

Are plain language summaries (PLSs) discoverable by the general public?

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Introduction

- Plain language summaries (PLSs) of medical journal articles are concise and simplified versions of the original research articles, written in plain, nontechnical language¹
 - Make complex scientific information more accessible to a broader audience, including patients and caregivers
 - Promote health literacy, empower patients, and facilitate decision-making between patients and health care providers²
- It is unknown if PLSs are reaching the intended audiences because they are not easy to find^{1,3}
 - A study conducted in 2022 looking at the correct use of meta tags to categorize PLSs on PubMed found that out of the entire PubMed database of 31,817,472 records, only 3217 (0.01%) had the correct meta tag for PLS in the "Other Abstract" field, and of these 3217, 15% had used the tag incorrectly³
- Whereas clinicians/researchers/publication professionals primarily use PubMed and publishers' websites, the general public may use search engines and social media to find medical information^{2,4,6}

Objective



Determine if PLSs are easily discoverable by the general public (eg, patients and caregivers)

Methods

- PLSs published between January 1, 2022, and September 30, 2023, were selected through a PubMed search conducted on August 23-24, 2023
 - A previous search identified journals that published a large number of PLSs
 - A second search used these journals in the journal field of the following search string: "plain language summary" OR "lay summary" OR "patient abstract" OR "patient summary" OR "lay abstract") AND journal name[JOUR field]
- Publishers' websites were searched using the results of the PubMed search to confirm PLSs were available and to find additional PLSs
 - The same search string was used as the PubMed search, with substitutes made to follow journal search engine functionality (eg, *Autism Res* used the term "lay summary" instead of "plain language summary")
- Citations were downloaded to EndNote and transferred to an Excel spreadsheet
- Pivot tables were created to analyze data
- Thirty-five PLSs were manually selected to encompass a variety of therapeutic areas, different publishers, and similar numbers of PLSs from 2022 and 2023, when possible
 - Seven therapeutic areas: 5 articles each for autism, diabetes, gastroenterology, nephrology, nursing, oncology, and therapeutics
 - Six publishers: Future Medicine, National Kidney Foundation, Sage, Springer, Taylor & Francis, and Wiley
- Separate manuscript title and PubMed keyword searches (**Figure 1**) were conducted using search engines and social media
 - Search engines: Bing, Google, and Google Scholar
 - Social media: Facebook, X (formerly Twitter), and Instagram

Figure 1. Example of PubMed record for identification of title and keywords



Results

- Table 1** provides a summary of the PLSs included in the analysis (N=35)
 - Most (n=22 [62.9%]) were from 2023
 - Most (n=26 [74.3%]) were studies
 - Most (n=27 [77.1%]) were open access

