SCHWERPUNKT

Information overload in healthcare: too much of a good thing?

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*Informationsüberlastung im Gesundheitswesen:
zu viel des Guten?*

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Summary   The rapidly growing production of healthcare information — both scientific and popular — increasingly leads to a situation of information overload affecting all actors of the healthcare system and threatening to impede the adoption of evidence-based practice.

In preparation for the 2015 Cochrane Colloquium in Vienna, we discuss the issues faced by three major actors of this system: patients, healthcare practitioners, and systematic reviewers. We analyze their situation through the concept of "filter failure", positing that the main problem is not that there is "too much information", but that the traditional means of managing and evaluating information are ill-suited to the realities of the digital age. Some of the major instances of filter failure are inadequate information retrieval systems for point-of-care settings, the problem of identifying all relevant evidence in an exceedingly diverse landscape of information resources, and the very basic lack of health information literacy, concerning not only the general public.

Finally, we give an overview of proposed solutions to the problem of information overload. These new or adapted filtering systems include adapting review literature to the specific needs of practitioners or patients, technological improvements to information systems, strengthening the roles of intermediaries, as well as improving health literacy.

Zusammenfassung   Die wachsende Menge an wissenschaftlichen und nichtwissenschaftlichen Online-Veröffentlichungen im Gesundheitsbereich führt zunehmend zu einer Situation des Informationsüberflusses, die nicht nur alle Akteure des Gesundheitswesens betrifft, sondern auch ein Hindernis für die Verbreitung evidenzbasierter Medizin darstellt. In Vorbereitung auf das Cochrane Colloquium 2015 zeigen wir Probleme auf, mit denen sich drei wichtige

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Akteure — Patienten, medizinisches Personal, Verfasser von systematischen Reviews — konfrontiert sehen. Wir analysieren ihre Situation mithilfe des „Filter-Failure"-Konzepts: Das tatsächliche Problem ist demnach nicht das Übermaß an Information, sondern dass die traditionellen Praktiken der Auswahl von relevanten Informationen den Realitäten des digitalen Zeitalters nicht gewachsen sind. Zu wichtigen Beispielen von „filter failure" gehören unzureichende Integration von elektronischen Informationssystemen in die Arbeitsabläufe medizinischer Praxis, die Schwierigkeit, in einer heterogenen Informationslandschaft relevante Evidenz zu identifizieren, sowie mangelnde Informationskompetenz. Dementsprechend zielen Strategien zur Bekämpfung von Informationsüberfluss auf die Einführung neuer und die Anpassung existierender Filtersysteme ab: Die Erstellung von Informationsformaten, die den Bedürfnissen der einzelnen Akteure besser angepasst sind, die Verbesserung von Information-Retrieval-Technologien, die Stärkung von Vermittlerrollen und die Verbesserung der Informationskompetenz aller Akteure.

Introduction: Information overload and filter failure

Information overload is not a new concept: Innovations in information technology - be it the development of the written language or recent social networking technologies - cause both an increased production of information, and an increased access to information, invariably leading to the complaint that there is "too much information." On the other hand, access to information is an important demand: The 1986 WHO Ottawa Charter for Health Promotion explicitly includes information as a health resource for the public. It states that health promotion should enable "access to information, life skills and opportunities for making healthy choices. People cannot achieve their fullest health potential unless they are able to take control of those things which determine their health." [1] Unfortunately, it is now the case for most citizens, that "an individual's efficiency in using information . . . is hampered by the amount of relevant, and potentially useful, information available to them".[2]

This information overload is present at every level of the healthcare system. In this article we explore online health information and the situation faced by three specific actors: practitioners, patients, and systematic reviewers. To put their issues and needs into a framework, we use the concept of "filter failure" introduced by the American journalist Clay Shirky: From this perspective, the "problem" of information overload is not that there is *too much* information, but that the *strategies* for deciding which information is relevant have not evolved at the same pace as the means of producing information.[3] This means that the true issue of information overload is the ability of individuals to actually *use* the information at their disposal, which depends on the performance of their "information filters". These filters are both human and non-human agents that (help to) identify potentially relevant information according to explicit or implicit rules. The "filters" used by patients, practitioners, and systematic reviewers in dealing with digital information are distinct, but they do overlap, in particular because they all take place in the same (virtual) space, the world wide web (www).

We begin this exploration by introducing the reasons behind the information overload for these three groups. Subsequently we will introduce some proposed methods for reducing this overload.

The aim of this article is to introduce the reader to the topic of the 23rd Annual Cochrane Colloquium, hosted by Cochrane Austria in Vienna in October 2015: "Filtering the information overload for better decisions". As such, the issues and solutions presented in this article are the result of literature searches and citation tracking of recent health information literature, but they do not represent a systematic summary. There are also other limitations to this review: Most notably, since the Internet is the main factor of our current climate of information overload, we focus on information types, issues, and solutions that are based around electronic and online communication. This approach obviously cannot capture the whole of health information; it omits for example patient information delivered by the medical practitioner or via printed leaflets. Furthermore, choosing the concept of information overload as the point of departure, our approach is informed by media technologies and explicit (i.e. teachable) knowledge. As such cognitive, psychological, and social dimensions of individual information gathering and processing behavior are outside the scope of this article. We acknowledge that this an artificial distinction as the processes of creating and using information filters cannot be completely separated from these aspects.[4,5]

Why does the digital age create a feeling of information overload?

Parallel to the growth of available information in general, the information produced in and about healthcare has grown exponentially with the advent of the www and online communication. This information undergoes various types of filtering before it reaches our three stakeholder groups. For example, some of the information filters are technological systems such as web search engines or healthcare databases. Others are communication systems: the general media filters and disseminates scientific findings, but also non-scientific communication and personal accounts about healthcare issues. Other filters are processes, like the peer review system of academic publishing, which filters information for practitioners and systematic reviewers. Finally, the human actors themselves don't only receive information; they also serve as information filters, e.g. the practitioner filtering health information for the patient.

One oft-cited dimension of the information overload issue is the increased pace and production of research