Media use by older adults with hearing loss: An exploratory survey

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Abstract

Objectives: There has been a substantial increase in people with health conditions seeking health-related information online. The aim of this study was to examine the media usage by older adults with hearing loss.

Method: The study used a cross-sectional survey design. A total of 556 older adults with hearing loss (Hearing Tracker website users) completed the survey which was focused on (a) demographic information, (b) general electronic media usage (c) sources of hearing health information, and (d) social media use for hearing health information. Data were analyzed using descriptive statistics and Chi square tests.

Results: When seeking hearing health care information the majority of the participants turned to the Internet (54%) followed by health professionals (34%) as the first response to their symptoms. Both these sources were also rated as the easiest means of obtaining hearing health information. The information from health care providers was rated as more reliable and important for decision making than that from the Internet. Facebook and YouTube were the most frequently used social media platforms with over 40% of the respondents using them ‘most of the time’ or ‘sometimes.’ All the social media platforms were rated less favorably than other sources for ease of finding information, reliability, and importance in decision making.
**Conclusion:** Older adults with hearing loss use various forms of electronic media for seeking hearing health information. They place the most trust on the information obtained from hearing health care professionals. These professionals need to be aware of the quality of information available on the Internet and social media sources in order to direct patients to credible sources.

**Key Words**

Hearing loss, Media, Internet, Health information, Health communication

**Introduction**

Patient involvement in their health care has transformed dramatically over the last decade. Patients are more likely to seek health information, make informed decisions about rehabilitation choices, and self-manage their condition than in previous decades. There has also been a shift in where this information is sought. Traditionally people with disabilities and health conditions consulted health professionals or discussed their health conditions with their friends and family. In recent years there has been a rise in people using the Internet and social media to gather information about health conditions (Marton & Wei Choo, 2012; Zhao & Zhang, 2017; Pew Research Center, 2019).

Electronic media (i.e., news media, social media, and the Internet) provides easy and free access to information on various health conditions including hearing loss. Patients can access information when and where they want just by searching the Internet using their personal computer or smartphone. Patients can assess information on issues they perceive as relevant. Moreover, patients can interact with others with similar conditions to hear their opinion and
experiences or to share their own experiences with others. Hence, patients may feel more empowered (Oh & Lee, 2012) and may be more motivated to be involved in health decision making and management (Broom, 2005). This is unlike clinical settings where health professionals may control the conversation (Antheunis, Tates, & Nieboer, 2013). These factors have contributed to the changes observed regarding the way in which patients seek and use information and the way in which they interact with health professionals.

Despite the obvious benefits of electronic media in improving the accessibility of health information, there are some limitations (Finn, 2019; George, Rovniak, & Kraschnewski, 2013). For instance, (mis)information about health on the Internet and social media is suggested to be one of the biggest threats (Hill et al., 2019). Online health information, in particular information shared through social media, may do more harm than good (George et al., 2013). Shared (mis)information may provide inappropriate health care choices. Moreover, the use of electronic media for health information seeking has also influenced the patient-physician relationship (Smailhodzic, Hooijsma, Boonstra, & Langley, 2016). For instance, patients can be more aware of issues and may ask questions about various myths they have. Alternatively they may have preference for a particular management strategy as a result of reading about it on the Internet. For these reasons, it is essential that health professionals are aware of the type of electronic media used by people with different health conditions and the quality of information available on those sources. This will help them to be better prepared to address the questions or concerns raised by patients.
There has been increasing interest in understanding the Internet and social media use by people with hearing related conditions. Henshaw, Clark, Kang, and Ferguson (2012) explored the use of computers and the Internet in a sample of older adults (50-74 years) in the United Kingdom. Their study suggested that older adults experiencing slight hearing difficulty have increased odds of greater computer skill and Internet use than those reporting no hearing difficulty. Thorén, Oberg, Wänström, Andersson, and Lunner (2013) found that over 60% of participants with hearing loss used computers and the Internet. This proportion was higher than that of the general Swedish population. Higher Internet usage was associated with more male hearing impaired adults of a younger age and higher educational status. There was no association between Internet usage and the degree of hearing loss. More recently studies have examined social media use by people with hearing loss and tinnitus (e.g., Choudhury, Dinger, & Fichera, 2017; Deshpande, Deshpande, & O’Brien, 2018; Manchaiah, Ratinaud, & Andersson, 2018). While these studies have examined the frequency of electronic media use, they have been limited by either focusing on a specific domain (e.g., the Internet), and/or by focusing on the content and frequency of information. These studies highlight that people with hearing related disorders often use electronic media including social media for hearing health information. However, we do not know users’ perception of ease in gathering online information, users’ perception of reliability of information gathered, and if users’ ease and trust influences decision making. Hence, there is a gap in the literature in terms of what kind of electronic media people with hearing loss use, how they perceive the information obtained and how it influences their health management decisions.

