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Awareness, use and opinions of methodological search filters used for the retrieval of evidence-based medical literature – a questionnaire survey.

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ABSTRACT

The aim of this study was to determine the level of awareness of methodological filters among health and academic librarians in the UK and ROI, their use of filters and views on the perceived benefits, limitations and ways to increase usage of methodological filters. A random proportional sample of health and academic librarians were surveyed by telephone and fax. Results indicate a high level of awareness of methodological filters but low level of usage. Furthermore, a high level of awareness did not necessarily correlate with a high level of understanding. Examination of responses revealed limitations and recommendations beyond those reported in the literature and highlights the relationship between understanding and effective use of filters. Better guidance to inform users on filter usage and improved publication of filters on the www are needed.

Keywords: Information Storage and Retrieval, Medline, Evidence-Based Medicine, Subject headings, Questionnaires

INTRODUCTION

From the mid-1990s onwards much has been written in the literature of the opportunities and challenges that Evidence Based Practice (EBP) provides for health librarians. The role of the librarian has evolved with their acquisition of new knowledge and skills (1,2,3), and new initiatives have developed to assist librarians in their pursuit of EBP (4,5, 6). Yet, little has been reported about how or indeed whether librarians are actually arising to these challenges.

One such search aid that has been developed to assist both librarians and clinicians in the retrieval of high quality evidence from the medical databases is the methodological filter, a search strategy combining search terms relating to the research methodology. The Evidence-Based Medicine Working Group at McMaster University lead the way in this field (6-9). Researchers hand-searched 10 general medical journals from two years (1991 and 1986) to identify studies relating to diagnosis, etiology, prognosis and treatment. Search terms relating to the methodology of each of the four studies were collated, combined into MEDLINE search strategies and tested against the 'gold standard' hand-search. Sensitivities, specificities, precision and accuracy of 134,264 unique combinations of search terms were calculated for all four study types. Results revealed high sensitivities and specificities for all strategies and concluded that retrieval of clinically sound research was enhanced by using optimally derived search strategies combining freetext and controlled vocabulary. Further research has extended the range of methodological filters available designed to retrieve levels of evidence and types of clinical queries. (10-15)

The importance afforded to quality filters as a retrieval tool is reflected by their incorporation into the search interface of one of the largest and freely available medical databases, PubMed, as 'Clinical Queries' (16). Recent initiatives include specific courses on methodological filters (4,17). Articles promoting the use of filters have appeared in medical journals (15,18,19), library science journals (6, 10-12,20,21) and EBM books (22, 23). O'Rourke et al (24) believe that filters will be an influencing factor in affecting the way in which clinicians will conduct a search.

Despite the increasing volume of work advocating the use of methodological filters there have been no reported studies examining the use of filters and the extent to which they have penetrated into literature searching techniques of librarians. In developing a qualitative filter Grant (25) investigated the experiences and opinions of optimal search strategies among qualitative researchers rather than librarians. The findings indicated a number of reservations among the researchers regarding the purpose of a filter and when to use it. Papers focusing on methodological filters describe the development behind them, how they have been tested and evaluated rather than looking at the issues of usability. Yet the establishment of these issues based on users' experiences and opinions of filters, is critical for both the development and the effective use of filters.

AIMS

This survey explores the value and limitations of methodological filters, as part of a wider study on the development of subject filters. A telephone and fax survey set out to discover awareness, understanding and usage of methodological filters currently available, and views on the perceived benefits, limitations and ways to increase usage of methodological filters. The interpretation of the findings form the basis on which recommendations can be made for not only for the increased use of filters, but also the more effective usage of these tools.

METHODS

A telephone questionnaire was designed to establish the level of awareness of methodological filters currently available. If participants used methodological filters, they were invited to take part in a further faxed questionnaire designed to investigate usability concerns. Confidentiality and anonymity were assured and implied consent was obtained from each librarian prior to participation. A covering letter was sent out, and where the first call was not convenient an alternative time arranged. Both questionnaires were piloted. Closed questions were used to obtain primarily factual data and open questions to obtain knowledge and opinions of methodological search filters.

