

Accuracy and Completeness of Drug Information in Wikipedia: A Comparison with Standard Textbooks of Pharmacology

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Abstract

The online resource Wikipedia is increasingly used by students for knowledge acquisition and learning. However, the lack of a formal editorial review and the heterogeneous expertise of contributors often results in skepticism by educators whether Wikipedia should be recommended to students as an information source.

In this study we systematically analyzed the accuracy and completeness of drug information in the German and English language versions of Wikipedia in comparison to standard textbooks of pharmacology. In addition, references, revision history and readability were evaluated. Analysis of readability was performed using the Amstad readability index and the Erste Wiener Sachtextformel. The data on indication, mechanism of action, pharmacokinetics, adverse effects and contraindications for 100 curricular drugs were retrieved from standard German textbooks of general pharmacology and compared with the corresponding articles in the German language version of Wikipedia.

Quantitative analysis revealed that accuracy of drug information in Wikipedia was $99.7\% \pm 0.2\%$ when compared to the textbook data. The overall completeness of drug information in Wikipedia was $83.8 \pm 1.5\%$ ($p < 0.001$). Completeness varied in-between categories, and was lowest in the category “pharmacokinetics” ($68.0\% \pm 4.2\%$; $p < 0.001$) and highest in the category “indication” ($91.3\% \pm 2.0\%$) when compared to the textbook data overlap.

Similar results were obtained for the English language version of Wikipedia. Of the drug information missing in Wikipedia, 62.5% was rated as didactically non-relevant in a qualitative re-evaluation study. Drug articles in Wikipedia had an average of 14.6 ± 1.6 references and 262.8 ± 37.4 edits performed by 142.7 ± 17.6 editors. Both Wikipedia and textbooks samples had comparable, low readability.

Our study suggests that Wikipedia is an accurate and comprehensive source of drug-related information for undergraduate medical education.