ABSTRACT
Over half of older adult Internet users search for health information online, a number likely to continue to climb. To design a better online environment for older adults, we need to understand how they search for health information online. In an observational study, 17 older adults aged from 56 to 78 completed four health-related online search tasks. Through recordings of search activities, “think aloud” audio recorded data, interviews and questionnaires, we identified multiple key issues regarding older adults’ search behavior for online health information, including: 1) using insufficient search queries to search for complex search constructs; 2) misunderstanding different Web browser and webpage search tools (e.g., address bar, search bar, webpage search boxes); 3) extensive reliance on prior knowledge in performing searches; and 4) a lack of ability to evaluate the quality of online health information. These findings have implications for developing design and educational interventions for older adults.

Categories and Subject Descriptors
H.3.3 Information Search and Retrieval – information filtering, query formulation, search process, selection process.

General Terms
Design, Human Factors.

Keywords
Online Search Behavior, Older Adults, Health Information.

1. INTRODUCTION
Older adults are increasingly turning to online resources to meet their health information needs. In 2009, approximately 38% older adult over age 65 went online, and this number climbed to approximately 45% in 2010 [1, 2]. Over 69% of these older Internet users looked for health information online [2]. Recently, middle-aged adults (age 40-59) form the majority of online health information seekers [3]. As these users age in the next few decades, they will contribute to a significantly growing number of older adults who seek for health information online.

Researchers have begun to examine how Web users search for health information online [4-6]. Evidence suggests that users tend to choose commercial search engines over health portal websites to initiate their health information searches [4-6], although this strategy does not always lead to successful searches [7]. Users typically use short search queries (an average of two words) to look for online health topics [8]. Few users expand their queries or use more sophisticated methods such as phrase searches or exclusions [9]. Online health information seekers often do not evaluate the sources of the information provided on websites [4]. They often experience difficulties such as retrieving inaccurate information from commercial search engines [10] and encountering commercial websites selling products [11].

As Internet users become more diverse in their skill levels [1], it is important to investigate how different users may search for health information differently (and/or similarly). Existing research tends to focus on the online search behaviors of younger age groups [4, 5, 6, 12]. Relatively little is known about the online search behaviors of older adults, who, due to age-related changes [13], are likely to have different patterns of online searches.

To begin to address this gap in the literature, we conducted an observational study to examine how older adults search for health information online. The observational method enabled us to obtain an in-depth understanding of participants’ search behavior [5]. We asked the following primary research questions:

- What patterns do older adults demonstrate in their searches for online health information?
- What major barriers do older adults encounter in their online health information searches?
- How effective are they at finding and evaluating the information?

2. LITERATURE REVIEW
Lenz [14] proposes a six-step model for the process of health information seeking behavior. These steps include: the user receives a stimulus to search, sets up search goals, decides to seek information actively, searches, acquires the information, and evaluates it. The amount of information to seek, sources of searching and familiarity with the search topics mutually affect the search process [14]. A literature review on health information search behaviors calls for more attention to behavior patterns,
stages of health conditions and contexts, and the variability of personal selections over different types of health information, focusing particularly on health information search behaviors in different cultures and age groups [15].

McMillan and Macias [16] examine three types of older American Internet users and how their computer literacy is associated with their attitudes of searching. The first type, the “power users” who are experienced in using computers, tend to be “health technologist.” These users take advantage of online health information resources and are likely to rate these resources as of high quality. The second type is “the older men user group” who hold the traditional, conservative belief that physicians should take most, if not all, of the control of their health communication and decision-making. Lastly, the “well-to-do” users generally have good health and education, but are less likely to use the Internet for health information [16].

Functional literacy is crucial to older adults’ ability to find and understand health information. Age-related declines in functional literacy impede older adults’ understanding of health information and their ability to communicate the information with others [17]. Older adults’ preferences for health information and decision-making autonomy may affect their relationships with health professionals [18, 19]. Efforts have been made to design health websites for older adults [20] and to develop tutorials to help older adults access reliable health information [21].

Several studies have examined older adults’ search behaviors for general search topics [22-24]. These studies have revealed multiple challenges and difficulties older adults often encounter. For example, older adults struggle when formulating conceptual knowledge such as constructing search queries [22]. Compared with younger adults, older adults are less successful in accomplishing search tasks due to their limited knowledge about available search strategy options [23]. Older adults prefer to use links on the web pages, because the links are more visible, and seem to be less complicated, than search engines [24].