Sample

Participants were selected from health libraries and academic libraries to reflect possible users of filters. A random sample of 194/388 health libraries was obtained from the Directory of Health Library and Information Services in the UK and the Republic of Ireland 2002/3 (26). Libraries were excluded if they did not have access to MEDLINE, if they were listed as a veterinary library and if they were affiliated to a university. All 30 UK academic libraries offering Medicine as an undergraduate course in 2002/3 identified from the UCAS undergraduate list 2002-3 (27) were also surveyed. Respondents all undertook literature searches using the MEDLINE database.

Data analysis

SPSS version 11.0.0, 2001 for Windows was utilized to collate closed question responses. An independent assessor checked data entry. Qualitative data analysis was undertaken on the open-ended questions. Open coding placed all responses into initial categories using the constant comparison method (28,29). Responses were read several times and categories refined. A second independent assessor checked the assigned categories.

RESULTS

Response rate

Telephone questionnaire

Among the Health libraries 168/194 (87%) completed the telephone questionnaire. Of the remaining 26 there were 18 non-responders, 5 were duplicate institutions (i.e. one librarian was responsible for more than one library), 2 libraries had closed and one refused to participate. Twenty-eight out of thirty (93%) of university libraries responded, the remaining two were non-responders despite repeat calls and messages left. Overall the response rate for the telephone questionnaire was 196/224 (88%).

Fax questionnaire
Of the 168 health libraries surveyed 58 were eligible to take part in a further fax questionnaire, Forty-eight agreed, of which 41 (85%) replied. Ten (77%) of the 13 university libraries eligible to complete the fax questionnaire responded. The overall response rate for the faxed questionnaire was 84% (51/61).

Untoward events
Upon request, three questionnaires were emailed to respondents, of which 2 were completed and returned. Consequently, consideration in the analysis was given to the question asking for a definition of filters since one may have been looked up. On three occasions telephone numbers listed in the Directory were incorrect and obtained by other means.

Telephone questionnaire
Access to medical databases
Institutions were asked whether they had access to MEDLINE, CINAHL, EMBASE and PsychInfo, since filters (both tested and untested) are available for use in all four databases. As expected, MEDLINE access was available in all institutions. CINAHL in 187/196 (95%) institutions, PsychInfo in 169 (86%) and EMBASE in 148 (76%). OVID was the most common form of system interface access, with 163 (86%) institutions accessing MEDLINE via this system (See Notes 1,2). PubMed was accessible in 155 (79%) institutions, SilverPlatter in 30 (15%) and SilverPlatter WebSpirs in 5 (3%). Other points of access included subscription based services the two most common being CSA abstracts and Science Direct.

Awareness and use of methodological filters

Type of library	Unaware of filters	Aware filters	Use filters	Don't use filters
Multi 105	15	90	34	56
Medical 23	10	13	7	6
Nursing 4	1	3	2	1
Psych 3	0	3	2	1
Other 33	8	25	13	12
Academic 28	6	22	13	9
Total	40/196	156/196	71/156	85/156

Table 1 Awareness and use by type of health library

Taking into account the fact that methodological filters are also known as Clinical Queries, respondents were asked whether they had heard of either of them. Table 1 shows the level of awareness and use of methodological filters among the types of libraries. Of 196 librarians, 40 (20%) had not heard of methodological filters. There were no regional differences in awareness, however there was a significant relationship between the types of health and university libraries and awareness of filters χ^2 =11.158, *df*=5, p=0.048. Of the 156/196 (80%) of respondents who were aware of filters, less than half (71/156 (46%)) are actually using them. From a total of 196 responders therefore, only 71 (36%) of librarians are utilising filters.

Searching experience and frequency
Tables 2 and 3 show the length of medical database searching experience and frequency of searching carried out by respondents.

