

Factors associated with database searching among pharmacy faculty and students: PubMed vs. Google Scholar

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Abstract

Objective: Google Scholar use among medical professionals has increased since its introduction in November 2004 and in 2005, Google Scholar linked more visitors to biomedical journal Websites than PubMed. The purpose of this study was to determine the factors associated with database searching (PubMed and Google Scholar) among pharmacy faculty and students including: primary reasons for searching, frequency and satisfaction of database access, and the number of Web pages participants are willing to review to answer a drug-related question.

Methods: A 26-item survey was developed and delivered to Samford University, McWhorter School of Pharmacy faculty (n=35) and fourth-year students (n=113). Survey results were entered into SPSS, Version 15.0, and analyzed via descriptive and inferential statistics. The research was IRB approved.

Results: Approximately 77% (n=27) of the faculty and 64% (n=72) of the students responded to the survey. Approximately 52% and 15% of responders denied use of Google Scholar and PubMed, respectively. The top 3 reasons for searching Google Scholar were ease of use, speed, and availability of free, full-text articles; whereas the top 3 reasons for PubMed searching were efficiency and accuracy of searches and availability of free, full-text articles. Approximately 37% and 68% of responders used Google Scholar and PubMed 1-5 times weekly, respectively. More responders were satisfied with search features of PubMed (86%) compared to Google Scholar (32%). The most frequent response for pages to search was 1-5 for Google Scholar (50%) versus 6-10 for PubMed (36%).

Conclusions: The availability of free, full-text articles was a top reason for using both PubMed and Google Scholar. Responders felt that the search features of PubMed were superior compared to Google Scholar and were more willing to search additional PubMed pages compared to Google Scholar.

Key words: Google Scholar, PubMed, database searching

Introduction

The Google Scholar search engine was introduced in November 2004 and was designed to search for multidisciplinary, scholarly literature that includes peer-reviewed publications, theses, books, abstracts and other articles from academic publishers, professional organizations, preprint repositories, universities and other scholarly organizations.¹ Literature in Google Scholar is derived from full-text journal content provided by commercial and open source publishers, including WorldCat and PubMed.² Scholarly literature is ranked by the availability of full-text

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articles, author name, notoriety of the publication in which the article appears, and the number of times the article was previously cited. According to Google Scholar, the most relevant results are always located on the first search page.¹

PubMed is a biomedical literature abstracting service that is produced by the National Library of Medicine. PubMed indexes both primary (e.g., clinical trials, case reports) and tertiary literature (e.g., review articles, practice guidelines). The database includes over 17 million citations in over 5000 journals published from the mid 1950s to the present in the United States and 80 other countries.³ New citations are added to PubMed daily (Tuesday through Saturday).³ Additional PubMed services include: availability of a controlled vocabulary; links to many sites providing full text articles; links to citations of related articles; ability to store collections of citations; ability to save searches that can be automatically updated; and ability to spell check search terms.⁴

Google Scholar's use has increased rapidly since its introduction. More visitors were linked to biomedical journal Websites by Google Scholar within a year of release than PubMed in the same year.⁵ Google Scholar's success may be due partially to user's confidence and/or familiarity with Google searches and the perceived ease of use and availability of full-text journal articles within Google Scholar (i.e., users may be directed to an abstract of an article or pay-per-view option). Libraries can also use Google Scholar to provide access to full-text content to their subscribers.²

The growing popularity of Google Scholar is also evident by a greater number of author's including Google Scholar in the Methods section of systematic reviews or literature searches. Fifty-seven citations were retrieved when "Google Scholar" was typed into the search screen in PubMed.⁶ Many of those citations were accessed with the search because "Google Scholar" was used in the author's search strategy. In addition, pharmacy journals such as the *Annals of Pharmacotherapy* and the *American Journal of Health-System Pharmacy* currently have links to Google Scholar either on the side bar or at the bottom of the Web page when viewing the article in full text.

Pharmacists need access to current resources to obtain information for preparing recommendations or responses to drug-related question requests for patient care. Various free Internet sites (e.g., Google Scholar and PubMed) are available that provide useful and up-to-date information for health care providers. Google is one search engine that has increased in popularity. Google is so popular that Webster's dictionary categorizes the word as a verb and it is defined as, "to use the Google search engine to obtain information about (as a person) on the World Wide Web."⁷ Due to the increasing amount of medical information contained on the Internet, pharmacists must be knowledgeable of the available search engines and the reliability of information contained within these databases.