To date few studies have involved direct observation of older adults’ online health information seeking behaviors. Relatively little is known about which specific search strategies and features older adults use, how older adults construct and modify search queries, and if and how they evaluate the search results. This study aims to begin to address these gaps.

3. METHODS
3.1 Participants
Seventeen older adults were recruited from Maryland public libraries and senior centers. These older adults were former or current students enrolled in the Electronic Health Information for Life-long Learners (eHILL) research project [25]. The eHILL project involves training for older adults in public libraries on basic computer skills and use of the Internet to access reliable health information. Participants were screened for their prior Internet search experience. All participants of the present study were able to use Internet search engines.

Participants’ age range was 56-78 years old ($M = 65, SD = 7.28$). Of these participants, 65% were women and 71% were Black/African Americans. 65% of the participants reported a yearly household income of less than $30,000 and 76% received at least High school degrees. 53% of the participants used the computer at least once per week and 41% of them accessed the Internet at least two or three times per week.

3.2 Data Collection
The data collection for this study consisted of four parts:
1) Participants’ search activities on the Internet were recorded by two built-in screen recording software applications: Camtasia and Sonar InterGuard. Camtasia captured a video of all screen activities and synced with an audio file. Sonar InterGuard recorded the data of web pages visited, search engines visited, search terms used and time spent on each screen activity.
2) “Think aloud” data were audio recorded using Camtasia during participants’ searches. Participants were encouraged to verbally describe their thought process and impressions at each step of their searches.
3) Interviews about search experiences were conducted after participants finished all of the search tasks. The interviews were audio recorded and transcribed for coding and analysis.
4) Participants completed a brief exit questionnaire about their demographics and prior experience searching on the Internet for general and health topics.

3.3 Procedure
The study sessions were conducted in a quiet meeting room at a public library from March to May 2011. Each session lasted for approximately 1.5-2 hours. A researcher worked with one participant per session. Participants used a laptop provided by the research team, installed with Camtasia and Sonar InterGuard, as well as Internet Explorer (IE), Firefox, and Chrome web browsers, to ensure that participants could use their preferred browser. Blank homepages were set up in all browsers, so that users could start with their preferred Web page. Google search was set up as the default search engine for all built-in search capabilities. The laptop ran Windows XP operating system with external mouse and keyboard similar to those used on the desktop computers at the public library site. Before each session, a researcher explained the goals and procedures of the study and asked participants to sign an informed consent form (approved by the Institutional Review Board of the authors’ university).

Participants were assigned four search tasks related to various health conditions commonly experienced by older adults. A researcher read the scenarios to participants, and also provided a hardcopy handout to participants. Participants were encouraged to “think aloud” to explain their thoughts and feelings during the search. When participants stopped talking during the search, the researcher gently prompted them to continue their explanations with questions or comments. Participants were instructed to finish each task within 10 minutes. If it looked like a participant needed more time to finish a task, the researcher would give a gentle warning at the end of the 10 minutes, stating “our allotted 10 minutes for this search task are over; we can either move onto the next search task now or you can keep working on this one for another 5 minutes. What would you prefer?” After 15 minutes, the participant was asked to move onto the next task. The four search scenarios and associated search tasks were listed below:

Scenario I: A close friend was recently diagnosed with breast cancer. You would like to print off information from 2-3 Internet resources (Websites) that describe the different ways breast cancer
can be treated. Use the Internet to find the 2-3 sources about breast cancer treatments and show them to the facilitator.

Scenario II: It’s flu season. You want to find a place in your area that offers free flu shots. Use the Internet to find this information. Write down the name and address of this place below.

Scenario III: Your friend has had several falls in her house in the past month, and had to be taken to the ER several times. You want to create a list of 3-5 common hazards that cause falls among older adults. Use the Internet to find the hazards. Write down the names of these hazards below.

Scenario IV: A friend recently started taking a drug called Paxil for depression; he seems to be tired all the time. Use the Internet to find out if this drug might be making him sleepy. Write down yes or no below.