Medical database search experience * Aware of methodological filters Crosstabulation

			Aware of methodological filters		
			no	yes	Total
Medical database search experience	less than 6 months	Count		2	2
		% within Medical database search experience		100.0%	100.0%
	6-12 months	Count	6	4	10
		% within Medical database search experience	60.0%	40.0%	100.0%
	1-5 years	Count	17	47	64
		% within Medical database search experience	26.6%	73.4%	100.0%
	more than 5 years	Count	17	103	120
		% within Medical database search experience	14.2%	85.8%	100.0%
Total		Count	40	156	196
		% within Medical database search experience	20.4%	79.6%	100.0%

Institution type (total in sample)	None	<6months	6mths-1year	1-5years	>5 years
Health libraries (168)	0	2	9	58	99
Academic (30)	0	0	1	6	21
Total (196)	0	2	10	64	120

Table 2 Medical database searching experience

Frequency of conducting searches * Aware of methodological filters Crosstabulation

			Aware of methodological filters		
			no	yes	Total
Frequency of conducting searches	at least once a day	Count	19	93	112
		% within Frequency of conducting searches	17.0%	83.0%	100.0%
	at least once a week	Count	11	56	67
		% within Frequency of conducting searches	16.4%	83.6%	100.0%
	at least once a month	Count	8	7	15
		% within Frequency of conducting searches	53.3%	46.7%	100.0%
	less than once a month	Count	2		2
		% within Frequency of conducting searches	100.0%		100.0%
Total		Count	40	156	196
		% within Frequency of conducting searches	20.4%	79.6%	100.0%

Institution type (total in sample)	Never	At least once a day	At least once a week	At least once a month	< once a month
Health libraries (616)	0	100	57	10	1
Academic (30)	0	12	10	5	1
Total (196)	0	112	67	15	2

Table 3 Frequency of searching

The majority (120/196 (61%)) of both health and university librarians have over 5 years searching experience. On average searches using the medical databases were carried out at least once a day with health librarians carrying out searches more frequently than university librarians (100/168 (60%) v 12/28 (43%)). There is a highly significant relationship between both searching experience and awareness of methodological filters (χ^2 =14.533, *df*=3, p=0.002) and frequency of searching and awareness (χ^2 =19.285, *df*=3, p<0.0005).

Reasons for non-use

Over half (54%) of all respondents were aware of filters but did not use them. Analysis of the reasons for non-use revealed three categories, relating to both the user and the system. Box 1 shows the categories assigned with sample comments to qualify a category where appropriate.

Searcher preference

Prefer own terms
I prefer to use my own terms, once you have done a lot of searches you become aware of the terms which are best at retrieving what you need

Search intuitively
I tend to search as I go along

Not useful for type of search
I don't have the need to do advanced searches

Not useful for literature
Tend to search for community stuff, not medical based

Not useful for type of user
Not applicable to public health library users

Satisfied with LIMITs function on MEDLINE

Prefer to use other sources than MEDLINE

Loss of information
Too much chance of losing information

No demand for filters

Personal factors

Insufficient knowledge
I've heard of them, but don't know enough
I'm not entirely sure what they are and what the perceived benefits of using them are

Lack of time to get to know them
I know they exist but I've never got around to investigating them

Lack of experience using filters

Lack of training using filters

Implicit mis-understanding
I'm new to ADITUS, not had a chance to use them
Our users are not academic users
A lot of searching is for systematic reviews who just want everything
(I) don't do systematic reviews a lot

Perceptions of filters

(they) sound very complicated
(they) seem highly complicated and technical

System factors
Not preloaded
Used to use them but they were already installed on the CD-ROM. Now we use Internet access with individual user names and accounts so everyone would have to type in their own

Box 1 Reasons for non use of filters

Over a third of non-users (35%) felt that they had no need for using filters. The majority expanded on this view suggesting that filters may not be appropriate for types of literature, users or the level of search. Alternative search strategies were offered as preferred over and above filters in general. A more specific response suggested that the limits facility available on MEDLINE was sufficient. Demand was also a factor with two respondents stating simply that they had never been asked about them It is of interest to note that while five respondents reported they did not use filters themselves, they did promote their use through end-user training.

A lack of knowledge was also a prominent reason for non-use, while a lack of understanding was implicit in several remarks. For example, filters are pertinent to the medical databases such as MEDLINE, not the regional portal ADITUS as was suggested. Also, one respondent implied that filters are intended for academic users alone when in fact they are aimed at librarians, clinicians and researchers (1,5,13). There were conflicting reasons for not using a filter, which relate back to an understanding of when to use a filter. One librarian did not use them because they do a lot of systematic reviews, while another had no need because they don't. Other personal factors included a lack of time to 'get to know them', lack of experience and confidence in using them. Finally, some preconceptions about filters were also noted, most referring to their complexity and a lack of awareness of all filter types available, in particular the clinical query filters.

