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Monkman, Helen; Schmidt, Thomas; Nøhr, Christian Gradhandt

*Publication date:*  
2019

*Document Version*  
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

### *Citation for published version (APA):*

Monkman, H., Schmidt, T., & Nøhr, C. G. (2019). *A Comparison of Online Consumer Medication Information from Canada, Denmark, and the United States of America*. Poster presented at American Medical Informatics Association annual symposium 2019, Washington, DC, United States.

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# A Comparison of Online Consumer Medication Information from Canada, Denmark, and the United States of America

Helen Monkman, PhD<sup>1</sup>, Thomas Schmidt, PhD<sup>2</sup>, Christian Nøhr, PhD<sup>2</sup>

<sup>1</sup>School of Health Information Science, University of Victoria, BC, Canada; <sup>2</sup>Maersk McKinney Møller Institute, University of Southern Denmark, Denmark

## Introduction

Many people around the world take prescription medications: some for short durations (e.g., antibiotics) others continuously on a daily or multiple times daily basis. Taking any prescription medication inherently has both benefits (i.e., alleviating symptoms) and risks (e.g., side effects, contraindications, interactions, overdoses) for consumers. This study compared the content and design of online Consumer Medication Information (CMI) from three sources: one Canadian and one American pharmacy, as well as the Danish national resource *minmedicin.dk*. The investigators identified strengths and weaknesses of each of the three online CMI sources revealing opportunities for improvement.

## Methods

We independently analyzed online CMI from three countries (Denmark, Canada, United States) for three medications (an inhaler, a tablet, and an intravenous medication), for a total of nine CMI. We assessed the *content* of each CMI against Monkman and Kushniruk's<sup>1</sup> content utility criteria to assess whether important topics were present. We also assessed the *design* of the three online CMI resources by critically examining how each one presented information and how users interacted with the site.

## Results

**Content:** Generally, all nine online CMI addressed the majority of the content criteria. The American CMI was the most comprehensive and the least comprehensive was the Danish CMI. However, each country's CMI had its shortcomings. We found no drug interaction information in the American CMI, no information concerning missed doses in Danish CMI, and no overdose information in the Canadian CMI. Directions for use varied considerably from very brief to elaborate descriptions. Only the American CMI provided patient to patient medication information using summary statistics drawn from PatientsLikeMe. Finally, only Denmark provided specific information about the frequency of experiencing side effects (e.g., <10 in 100 people). **Design:** Each online CMI source relied on content structuring using templates. Navigation varied between the three CMI sources. Canada used in-page anchor links, with all content visible on page load. In contrast, both the USA and Denmark leveraged expandable text boxes. When expanded, the American text boxes were lengthy blocks of text. Both the American and Danish sites displayed pictures of the medications. However, only Denmark offered slideshows and videos to convey directions for use.

## Discussion and Conclusion

This analysis of online CMI from three countries, highlighted interesting differences in both the content and design of online CMI. Research dictates that online text should be concise and easily scannable<sup>2</sup> and pages should not be too long<sup>3</sup>. However, American and Canadian online CMI violated these guidelines which impedes their usability and likely use as well. Both Canada and Denmark equipped consumers with actionable information to empower consumers, whereas the USA prompted them to consult their healthcare providers. Yet, only the USA provided peer experiences. Denmark's online CMI demonstrated unique benefits, which may be associated with its streamlined single national CMI approach, rather than relying on pharmacies to provide their own. In summary, each country's online CMI demonstrated unique strengths and weaknesses and we found opportunities for improvement.

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**Abstract**

*People around the world use prescription medications. Consumers often require information about their medications to support taking them safely and effectively. This study evaluated the content and design of Danish, American, and Canadian online CMI and revealed unique strengths and weaknesses of each country. These findings could help improve content and design of online CMI in each of the countries to facilitate consumers using these resources and thereby enhance safe and effective medication use.*