The Representativeness of "People Also Ask" of Google Web Search on the Information Needs Concerning Alzheimer's Disease and Related Dementias

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Introduction

While caring for patients with Alzheimer's disease and related dementias (ADRD) requires specialized knowledge and skills, the training and education caregivers receive are often not systematic or organized. To better support millions of people with ADRD and their caregivers, their information needs have been investigated by many researchers to guide the assistive technology design. Researchers applied multiple research methods including interviews, diary studies, focus groups, and questionnaires. However, several problems make it challenging to gain a whole picture of the information needs: (1) The results are generally limited to small samples due to the high resources required in recruiting participants and analyzing qualitative data; (2) It is challenging to relate the results of different studies based on the incommensurable data derived through different methodologies; (3) The results might carry bias and errors for the retrospective, self-reported studies. Systematic reviews of consolidating existing studies can be helpful, but they are costly in terms of time and effort. A more economical solution could be to collect the information needs using behavior statistics. Google Web Search, as the most widely used search engine in the United States, introduced the "People also ask" (PAA) section, which applied machine learning models, RankBrain and BERT to identify search patterns, predict individual searches, and offer suggestions according to a search query. We compare the results of systematic reviews and that of PAA to investigate how much PAA represents the review results.

Method

Information needs summarized in systematic review and scoping review in the past three years introduce four themes with thirty-eight specific information needs from 50 original studies in total[1, 2]. We collected the data by entering the terms "dementia" and "alzheimer's" into Google Web Search (www.google.com) and generating the list of frequently associated questions from PAA on the search result page. Clicking on each question on PAA will populate 1-2 more questions. For each search term result, we clicked 100 questions in its ranked order. As a result, we collected 574 questions in total (282 for "dementia" and 292 for "alzheimer's") and classified the questions according to the references. A clean-installed Chrome browser was applied to avoid the influence of personalized recommendations. We used the Scraper (v.1.7) tool to download the questions. The date for this collection was January 4th, 2021.

Results

Results showed that, for the theme of "disease-specific information," questions generated from PAA covered 91.67% of the 12 information needs identified in[1,2], but missed the information need of "current research on ADRD." For the theme of "patient care provision information", questions generated from PAA covered 73.33% of the 15 information needs, but missed "safety issues like how to improve safety of environment, how to keep patient safe, how to recognize fall risks and poor mobility", "emergency situations", "helpful experiences of other caregivers" and "how to deal with family and friends." For the theme of "healthcare service-related information", only 14.29% of the 7 information needs were covered, missing "where and how to use services/help available", "legal issues", "how to apply for care programs eg. daycare, long term care", "insurance", 'home help" and "transportation options." For the theme of "caregiver self-care," none of the 4 information needs was covered, including "stress management", "caregiver's entitlements (pension)", "managing emotions" and "general caregiver self-care activities".

Conclusion

The representativeness of PAA varied among the themes of information needs, possibly resulting from different usage habits on different platforms. PAA can be an efficient tool to identify specific areas of information needs. Future work should investigate the patterns of which information needs PAA represents better than others. Furthermore, we can explore combining behavior statistics from multiple aggregate search behavior tools (e.g., Google Trends, Alexa).

References

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