

Searching for religion and mental health studies required health, social science, and grey literature databases

Judy M. Wright*, David J. Cottrell, Ghazala Mir

Leeds Institute of Health Sciences, University of Leeds, 101 Clarendon Road, Leeds, West Yorkshire LS2 9LJ, UK

Accepted 28 February 2014; Published online 1 May 2014

Abstract

Objective: To determine the optimal databases to search for studies of faith-sensitive interventions for treating depression.

Study Design and Setting: We examined 23 health, social science, religious, and grey literature databases searched for an evidence synthesis. Databases were prioritized by yield of (1) search results, (2) potentially relevant references identified during screening, (3) included references contained in the synthesis, and (4) included references that were available in the database. We assessed the impact of databases beyond MEDLINE, EMBASE, and PsycINFO by their ability to supply studies identifying new themes and issues. We identified pragmatic workload factors that influence database selection.

Results: PsycINFO was the best performing database within all priority lists. ArabPsyNet, CINAHL, Dissertations and Theses, EMBASE, Global Health, Health Management Information Consortium, MEDLINE, PsycINFO, and Sociological Abstracts were essential for our searches to retrieve the included references. Citation tracking activities and the personal library of one of the research teams made significant contributions of unique, relevant references. Religion studies databases (Am Theo Lib Assoc, FRANCIS) did not provide unique, relevant references.

Conclusion: Literature searches for reviews and evidence syntheses of religion and health studies should include social science, grey literature, non-Western databases, personal libraries, and citation tracking activities. © 2014 Elsevier Inc. All rights reserved.

Keywords: Bibliographic databases; Information retrieval; Religion; Depression; Literature searching; Qualitative research

1. Introduction

The religious composition of a nation's population has been reflecting changes in population migration for as long as we have records available. Migration flows to the UK currently contribute to growth in its Muslim, Hindu, and Catholic populations [1].

The UK government is increasingly recognizing the value of health care sensitive to culture and religion [2–4]. Identifying health research studies that address religion and health is therefore likely to become increasingly important, as researchers aim to develop and evaluate such interventions.

The challenges in locating studies on religion and health include identifying suitable search terms and selecting the most appropriate sources in an expanding literature.

Problems have been reported in using subject indexes to effectively retrieve ethnic health studies [5] and studies on religion and health [6]. The Internet offers greater accessibility to published and unpublished research, and the volume of published research in health and spirituality (encompassing religion) is reportedly growing [7].

It is impossible to search every potentially relevant database and Web site in existence. A manageable and appropriate set of resources must be selected for review searches [8]. Searching a variety of Web sites and databases from different database hosts (eg, Ovid, EbscoHost) has implications for time and workload. The initial search is adapted or re-written so that it can run effectively on other databases. These have different search interfaces, search functions, command symbols (eg, truncation), index terms, and reference download processes. Databases with basic search functions may limit the number of terms or combinations made per search query. Many basic searches may need to be run and reference downloads made (with more duplicates) to achieve the same overall search as a single complex search strategy run on a database with enhanced functionality.

Financial disclosure: This article presents independent research funded by the National Institute for Health Research under its Research for Patient Benefit Programme (grant reference number PB-PG-1208-18107).

* Corresponding author. Tel.: +44-(0)113-343-0876; fax: +44-(0)113-343-8496.

E-mail address: j.m.wright@leeds.ac.uk (J.M. Wright).

What is new?

- Searching 10 carefully selected health, social science, and grey literature databases plus researchers' personal libraries and checking the references of key articles was found to identify the most relevant studies of religion and mental health.
- Searching databases of religious literature was not effective in identifying unique, relevant references in this case study.
- Social science, grey literature, and non-Western health databases contain studies of mental health in Muslim communities that are not found in major Western health databases.
- Citation tracking and searching the personal libraries of individual researchers identify unique, relevant references not found in database searches.
- Database selection for multi-disciplinary reviews should consider evidence for relevant subject content from databases covering different disciplines and grey literature databases. A framework is suggested for selecting databases to search and for evaluating their effectiveness incorporating their content and workload factors.

Investigations into database selection for health systematic reviews highlight the importance of searching beyond MEDLINE [9–11], but also point to inefficiencies in searching too many databases [12–14]. It is unclear if this applies to multi-disciplinary qualitative syntheses or reviews. Searching MEDLINE and EMBASE plus subject-specific databases (eg, PsycINFO) is recommended by the NHS Centre for Reviews and Dissemination [15] and the Cochrane Collaboration [10] who also recommend searching the Cochrane Library to support systematic reviews. There is no consensus for which databases should be searched as a minimum for qualitative literature syntheses.

There is conflicting evidence for which databases are most appropriate for religion and health studies. Searches of American Theological Library Association (Am Theo Lib Assoc) appeared to yield no unique references for a Cochrane systematic review of intercessory prayer [16]. However, Am Theo Lib Assoc searches identified unique references, not found in MEDLINE and PsycINFO in a study of religion and addiction [17]. Grey literature databases are likely to be important sources of unpublished studies of religion and mental health. A systematic review of ethnic minority mental health research reported that most of its included studies were unpublished [18]. This may also be the case in literature on religion and mental

health because studies of minority populations generally focus on ethnicity rather than religious identity [19].