Although use of Google Scholar has increased rapidly since its introduction, the use among pharmacy students and faculty is unknown. The purpose of this study was to determine the factors associated with database searching among pharmacy faculty and students including: primary reasons for searching, frequency and satisfaction of database access, and the number of Web pages participants are willing to review to answer a drug-related question.

Methods

In May 2007, a 26-item survey (see Appendix A) was developed and administered to Samford University, McWhorter School of Pharmacy faculty (n=35) and fourth-year, professional students (n=113). Faculty responses were solicited after the monthly faculty meeting. Survey instruments were collected following the faculty meeting and a 1-week time frame for responses was allowed for faculty members not in attendance to return surveys. Student responses were assessed during the McWhorter School of Pharmacy sponsored, end of the year North American Pharmacists Licensure Examination (NAPLEX) Board Review. To increase survey responses,

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students who participated were entered into a raffle to receive one \$50 Visa gift certificate. Student surveys were administered during the first morning break of the review session and surveys were collected and the raffle winner was chosen during the first afternoon break. A total of 148 surveys were distributed to faculty and students and 109 completed surveys needed to be returned to achieve 95% confidence ($\pm 5\%$ accuracy) of survey results.

The survey consisted of 6 multiple choice questions and 20 Likert-type questions. Demographic information including rank for faculty, age for students, and primary reasons for searching PubMed and Google Scholar was assessed. Responders who documented that they did not use either PubMed or Google Scholar were asked to return unanswered surveys. Additional items assessed included frequency of weekly access, satisfaction with search features, ease of use, extent to which initial searches are conducted, top 3 reasons for searching, and number of Web pages that responders were willing to access to locate answers to drug-related questions in both databases. Responders to the top 3 reasons for searching either database question were allowed to choose between 9 options (e.g., updated daily, search features, ease of use; provides efficient search; provides citations in the most time-efficient manner, provides accurate searches, speed, provides links to free full-text articles, other, do not use the database). Differences in faculty and student responses were also assessed.

Survey results were entered into SPSS, Version 15.0 (SPSS, Inc. Chicago, Ill) and Minitab 14.1 statistical software and analyzed via descriptive and inferential statistics (z-test for 2 independent proportions). The z-test for independent proportions is most appropriate when comparing rates or proportions of a given event across independent groups (such as faculty and students and it is generally not appropriate to take the mean or median percentage in such comparisons). The research was approved by Samford University Institutional Review Board.

Results

A total of 148 surveys were administered and 99 were returned (27 faculty; 72 students). Two faculty responders reported no use of Google Scholar or PubMed and did not complete the survey. The majority of faculty responders were ranked as Assistant Professors (40.7%). Fifty-seven percent of responders reported that they were computer literate. Additional demographic information is available in Table 1.

Table 1: Demographics

Responder type	Percentage (%)
<i>Student</i>	72.7
<i>Faculty</i>	27.3
Assistant Professor	11.1
Associate Professor	7.1
Professor	9.1
Age Range (Years, student responders only)	
20-25	38.4
26-30	26.3
31-35	9.1
>35	26.3

Although 52% of responders reported no use of Google Scholar (Table 2), the responders who did use the database reported searching for general topics between 1-5 times weekly. In addition, there was a slight discrepancy between the percentage of faculty (51.9%) and students (51.4%) who reported no use of Google Scholar compared to the weekly use of Google Scholar between faculty (52%) and students (59.7%). The primary use of PubMed was to perform