System related reasons for non-use prompted four respondents to claim that not having them pre-loaded on the system was a factor, of which two said they had used them previously when accessing MEDLINE on CD-ROM since they had been pre-stored.

Reasons for use
If respondents used filters, they were asked why they used them. Most respondents interpreted this question to mean for what types of literature did they apply filters. In this instance respondents replied that they used filters when searching for specific types of information. In particular when searching for Evidence Based Medicine material, focusing on levels of evidence; systematic reviews, RCTs or types of clinical queries; diagnosis, prognosis, etiology, therapy. According to one respondent filters are the

best way of getting the EBM information (124).

Two respondents interpreted the question to mean when would they apply a filter, stating they used them when assisting people who are undertaking a systematic review or conducting advanced searches. A range of further reasons for use were given which appeared to correlate with responses given for the benefits of a filter, specifically; to save time, refining searches, increasing the sensitivity of a search, and making the results more manageable.

Understanding of a methodological filter
Wilczynski et al define a methodological search filter as 'a *search term or terms (such as 'random allocation' for sound studies of medical intervention) that select studies that are at the most advanced stages of testing for clinical application* (Wilczynski 94, p905). This definition was used to derive the criteria for the assessment of each response given. That is, a

response could be 'scored' by its mention of identification of methodology sound research, retrieval of quality information or tested filters. A further three levels for assessing definitions were provided by way of a specific example, those which were vague (no mention of aforementioned criteria) or simply unable to provide a response.

Based on these criteria respondents showed a poor level of understanding of what a methodological filter is. Among the 71 respondents who used filters only 7 (10%) made any reference whatsoever to the fact that the terms in the filter related to the methodology of the type of research the filter is designed to retrieve. Six respondents mentioned that filters are designed to retrieve quality material, three highlighted the fact that are tested strategies while only 2 mentioned they are validated. The majority (52%) did, however, define methodological filters as search strategies designed to filter out or focus on types of information by way of an example, for instance,

> *It's a search strategy put together to pull out a particular type of study or type of clinical study, for example diagnosis*
>
> *A search set up as a limiting strategy for EBM for example systematic reviews, limiting to specific areas of EBM*

A further 19 (28%) were vague in their definition, in that they stated it is a search strategy but gave no further information as to what type of search strategy. Typical explanations include;

> *A preset limit on a search with a particular focus*
>
> *A way of targeting or narrowing a search to pick out the more relevant items*

Definitions provided by five respondents (7%) were so vague that it would be impossible to interpret that what they are defining is indeed a methodological filter. Examples of such responses are,

> *Combining searches, exploding a search. I'm a bit hazy on the terminology*
>
> *I go to PubMed and use subject headings to refine and explode*
>
> *A piece of code*

Nine (13%) were unable to demonstrate any understanding replying simply 'no' or 'don't know'.

Faxed questionnaire

First heard of methodological filters
Twenty-two (37%) respondents indicated that a search skills course was the primary channel of awareness. Thirteen (22%) respondents stated their source as the published literature, the same number (22%) also had filters recommended to them by a librarian. The www was the source of 6 (10%) filters while 5 respondents stated other sources, including through training or through an institutions' own work on filters.

Types of filters used
Table 4 shows the filter used the most by librarians in the MEDLINE database is the one designed to retrieve systematic reviews with 48/51 (94%) respondents using it filters designed to retrieve levels of evidence are used by more respondents than filters designed to retrieve types of clinical query. Seven respondents are using other filters including, qualitative, epidemiology, adverse effects, economic evaluation, meta-analyses and paediatrics.