This study is part of a research project to develop a faith-sensitive treatment (FST) manual for depression in Muslim communities based on behavioral activation (BA) psychotherapy. We searched for and synthesized both qualitative and quantitative studies to identify BA interventions, that incorporate religion, and treatments for depression in Muslim communities. Descriptive and effectiveness data were synthesized. The search aimed to be as comprehensive as possible, given time and budget restraints and adhered to guidance for systematic reviews and qualitative synthesis [10,15]. This case study explores whether searching a wide range of databases is required to limit publication bias or whether a smaller selection of databases could achieve similar results.

Muslim communities are concentrated in non-Western countries yet the major health databases that are usually searched to identify health research are dominated by research from Western countries. The research team considered whether databases covering non-Western journals and reports for example ArabPsyNet should be searched to ensure we identify health studies related to Muslims.

We used similar methods to those for assessing database sources for systematic reviews [11,12,20,21] and health technology assessments [14] to develop a priority list of sources for studies of religion and depression. This article differs from previous work because it prioritizes databases for any study design within a specific subject area, rather than prioritizing databases for reports of a particular study design (eg, RCT). Our results can be generalized to searches for studies of religion (particularly Islam) and depression. It is more difficult to come to conclusions for searches for quantitative studies than qualitative studies because around a quarter of our included references were quantitative studies.

Findings can help guide searchers to identify key sources in this area and suggest search terms. The findings may also help in the planning and costing of search activities for evidence syntheses or reviews for health and religion studies.

2. Objectives

Our aim is to determine the optimal databases to search for studies of faith-sensitive interventions for depression. We achieve this by evaluating the database origins of references identified during the development of a faith-sensitive therapy manual (FST Manual).

2.1. Objectives

1. To identify search terms for studies relevant to depression in faith communities and Muslim communities in particular
2. To develop priority lists of databases for studies on faith-sensitive therapies for depression, with specific

attention to treating depression in Muslim communities with behavioral therapies

3. To determine whether searching a combination of MEDLINE, EMBASE, and PsycINFO would find the majority of included references
4. To identify factors to consider when selecting databases to search for religious and mental health studies
5. To determine if optimal databases for included references can be predicted by analyzing the number of references identified by each database from the search results and the potentially relevant references

3. Methods

3.1. Search term identification

During 2010, we developed sensitive search strategies to find studies that could help inform the FST manual development because our initial scoping searches for studies of BA therapy for Muslims with depression found no relevant references. These searches were designed to identify studies of behavioral therapies for depression adapted to any religion and studies about treating depression in Muslim communities. Search strategies were developed by the information specialist (JW) in collaboration with the project team and advisory group. The groups suggested English and Arabic terms to improve the sensitivity of the search for Muslim communities alongside search terms for any religion. Terms relating to the treatment of depression in a Muslim context (eg, Arabic terms for sorrow) were sought from the groups. A published behavioral activation review [22], relevant articles, and a text containing Islamic psychological terms [23] also informed the search strategy.

We also developed a geographic search filter to increase the sensitivity of the “Muslim communities” search by identifying studies conducted or written in Muslim-dominant countries. Terms for all countries with over 95% Muslim population [24] were combined with general religion terms such as “pray”, “faith”, “worship”. Bangladesh was included despite being less than 95% Muslim as Bangladeshi Muslims account for 16% of Great Britain’s Muslim community [25].

The search strategies were initially developed for MEDLINE and involved several iterations before being accepted by the project team and advisory group. We conducted very similar searches in each database to enable us to compare search results. Terms, subject headings, and search commands were carefully translated to the other databases to ensure as close a match to the original search as possible. Specific search concepts were omitted where that concept was already explicit in the coverage of a database for example the “religions” search concept was not used when searching the religion database Am Theo Lib Assoc. The MEDLINE search strategies in (Appendices A and B at www.jclinepi.com) illustrate typical strategies. Full search strategies from all databases can be accessed from the author on request.

3.2. Priority list development

We selected 23 databases (18 plus 5 within The Cochrane Library) to search for published and unpublished studies of religion and depression (Table 1). The Information Specialist selected health (Western and non-Western based), religious, social science, and grey literature databases with the aim of reducing publication biases to find a representative evidence base. We did not search Internet search engines for example Google because a broad selection of grey and published literature databases were searched. References from databases were imported into EndNote either using direct export facilities or using tagged text files. Where export facilities did not exist, we manually generated tagged text files to enable them to be imported into EndNote. We created a “master” EndNote library containing all the references found before duplicates had been removed. Each reference was indexed with its database of origin to allow analysis of database overlap and yield (number of references found). Ovid MEDLINE and Ovid MEDLINE In-Process & Other Non-Indexed Citations were searched individually but we combined their results to indicate the yield that could be achieved by PubMed (the freely available and widely used version of MEDLINE), which has a similar coverage to these databases combined [26]. The combined Ovid MEDLINE results will be relevant both to PubMed and Ovid MEDLINE users.

References found from checking bibliographies of key articles and the personal library were added to the EndNote library, labeled as “personal library” references and used to evaluate the importance of discovering references through alternative methods to the electronic search.