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searches for published literature (92.9%) one-to-5 times weekly. However, 1.4% of the students and 7.4% of the faculty reported no use of PubMed. When asked how often PubMed was used, 19.4% of the students and 4% of the faculty, respectively reported no weekly use of PubMed. Thirty-three percent and 88% of responders who use Google Scholar and PubMed reported satisfaction with search features of the database, respectively. A greater percentage of responders reported that PubMed provided thorough search results compared to Google Scholar (89.9% vs. 26.2%, $p=0.046$, Table 3). More responders performed initial searches with PubMed compared to Google Scholar (81.8% vs. 20.2%; $p<0.001$). Approximately 8% of responders felt that Google Scholar provided better information than PubMed. Responders reported that the top 3 reasons why Google Scholar is accessed were ease of use, speed, and availability of free full-text journal articles. The top 3 reasons why PubMed is accessed was due to accurate and efficient searches, and availability of free full-text journal articles. The majority of responders (52%) reported that they would search between 1-5 pages of Google Scholar that displayed 20 results per page to find answers to drug related questions compared to 36% of PubMed users (Table 4, Table 5). However, a greater number of responders were more willing to search up to 15 pages to find answers to drug-related questions in PubMed compared to Google Scholar (84% vs. 64.8%; respectively [$p=0.001$]; Table 5).

Table 2: Selected responses

Primary reason why Google Scholar is used (all values expressed as percentages)			
Response	Student	Faculty	Mean
Perform primary literature searches	11.1	11.1	11.1
General topic search	27.8	25.9	27.3
Full text journal article retrieval	5.6	7.4	6.1
Other peer review literature	2.8	3.7	2.0
Other	1.4	0	2.0
Do not use	51.4	51.9	51.5
Primary reason why PubMed is used (all values expressed as percentages)			
Response	Student	Faculty	Mean
Perform primary literature searches	94.4	88.9	92.9
General topic search	0	3.7	1.0
Full text journal article retrieval	4.2	0	3.0
Do not use	1.4	7.4	3.0
How often Google Scholar used weekly (all values expressed as percentages)			
Response	Student	Faculty	Mean
None	59.7	52	57.7
1-5 times	37.5	40	38.1
6-10 times	1.4	4	2.1
11-15 times	0	4	1.0
> 15 times	1.4	0	1.0
How often PubMed used weekly (all values expressed as percentages)			
Response	Student	Faculty	Mean
None	19.4	4	15.5
1-5 times	77.8	44	69.1
6-10 times	2.8	32	10.3
11-15 times	0	4	1.0
> 15 times	0	16	4.1

Table 3: Percentage of combined and student vs. faculty responses to selected survey questions

Questions	SA	A	N	D	SD	Do not use
I am computer literate	36.1	57.7	3.1	0	3.1	0
Student	38.9	55.6	2.8	2.8	0	0
Faculty	28	64	4	4	0	0
I am satisfied with the search features of Google Scholar	5.2	27.8	11.3	6.2	2.1	47.4
Student	4.2	29.2	12.5	6.9	0	47.2
Faculty	8	24	8	4	8	48
I am satisfied with the search features of PubMed	22.7	64.9	8.2	3.1	1.0	0
Student	18.1	69.4	9.7	1.4	1.4	0
Faculty	36	52	4	8	0	0
I am satisfied with the results retrieved in Google Scholar	2.1	24.7	15.5	7.2	2.1	51.5 ^b
Student	1.4	26.4	16.7	6.9	0	18.6
Faculty	4	20	12	8	8	48
I am satisfied with the results retrieved in PubMed	28.9	62.9	5.2	3.1	0	0 ^p
Student	29.2	61.1	5.6	4.2	0	0
Faculty	28	68	4	0	0	0
Google Scholar is easy to use	21.6	23.7	3.1	2.1	1.0	48.5
Student	20.8	25	2.8	2.8	0	48.6
Faculty	24	20	4	4	0	48
PubMed is easy to use	14.4	55.7	14.4	11.3	4.1	0
Student	13.9	51.4	16.7	12.5	5.6	0
Faculty	16	68	8	8	0	0
I am comfortable searching Google Scholar	18.6	23.7	7.1	2.0	0	48.5
Student	18.1	25	6.9	1.4	0	48.6
Faculty	20	20	8	4	0	48
I am comfortable searching PubMed	24.7	61.9	6.2	6.2	1	0
Student	25	62.5	6.9	4.2	1.4	0
Faculty	24	60	4	12	0	0
I perform initial searches with Google Scholar	8.2	12.4	4.1	20.6	5.2	49.5 ^{a,c}
Student	8.3	13.9	4.2	19.4	4.2	50
Faculty	8	8	4	24	8	48
I perform initial searches with PubMed	33	50.5	7.2	9.3	0	0 ^{a,c}
Student	27.8	51.4	9.7	11.1	0	0
Faculty	48	48	0	4	0	0
Google Scholar provides better information than Pubmed	2.1	6.2	16.5	20.6	5.2	49.5
Student	2.8	5.6	19.4	19.4	2.8	50
Faculty	0	8	8	24	12	48