Institution	RCT	SR	Diag	Prog	Etiology	Therapy	EBH	Guidelines	Treatment	Other

type									outcomes	
Health libraries (41)	34	38	27	26	27	31	18	28	18	7
University (10)	9	10	7	7	6	7	7	5	2	2
Total	43 (84%)	48 (94%)	34 (67%)	33 (65%)	33 (65%)	38 (75%)	25 (49%)	33 (65%)	20 (39%)	9 (18%)

Table 4 Types of filters used

Sensitivity, precision, one-line filters

Table 5 shows the use of sensitive, precise and one-line methodological filters. With the exception of the RCT and Evidence Based Healthcare filters, more respondents used the sensitive filters than any other type. In 22 cases it is unknown which type of filter is being used.

	RCT	SR	Diag	Prog	Etiology	Therapy	EBH	Guidelines	Treatment outcomes	Other	Total
Sens	30	33	28	29	27	28	15	19	12	3	204
Prec	31	29	22	22	23	25	17	17	11	0	197
One-line	10	13	15	14	15	17	6	14	5	2	111
Unknown	2	3	2	2	2	2	3	3	3	0	22

Table 5 Use of sensitive, precise and one line filters

Databases filters used in

All respondents used filters in the MEDLINE database. Less than half respondents (21/41 (41%)) used filters in the CINAHL and EMBASE databases and only 16/41 (31%) were using them in PsychInfo.

Source of filters

Table 6 shows that the main source of filters originates from Search Skills courses, the ADEPT course in particular being mentioned on several occasions. Thirteen filters were obtained from unknown sources. Specific sources named include Cochrane, CASP and PubMed among the other sources, all of which are available on the www. One respondent reported using a filter designed by a colleague, while another used their own filter.

	RCT	SR	Diag	Prog	Etiology	Therapy	EBH	Guidelines	Treatment outcomes	Other	Total
Pub lit	16	15	8	8	9	10	6	10	8	0	90
www	16	18	13	12	11	13	11	9	4	2	109
Librarian	10	11	7	6	6	7	5	7	3	4	66
Search skills	17	19	15	15	16	18	9	14	7	0	130
Unknown	1	1	1	2	2	1	2	1	1	1	13
Other	2	2	4	3	3	3	0	1	0	2	20

Table 6: Sources of filters

Amending a filter

Asked if they would amend a filter before use, 19 (37%) respondents stated that they would never amend a filter, 30 (59%) sometimes amended a filter, while 2 (4%) always amended a filter before use.

Benefits of methodological filters

Box 2 details the perceived benefits of methodological filters.

Data

Exclude irrelevant
Filtering out articles that are not useful to you because they haven't used an appropriate study design

Include relevant
Ensures relevant papers aren't missed

More effective than MeSH

	Diagnosis/etiology/therapy more effective than MeSH subheadings alone *Applying a filter will retrieve better results than from using a subheading*
	Developed by experts
	Tested *For MEDLINE – offers a **validated** method of retrieving higher quality evidence*
	Focusing on types of information *Ensuring the search focuses specifically on the topic under consideration*
	Retrieving quality material *…ensuring the best quality of evidence is retrieved, as that evidence fitting criteria such as 'guidelines' only are retrieved*
User	
	Save time *Help you cut out a lot of the legwork associated in looking for specifics in a large database* *Ability to search difficult concepts quickly*
	Refining searches
	Structure a search *A **systematic** way of filtering a subject search*
	Source of search terms
	Manageability of results *Breaks down the number of search results into something more manageable*
	Teaching tool *Gets some students to understand more complex searches*
	Impress end users

Box 2 Benefits of methodological filters

The main perceived benefit was as a limiting tool in *excluding irrelevant* information. Conversely, filters are also reported as useful in *including relevant* material. Many also commented on the fact that filters assist in retrieving specific types of information and focus a search to retrieve only high quality studies. Two respondents felt they were a better way of searching than using other search facilities available on MEDLINE. According to one respondent the fact that filters are developed by experts is a benefit. A consequence of being developed by experts is the fact that they have been tested, a fact highlighted by just two people. Only one respondent mentioned that filters had been validated for the MEDLINE database. From a user point of view the most common benefit reported was that they saved time, not only in providing relevant search terms to conduct a search, but also in reducing the number of references to be reviewed at the end of a search. Finally, one librarian had a slightly different view of the benefits of methodological filters, and used them because they '*impress (the) reader!*'

Limitations of methodological filters

Limitations reported (see Box 3) arise from the data, user and system.

