Accuracy and Completeness of Drug Information in Wikipedia

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Abstract

Web 2.0 technologies, where users participate in content production, are increasingly used as informational and educational resources. Wikipedia is frequently cited by students in the healthcare professions. This study compared the accuracy and completeness of drug information in Wikipedia to Medscape Drug Reference, a traditionally-edited resource. Wikipedia answered fewer questions [40.0% vs. 82.5%] ($p<0.001$) and was less complete ($p=0.00076$) than Medscape. No gross errors were found in Wikipedia and its content has improved over time.

Introduction

With the advent of Web 2.0 technologies, user-edited online resources such as Wikipedia are increasingly tapped as resources.[1] Wikipedia content is frequently cited by students in the healthcare professions, sometimes as an authoritative resource.[2] Despite this, there has been little research on the quality of information found in Wikipedia. The objective of this study was to compare the accuracy and completeness of drug information in Wikipedia and a free, online traditionally-edited database.

Methods

Wikipedia and a free, online database (Medscape Drug Reference) were assessed on eight essential categories of drug information (Table 1). Questions on well-established and novel drugs used for inpatient and outpatient settings were constructed to populate the categories and answers were verified with gold standard resources.

Wikipedia and Medscape Drug Reference were evaluated according to scope (breadth of coverage) and completeness (depth of coverage on a three-point scale). Descriptive statistics were used to summarize the components. Fisher's exact was used to compare scope and paired Student's t test was used to compare current and previous Wikipedia results.

Timestamp entries for each drug in Wikipedia were recorded and the results were compared to the entry 90 days prior to assess positive or negative change.

Results

Scope: Wikipedia answered 40.0% of the drug information questions, compared to Medscape at 82.5% ($p<0.001$); details in Table 1. *Completeness:* Answers in Wikipedia were less complete than Medscape ($p=0.00076$). No gross errors were found in Wikipedia, whereas four answers in Medscape conflicted with the answer key. There was a marked improvement in the quality of drug information in Wikipedia over time, as current entries were superior to those 90 days prior ($p=0.024$).

Table 1. Scope scores by drug information category

Question category	Wikipedia (current)	Medscape
Administration	3	9
Adverse drug event	5	8
Contraindications	3	8
Dosage	0	9
Drug interactions	4	10
Indications	6	5
Mechanism of action	8	8
Pregnancy	3	9
TOTAL	32	66

Conclusion

Drug information in Wikipedia for eight essential categories was more narrow in scope and less complete than a traditionally edited comparator database. However, concerns about dangerously incorrect information were unfounded based on this sample. Wikipedia is a readily available online resource, but has not reached the threshold as a trusted source for drug information.

References

1. Boulos MN, Maramba I, Wheeler S. Wikis, blogs and podcasts: a new generation of Web-based tools for virtual collaborative clinical practice and education. BMC Med Educ 2006;6:41.
2. Taylor-Medes C. Proceed with caution: using Wikipedia as a reference. Neonat Netw 2007;26(3):140-1.