Table 1. Journals, publishers, years, and open access availability

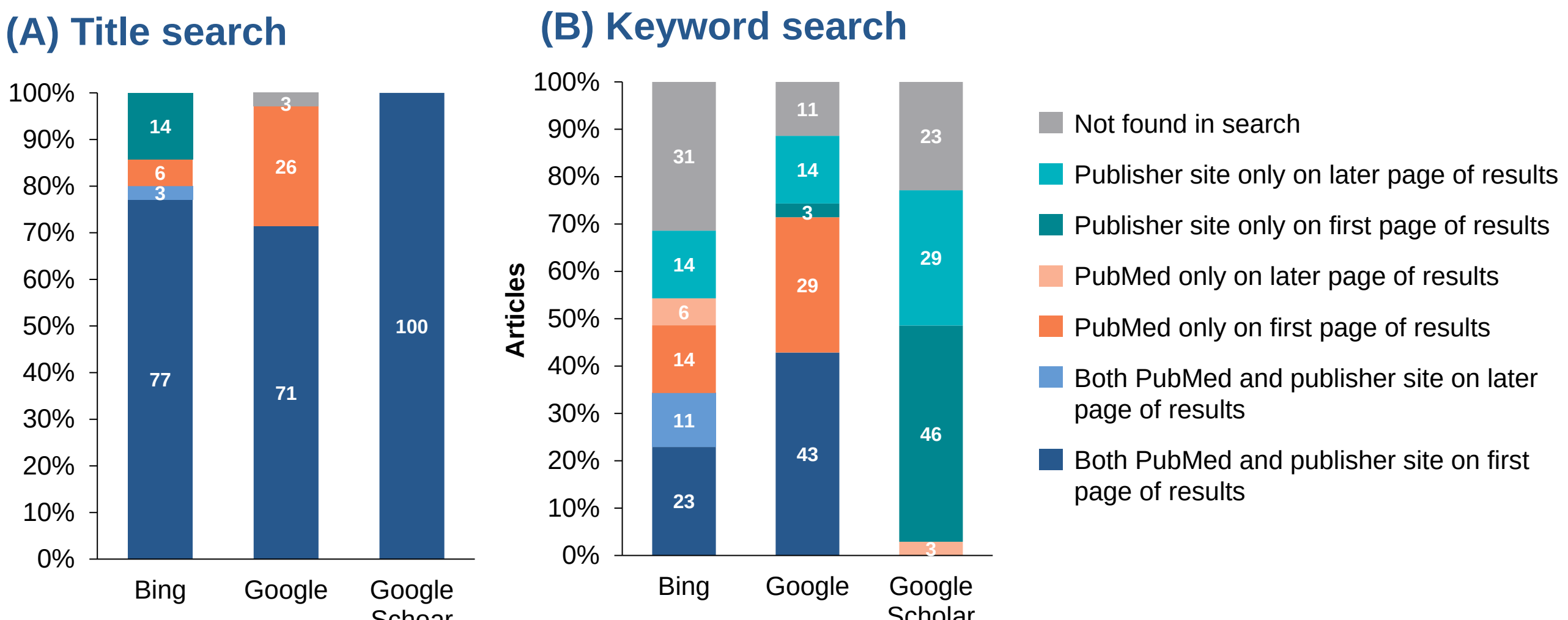
Journal title	Publisher	Publication year	Study (S) ^a /review (R) ^b	Open access
<i>Adv Ther</i> (n=5)	Springer	2022: 2 2023: 3	S: 5 R: 0	Y: 5 N: 0
<i>Diabetes Ther</i> (n=5)	Springer	2022: 2 2023: 3	S: 3 R: 2	Y: 5 N: 0
<i>Am J Kidney Dis</i> (n=5)	National Kidney Foundation	2022: 2 2023: 3	S: 4 R: 1	Y: 3 N: 2
<i>Future Oncol</i> (n=5)	Future Medicine	2022: 2 2023: 3	S: 2 R: 3	Y: 2 N: 3
<i>Therap Adv Gastroenterol</i> (n=5)	Sage	2022: 2 2023: 3	S: 4 R: 1	Y: 5 N: 0
<i>Contemp Nurse</i> (n=5)	Taylor & Francis	2022: 1 2023: 4	S: 5 R: 0	Y: 3 N: 2
<i>Autism Res</i> (n=5)	Wiley	2022: 2 2023: 3	S: 3 R: 2	Y: 4 N: 1

^aIncludes clinical trials, surveys, interviews, mathematical models, and in vitro studies. ^bIncludes narrative and systematic literature reviews.

Key Insight

Most PLSs are found through search engines using the title or keywords but are not readily found through social media. Publishers should consider expanding their social media use to disseminate PLSs.