Data	
	Literature *Sometimes the literature in an area is not comprehensive enough to allow their use* *Not particularly useful for questions about the qualitative end of healthcare*
	Exclude relevant information *Like with any search tool there is always a danger of limiting out articles of relevance* *Increasing specificity reduces sensitivity*

Include irrelevant information
Sensitive filters throw up a lot of irrelevant information

Search terms in filter
They need regular updating and testing so an out of date filter is not necessarily the answer
May miss out on references that may be more relevant that haven't been indexed/filtered as a method of research (100)

Indexing
(they are) o*nly as reliable as the abstracting/indexing*

System
Some are so complex they crash the system

User (professional)
Time
Can be tedious to type in a large filter i.e. long
Take time to learn

Misuse
There may be more than one filter for a specific study eg RCT, which one do you use?
One line filters usually find different citations to sensitive filters. Sometimes I end up using both
One size does not always fit all
Balance between using higher sensitive filters and corresponding low specificity and precision is not easy

Difficulty in explaining filters to others
It's hard to describe to other people what they are doing

Perceived difficulties for end-users
Not all end users grasp the concept or have the knowledge to decide which to use
Are quite complex for the inexperienced searchers to take on
Perceived as 'difficult' many by end users
Long strings of terms which less experienced searchers find frightening

Not complete solution
Not as thorough as hand-searching
Not 100% foolproof

Box 3 Limitations of methodological filters

The most frequent limitation mentioned was that they excluded relevant material, in particular they were too precise or too specific. Conversely, others felt that some filters were too sensitive and consequently having to trawl through a large amount of irrelevant material to retrieve the few relevant citations was off-putting for users. Concerns were common over the quality and consistency of indexing that could affect the overall performance of filters. Only three respondents however, reported concerns that filters could be out-of date due to annual changes in MeSH terminology and therefore, need to be updated on a regular basis.

Another reported limitation was that they are not suitable for retrieving all types of literature. In particular they were not perceived as being useful when the literature in a particular area is not comprehensive enough, or were the methodology of studies relating to a filter is not the common form of assessment. Indeed, there is feeling among quite a few respondents that filters are not a complete solution. However, one respondent accepted that this is not unique to filters and there are limitations with all types of search tools.

Concerns over the misuse of filters were also commonly expressed relating to how, when and which filters should be used. In some instances this is due to the number of filters available for a particular study type. In others, it is due to filter design. A few respondents noted that accurate input is essential, while a considerable number raised concerns over the types of filters available (sensitive, precise, one-line). In one instance this has resulted in confusion and a lack of understanding of which type of filter to apply. Problems also arise when

librarians are attempting to explain filters to end-users. Four respondents reported difficulties when trying to explain to end users what a filter is and why they are necessary. Finally, an interesting limitation that was common among respondents is librarians' perceptions of end-users needs and abilities to understand and use filters with some librarians expressing doubts about whether end-users have the ability to cope with filters.

Increasing use of methodological filters
Comments on how best to increase the use of filters refer to system, user and data issues (see box 4).

System
- Integrated filters
  - *A "one hit" button for them in Medline would be good (as in PubMed)*
  - *Simplification where possible. Software suppliers e.g. OVID using built in filters bypassing the need to 'type in.*

User
- Increase awareness
  - *There is a lack of awareness of the availability of key filters. Sometimes difficult to locate appropriate filters as they are in different locations on the web*
  - *Unless clinicians have attended an information skills course, it would be difficult for them to discover filters on their own*
- Improve understanding
  - *Demonstration of their usefulness in eliminating the studies which do not satisfy the criteria*
  - *A web-based 'simple-to-understand' package would be of use*

Data
- Improve indexing

Box 4 Methods of increasing use of filters

Just under half of all respondents felt that integrated filters would increase the use of filters. One respondent reported that having them integrated within the system would overcome typographical errors and save time. Ways of increasing filter usage before even attempting to input a filter were also mentioned. Initially, increasing awareness of filters, especially for end-users is necessary. A number of respondents felt this could be achieved by having a centralised database of all filters on the www or by making them accessible through the regional library web pages (e.g. KA24). Understanding the concept and function of a filter would also increase usage according to a couple of respondents and ways in which this could be delivered to end-users were highlighted. Suggestions were also made that improvements to data would increase usage, in particular better agreement in terminology between the databases, and improvements to the indexing process.