The titles and abstracts of all references were screened by the reviewer for eligibility, and a 10% sample was double checked by a second reviewer. Themes from selected articles were categorized for the qualitative synthesis before incorporation in the FST Manual. By tracking the references selected for full text assessment, we identified which databases yielded most potentially relevant references to faith-sensitive behavioral therapies for depression. Once the FST Manual had been completed in 2012, we tracked the database sources of references and created four database priority lists based on:

1. how many references each database supplied to our search results
2. how many references each database supplied to the set of potentially relevant references for the FST manual
3. how many included references each database supplied to the FST manual and
4. how many of the included references were present in each database (though they may not have been picked up by our search)

Lists 1 to 3 correspond to different stages within the synthesis process; list 4 indicates which databases contained

Table 1. Characteristics of databases searched

Database short name	Database	Host (search interface)	Subject specialty
ArabPsyNet	ArabPsyNet English edition	Arab Psychological Sciences Network	Health/Non-Western
ASSIA	Applied Social Sciences Index and Abstracts 1987–current	Cambridge Scientific Abstracts	Social science
Am Theo Lib Assoc	American Theological Library Association (ATLA) Religion database 1949–present	EBSCOhost	Religion
CINAHL	Cumulative Index to Nursing & Allied Health (CINAHL) 1981–present	EBSCOhost	Health
Cochrane Db Sys Revs	Cochrane Database of Systematic Reviews 2010	Wiley InterScience	Health
CENTRAL	Cochrane Register of Controlled Trials 2010 issue 2	Wiley InterScience	Health/grey literature
Conf Papers Index	Conferences Papers Index 1982–current	Cambridge Scientific Abstracts	Grey literature
Db Abs Revs Effects	Database of Abstracts of Reviews of Effects 2010	Wiley InterScience	Health
Diss & Theses	ProQuest Dissertations and Theses database	ProQuest Databases	Grey literature
EMBASE	Embase Classic + Embase 1947–2010 April 26	OvidSp	Health
FRANCIS	FRANCIS 1984–present	OCLC First Search	Religion/Social science
Global Health	Global Health 1973–March 2010	OvidSp	Health/Non-Western
Health Mgt Inf Cons	Health Management Information Consortium 1983–present	OvidSp	Grey literature
Health Tech Assess	Health Technology Assessment database	Wiley InterScience	Health
Index Islam	Index Islamicus 1906–current	Cambridge Scientific Abstracts	Religion
MEDLINE	Ovid MEDLINE(R) 1950–April Week 2 2010	OvidSp	Health
MEDLINE In-Process	Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations April 27, 2010	OvidSp	Health
NHSEED	NHS Economic Evaluation Database 2010 issue 2	Wiley InterScience	Health
OpenSIGLE	OpenSIGLE System for Information on Grey Literature in Europe	GreyNet International	Grey literature
PakMediNet	Pakistani Medical Journals and Drugs database	PakCyber	Health/Non-Western
PsycINFO	PsycINFO 1806–April Week 2 2010	OvidSp	Health
Soc Serv Abs	Social Services Abstracts 1979–present	Cambridge Scientific Abstracts	Social science
Soc Abs	Sociological Abstracts 1952–present	Cambridge Scientific Abstracts	Social science

the most included references, regardless of whether our searches had picked them up.

We identified the minimum set of “essential” databases that had to be searched to identify our included references. Each “essential” database contained some unique, relevant references not found in the other databases. The “non-essential” databases only provided irrelevant references or duplicates to those found in the essential databases and were effectively redundant to our search.

3.3. Evaluating MEDLINE, EMBASE, and PsycINFO combined search results

Because MEDLINE, EMBASE, and PsycINFO could be considered to be the bare minimum set of databases expected to be searched for any review of depression therapies (following systematic review search guidance [10,15]), we calculated the proportion of total references they identified for each of our priority lists. The reviewer (GM) rated the impact of included references found in the less familiar databases (not MEDLINE, EMBASE, and PsycINFO) that may incur a higher workload for the information specialist and reviewer. The impact of a reference was rated by whether it gave a unique contribution to identifying issues, which informed the development of the FST manual. This helps indicate whether searching beyond the “bare minimum” databases is worthwhile in identifying references that improve the quality of the FST Manual.

3.4. Identifying factors to consider when selecting databases

We looked at the impact on workload and the expertise required in searching, managing, and screening references from different databases. We noted whether each database had a common host (search interface) for example, Ovid. We logged where time required to download references was prohibitive, where a database did not provide download facilities, or where download formats were incompatible with reference management software.

To measure the difference in time required to screen references found from the essential databases compared with the 23 selected databases, we calculated the Number Needed to Read (NNR). The NNR is the number of titles and abstracts that are screened to identify one relevant reference [20].

3.5. Predicting optimal databases for potentially relevant and included studies

Priority lists 1, 2, and 3 were compared to identify which databases were most likely to include the highest yields of (1) references in the search results, (2) potentially relevant references, and (3) included references. The position of databases within each priority list was compared to identify any similarities between the lists and evaluate whether priority order of the search results list could predict which databases are likely to be of the highest priority in the other two lists.

4. Results

The PRISMA flow diagram (Fig. 1) illustrates the number of references identified via searches (3,499) and the personal library (41), the number of full text articles assessed for eligibility (319), and the number of references included in the FST Manual (96). In line with usual qualitative synthesis practice, some references were not selected or included despite being relevant, as they did not add further information to the issues and themes already identified [8]. The database sources of these references that were not included in the synthesis have not been analyzed.

4.1. Search terms

The project advisory group and research team identified 30 terms pertaining to Muslims or low mood in Muslims:

Islam, islamic, quran*, koranic*, koran, muslim*, moslem*, moslim*, muslem*, mosque*, nafs*, shuhud*, dhikr*, zikr, fitrah, qalb, islamization, ghummah, ruh, imam, tibt, sabr, fiqh, jinn, iman, mosque, “baha i”, “al Ghazali”, “al Kindi”, “ibn Sina”.