Abbreviations: SA, strongly agree; A, agree; N, neutral; D, disagree; SD, strongly disagree

^aMore responders performed initial searches with PubMed vs. Google Scholar (responses were tabulated as agree or disagree)

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^b $p < 0.046$; ^c $p < 0.001$

Table 4: Number of pages responders are willing to search to find answers for Google Scholar searches (all values expressed as percentages)

Response	Student	Faculty	Mean
None	12.9	25	16
1-5 pages	54.3	45.8	52.1
6-10 pages	27.1	25	26.6
11-15 pages	2.9	0	2.1
> 15 pages	2.9	4.2	3.2 ^a

^aGreater number of responders were more willing to search up to 15 pages to find answers to drug-related questions in PubMed compared to Google Scholar (84% vs. 64.8%); $p = 0.001$

Table 5: Number of pages responders are willing to search to find answers for PubMed searches (all values expressed as percentages)

Response	Student	Faculty	Mean
None	2.8	12	5.2
1-5 pages	38.9	28	36.1
6-10 pages	37.5	36	37.1
11-15 pages	11.1	8	10.3
> 15 pages	9.7	16	11.3 ^a

^aGreater number of responders were more willing to search up to 15 pages to find answers to drug-related questions in PubMed compared to Google Scholar (84% vs. 64.8%); $p = 0.001$

Faculty were more likely to deny use of Google Scholar than students (52% vs. 11%, $p = 0.001$; Table 2). Similarly, more students reported use of Google Scholar and PubMed 1-5 times weekly compared to faculty (68% vs. 37%, $p = 0.004$; Table 2).

Discussion

Although Google Scholar use may be widespread in other academic environments, use appears to be moderate among Samford University, McWhorter School of Pharmacy faculty members and students.

Many students and faculty (52%) at Samford University, McWhorter School of Pharmacy do not use Google Scholar. Most responders (93%) reported that PubMed is the preferred database for searching primary literature. The majority (70%) of faculty and students responded that PubMed is easy to use and those who use PubMed are relatively comfortable (87%) with using this database. Responders are willing to search more pages (>15) to find information with PubMed (11.3%) compared to Google Scholar (3.2%). There were discrepancies between students and faculty regarding their use of Google Scholar and PubMed. Although 51.4% of students and 51.9% of faculty responded that they did not use Google Scholar and 1.4% and 7.4% of students and faculty, respectively, reported no use of PubMed, more students and faculty responded that they did not use these Google Scholar (59.7% vs. 52%) and PubMed (19.4% vs. 4%) on a weekly basis. One explanation may be that their use of the databases is so infrequent, that it was not captured on the survey.

Google is the most frequently used search engine⁸ and is used widely by many health professionals. This may be due to various reasons, which include ease of use, free access, and practical information located with using this search engine. For instance, a recent letter to the editor in the *New England Journal of Medicine* highlights a scenario in which a medical fellow made a diagnosis based upon evidence located after conducting a Google search.⁹ Although this is a single case example, another article reported the frequency of searching Google that lead

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physicians to the correct diagnosis.¹⁰ The investigators selected diagnostic cases over a one-year time period (2005) from the *New England Journal of Medicine* case records (n=26) and determined the percentages of correct diagnoses from Google searches compared with diagnoses published in the journal. The correct diagnosis was made in 15 cases (58%, 95% CI 38% to 77%) through Google searches. Although these reports are from Google searches (not Google Scholar), Google Scholar's reputation may promote students and academicians to search the database as the new name suggests superiority and/or may be more specific for academicians compared to its predecessor. Increasing accessibility of the Internet may also provide rationale of increased use of Google and Google Scholar.