The aim of this study was to examine media usage by older adults with hearing loss to:
a) Determine how frequently different electronic media sources are used by older adults with hearing loss to search for general information.

b) Identify the initial sources used to seek health information as a result of a health symptom and whether these choices are associated with any personal characteristics.

c) Compare the frequency of use of non-media sources (i.e., health care provider, family and friends) and media sources (i.e., Internet, television, news media, radio) for hearing health information, perception of ease of finding hearing health information, perception of reliability of the source providing the hearing health information and the importance of the source decision making.

d) Compare the frequency of use of social media (i.e., Facebook, YouTube, Twitter, LinkedIn, Instagram) for hearing health information, perception of ease of finding hearing health information, perception of reliability of the source providing the hearing health information and the importance the source decision making.

Method

Study Design

The study used a cross-sectional survey design. Ethical approval (IRB-FY19-106) was obtained from the Institutional Review Board at Lamar University, Beaumont, Texas, USA.

The aim of the sampling strategy was to recruit a wide range of older adults with hearing impairment who regularly used the Internet. Hearing Tracker is a private entity which serves as a consumer-led website to promote best practice in audiology and provides comprehensive and unbiased information about hearing instruments and practices. There are over 12,000 registered
users (mainly people with hearing loss) who subscribe to their mailing list. As such, this was identified as an appropriate means of recruiting Internet users with impaired hearing. An email with the web-based survey link using the Qualtrics platform was sent to all registered users of Hearing Tracker. The email was delivered to 12,682 members. Of those, 5,797 members opened the email, and 896 members clicked on the survey link. Of those that clicked on the survey, 620 registered to complete the survey. The participants self-selected themselves to participate in the study. The inclusion criteria included: adults over 18 years of age with hearing impairment, ability to read and write English, and resident of the United States. The response from those who did not meet these criteria were excluded. The survey title stated that the survey was about the electronic media usage.

**Participants**

The survey resulted in 620 responses, of which 64 responses were incomplete with missing data on 5 or more questions. Hence, responses with missing data were excluded and remaining 556 responses from individuals with hearing impairment were included in the analyses. Table 1 provides the demographic details of the study participants. The participants had a mean age of 67 years and 62% of the participants were males. A large number of the participants were retired (64%), of white ethnicity (90%), and had hearing loss in both ears (96%). Over 70% used the Internet for more than 10 hours a week and nearly 15% used the Internet for more than 30 hours a week.