These are incorporated within search lines 1 to 28 of the Muslim Depression search strategy (Appendix B at www.jclinepi.com). The geographic search filter for Muslim-dominant countries is presented in (Appendix B at www.jclinepi.com).

4.2. Priority lists

The searches retrieved references from all databases except the NHSEED and Health Tech Assess database. The four database priority lists shown in Table 2 rank how

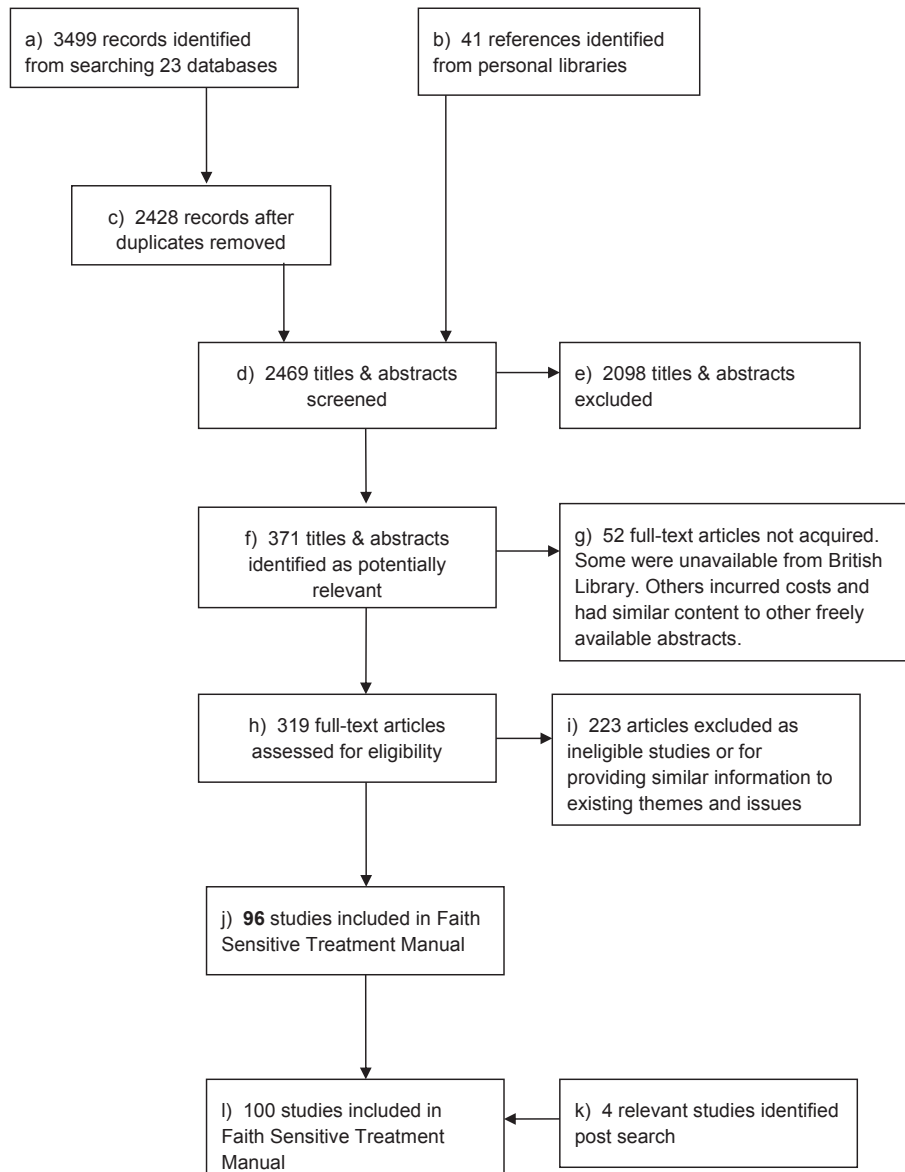


Fig. 1. PRISMA flow diagram.

Table 2. Databases priority lists

Database	List 1		List 2		List 3		List 4	
	% Of the 2,469 search results found by each database search	Rank	% Of the 371 selected references found by each database search	Rank	% Of the 96 FST manual included references found by each database search	Rank	% Of the 96 FST manual included references available in each database	Rank
PsycINFO	36.2	1	48.8	1	44.8	1	65.6	1
EMBASE	24.7	3	25.1	2	20.8	2	37.5	2
MEDLINE & MEDLINE In-Process	26.9	2	18.9	3	19.8	3	31.3	3
Personal Libraries	1.7	14	8.9	5	21.9	4	21.9	4
CINAHL	9.5	4	8.4	7	9.4	5	18.8	5
FRANCIS	6.6	6	9.7	4	6.3	6	18.8	6
ASSIA	5.6	7	8.4	6	5.2	8	13.5	7
Diss & Theses	6.6	5	6.5	8	4.2	11	11.5	8
Am Theo Lib Assoc	5.3	8	2.4	12	2.1	13	8.3	9
CENTRAL	1.8	12	1.1	16	4.2	10	6.3	10
Global Health	3.4	11	4.3	11	5.2	9	6.3	11
Soc Abs	4.9	10	4.6	10	4.2	12	6.3	12
ArabPsyNet	1.5	15	4.9	9	5.2	7	5.2	13
Health Mgt Inf Cons	0.5	18	0.8	17	1	15	5.2	14
Soc Serv Abs	0.4	19	1.9	14	1	17	5.2	15
Index Islam	1.8	13	2.2	13	2.1	14	4.2	16
Db Abs Revs Effects	0.1	21	0	21	0	20	1	17
PakMediNet	0.6	16	0.5	19	1	16	1	18
Cochrane Db Sys Revs	0.1	20	0	20	0	18	0	19
Conf Papers Index	0.5	17	1.6	15	0	19	0	20
Health Tech Assess	0	22	0	22	0	21	0	21
NHSEED	0	23	0	23	0	22	0	22
OpenSIGLE	5.7	7	0.8	18	0	23	0	23

Databases are ranked by order of % of references found.

strongly each database contributed to the references identified and selected at different stages of the synthesis process. PsycINFO searches made the largest contribution to the search results references (36.2%), the potentially relevant references (48.8%), and the included references (44.8%).

