including people with blindness and very low vision. Early evidence suggests that people with disabilities are not well represented in the growth of mobile healthcare, and particularly the proliferation of mobile health software applications (mHealth apps) for smartphones and tablets (Jones, et al., 2018; DeRuyter, et al., 2018). This underrepresentation could lead to further health disparities, and perhaps more fundamentally fail to take advantage of new and effective ways of engagement in personal health management. This article presents data analysis from focus group research with blind and low vision individuals to map their experiences and needs for mHealth solutions. This is an important initial step for setting the mHealth research and development agenda.

Discussion

Methods

We conducted an exploratory study on the use mHealth technologies among individuals with visual impairment (blindness and low vision). Data were collected in 2 focus group in March 2018. There were 6 individuals with blindness in one group and 8 individuals with very low vision in the other. Participants were recruited from a local metro-Atlanta organization providing rehabilitation and support for the visually impaired community.

To be eligible for the study, participants had to be 18 years or older, fluent in English, and self-identified as having blindness (little or no usable vision) or very low vision (difficulty accomplishing visual tasks even with prescribed corrective lenses). A recruitment screening questionnaire was used to identify eligible participants and record basic data on demographics (table 1) and technology profiles (table 2).

Table 1

Demographic and technology profile (all participants)

Age range (years)	30-67
Age mean (years)	44
Gender (% Female)	36%
Education (% with Bachelor's degree or higher)	50%
Income (% below $15,000 annual income)	50%
Household structure (% living alone)	36%
Assistive technology – use screen reader (%)	86%
Assistive technology – use screen magnifier (%)	57%
Consumer technology – use smartphone	93%
Consumer technology – use tablet	86%

Table 2
Do you own or use any of the following technologies to support your health and wellness? (all participants)

Desktop computer	36%
Laptop computer	64%

Cellphone	86%
Tablet	64%
Wearable device	21%
Patient portal	64%
Dedicated health monitors (glucose, BP)	29%
Automated devices in the home	21%

Data Analysis

A semi-structured moderator script was used to ask participants open-ended questions about their use of mHealth technology and their health interests and needs. Using a consensual qualitative approach, two members of the research team read the focus group/interview transcripts independently to get an overall sense of the tone and content of the material, and to identify major themes and topics. Initial themes derived from the moderator script and focus group transcripts are summarized below. The moderator script provided the initial set of major themes and topics. These predefined themes (listed below) will be supplemented by additional major themes that may emerge from data analysis.

- What is mHealth technology?

- What types of mHealth Technology do you use?

- Benefits to using mHealth technology

- Barriers to using mHealth technology

- Health Interests and Needs of People with Visual Impairment

- Specific Assistance Needed Related to mHealth Technology

- Discovering New mHealth Technologies and Resources

For the full research article, we will extend and refine the coding scheme and develop a codebook, followed by detailed coding of subcategories. The two data analysts will meet to discuss the interpretations, ensure that there is consistency in coding, clarify and derive

consensus on any discrepancies, and ensure saturation. Quotes illustrating the themes also will be identified.

Results

Below we summarize the initial coding and results for both groups (blind and low vision) taken together. While there were some areas of divergence in the specific experiences of each group, these were relatively minor. Instead, there was considerable commonality in the experiences, needs, and desires of both groups with regard to attitudes toward mHealth (generally positive), and usefulness and usability of mHealth solutions (some mixed feelings), and sources of information when seeking new mHealth solutions to try. For the full research manuscript, we will explore these areas of divergence in greater detail.

Participants gave descriptions of the term "mHealth technology" and provided examples of the types of mHealth technology they use, most of which could be sorted into five categories: patient portals, personal health applications, medical/health-related devices, accessibility supports, and search engines. The overall benefits of mHealth technology for both groups included better management of personal health data through electronic tracking; support of physical activity, nutrition, weight, sleep, and stress management goals; access to global health and medical information; and opportunities for improved communication with clinicians involved in their healthcare.

Participants in this study identified several reasons why they use mHealth technology: accountability, motivation, enjoyment, and entertainment. They also detailed several factors preventing them from using mHealth technology, such as inaccessibility of technology, lack of available storage, and updates affecting the functioning of their phone and personal health apps. Individuals abandoned mHealth technology (especially mHealth apps) because they did not

personally see the value, lacked familiarity or knowledge of the solution, had difficulty with use, and the cost outweighed the perceived benefits.

Participants' specific health interests and conditions supported by mHealth technology included cardiovascular health, diabetes, nutrition, and medication management. Information resources for finding mHealth solutions included social media, the internet, the App store, curation sites, and word of mouth.

Conclusion

This exploratory research study is the first step in identifying the current use of mHealth ICT by people with vision impairment. Overall, there were similar experiences between the blind and low vision groups about technologies used, benefits, barriers, health needs and interests. Both groups identified a range of health concerns and conditions that require regular attention and an ongoing focus on healthy behaviors. Barriers to use focus mainly on accessibility – enabling the technologies with auditory input and output; for blind users, this functionality needs to be enable immediately out of the box. Additionally, both groups expressed concern about the accuracy of mHealth technologies (mainly trackers and sensors); and about controlling the proliferation of mHealth ICT solutions (apps, sensors, trackers, etc.) in their lives.

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