Analysis of the accuracy and readability of herbal supplement information on Wikipedia

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Abstract

Objective: To determine the completeness and readability of information found in Wikipedia for leading dietary supplements and assess the accuracy of this information with regard to safety (including use during pregnancy/lactation), contraindications, drug interactions, therapeutic uses, and dosing.

Design: Cross-sectional analysis of Wikipedia articles.

Interventions: The contents of Wikipedia articles for the 19 top-selling herbal supplements were retrieved on July 24, 2012, and evaluated for organization, content, accuracy (as compared with information in two leading dietary supplement references) and readability.

Main Outcome Measures: Accuracy of Wikipedia articles.

Results: No consistency was noted in how much information was included in each Wikipedia article, how the information was organized, what major categories were used, and where safety and therapeutic information was located in the article. All articles in Wikipedia contained information on therapeutic uses and adverse effects but several lacked information on drug interactions, pregnancy, and contraindications. Wikipedia articles had 26%–75% of therapeutic uses and 76%–100% of adverse effects listed in the Natural Medicines Comprehensive Database and/or Natural Standard. Overall, articles were written at a 13.5-grade level, and all were at a ninth-grade level or above.

Conclusion: Articles in Wikipedia in mid-2012 for the 19 top-selling herbal supplements were frequently incomplete, of variable quality, and sometimes inconsistent with reputable sources of information on these products. Safety information was particularly inconsistent among the articles. Patients and health professionals should not rely solely on Wikipedia for information on these herbal supplements when treatment decisions are being made.

Keywords: Herbal supplements, Wikipedia, Internet.

J Am Pharm Assoc. 2014;54:406–414.
doi: 10.1331/JAPhA.2014.13181

Received August 29, 2013, and in revised form December 6, 2013. Accepted for publication March 29, 2014.

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Disclosure: The authors declare no conflicts of interest or financial interests in any product or service mentioned in this article, including grants, gifts, stock holdings, or honoraria.

Funding: Midwestern University Chicago College of Pharmacy student research grant.

Previous presentation: American Society of Health-System Pharmacists Midyear Clinical Meeting, Las Vegas, NV, December 2–6, 2012.

Wikipedia is an open-access, Web-based encyclopedia that is collaboratively edited by users from all over the world. In addition to containing popular information, Wikipedia has a health section that includes information on disease states and drugs. Wikipedia articles often appear near the top of search engine results; a recent study found that Google more frequently showed results from Wikipedia than from other online health information sources such as MedlinePlus and the now-decommissioned NHS Direct Online. Additionally, there were more page views for Wikipedia articles than for MedlinePlus articles.[1]

Another study found that, approximately 85% of the time, Wikipedia listings were the first results to appear when using Google to search for generic drug names.[2] At the time, Alexa.com reported that Wikipedia was currently the sixth most commonly viewed website and the most commonly browsed Internet encyclopedia,[3] and this remained the case at the time this article was published.

In light of the ubiquity of Wikipedia, patients should be aware that the quality and accuracy of information contained on the site is questionable. The content can be written and edited by anyone, and some articles are written anonymously.

We performed a PubMed search to identify published articles on this topic using the search terms "Wikipedia" and "accuracy," as well as reviewed reference lists of published articles. Some published studies have compared Wikipedia with other drug reference sources.[4-6] One study reported that Medscape Drug Reference (MDR) answered more drug information questions and was better able to provide drug dosing information compared with Wikipedia.[4] The same study found that MDR provided more complete answers than did Wikipedia.

Another study reported that the information found on Wikipedia about osteosarcoma was substandard compared with the information provided by the National Cancer Institute (NCI).[5] The study used 20 different osteosarcoma-related questions to assess the scope, completeness, and accuracy of information made available through NCI and Wikipedia.

Another area of concern about Wikipedia is that there may be gaps in the information provided by the website. Kupferberg et al.[6] found that Wikipedia was missing information about drug interactions and contraindications, increasing the chance that patients could be harmed when using over-the-counter medications or dietary supplements.

Others have found that Wikipedia has a readability level that exceeds the eighth- to ninth-grade reading level of the average American.[7] Individuals who read at lower levels do not grasp the relevance of the information provided by Wikipedia as readily as those who read at higher levels. Thompson et al.[8] determined that Wikipedia has a 12th-grade readability level and includes scientific terminology.

Wikipedia is not the only Internet-based resource with a high reading level. In another study, Walsh et al.[9] evaluated 100 consumer health articles from five medical associations for readability. When the Simple Measure of Gobbledygook (SMOG) test was used, 4 articles were categorized as "average" and 96 articles were classified as "difficult" using categories developed by the U.S. Department of Health and Human Services. Similarly, when Gunning's FOG Index was used, 1 article was classified as "easy," 4 articles were categorized as "average," and 95 articles were considered "difficult." In using the Flesch-Kincaid Grade Level test, 3 articles were identified as being at an "easy" reading level, 22 at an "average" reading level, and 75 at a "difficult" reading level.

Since increasing numbers of patients use herbal supplements, it is important to analyze sources of information about these products.[10] Herbal dietary supplements are available without a prescription and do not require approval from the U.S. Food and Drug Administration.[11]

At a Glance

Synopsis: This analysis of dietary supplement information in Wikipedia assessed the accuracy and readability of articles for the top 19 herbal products based on sales reported by the National Center for Health Statistics. For each article, researchers evaluated the quality and thoroughness of content, as well as how the information was organized and presented. In comparison with two specialized, evidence-based herbal supplement resources, the Wikipedia articles were inconsistent in structure and often lacked complete listings of safety concerns, contraindications, drug interactions, therapeutic uses, and dosing information. Additionally, all Wikipedia articles analyzed were at a ninth-grade reading level or above.

***Analysis*:** *Considering the ubiquitous Web presence of Wikipedia and the growing number of patients using herbal supplements, the study authors urge patients and health care providers to exercise caution when relying on health information obtained from this website. Wikipedia articles can be created by anyone, and this study found they were generally written at a reading level exceeding that of the average U.S. adult. The need to consult with pharmacists and search more comprehensive online databases before taking supplements was underscored by study findings that only 25% of the Wikipedia articles analyzed included information about contraindications, only 55% included dosing information, and less than 50% included mention of safety concerns identified by more reliable resources.*