We found 1,071 duplicate references across the databases. We identified five “redundant” databases which did not retrieve any of the included references plus a further nine redundant databases which only retrieved duplicates of included references. The nine “essential” databases required for our searches to retrieve the FST manual included references were ArabPsyNet, CINAHL, Diss & Theses, EMBASE, Global Health, Health Mgt Inf Cons, MEDLINE, PsycINFO, and Soc Abs. The personal library references were also essential, providing unique, relevant references.

Our searches identified a significant proportion of the included references that were available in each database. Searching a range of databases appeared to increase the chance of identifying relevant references. Sometimes our searches failed to find a relevant reference that actually existed in a database (eg, MEDLINE) but they picked up the relevant reference in a different database (eg, CINAHL). Some relevant references were missed because (1) we did not maximize the sensitivity of our search terms, (2) we did not search for “background” statistical and policy

articles, and (3) some databases may have spelling and indexing errors which prevent identifying some studies. When identifying which databases contained included references missed in our searches (list 4) we discovered a slightly different set of 10 “essential” databases were required together with the personal library: ArabPsyNet, Am Theo Lib Assoc, CINAHL, Diss & Theses, EMBASE, Global Health, Health Mgt Inf Cons, Index Islam, PsycINFO, and Soc Abs. If “perfect” searches were run on these 10 databases that retrieved all the included references, a search of MEDLINE would not be necessary.

Across the four priority lists, FRANCIS provided more relevant references than the other religious databases, ASSIA performed better than other social science databases, and Diss & Theses was the best performing grey literature database. A considerable proportion of our grey literature references were found in OpenSIGLE but very few were potentially relevant, and none were included. The highest-ranking “Western-focused” health databases were PsycINFO, EMBASE, MEDLINE, and CINAHL. ArabPsyNet and Global Health performed better than PakMediNet as health databases with a non-Western geographic coverage. The Cochrane Library databases provided few relevant references but this was unsurprising because there is currently a lack of intervention studies in this field [27].

Table 3. Workload factors to consider when selecting databases to search

Database	Unique included references identified by our search?	Familiar search interface? (Ovid, EBSCOhost, CSA, Wiley)	Proximity search function available?	Able to enter complex search strings	Records download into EndNote and require no further editing
ArabPsyNet	Yes	No (APSN)	No	No	No
ASSIA	No	Yes	Yes	Yes	Yes
Am Theo Lib Assoc	No	Yes	Yes	Yes	Yes
CINAHL	Yes	Yes	Yes	Yes	Yes
Cochrane Db Sys Revs	No	Yes	Yes	Yes	Yes
CENTRAL	No	Yes	Yes	Yes	Yes
Conf Papers Index	No	Yes	Yes	Yes	Yes
Db Abs Revs Effects	No	Yes	Yes	Yes	Yes
Diss & Theses	Yes	No (ProQuest)	Yes	Yes	Yes
EMBASE	Yes	Yes	Yes	Yes	Yes
FRANCIS	No	No (OCLC first search)	Yes	Yes	No
Global Health	Yes	Yes	Yes	Yes	Yes
Health Mgt Inf Cons	Yes	Yes	Yes	Yes	Yes
Health Tech Assess	No	Yes	Yes	Yes	Yes
II	No	Yes	Yes	Yes	Yes
MEDLINE	Yes	Yes	Yes	Yes	Yes
MEDLINE In-Process	Yes	Yes	Yes	Yes	Yes
NHSEED		Yes	Yes	Yes	Yes
OpenSIGLE	No	No (GreyNet International)	No	No	No
PakMediNet	No	No (PakCyber)	No	No	No
PsycINFO	Yes	Yes	Yes	Yes	Yes
Soc Serv Abs	No	Yes	Yes	Yes	Yes
Soc Abs	Yes	Yes	Yes	Yes	Yes

4.3. Combined MEDLINE, EMBASE, and PsycINFO search results

Taking duplication into account, a combination of search results from MEDLINE, MEDLINE In-Process, EMBASE, and PsycINFO produced 64.4% of the 2,469 references in the searches. References found from these databases comprised 57.3% of the final 96 FST manual references. Only 75% of the FST manual references are available in MEDLINE, EMBASE, and PsycINFO indicating that they cannot provide all relevant studies on faith-sensitive therapies for depression.

The FST manual references that were identified in databases other than the bare minimum (MEDLINE, EMBASE, and PsycINFO) were assessed for whether they were unique in reporting an issue, or whether several references reported the same issue. The personal library contained five references that each reported a relevant issue not described in any other study found during the search. ArabPsyNet provided references on four unique issues, Am Theo Lib Assoc and Index Islamicus provided references on two unique issues, whereas Soc Abs provided a reference on one unique issue. Health Mgt Inf Cons was the only supplier of policy document references.

