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Research paper

Searching for evidence-based geriatrics: Tips and tools for finding evidence in the medical literature

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ABSTRACT

Introduction: Information to treat geriatric patients evidence-based is hard to find. Recently, a sensitive and a specific search filter to improve searching for literature relevant to geriatric medicine were developed in a research setting. The aim of this study is to determine whether these filters are able to find the articles considered relevant for daily clinical practice by young geriatricians.
Materials and methods: For this study, we included references identified for lectures of the session of the 9th European Academy for Medicine of Ageing (EAMA) course 2011 about "Ageing and functionality" and lectures of the session entitled "Evidence-Based Medicine" (EBM). Relevant references were combined with the specific and sensitive search strategy in MEDLINE.
Results: Of the 50 relevant articles for the course "Functionality", the sensitive filter identified 46 (92%); the specific filter 39 (78%). Of the 92 relevant references on "EBM", the sensitive filter retrieved 80 (87%), the specific filter 59 (64%). Articles not identified by the sensitive filter, were mostly missed because the filter specifically search for relevant terms mentioned in title or abstract.
Conclusion: Geriatricians can be confident that the majority of relevant articles will be retrieved by the sensitive search filter. Searching for literature will be simplified and made more efficient by using a search filter. By demonstrating the pros of the filter we hope to stimulate implementation in daily clinical practice, so our elderly population is as much treated by the most up to date available evidence as possible.

1. Introduction

The ageing population poses an increasing demand on health professionals. Geriatric patients often have multiple chronic conditions, resulting in the use of several medications. A study about prevalence of morbidities in the elderly showed that 82% of patients aged 65 and over had at least one chronic condition; 24% had even four or more conditions [1]. Due to deteriorating organ functions they are prone to medication-related side effects [2]. Consequently, the care for elderly is complicated. To provide the best care, doctors need to base their decision on valid evidence.

However, evidence specifically directed to geriatric patients is hard to find for several reasons. Geriatric medicine overlaps with, among others, psychiatry, internal medicine and neurology and therefore, evidence on geriatrics is published in a wide range of journals. In addition to that, the amount of available information is increasing rapidly, and time for searching is limited. Even though bibliographic databases often provide tools to simplify searching (e.g. Medical Subject Heading (MeSH) terms in MEDLINE), correctly using these tools is challenging. Moreover, indexing for MEDLINE is not always consistent; furthermore it lags months behind so that recently published articles will not be found when only MeSH terms are used. In sum, finding the best and most up to date evidence can be challenging, especially for a busy clinician. However, general tools to help finding evidence-based literature relevant for a specific clinical subject in medicine are currently more wide spread [3]. Previously, researchers have developed search filters for different purposes [4,5]. Search filters consist of MeSH terms and text words in titles and abstracts that are related to the subject of the intended search.

Van de Glind et al. developed a search strategy or "filter" to find the answers to clinical questions concerning geriatric patients more efficiently than with a general search in the whole database (Table 1) [6]. Searchers could, for example, combine "heart failure" with this geriatric search strategy to retrieve mainly articles relevant for the geriatric patient with this disease. The most sensitive search strategy had a sensitivity of 92.0%, a specificity of

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Table 1
Specific and sensitive filter.

Specific filter	Sensitive filter
Elderly [tiab] OR community-dwelling [tiab] OR geriatric [tiab] OR "mini-mental state" [tiab] OR Alzheimer [tiab] OR Alzheimer's [tiab] OR Alzheimer's [tiab] OR MMSE [tiab] OR caregivers [tiab] OR falls [tiab] OR ADL [tiab] OR Frailty [tiab] OR Gds [tiab] OR Ageing [tiab] OR elders [tiab] OR Frail [tiab] OR MCI [tiab] OR Demented [tiab] OR Psychogeriatrics [tiab] OR "cognitive impairment" [tiab] OR "postmenopausal women" [tiab] OR Comorbidities [tiab] OR geriatric assessment [mh] OR Nursing homes [mh] OR frail elderly [mh] OR cognition disorders/diagnosis [mh] OR cognition disorders/epidemiology [mh] OR homes for the aged [mh] OR Alzheimer disease [mh] OR dementia [tiab]	Elderly [tiab] OR community-dwelling [tiab] OR geriatric [tiab] OR "mini-mental state" [tiab] OR Alzheimer [tiab] OR Alzheimer's [tiab] OR Alzheimer's [tiab] OR MMSE [tiab] OR caregivers [tiab] OR falls [tiab] OR ADL [tiab] OR Frailty [tiab] OR Gds [tiab] OR Ageing [tiab] OR "hip fractures" [tiab] OR elders [tiab] OR Frail [tiab] OR MCI [tiab] OR Demented [tiab] OR Psychogeriatrics [tiab] OR "cognitive impairment" [tiab] OR "postmenopausal women" [tiab] OR comorbidities [tiab] OR dementia [tiab] OR aging [tiab] OR older [tiab] OR "daily living" [tiab] OR "cognitive decline" [tiab] OR "cognitive impairment" [tiab] OR residents [tiab] OR "cognitive functioning" OR "old people" [tiab] OR nursing homes [mh] OR Geriatric assessment [mh] OR aging [mh] OR frail elderly [mh] OR Alzheimer disease [mh] OR homes for the aged [mh] OR cognition disorders [mh] OR dementia [mh] OR Activities of daily living [mh] OR aged, 80 and over [mh]