Since a required, stand alone, Drug Information course and advanced pharmacy practice experience is available in 70% and 23% of schools of pharmacy, respectively,¹¹ Google Scholar use at the McWhorter School of Pharmacy (MSOP) may be falsely lowered compared to other institutions due to the heavy emphasis on PubMed and International Pharmaceutical Abstracts (IPA) at MSOP. Students at other pharmacy schools may not be as exposed to PubMed because they have been taught Medline through another interface (e.g., Ovid). As a result, Medline may be interfaced with a password protected database and students may not be able to access the database after graduation. Therefore, students may use other databases (e.g., Google Scholar) in an attempt to locate biomedical and pharmacy literature because of their unfamiliarity with PubMed.

Three Drug Information classes are required at the McWhorter School of Pharmacy. During the first year, students enroll in the PHRD 303 Information Systems course which emphasizes the three types of literature and appropriate search strategies for each type of literature. Students in the third year drug information class, PHRD 527 Drug Literature Evaluation, receive training on literature evaluation and study design. Students completing the Drug Information Advanced Pharmacy Practice Experience (PHRD 606) also receive training to prepare them to serve as effective providers of drug information. Projects are assigned to improve literature evaluation skills, literature retrieval skills and verbal and written communication skills. Biomedical and pharmacy literature searches via the PubMed and International Pharmaceutical Abstracts (IPA) databases, respectively are emphasized in all courses. In addition, activities throughout the curriculum are designed to emphasize these skills. Although a link to Google Scholar is provided on the Samford University Global Drug Information Service Web site, the Google Scholar engine is not emphasized in the drug information curriculum.¹² Some students and faculty are not aware of the existence of the Google Scholar search engine, as evidenced by the responses to the survey, and this may be one reason why there appears to be moderate use at this university.

Several advantages exist for PubMed. The database is updated daily and searches only published, biomedical literature. The search features enable researchers to narrow or broaden searches to encompass human, animal, English or non-English literature articles and it is published by the National Library of Medicine, a reputable, nonprofit source. The controlled vocabulary, Medical Subject Headings [MeSH], allows PubMed searchers to use headings that the National Library of Medicine librarians use to locate articles specific for the search. The spell check feature allows the researcher to make the appropriate use of his/her time by avoiding potential problems associated with misspelling search terms. Free, full-text journal articles can be found with some searches. Searches and citations may be saved, emailed, or printed. Limit features enable searches to locate specific articles based on publication type, author, year published, etc.

Google Scholar shares many of the advantages as PubMed (i.e., availability of free, full-text articles, limiting searches to authors, publication name, date, and subject area). Searches with Google Scholar may also contain unpublished literature (i.e., dissertations, abstracts); however, there are several disadvantages to Google Scholar. Results retrieved may not be as reliable as other searches. Unlike PubMed, the citations are indexed by those that are most frequently cited.

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The most frequently cited citations appear first on the search pages. The citations that are retrieved may be relevant; however, since Google Scholar does not contain a controlled vocabulary, the relevance of the retrieved citations may vary.

Limitations

A total of 109 surveys needed to be returned for 95% confidence \pm 5% accuracy of survey results. Although only 99 surveys were returned, the authors considered this an adequate number of returned subjects' surveys. The post-hoc power calculation indicated that the 95% confidence interval achieved with a sample size of 99 yielded a \pm 5.8% accuracy of the survey results.

A large number of responders reported no use of Google Scholar. The use of Google Scholar at this institution may be falsely lowered compared to other institutions due to the emphasis of drug information content throughout the curriculum. Since this study was conducted at a single pharmacy school, the extrapolation of the results to other institutions, specifically those without a formal drug information course sequence, is limited. In addition, differences in accessing Google Scholar and PubMed between faculty members in the pharmacy practice and pharmaceutical sciences departments were not assessed.

Conclusion

The use of Google Scholar, a search engine designed to search for scholarly literature, was assessed among pharmacy faculty and students at Samford University. The participants were required to document the primary reasons for searching, frequency and satisfaction of Google Scholar and PubMed access, and the number of Web pages they were willing to search to answer drug-related questions. Approximately half of the participants revealed that they did not use Google Scholar; however, those participants who use Google Scholar reported access between 1-5 times weekly. The major reasons for accessing Google Scholar were ease of use, speed, and availability of free full-text journal articles. Differences between faculty and students were more pronounced. More faculty members denied use of both databases compared to students. Although use of Google Scholar at this institution is moderate, the results of this study indicate that pharmacy faculty members need to be aware of search engines available on the Internet and teach students advantages and disadvantages of using this type of technology.