After participants completed the search tasks, a researcher conducted interviews about participants’ search experience. Sample interview questions included:

- How do you feel about today’s session?
- What do you think of the results you’ve found?
- What prior experience helped you in your searches today?
- What were the biggest challenges you encountered?
- How were the search tasks we asked you to perform similar to or different from the searches you performed previously?
- Is there anything you would have done differently if you were using your own computer to conduct these searches?
- What would you like to know about searching health topics online?

Next, participants filled out a brief exit questionnaire about their basic demographics and prior computer and Internet experience.

Finally, participants received a brief “Take-Away” handout with information on evaluating the quality of online health information. This handout included a checklist we developed based on a tutorial by the National Library of Medicine [26].

3.4 Data Analysis

Using the data automatically captured by Sonar InterGuard, the researchers manually coded the search behaviors. Codes for these search behaviors were adopted from the Hansen, et al. (2003) study and adapted as necessary to describe: search results chosen, number of pages within a website reviewed, length of search query, use of menus and directories, and use of advertisements (either on the search results page or individual websites).

We also coded the types of search strategies used by participants. We used four mutually exclusive categories: 1) “Browser built-in search box” referred to using the search box embedded in the Internet browser window, which in this study was identified as the right top corner of IE. 2) “Browser address bar search” meant searching in the web address bar. Both built-in search box and web address bar of IE on the laptop used Google as the default search engine. 3) “Web search engine” strategy meant the user went to a specific search engine website, e.g., Google.com or Yahoo.com. 4) “Health website” search referred to specific health-related websites that the participant directly visited (e.g., NIHSeniorHealth.gov, WebMD.com, MedlinePlus.gov).

We coded the success of the search results as “Successful,” “Partially Successful,” or “Unsuccessful.” For example, in Scenario I participants were asked to identify two to three online information resources. A participant’s search results were rated “Successful” if they included two or more different Websites providing information about breast cancer treatments. If the participant found resources on breast cancer in general but not specifically dealing with treatment information, or if the participant found fewer than two resources, then the search was rated as “Partially Successful.” If the participant failed to find any relevant website, the search was rated as “Unsuccessful.”

We developed and refined these codes and the coding criteria through an iterative process. All team members watched over half of the search scenarios, took individual notes, and discussed appropriate coding schemes. After unambiguous codes were created, one research team member coded data from all sessions. Problematic cases were discussed within the entire team until a consensus was reached. In addition, we took individual notes during these group sessions and during the live sessions on other themes that emerged. Common themes were discussed as a group, using video recordings to test and validate them. These were reported in the qualitative findings section.

4. RESULTS

All participants attempted to complete all search tasks. Less than half of the tasks were successfully completed (48.5%). It took between 55 seconds to 15 minutes to successfully complete the task, with an average of approximately 8 minutes.

The most difficult tasks were those related to finding information about a local facility offering free flu shots (Scenario II) and information on side effects of Paxil (Scenario IV). Most users were able to successfully find at least two resources on breast cancer treatments. Users trying to find resources listing fall hazard information were not very successful (only 8 participants were successful). After being unable to find online information on this topic, several users generated answers based on their prior experience (e.g., a local pharmacy). We coded this type as being “unsuccessful” because it did not involve online searches.

These findings are summarized in Table 1 below.
### 4.1 Variability of Search Strategies

All participants used IE to conduct their searches, which was likely affected by their prior experience with the eHILL project that used IE in the training. A variety of search strategies were used to initiate the search: 21 (30.8%) with entering search queries into IE address bar, 25 (36.8%) with health websites, 11 (16.2%) with Web search engines (e.g., Google.com, Yahoo.com) and 11 (16.2%) with IE’s built-in search box supported by Google search.

Among the 68 scenarios by the 17 participants, seven included more than one type of search strategies. Participants first adopted one search strategy, later switched to another. These seven searches all initiated by using a health website, and then five of them switched to using IE’s built-in search box and two switched to IE’s browser address bar. All seven searches began with NIH Senior Health.gov, which was the key website covered in the eHILL program. Figure 1 below illustrates these changes. Table 2 summarizes the final search strategies by search success.