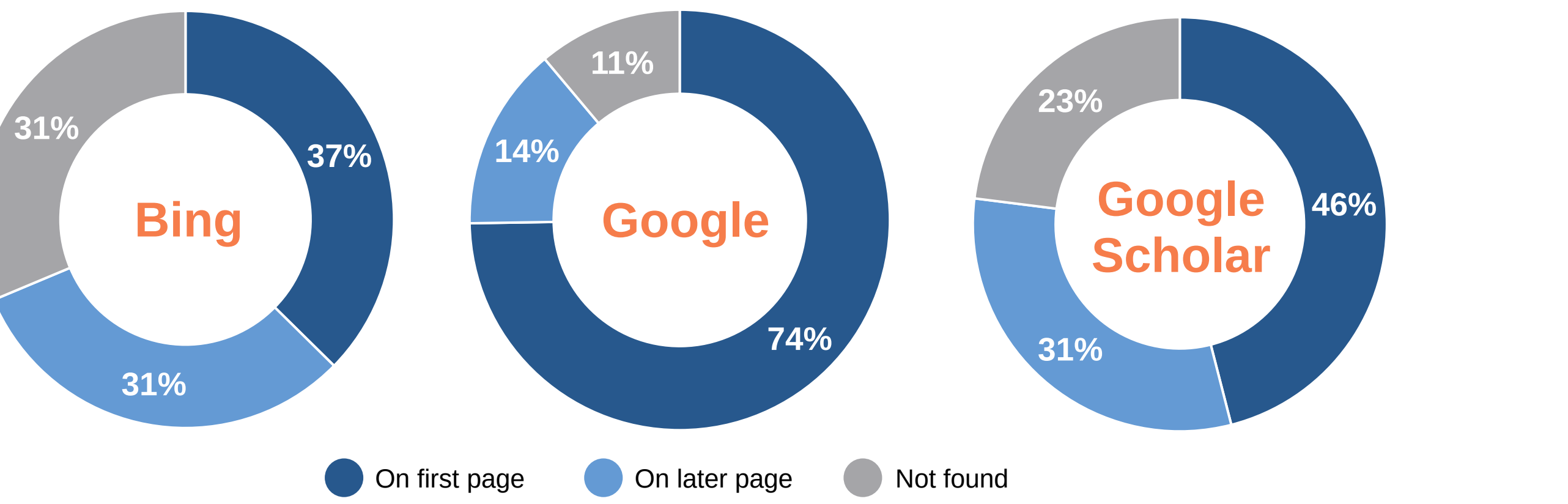
Figure 2. Search engine results for titles (A) and keywords (B)



Search engines

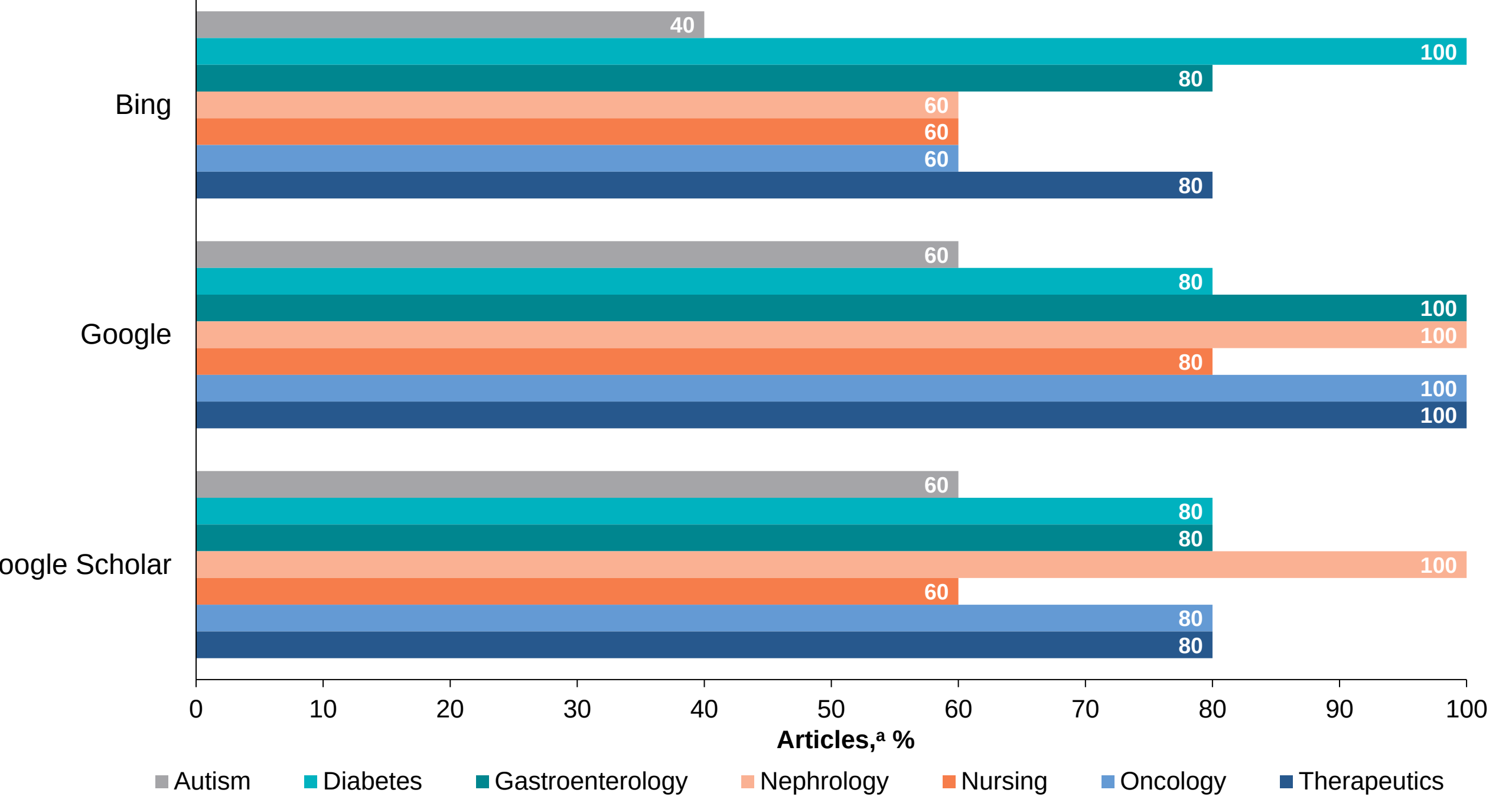
- Bing and Google
 - Using the article title, 100% (Bing) and 97% (Google) of articles were found (on the first or later pages) (**Figure 2A**)
 - Using keywords, 68.6% and 88.6% of articles were found, respectively (**Figure 2B**)
- Google Scholar
 - Using the article title, 100% of articles were found on the first page
 - Using keywords, 27 (77.1%) articles were found, with:
 - 16 (45.7%) on the first page
 - 11 (31.4%) on a later page
 - Most linked to the publisher's site