**Table 1: Demographics (n=556)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>N (%)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in Years)</td>
<td>-</td>
<td>67.73 (12.6)</td>
</tr>
<tr>
<td>Duration of hearing loss (in Years)</td>
<td>-</td>
<td>21.85 (17.0)</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>---</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>342 (61.5)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>205 (36.9)</td>
<td>20 (3.6)</td>
</tr>
<tr>
<td>Gender diverse</td>
<td>9 (1.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Work</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entry level or unskilled</td>
<td>10 (1.8)</td>
<td></td>
</tr>
<tr>
<td>Skilled or professional</td>
<td>172 (30.9)</td>
<td>-</td>
</tr>
<tr>
<td>Retired</td>
<td>354 (63.7)</td>
<td>-</td>
</tr>
<tr>
<td>Not working</td>
<td>20 (3.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>8 (1.4)</td>
<td>-</td>
</tr>
<tr>
<td>High school or GED</td>
<td>34 (6.1)</td>
<td></td>
</tr>
<tr>
<td>College, but no degree</td>
<td>101 (18.2)</td>
<td>-</td>
</tr>
<tr>
<td>Associate degree</td>
<td>48 (8.6)</td>
<td></td>
</tr>
<tr>
<td>Bachelor degree</td>
<td>175 (31.5)</td>
<td>-</td>
</tr>
<tr>
<td>Graduate degree</td>
<td>190 (34.2)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>16 (2.9)</td>
<td>-</td>
</tr>
<tr>
<td>Asian</td>
<td>20 (3.5)</td>
<td></td>
</tr>
<tr>
<td>Black or African American</td>
<td>7 (1.3)</td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>10 (1.8)</td>
<td></td>
</tr>
<tr>
<td>Native Hawaiian or Other Pacific Islander</td>
<td>2 (0.4)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td><strong>White</strong></td>
<td>501 (90.1)</td>
<td></td>
</tr>
<tr>
<td><strong>Hearing Loss</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• One ear</td>
<td>23 (4.1)</td>
<td></td>
</tr>
<tr>
<td>• Both ears</td>
<td>533 (95.9)</td>
<td></td>
</tr>
<tr>
<td><strong>Self-reported hearing disability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Very easy</td>
<td>4 (0.7)</td>
<td></td>
</tr>
<tr>
<td>• Fairly easy</td>
<td>149 (26.8)</td>
<td></td>
</tr>
<tr>
<td>• Fairly hard</td>
<td>275 (49.5)</td>
<td></td>
</tr>
<tr>
<td>• Very hard</td>
<td>128 (23.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Hearing aids</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• One ear</td>
<td>50 (9.0)</td>
<td></td>
</tr>
<tr>
<td>• Both ears</td>
<td>454 (81.7)</td>
<td></td>
</tr>
<tr>
<td>• No</td>
<td>52 (9.3)</td>
<td></td>
</tr>
<tr>
<td><strong>Other hearing devices</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• None</td>
<td>362 (65.1)</td>
<td></td>
</tr>
<tr>
<td>• Cochlear Implants</td>
<td>24 (4.3)</td>
<td></td>
</tr>
<tr>
<td>• Bone Anchored Hearing Aid (BAHA)</td>
<td>4 (0.7)</td>
<td></td>
</tr>
<tr>
<td>• Phone amplifier</td>
<td>90 (16.2)</td>
<td></td>
</tr>
<tr>
<td>• Other</td>
<td>76 (13.7)</td>
<td></td>
</tr>
<tr>
<td><strong>Family history of hearing loss</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Yes</td>
<td>285 (51.3)</td>
<td></td>
</tr>
<tr>
<td>• No</td>
<td>271 (48.7)</td>
<td></td>
</tr>
</tbody>
</table>

Note: GED = Graduate Education Development
Questionnaire

An electronic survey was used to identify the best method to answer the research aims. As no appropriate standardized questionnaire was found, a 22-item questionnaire was developed (see Supplemental Materials). The questionnaire focused on (a) demographic information, (b) general electronic media usage, (c) sources of hearing health information, and (d) social media use for hearing health information. Items were derived primarily through discussion among the research team members and by considering previous literature on media use related to health information. Questions were related to the frequency and ease of use as well as reliability and usefulness for decision making of different sources of information. The response scale varied based on the questions. However, the key questions about the ‘source of information’ and ‘electronic media use’ were rated in a four-point Likert-scale (e.g., most of the time, sometimes, rarely, never).

We wanted to ensure that the questionnaire was easily readable and comprehensible to the study participants. Readability is the ease with which a person can read and understand written materials (Davidson, 1984). The use of readability formulas determine the ease with which materials can be comprehended (Doak, Doak, & Root, 1996). Guidelines from the US Health and Human Services and the American Medical Association recommend that health material are written in plain language at or below the 6th reading grade level (Doak et al., 1996). Reading Grade Level (RGL) scores were calculated using Readability Studio (version 2012.1). The original questionnaire had a reading grade level of 8.9 in the Flesch-Kincaid grade level formula. Hence, the questionnaire was revised to achieve the desired reading grade level. This involved reducing the sentence length to less than 21 words, reducing the word complexity to no more
than 3 syllables per words, increasing word familiarity by removing complex words, and reducing the word length to 66 characters or less where appropriate. The readability assessment following these changes resulted in a reading grade level of 5 in the Flesch-Kincaid grade level formula in the final questionnaire.

188 **Data Analysis**

189 Statistical analyses were conducted using the IBM SPSS Software Version 24. Descriptive statistics were used to examine answers to most of the questions. In addition, Chi square test was performed to examine the association between demographics variables (i.e., age, gender, education, and work status) and Internet use and initial response to symptoms. The continuous variable age was split into two categories using the median age as the cut-off point. For all analyses, an alpha level of < 0.05 was used as statistical significance.

196 **Results**

197 **General Electronic Media Usage**

198 Participants were asked to indicate the type of electronic media they used of the nine different sources of electronic media listed. They were asked to rate their general usage of these sources, not specifically related to obtaining health-related information. Internet (100%), television (85%) and news media (73%) were the most frequently used media outlets followed by the radio (59%) as seen in Figure 1. The respondents also used social media for information with over half of them using Facebook (54%) and YouTube (56%). However, the use of Twitter, LinkedIn and
Instagram was used by less than a quarter of the study respondents.