![Figure 1. Dynamics of changing search strategies.](image)

### Table 2. Dynamics of changing search strategies.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Successful</th>
<th>Partially Successful</th>
<th>Unsuccessful</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Breast cancer</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>II. Flu shots</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>III. Falls</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>IV. Paxil</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

*We accept any websites and resources on the list compiled by authority health websites such as NIH Senior Health.gov, MedlinePlus.gov, Healthfinder.gov.*

### 4.2 Search Query Formation

Most searches (73.5%) involved using at least one search phrase. The length of search queries for different search tasks varied. Finding free flu shots at a local facility involved an average of 4.3 words in the search query, while locating breast cancer websites had the shortest query with an average length of 2.1 words. Participants did not reconstruct their search queries often; the average number of query trials was around 1.2 (Table 3).

### Table 3. Search query length, trials, number of websites and webpages visited

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Ave. Length of Query (words)*</th>
<th>Ave. Number of Query Trials*</th>
<th>Ave. Number of Websites Visited</th>
<th>Ave. Pages Viewed for each Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Breast cancer</td>
<td>2.3</td>
<td>1.2</td>
<td>1.7</td>
<td>2.7</td>
</tr>
<tr>
<td>II. Flu shots</td>
<td>4.3</td>
<td>1.4</td>
<td>1.5</td>
<td>2.3</td>
</tr>
<tr>
<td>III. Falls</td>
<td>3.2</td>
<td>1.2</td>
<td>1.4</td>
<td>4.1</td>
</tr>
<tr>
<td>IV. Paxil</td>
<td>2.6</td>
<td>1.2</td>
<td>1.5</td>
<td>3.6</td>
</tr>
</tbody>
</table>

* Applied to search query based strategies only

### 4.3 Ability to Evaluate Search Results

Participants were exposed to commercial websites advertised in the search results page or embedded in individual websites. They clicked on advertisements in 14 (20.6%) searches. No participant indicated in the think-aloud protocol that they were clicking on an advertisement. They did not appear to realize they had done so. Participants were able to find the answers successfully in six of these advertisement sites, but were unable to find the answers in six others. The advertisements often led the searcher to irrelevant information. Table 4 summarizes advertisements-visited searches.

### Table 4. Final search strategies by search success

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Successful</th>
<th>Partially Successful</th>
<th>Unsuccessful</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Breast cancer</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>II. Flu shots</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>III. Falls</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>IV. Paxil</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

### 4.4 Major Themes from the Qualitative Data

Several major themes were identified from the data gathered from the observations and post-search interviews.

First, participants misunderstood different components of web browsers and web page search tools. One participant initiated the search using IE’s built-in search box on the right top corner of the browsing window. After she entered the search query, she clicked on the drop-down menu button next to the search box and then chose “Find on this Page…” option in the list (Figure 2).
Our study helps identify the patterns and major barriers older adults face when searching health information online. In line with the findings of prior research [4–6], our study finds older adult Internet users use search engines and health websites in their searches. They may use other techniques such as entering keywords into the web address bar either intentionally or accidently. Our study suggests older adults could easily get confused about different components on a web page, including the web address bar, search bar and web page search boxes. To help older adults develop a better understanding of the purpose and function of different components in a web browser, it is important to design education interventions focusing on teaching basic concepts of search box, web address bar and their similarities and differences.

Search queries were examined as part of the search behavior to reveal users’ logics in conducting the initial step in the search process [8,27,28]. Online health information seekers tended to construct short search queries [8,9]. This pattern might be a result of the functionalities of commercial search engines that provided powerful support for natural language communication and processing [9]. This function made it less challenging for health consumers to recall and enter medical terminology. However, users still encountered challenges because the search engines may not be able to retrieve the right information [10]. This was the case in our study, where participants often failed to find information using their poorly constructed search queries. Also, participants spent more time on searches than previously reported in a study of adolescents using similar search tasks [5]. Our findings suggest that older adults may have more difficulties than younger users in forming search queries, which may due to their limited knowledge of the Internet and a lack of experience with online searches. Computer training programs for older adults will need to teach them about using search keywords and constructing effective search queries.

Our findings suggest that participants have difficulties constructing effective search queries, especially in scenarios dealing with finding local information. Participants tend to use short search queries even in complex search tasks. Entering incorrect search words and adopting irrelevant auto-filled suggestions by search engines are among the factors that contribute to search failures. Our findings are in line with the literature, which reported that lexical mismatch (user misspells search words), semantic mismatch (user unable to use synonyms interchangeably) and mental model mismatch (user describes the same health condition differently from that health professionals do) being the major causes of health consumers’ search failure [10]. Older adult participants in our study encountered similar difficulties in correctly constructing search queries, and at times their misspelled search queries that could not be processed by the system. These findings suggest that it is important to consider teaching skills and techniques to construct effective search queries as well as use search engine auto fill function properly.