Advertising methodological filters
Sixteen out of fifty-one (31%) institutions advertise methodological filters within their institution (e.g. on the internet/intranet/public display). Thirty-five (69%) out of fifty-one respondents do not advertise filters. Of the 16 that do advertise, all provide instructions on their use.

Training in methodological filters
Fifteen (29%) of respondents provide structured training (i.e. advertised classes run by your institution and not informal one-on-one instruction) in the use of methodological filters, 36 (71%) offered no training.

DISCUSSION

The results of this study indicate a reasonably high level (80%) of awareness of methodological filters among health and university librarians. However, the use of such filters

is significantly lower (36%). This study is a snapshot of the situation in 2002/3 and provides baseline data on methodological filter awareness, usage and opinions among librarians and information professionals.

Awareness of methodological filters

There were a number of issues surrounding awareness, in particular it was not possible to obtain a consistent picture of the sources for awareness of filters. Although there is a high level of awareness overall, respondents working in medical/clinical institutions were, on average, almost twice as likely to be unaware of filters (10/23, 43.5%) than those in other types of institution. This is surprising since tested filters are designed for clinical medicine (6) and one would expect more awareness in this type of institution than any other. Just under a quarter of all respondents who had access to PubMed were unaware of methodological filters despite there being a link to them on the front screen via the 'Clinical Queries' option. It may be that people are simply unaware of the fact that 'Clinical Queries' are also known as methodological filters, also referred to as hedges or optimal search strategies. Too many names assigned to one concept would indeed create confusion. It may also indicate that even advertising filters through a system interface does not guarantee that people will notice them. The www seems the ideal way of increasing awareness, but as of yet there is no single website that lists all available filters and it is noted that the majority of respondents in this study who used filters, first became aware of them through training courses on search skills.

Increasing awareness for locating filters is only part of the issue; not only is there a need for consistency in their promotion as discussed above, some important considerations relating to awareness of filter design, their implementation and effective usage can be drawn on from key observations arising from the data on use, benefits and limitations in this study.

Use of methodological filters

Reasons given for non-use of methodological filters are not directly related to the actual design of filters, with only two respondents not using them because they feel they would lose too much information. This is encouraging for those who are involved in designing and promoting filters since there appears to be no outright rejection of such search aids. Indeed, responses suggest that consideration is given to whether a filter is actually suitable for the type of query and therefore not used for the right reasons. The results show that librarians are using a variety of methodological filters, in the MEDLINE database. Above all they are using them to obtain specific types of information relating to EBP, indicating that a more structured approach to searching in order to retrieve the 'best evidence' is being carried out.

Furthermore, the benefits of filters as perceived by librarians relate back to those stated in the literature. Firstly, filters save time in constructing complex searches (11), thus overcoming one of the often cited barriers to practising EBP, that of a lack of time (30, 31). Secondly a number of respondents felt that filters were more effective than relying on MeSH alone. Overcoming inconsistencies in the indexing process is one of the reasons filters were developed in the first place (6). The study also confirms White et als (11) view that searchers are using filters to *focus searches on the best quality evidence.* While filters will retrieve the highest levels of evidence, the onus remains on the end-user to actually evaluate the research for quality and relevance (25).

Analysis of the reasons for non use and limitations reveal that an awareness of methodological filters is not enough for effective use, an understanding of the concept of a filter is also necessary. A significant number of respondents cite a lack of knowledge as a reason for non-use. Examining the results further reveals that it is both the concept of filters and the use of them that is not properly understood. Misconceptions were noted over whether a filter is an exclusion tool or inclusive tool, which could impact on the decision of whether to use a filter. It might be the case as Grant (25) argues that the term 'filter' indicates that they

are an exclusion tool when in fact they are an inclusive tool and that the term 'optimal search strategy' more accurately describes their function. Certainly, more respondents reported concerns over the exclusion of relevant information as opposed to the inclusion of too much information. Some indication that the librarians may lack knowledge on the concept could also be derived from the large number of respondents who were unable to give a clear definition of a filter.