![Media Usage (n=556)]

**Figure 1**

**Initial Source of Information for Health-Related Symptoms**

Participants were asked to identify their initial source of information when searching for health-related symptoms. Figure 2 showed that the majority turned to the Internet (54%) or health professionals (34%). Consulting friends and family (4%) and use of other sources (8%) were the least used sources. Chi square test was performed to examine the relationship between demographics variables (i.e., age, gender, education and work status) and the type of initial response to health symptoms (i.e., source was used). There was no significant association between initial response to symptoms and age [$\chi^2 (5, 556) = 8.3$, $p = .14$], and gender [$\chi^2 (10, 556) = 7.4$, $p = .69$], work status [$\chi^2 (15, 556) = 16.8$, $p = .33$], or education [$\chi^2 (25, 556) = 17.4$, $p = .46$].
Weekly Internet Use

Over 70% of the respondents use the Internet more than 10 hours a week (see Figure 3).

Interestingly, nearly 15% of the respondents use the Internet more than 30 hours a week. Chi-square testing indicated that there was no significant associations between weekly internet use and variables age [$\chi^2 (5, 556) = 3.8, p = .57$] and gender [$\chi^2 (10, 556) = 5.2, p = .88$]. A significant association was found for variables work status [$\chi^2 (15, 556) = 43.4, p < .0001$] and education [$\chi^2 (25, 556) = 61.3, p < .0001$].
Sources of Hearing Health Information

Participants were asked to indicate the frequency with which they used six different sources (both non-media and media) of information to gather hearing health information. They were then asked how easily the information was obtained, how reliable it was, and whether the information was used during decision making. Results indicated that the Internet and health care providers were the most frequently used sources, followed by the news media (see Figure 4a). The Internet and health care providers were also rated as the easiest sources of hearing health information with nearly 90% respondents rating the Internet and 80% rating health care providers as ‘very easy’ or ‘fairly easy’ sources of Information (see Figure 4b). However, when rating the reliability (see Figure 4c) and importance of the information obtained during decision making (see Figure 4d) health care providers were rated more favorably than the Internet. Although the news media was used as a source of information by nearly one third of respondents, the reliability and importance of the information obtained was rated less favorably. Television and radio sources
were used less frequently, rated more difficult to find information, and were viewed as less favorable for reliability and importance in decision making. Friends and family were used as a source of information by over 40% of respondents. Ease of access to information, reliability, and importance of decision making ratings were favourable by 35 to 40% of individuals about friends and family.

Figure 4

Social Media Use for Hearing Health Information

Participants were asked to indicate the frequency with which they used five different social media sources of information to gather health information. They were then asked how easily the information was obtained, how reliable it was and whether the information was used during decision making. Facebook and YouTube were the most frequently used social media platforms
with over 40% of the respondents using them ‘most of the time’ or ‘sometimes’, whereas the other three sources (i.e., Twitter, LinkedIn, Instagram) were used by less than 10% of respondents (see Figure 5a). Facebook and YouTube were rated as ‘very hard’ to find information on by nearly 61% and 47% of the respondents respectively (see Figure 5b). Facebook and YouTube were rated as ‘not at all’ reliable by nearly 55% and 42% of the respondents, respectively (see Figure 5c). In addition, Facebook and YouTube were rated as ‘not well at all’ in terms of importance in decision making by nearly 69% and 57% of the respondents, respectively (see Figure 5d). Twitter, LinkedIn and Instagram were rated as most difficult, less reliable and least important in decision making by most of the respondents.

Figure 5
Discussion

The current study explored media and non-media usage by older adults with hearing loss. Electronic media brings many advantages for people with hearing loss as they may provide a means to facilitate communication, remove auditory barriers (Barak & Sadovsky, 2008). Use of the Internet thus appeals to those with text-based communication preferences (Pilling & Barrett, 2008). The impact of obtaining information from electronic media in relation to direct sources of information (i.e., health care profession, family, friends) should be considered by health care professionals. The current study found that older adults with hearing loss do use various sources of information including the Internet and social media. This is not surprising in light of the fact that increasing numbers of people are using the Internet and social media to gather information about health conditions. These results are in line with previous findings that 70% of hearing impaired adults sampled reported using the Internet more than 10 hours a week (Henshaw et al., 2012; Thorén et al., 2013). To date there have been conflicting findings regarding whether demographics factors are related to the frequency of Internet usage.