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Appendix A: Factors associated with database searching: PubMed vs. Google Scholar

1. Check the following category that best describes you:
 - A. Assistant Professor
 - B. Associate Professor
 - C. Professor
 - D. McWhorter School of Pharmacy student

2. Age (in years):
 - A. 20 – 25
 - B. 26 – 30
 - C. 31 – 35
 - D. >35

3. Which of the following is the primary reason you use Google Scholar when searching for information? (Check only one)
 - A. Primary literature searches
 - B. General topic searches (i.e., not necessarily biomedical literature)
 - C. Full-text journal article access
 - D. Other peer reviewed literature (e.g., review articles, books, theses)
 - E. Other _____
 - F. I do not use Google Scholar.

4. Which of the following is the primary reason you use PubMed when searching for information? (Check only one)
 - A. Primary literature searches and/or other published literature
 - B. General topic searches
 - C. Full-text journal article access
 - D. Other _____
 - F. I do not use PubMed.

*If you answered **BOTH** "I do not use Google Scholar" **AND** "I do not use PubMed", you have completed the survey. Thank you for your participation.*

5. How often do you access Google Scholar on a weekly basis?
 - A. None
 - B. 1 - 5 times
 - C. 6-10 times
 - D. 11-15 times
 - E. > 15 times

6. How often do you access PubMed on a weekly basis?
 - A. None
 - B. 1 - 5 times

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- C. 6-10 times
- D. 11-15 times
- E. > 15 times

To what extent do you agree or disagree with the following statements (questions 7 – 22).

7. I am computer literate.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
8. I am satisfied with the search features (e.g., related articles, publication sort date, etc) of Google Scholar.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use Google Scholar
9. I am satisfied with the search features (e.g., related articles, publication sort date, limits: human, English language, etc) of PubMed.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use PubMed.
10. Google Scholar provides thorough search results.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use Google Scholar
11. PubMed provides thorough search results.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use PubMed

12. Google Scholar is easy to use.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use Google Scholar.
13. PubMed is easy to use.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use PubMed
14. I am comfortable searching Google Scholar.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use Google Scholar.
15. I am comfortable searching PubMed
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use PubMed
16. I conduct initial literature searches with Google Scholar.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use Google Scholar.
17. I conduct initial literature searches with PubMed.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use PubMed

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18. Google Scholar provides quick answers to complex questions.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use Google Scholar
19. PubMed provides quick answers to complex questions.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use PubMed
20. Google Scholar provides quick answers to simplistic questions.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use Google Scholar
21. PubMed provides quick answers to simplistic questions.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use PubMed
22. Google Scholar provides better information than PubMed.
- A. Strongly Agree
 - B. Agree
 - C. Neither Agree or Disagree
 - D. Disagree
 - E. Strongly Disagree
 - F. I do not use Google Scholar
23. Rank, in the order of preference, the top 3 reasons why you access Google Scholar.
(Choose 3)
- A. Updated daily
 - B. Search features
 - C. Ease of use
 - D. Provides efficient search (i.e., provides citations in the most time-efficient manner)
 - E. Provides accurate searches

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- F. Speed
 - G. Provides links to free full-text articles
 - H. Other _____
 - I. I do not use Google Scholar
24. Rank, in the order of preference, the top 3 reasons why you access PubMed. (Choose 3)
- A. Updated daily
 - B. Search features
 - C. Ease of use
 - D. Provides efficient search (i.e., provides citations in the most time-efficient manner)
 - E. Provides accurate searches
 - F. Speed
 - G. Provides links to free full-text articles
 - H. Other _____
 - I. I do not use PubMed
25. You have conducted a search in Google Scholar that has revealed a total of 2000 hits with 10 hits per page. How many pages containing 10 hits per page are you willing to review to answer a question?
- A. None
 - B. 1-5
 - C. 6-10
 - D. 11-15
 - E. > 15
26. You have conducted a search in PubMed that has revealed a total of 2000 citations with 10 citations per page. How many pages containing 10 citations per page are you willing to review to answer a question?
- A. None
 - B. 1-5
 - C. 6-10
 - D. 11-15
 - E. > 15

You have completed the survey. Thank you for your participation.