### 5.2 Web Designers and Content Providers

As discussed above, different components of the web browser, e.g., web address bar and built-in search box, may cause confusions and difficulties in older adults’ search experience. These components, usually in the format of text boxes, have no label to inform the user of their functions. Using a text label to indicate each text box’s purpose and function may help older adult users greatly with their searching experience.

Users tended to enter search queries into Web search engines instead of using the health websites’ own built-in search boxes [8]. This was similar to what we found among our older adult participants. It may be necessary to improve the websites’ built-in search boxes and make them more visible and attractive.

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**Figure 2. Components of the web browser.**

However, “Find on this Page…” is an in-document search feature and it searched only text in the current page. The participant thought this in-document search served the same function as web search engine did, and she failed to find the answer. She did not seem to understand the role of the address bar as being distinct from the other search boxes. While the search functionality built into the address bar was convenient, it might also be leading to a misunderstanding about web URLs and how to navigate to them. Additionally, some participants did not realize that search boxes on a particular site would search only that site and not the entire Web. Finally, some participants tended to choose one of the automatically generated search phrases recommended by Google. These findings suggest these participants’ lack of an understanding of the web and browser infrastructure.

Second, participants relied extensively on their prior knowledge in performing the searches. One participant, when searching for a local facility providing free flu shots, entered “riteaid” as part of the search query. “RiteAid” was the name of a local drug store, and the participant believed that this store might provide free flu shots. Another participant, when looking for breast cancer treatment websites, stated that “I assume hospitals may have some types of information for breast cancer.” He then entered a hospital’s name directly as the search query. After failing to find relevant information online, several participants listed fall hazards based on their own knowledge.

Third, despite their low success rate in finding the information, participants showed a high level of satisfaction about their search experience. When asked, “How do you feel about today’s session,” all participants responded positively about their search experience and the information they found. One participant said: “It is enlightening. It gives me better understanding about how to get onto search. It broadens my scope of using the Internet and computers.” Another participant stated: “The session is informative. It promotes thoughts and curiosity to know about what I found.”

### 5. DISCUSSION

#### 5.1 Designing Educational Interventions

Our study helps identify the patterns and major barriers older adults face when searching health information online. In line with the findings of prior research [4–6], our study finds older adult Internet users use search engines and health websites in their searches. They may use other techniques such as entering...
Improving the functionalities of search engines to reduce search failures also improved users’ search experience [10,23]. McCray and Tse [23] found that relevant search queries might not be available in the search system and the system could fail to process misspelled queries. These problems with search engines echoed what we found from our older adult users: auto fill suggestions could generate irrelevant search words, which made users choose inappropriate search words that lead to failed searches. The search engine might not process misspelled queries and users might feel frustrated about their search experience when their search results were not desirable. McCray et al. [29] analyzed search queries entered into a specific medical website and developed techniques to optimize the search engine to help users reduce search failures. One of the strategies adopted was to make search queries less narrow. Plovnick’s [30] study provided qualitative evidence that replacing health consumers’ search queries with professional terminologies could help improve the precision of search results. This strategy showed its advantages in both health website built-in search engines and commercial search engines such as Google. Improving search engines’ suggestion function for health related websites might be a future research direction for both web designers and content providers.

Our older adult participants generally did not click on the first link at the top of a search results page, which was in line with findings of an adolescents study [5]. Our participants selected the link based on how well the description caught their eyes and if it contained the exact keywords they entered. Health website content providers may need to optimize their sites’ descriptions so that it is more visible to older adult users.

Our findings also suggest that older adults may not be able to distinguish advertisements from the other web contents, and they may perceive that information on any websites is of good quality. It may be helpful if the advertisement sections of the web page are clearly labeled as such.

5.3 Search Engines and Evaluation of Results

Accessing high quality health information is essential to informed consumer health decision-making. Researchers have called attention to the importance of evaluating the credibility of online health information sources [11,32]. Slater and Zimmerman [11] studied five different Web search engines and found that the percentage of search results based on non-scientifically approved health claims could be as high as 43% among certain search engines. Thus, health consumers searching for health information online were likely to encounter Web sites selling products not backed up by scientific evidence. This was especially true for searching health issues “such as weight loss in which the science is less well developed” (p. 317).