4.4. Factors to consider when selecting databases

We identified the following factors as impacting on the workload of the Information Specialist and/or Reviewer: number of databases searched, familiarity with search interface, availability of proximity search functions, ability to

process complex search strings, ease of downloading references into EndNote, and ease of obtaining full text documents. The NNR for our searches across 23 databases and personal library was 25.7 (2,469/96). Had we conducted the same searches across the personal library and nine “essential” databases we identified, the NNR would have been 21.1 (2,026/96). Overall, the reviewer would have had to screen 443 fewer references saving approximately 15 hours of time.

Selecting fewer databases would have also saved time spent translating the search strategies and downloading references. Table 3 illustrates those databases where searching and downloading are likely to take more time. Searches were relatively quick to translate for databases that share a database host. The MEDLINE search strategy for retrieving words from titles and abstracts was re-run in other Ovid databases (EMBASE, Health Mgt Inf Cons, Global Health, MEDLINE In-Process, and PsycINFO) without further editing. Appropriate subject headings had to be identified for every database, as almost all have a unique subject heading index. Databases demanding most time and effort in achieving a search similar to the MEDLINE search were ArabPsyNet, Diss & Theses, FRANCIS, OpenSIGLE, and PakMediNet. Time and effort could have been saved by not searching and managing references from FRANCIS, OpenSIGLE, and PakMediNet.

In Fig. 1, box g illustrates the number of documents we were unable to obtain. Dissertations took considerably longer to acquire than other document requests. Because the project did not have the funds to acquire all potentially relevant dissertations and the reviewer did not have time to

read them, a targeted selection was made of key dissertations that appeared to address unique issues.

4.5. Determining if ranking databases at earlier stages is useful

Most databases maintained a similar ranking in priority whether we analyzed the databases for search results, potentially relevant references, or included references. In each priority list, the same five databases (PsycINFO, EMBASE, MEDLINE & MEDLINE In-Process, CINAHL, and FRANCIS) appeared within the top six rankings. NHSEED, Cochrane Db Sys Revs, PakMediNet, and Db Abs Revs Effects were always in the bottom six ranking. The main anomalies were OpenSIGLE, which contributed significantly to the search results, yet none were included. Conversely, ArabPsyNet and the Personal Library contributed relatively few search results, but most of their search results became included references. This indicates that a searcher should persist with specialist databases and personal libraries because they are likely to have high subject coverage although they may perform poorly in term of initial number of search results. However, the same is not true for more general databases, which could be removed from the final search strategy with a low risk of missing relevant references. Large databases with challenging search and download functions (eg, OpenSIGLE) should be assessed carefully first for potentially relevant studies before committing to undertaking a systematic search.

5. Conclusion

The need to search beyond the three “bare minimum” databases for studies of religion and depression is clearly demonstrated in our findings. MEDLINE, EMBASE, and PsycINFO contained 75% of the known relevant references in our study. Searches of social science and grey literature databases plus personal libraries and citation tracking ensured further relevant references were located. Grey literature is an important resource of Muslim mental health qualitative studies. A relatively high number of dissertations and theses were identified as potentially relevant and included in the FST manual. Unique mental health studies were found in some non-health databases (Am Theo Lib Assoc, Index Islam, Diss & Theses, Soc Abs), underlining the importance of searching beyond the immediate health literature for health studies which cross over other disciplines such as religion. Searches for studies on health in Muslim communities should include some developing country-based health databases. ArabPsyNet and Global Health provided a relatively small number of references but included some valuable unique references. Failing to search at least some social science and grey literature databases alongside the health databases would miss relevant references and may identify an unrepresentative set of studies.

Identifying and using literature from one’s own personal research library in addition to systematic searches is likely to happen in many reviews but is rarely described in the reviewer’s search methods. Where personal libraries are used and contribute to a review they should be reported in the search methods for transparency. References identified in project team members’ personal libraries and through citation tracking accounted for 21.9% of the included references in this case study. Some were policy documents, used to ground the findings in the broader health service context. Searches of policy databases (eg, HMIC) did not produce evidence relevant to faith-sensitive interventions for depression, this is likely to be because policy documents often addresses the needs of minority faith groups within the conceptual framework of ethnicity and cultural competence rather than religion [19]. It is unclear from the published literature if this proportion of personal library studies is typical of searches for qualitative syntheses, evidence syntheses, or indeed systematic reviews. This study implies that searching personal libraries and citation tracking search methods are essential for this topic. The reviewer provided articles from their personal library to aid the search strategy development and to identify sources. During the stages of theme identification and synthesis, the reviewer identified further relevant reports from their personal library, which contributed to the synthesis. Clear reporting of the sources of included references should allow evaluation of the search methods used to gather relevant evidence and indicate the role of “personal libraries” in syntheses. Included references from the personal library could be analyzed to identify how they could be retrieved in electronic searches. This presents an opportunity to develop knowledge by reflecting on which sources and terms should be used if the synthesis were to be repeated.

Searching a range of databases helped to overcome search barriers such as inconsistent indexing and limited search functions. However, searching more than 10 carefully selected databases proved unnecessary to uncover further unique relevant references in this case study. The searcher can feel more confident in excluding certain databases where there is evidence that they are unlikely to contain relevant references. Currently, intervention studies are uncommon in the field of religion and depression, and our findings suggest that Cochrane Db Sys Revs, Conf Papers Index, Health Tech Assess, and NHSEED would have the lowest priority when selecting databases to search. Searching CINAHL, Diss & Theses, Global Health, Health Mgt Inf Cons, Soc Abs, and adding any relevant specialist database (in our case, ArabPsyNet) would increase the number of unique studies on religion and depression.