Figure 3. Search engine results for keywords by how prominent in the results articles were found



- Using the title, almost all articles were found on the first page
 - Bing: n=1 (3%) on a later page
 - Google: n=1 (3%) not found
 - Google Scholar: 100% on the first page
- Using keywords, articles were mainly found on the first page (**Figure 3**)
 - Google had more articles on the first page than Bing or Google Scholar
- There was variation between search engines in finding articles by keywords for each therapeutic area (**Figure 4**)
- Autism PLSs were consistently the least likely to be found using the different search engines

Figure 4. Search engine results for keywords by therapeutic area



^aFound on PubMed and/or the publisher's website and on the first or later pages.

Social media

Articles found using social media

Instagram

0

Facebook

3

Title search

X (formerly Twitter)

25

Title search

6

Keyword search

- Instagram: 0 articles were found using either the title or keywords
- Facebook: all 3 articles found were from *Autism Res* as follows:
 - 1 linked to the article on the Autism Research Institute site
 - 1 linked to the article on a clinician's site
 - 1 linked to the article on Wiley Neuro's site
- X (formerly Twitter):
 - 31 articles found
 - Of the 6 articles found with keywords, 1 was from *Adv Ther* (Springer) and 5 were from *Diabetes Ther* (Springer)
 - The most readily available PLSs were those posted by the journal at time of publication using the exact title

Limitations

- The number of articles in each therapeutic area, for each publisher, and for other parameters (eg, year, study/review) was small, making comparisons difficult
- Keywords were taken from the PubMed record and may not be terms used by patients to find information about a particular study or article
- X (formerly Twitter) searches were restricted to users only, and only posts exactly matching search terms returned results

Conclusions

- Title searches were successful in finding articles using search engines and X (formerly Twitter)
 - PLSs were found through the link to the full article
- Keyword searches were largely unsuccessful in finding PLSs through search engines and social media
- Nearly all articles were found on the first page of search engine results when the title was used
 - However, more articles were found on later pages when keywords were used
 - Only 0.63% of Google searchers click on results from the second page⁷
- Some PLSs were only available via subscription (n=8 [22.9%])
 - Open access promotes transparency, enhances knowledge, supports public advocacy and involvement in medical research, and thus, provides an important societal benefit⁸



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