Variability existed among different search engines as some search engines present a high proportion of commercial websites in their search results [32]. This suggests that researchers need to consider the heterogeneity of web search engines and users preferences over search engines options, given that different choices of search engines may affect the search results.

Seullard [33] found that search engines tend to display the most relevant and popular information on the first page of the results list, but many websites included in the first page failed to provide relevant information. Also, government websites all appeared to provide “factually correct advice” (p. 582). Educational sites, interest group sites and individual sites had similar accuracy in the health information they have provided. Sponsored sites tended to provide information of poor quality and health professionals should direct patients to credible health websites, especially government-sponsored websites [33].

These findings raise the awareness that Internet searchers face unreliable health information resources online and they need to be very cautious about the search results found through commercial search engines. It is essential to acquire skills to scrutinize the features and functionalities of individual search engines to identify the correct and credible information from the search results. This also implies that for computer users who have low levels of skill in navigating search engines or are not confident about evaluating the search results, it may be wise for them to choose a government-sponsored site, at least as the starting point, for obtaining reliable health information.

Educational interventions to help older adult users evaluate quality of health information are available [25,33,34]. For example, the eHILL program uses a specific module on evaluating health information online. It helps older adults learn about the criteria for a reliable website against a non-reliable site. Although participants of the present study received some training on this topic either in their former or current eHILL classes, they still have a relative lack of ability to distinguish between advertisement sites and reliable resources. Additional training may be necessary to ensure their abilities in evaluating the quality of online health information.

6. Limitations and Future Directions

This study has some limitations. First, participants of this study were recruited from a convenience sample, which may not be representative of the older population nationwide. The participants are former or current students of the eHILL program that trains older adults to use computer and Internet to find reliable health information online. eHILL Students who joined the training program mostly did not have any prior knowledge and experience with computer and Internet. Also the eHILL program has an emphasis on teaching students to use specific reliable government websites (i.e., NIHSeniorHealth.gov and MedlinePlus.gov). Because of their prior familiarity to these sites, some participants chose to browse through these websites but were unable to find the answer. They then were forced to search for the information elsewhere (such findings were presented in Figure 1). Although the eHILL materials teach different techniques including using search engines to find and evaluate health information online, older adults may still choose website like NHISeniorHealth.gov to search for information. Thus, the findings should not be generated without caution.

Second, search tasks used in this study were designed to reflect health conditions and diseases pertinent to older adults. When searching for information for these health problems, older adults were likely to link the search tasks with their own medical history and thus relied on their prior experience in answering the questions. Extensive reliance on prior experience may have affected these participants’ behaviors in constructing the search queries and answering the questions.

Third, the older adult population has a wide range of variability in their demographics, computer literacy, health literacy and cognitive ability, to name just a few, and these factors may have significant impacts on older adults’ search behavior for online health information. This study was not able to control for some variables that may have significant effects on older adults’ search
behavior, e.g., cognitive abilities. Age-related declines in cognitive abilities may interfere with participants’ understanding of the search tasks and thus confound the result.

Future research is needed to validate the findings of this study with a more representative sample of older adults. Additionally, for Web designers and content providers, emphasis needs to be placed on improving search engines and web search tools in a senior-friendly way so that older adult Internet users can use the technology more effectively and efficiently.

7. CONCLUSION

This study provides insights into older adults’ search behaviors for online health information. Unique search behavior patterns, difficulties and challenges are identified among older adult Internet users, which have implications for health information providers, web designers and health educators. Several specific design guidelines are recommended:

Education Interventions:

- Understand Web browser components (e.g., search box, Web address bar)
- Understand key words and learn to construct effective search queries
- Understand functions of search engines (e.g., auto fill suggestions)

Web designers and content providers:

- Use text label to mark the function of each text boxes on the Web browser
- Improve health website built-in search box
- Improve health related search results precision
- Make Web sites description in the search results page attractive to older adult users
- Mark advertisements clearly on the web page

Search engine and evaluation of search results:

- Understand variability in search engines
- Provide training on appraisal of the search results

8. ACKNOWLEDGEMENTS

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9. REFERENCES