The Internet was the most frequent initial source of hearing health care information used by 54% of responders. Previous literature has also found the Internet to be the initial source of hearing related information (Peddie & Kelly-Campbell, 2017). It was encouraging that health care professionals still maintain a critical role in providing initial hearing health care information as they were the second most frequent initial information source used by 34% of responders. The initial source of information used was related to work status and level of education. The Internet was also rated as the easiest source of finding information by 90% of respondents, followed by 80% rating health professionals as an easy information source when compared to other sources.
However, health care professionals were rated as the most reliable source of information by 59% or responders, followed by the Internet (i.e., 27% of responders).

Perception of trust is an important element of hearing health care therapeutic relationship (Preminger Oxenbøll, Barnett, Jensen, & Laplante-Lévesque, 2015). Hence, it is clear that while older adults with hearing loss use the Internet, they view their hearing health care provider as the more trusted source. Older adults may go to the Internet for information, but then they may follow-up with their hearing health care provider to discuss the information they have gathered. Consequently, hearing health care provider should be aware of what hearing health information may be found on the Internet. This knowledge can help them prepare to engage in discussions with their patients which can promote patient-centered care.

The use of social media to gather hearing health care information was lower when compared to the use of the Internet and health professions. Facebook and YouTube were the most frequent social media sources of information compared with other social media platforms such as Twitter, LinkedIn, and Instagram. Social media sources received low ratings regarding the ease of information gathering, reliability of information, and the importance of information in decision making. The low trust placed on information obtained through social media can be seen in a positive frame since social media seems to have high percentage of (mis)information (Deshpande et al., 2018; Shin, Jian, Driscoll, & Bar, 2018). This highlights the need for professionals to add reliable evidence-based information on social media sources and highlight (mis)information. Patient’s evaluation of online health information is a complex cost-benefit analysis process that involves the use of a wide range of criteria and can be characterized as highly subjective and
contextualized (Sun, Zhang, Gwizdka, & Trace, 2019). Further work should be aimed at examining how patients gather health information and how this influences decision-making.

**Study Implications**

The information from this study is helpful in highlighting which communication channels are most likely to reach older adults with hearing loss. Stakeholders can develop reliable information sources for the Internet, as this is a frequent resource for hearing impaired adults. There is a clear need to improve the evidence-based and reliability of hearing health care information on the Internet (Sbaffi & Rowley, 2017). Hearing health care professionals should review the quality and relevance of health information in various electronic media and direct the patients to appropriate sources. In particular, such an approach may be necessary when dealing with patients who have low health literacy skills as they seem to have more difficulty evaluating online health information (Diviani, van den Putte, Giani, & van Weert, 2015). Moreover, consumer health literacy and information programs to empower patients and their family members to find quality information online should be encouraged and developed (e.g., Armstrong-Heimsoth et al., 2017).

Given the high usage of Internet for hearing health information, developing Internet-based rehabilitative strategies may be welcomed by patients (Beukes, Manchaiah, Baguley, Allen, & Andersson, 2019).

**Future Directions**

The current study adds to the existing literature regarding health seeking information by exploring perceptions of ease of gathering information, perceptions of reliability of information, and the importance of sources of electronic information in decision making. The study sample
was somewhat biased as the respondents volunteered to participate in the survey by self-selecting themselves which may have resulted in self-selection bias. Also, due to the nature of the survey administration, the survey only included Internet users from one source. This resulted in the sample consisting mostly of white males with a mean age of 67 years. Generalizations to other population may thus be limited as there are significant cultural differences in information processing preferences for online health information (Song et al., 2016). Future studies should extend this study to a broader clinical population. Future studies can examine the relationship between the information gathered by various sources and the resulting hearing health outcomes. Such outcome may include hearing symptoms management, help-seeking, hearing rehabilitation uptake, hearing rehabilitation use, and satisfaction from hearing rehabilitation.

Conclusions
The current study explored the media usage by older adults with hearing loss. Overall, the results suggested that (a) older adults use various sources for seeking hearing health information, (b) Internet and health professionals are more frequently used and the social media are less frequently used sources, and (c) patients have higher trust on health professionals when compared to other sources. Hearing health care professionals need to be aware of the quality of information available in various electronic media and direct the patients to the most appropriate sources. Moreover, enabling discussions about the information gathered in various electronic sources with patients may promote the clinician-patient therapeutic relationship.

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**Supplemental Materials**

We have included a copy of the Electronic Media Usage Survey in the supplementary materials.

**Figure Legends**

- **Figure 1**: Frequency of use of different electronic media sources
- **Figure 2**: First response to health symptoms
- **Figure 3**: Weekly Internet use
- **Figure 4**: Sources of information used to gather hearing health information
- **Figure 5**: Electronic media usage for hearing health information