Further analysis of the limitations expressed revealed that for many understanding not only the concept but also the usage of filters is a confusing issue. Similar reservations among qualitative researchers on the use of filters were also reported by Grant (25). Cross-referencing answers for limitations and benefits reveal that a number of respondents feel that one benefit of using filters are that they exclude irrelevant material, while at the same time they report a limitation that filters exclude relevant material. It is widely accepted that a search cannot be 100% perfect (32, 33) and it is impossible when using a filter to search for both sensitivity and precision. A number of respondents stated they had difficulty in trying to obtain a balance between using a sensitive filter and a precise filter. This is not an easy task, but in itself highlights the importance of promoting usage advice in the advertising of filters.

Clearly there is a relationship between understanding and the effective use of filters and as librarians are better informed on the concept of a filter, their effective usage may increase. Respondents in our survey noted they had difficulty in locating filters, but a real concern must be in locating filters that have been tested **and** validated. Various problems arise when using an untested filter, not least that there is no measure of how effective it is. Indeed, results published by Haynes et al (6) show that filters are more effective for certain types of clinical query than others, a comparison that can only be made through reproducing the methodology for each type of filter. It would also seem important to stress that filters have been tested as complete strategies to produce optimal Boolean combinations, and as such the question of whether a librarian should amend a filter during a search is moot. The majority of respondents (58%) in this study stated they sometimes amended a filter. The extent to which these filters are amended is of some concern: at what point do they cease to function as a methodological filter rendered to a source of terms from which one can simply pick and choose? Certainly a restriction in the development of filters is that they have only been tested for limited years and journals and thus require checking and updating. Correspondingly only a few respondents raised concerns over keeping filters up-to-date to reflect changes in terminology, however not one person mentioned the need to alter strategies to reflect back-searching as suggested in the guidance from Haynes et al (6).

Some of the comments noted on the perceived difficulties for end-users in using filters contradict the literature. While Haynes et al (6) state that filters can aid searchers who are inexperienced in constructing complicated searchers, respondents in our survey reported that inexperienced searchers found long strings of search terms *frightening* and *complex.* While the focus of this study is professionals rather than end-users, further research is warranted to see whether this is indeed the case. However it does seem to support the findings of this study that the awareness of filters alone is not sufficient and an understanding of the concept and function of a filter is also required. Improvements have been suggested based on raising the availability of filters and their ease of use on systems, yet an interpretation of the users' current perceptions and opinions provide indication of the need for the greater promotion of the concept of filters and guidance on their effective usage.

CONCLUSION

Awareness of methodological filters is fairly high among librarians, but it does not necessarily follow that there is a high level of understanding and it is apparent that the use of filters is still quite low.

Results from this survey show that there are limitations beyond those stated in the literature and so more than simple publication of filters is needed. The application of a methodological

filter is a complex process and the interpretation of the users' current perceptions and opinions indicate the need for greater clarity of the concept of filters and guidance on their effective usage.

Specific recommendations for users of filters to consider are:

- How up-to-date is the filter?
- Has the filter been tested and validated in an independent set?

Alongside this there is a requirement for:

- A website listing all tested/untested with references to published results
- Websites that advertise filters should also therefore report the results of effectiveness and when the filter was devised so the user can take into consideration new terminology that may have entered the indexing language since the filter was devised
- Clearer guidance to better inform users on which filter to use (sensitivity/precision/one-line) and how to use them
- Example of the effectiveness of filters for teaching and better promotion of filters among end-users
- Integrated filters at a local and system level

There is a potential for a considerable amount of research concerning filters to take place prompted by this study, the results of which could be used to better inform users on their use and application. If we are to embrace the opportunities that EBP presents us with then clearly an understanding of what exactly a filter is and what it is designed to do is essential for its effective use and to avoid potential misuse.

Notes

1. **The National Core Content introduced MEDLINE access through Dialog in April 2003 and hence access to MEDLINE via Dialog may have increased as a result**
2. **SilverPlatter WebSpirs and WinSpirs are now available via OVID**

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