86.9%, and a number needed to read (NNR) of 1.40. The most specific search strategy had a specificity of 96.0%, a sensitivity of 69.6%, and a NNR of 1.16. With regard to search filters, sensitivity is regarded as the proportion of relevant studies detected in the literature and specificity as the proportion of irrelevant studies that are excluded by the search. The number needed to read indicate how many articles have to be screened in order to find one relevant article. These geriatric search strategies could simplify searching for relevant literature by lowering the number of articles needed to read to find a relevant study and therefore, attribute to a better evidence-based practice. The search strategies are not only useful to the clinician who wishes a quick answer to a clinical question, but also to the researcher who wants to find as many articles as possible without missing too much relevant information, for example for systematic reviews or guideline development. Moreover, when searching in MEDLINE, extra studies that are not indexed with MeSH terms, can be identified.

However, although the search filter was tested and validated in a research setting, the usability in daily clinical practice is unknown. Additionally, the unknown possibility to miss relevant articles by using the filters could theoretically limit the implementation. Therefore, the aim of this study is to determine whether the various geriatric search filters are able find the articles considered relevant in daily clinical practice by young geriatricians.

2. Methods

For this study we used articles considered relevant in daily clinical practice by young geriatricians for lectures of the 9th European Academy for Medicine of Ageing (EAMA) course 2011 as a validation set. The hypothesis is that our search filters do not miss the references used by the EAMA students.

The EAMA is an Advanced Postgraduate Course in Geriatrics since 1995. The two-year course consists of four one-week sessions held twice a year. Each session covers a well balanced geriatric topic with experts from around the world. This course is directed towards faculty members of departments of geriatrics, academic teachers planning a career in geriatrics or in medical gerontology. The course can also be attended by junior potential academic staff working in other fields (internal medicine, sub-specialties, biology) involving the ageing process and care of elderly people. The program aims to increase scientific, clinical, educational and managerial competences in medical gerontology. Students have to prepare a state of the art lecture about a specific appointed relevant subject for geriatric medicine. For this lecture, they have to search evidence-based and choose maximal five relevant references.

The validation set for this study consists of articles found by the 16 students of the first session of the 9th EAMA course 2011 about "Ageing and functionality" and the 25 students of the second session entitled "Evidence-Based Medicine". References for the lectures were searched by students with little to average experience in searching electronical databases without making use of the geriatric search filters. Searches were not limited to a specific database, but were predominantly performed in MEDLINE. All study types, including guidelines, were allowed.

Because our search filters were developed for MEDLINE, we first checked the presence of the references found by the students in MEDLINE. References not available in MEDLINE were excluded. Two reviewers (BM and EG) independently reassessed the relevance for geriatrics of the available records. Articles were categorized as relevant for geriatric medicine if they described a condition of old age. Also, studies that included patients with mean age above 70, or that did a subgroup analysis in patients aged 70 years or above were considered relevant for geriatrics. These criteria are in agreement with the ones we used at the development of the search filters [6].

The relevant references were in two independent search strategies combined with the Boolean operator AND to firstly the specific and secondly the sensitive search strategy in MEDLINE (PubMed). The proportion of false negative results of these two strategies (missed relevant papers) was calculated to give an impression of the sensitivity of the filters for daily clinical practice.

3. Results

Of the 72 used articles for the EAMA course "Functionality", 61 (85%) could be retrieved in MEDLINE. In total, 50 records (82% of 61) were considered relevant for geriatric medicine. The sensitive search filter found 46 (92%) of these records (Table 2). The specific search filter retrieved 39 of the relevant articles (78%). In the course on "EBM", 121 references were identified. Four references were excluded because they were duplicates, five were not available in MEDLINE, and 30 were considered irrelevant. Of the 92 (82%) remaining relevant articles, the sensitive filter retrieved 80 (87%) and the specific filter 59 (64%). The articles considered irrelevant of both courses were on general not geriatric topics or comprised for example guidelines without subgroup description of elderly.

Table 2
Overview of identified articles.

Subject Lecture EAMA	Functionality	Evidence-based medicine
Articles in MEDLINE	61	112
Articles considered relevant (%)	50 (82)	92 (82)
Relevant articles identified with sensitive filter (%)	46 (92)	80 (87)
Relevant articles identified with specific filter (%)	39 (78)	59 (64)