Our findings can be generalized to inform future literature searches for other religions. Our final output (FST manual) was a therapy for Muslim service users but the literature search and reference selection incorporated evidence relating to a broad spread of religious groups (Appendix A at www.jclinepi.com). Literature searches

for religions other than Islam would need to adapt our searches by adding specific terms relevant to the religion in question and removing the Islam-specific terms listed in our searches. All our searches included a depression concept, giving strong evidence about prioritizing databases for studies of depression. Because the literature searches and evidence synthesis were not limited to a particular study design, for example qualitative studies or trials, our results can be generalized to literature searches for quantitative, qualitative, and mixed methods reviews of depression and religion.

Our findings indicate that searching grey literature, personal libraries, and reference lists of included references is more important for evidence syntheses than for systematic reviews of trials. Reports of trials are more likely to appear in journal publications as they are often larger and more expensive than qualitative studies. Searching specialist health databases and non-health databases in addition to MEDLINE, EMBASE, and PsycINFO is also essential to identify unique studies for multi-disciplinary reviews.

Prioritizing databases solely on their yield is problematic. A poor quality search may mislead with a very high or low yield. Even with a good quality search, selecting only high yielding databases risks excluding low yielding databases that contain high impact unique and relevant references. Consideration of the database's subject and journal coverage can help identify if it is likely to have relevant unique studies despite a low yield. There is published research on database coverage of psychiatry journals [28], but the searcher needs a good knowledge of journals relevant to the search topic to recognize a valuable resource.

A method for measuring the impact of a reference is needed to rate a database for its yield of relevant references plus their relative impact. When evaluating quantitative systematic searches, the value of a database can be determined by removing the trials found uniquely in that database from the meta-analysis to see if the meta-analysis outcome is altered [9]. This gives a quantitative measure of the impact of having found those trials from that database. We adopted an alternative approach because our studies were synthesized rather than subject to meta-analysis. The value of the database was determined by how many unique references it produced that identified new themes or added detail to the evidence synthesis. In this study, ArabPsyNet had a low yield yet had high impact references identifying additional data for the synthesis. A future challenge is to develop robust methods of assessing the relative impact of individual references in a qualitative synthesis or review. This could include levels of impact and test whether failing to search certain databases would have a detrimental effect on the outcomes of the synthesis.

Alongside the number and impact of relevant references found in databases, practical workload factors should be considered when selecting databases. Some databases may be excluded or given a lower priority if they are likely to take a long time to search. Databases with unfamiliar search

interfaces, limited search functions, and lack of effective reference download facilities are most likely to be dropped for pragmatic reasons. Alternatively, if the number of hits is limited, then the reviewer can browse the sets of results. However, care is required in documenting such searches and the results found. Databases may also be excluded, if they are considered to identify reports that are difficult and costly to obtain in full text (eg, overseas dissertations). The searcher may select a limited number of databases to ensure the number of references found can be screened by reviewers in the time available. These practical approaches are understandable, although, reviewers should be aware of introducing publication bias to their results. With hindsight, our study could have avoided searching 14 databases, saving considerable time in searching, downloading and screening references and without missing relevant references. However, the time taken to develop skills in searching and manually creating records from ArabPsyNet was worthwhile. It is important at the planning stage for searchers to test and evaluate how likely databases are to have unique relevant references, and whether they are practical to include in the overall search.

The database rankings in the priority lists were similar for each list, indicating that literature search results can indicate which databases are most likely to have the most relevant references. However, it is not a completely reliable method of predicting which databases will have the most relevant results. Our study showed notable exceptions in OpenSIGLE, Diss & Theses, and the personal library. It would be more useful to the searcher to see a comparison of priority databases determined by scoping searches (a few key phrases) compared with the included references priority list. This would help answer the question of whether commonly used scoping searches accurately predict which databases are most likely to have relevant references.

Published evidence and database guides should also inform the database selection. Qualitative syntheses and reviews that use staged approaches to searching for emerging themes can benefit from identifying a list of core and potential databases at an early stage. As the synthesis or review develops and themes emerge, the searcher can choose resources from their list of potential databases to search each theme systematically and iteratively.

This study could have been improved by including more widely used and readily available databases such as Web of Science databases, Scopus, SCIE, and Google Scholar. This would make the priority lists more comprehensive and give a better indication of the best freely available resources. This would have only been possible with further time allocated for searching, downloading, and screening records. Future database comparison studies should consider including freely available or well-used databases alongside less-known topic-specific databases.

Taking into account the “ignored” references that were relevant but not counted as they did not add anything new to the synthesis could lead to a lower yield of references

deemed “relevant” and a lower ranking in the priority lists of potentially relevant references and included references. Decisions about which studies to include and exclude in relation to a particular qualitative theme could be arbitrary, making it difficult to identify which databases contain the highest yield of relevant references. Future studies should consider counting all relevant references for all themes even if their content is ignored in the final synthesis.

Our study did not have the capacity to test the Muslim search terms and the geographic search filter for quality using a peer-review checklist, but the search terms were validated by advisory group members. A different searcher would develop a different search resulting in higher or lower yields, but we expect a similar pattern to emerge in terms of the priority lists of databases. We are confident that our search terms and strategies were sensitive enough to identify most studies because there is a close match between the database locations of included references found from our searches (list 3) and actual location of all the included references (list 4). Future work could test the precision of our search filter in identifying known relevant references from other reviews of studies on Muslim communities.

A robust system of scoring databases would support helpful comparisons, based on their yield of relevant references and NNR, the relative value of the included references plus the search workload factors; interface familiarity (common database host), search functions, indexing, reference download functions, and cost of full text acquisition.

Acknowledgments

The views expressed are those of the authors and not necessarily those of the NHS, the NIHR, or the Department of Health. The authors are grateful to Allan House and Dean McMillan who contributed to the research methods and design of the study to which this article relates. AH made comments on the study design and the final manuscript of the article.

Appendix

Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.jclinepi.2014.02.017>.

References

- [1] Office for National Statistics. Migration Statistics Quarterly Report, November 2011 [Internet]. 2011. Available at http://www.ons.gov.uk/ons/dcp171778_242548.pdf. Accessed November 27, 2012.
- [2] Department of Health. National service framework for mental health: modern standards and service models [Internet]. London, UK: Department of Health; 1999:149. Available at http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4009598. Accessed November 27, 2012.
- [3] Department of Health. Delivering race equality in mental health care: an action plan for reform inside and outside services and the Government's response to the independent inquiry into the death of David Bennett [Internet]. London, UK: Department of Health; 2005:92. Available at http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4100773. Accessed November 27, 2012.
- [4] National Institute of Health and Clinical Excellence. Depression: the treatment and management of depression in adults (NICE clinical guideline 90). London, UK: NICE; 2009:64.
- [5] Efthimiadis EN, Afifi M. Population groups: indexing, coverage, and retrieval effectiveness of ethnically related health care issues in health sciences databases. *Bull Med Libr Assoc* 1996;84(3):386–96. Available at <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=226159&tool=pmcentrez&rendertype=abstract>.
- [6] Lukoff D, Provenzano R, Lu F, Turner R. Religious and spiritual case reports on MEDLINE: a systematic analysis of records from 1980 to 1996. *Altern Ther Health Med* 1999;5(1):64–70.
- [7] O'Connor TSJ, McCarroll-Butler P, Meakes E, Davis A, Jadad A. Review of quantity and types of spirituality research in three health care databases (1962-1999): implications for the health care ministry. *J Pastoral Care Counsel* 2002;56(3):227–32.
- [8] Brunton G, Stansfield C, Thomas J. Finding relevant studies. In: Gough D, Oliver S, Thomas J, editors. *An introduction to systematic reviews*. 1st ed. London, UK: Sage Publications Ltd; 2012:107–34.
- [9] Egger M, Juni P, Bartlett C, Hohenstein F, Sterne J. How important are comprehensive literature searches and the assessment of trial quality in systematic reviews? Empirical study. *Health Technol Assess* 2003; 7:1–76.
- [10] Lefebvre C, Manheimer E, Glanville J. Searching for studies. Version 5. In: Higgins J, Green S, editors. *Cochrane handbook for systematic reviews of interventions* [Internet]. The Cochrane Collaboration; 2011. Available at <http://handbook.cochrane.org/>.
- [11] Stevinson C, Lawlor DA. Searching multiple databases for systematic reviews: added value or diminishing returns? *Complement Ther Med* 2004;12(4):228–32.
- [12] Royle P, Milne R. Literature searching for randomized controlled trials used in Cochrane reviews: rapid versus exhaustive searches. *Int J Technol Assess Health Care* 2003;19(4):591–603.
- [13] Glanville J, Paisley S. Identifying economic evaluations for health technology assessment. *Int J Technol Assess Health Care* 2010; 26(4):436–40.
- [14] Royle P, Waugh N. Literature searching for clinical and cost-effectiveness studies used in health technology assessment reports carried out for the National Institute for Clinical Excellence appraisal system. *Health Technol Assess* 2003;7:iii. ix–x, 1–51.
- [15] Centre for Reviews and Dissemination. Systematic reviews: CRD's guidance for undertaking reviews in healthcare [Internet]. York, UK: Centre for Reviews & Dissemination; 2011:281. Available at http://www.york.ac.uk/inst/crd/pdf/Systematic_Reviews.pdf. Accessed December 7, 2012.
- [16] Roberts L, Ahmed I, Hall S. Intercessory prayer for the alleviation of ill health. *Cochrane Database Syst Rev* 2007;(1):CD000368.
- [17] Geppert C, Bogenschutz MP, Miller WR. Development of a bibliography on religion, spirituality and addictions. *Drug Alcohol Rev* 2007;26(4):389–95.
- [18] Moffat J, Sass B, McKenzie K, Bhui K. Improving pathways into mental health care for black and ethnic minority groups: a systematic review of the grey literature. *Int Rev Psychiatry* 2009;21:439–49.
- [19] Mir G, Sheikh A. 'Fasting and prayer don't concern the doctors... they don't even know what it is': communication, decision-making and perceived social relations of Pakistani Muslim patients with long-term illnesses. *Ethn Health* 2010;15(4):327–42.
- [20] Whiting P, Westwood M, Burke M, Sterne J, Glanville J. Systematic reviews of test accuracy should search a range of databases to identify primary studies. *J Clin Epidemiol* 2008;61:357–64. Available at <http://www.ncbi.nlm.nih.gov/pubmed/18313560>. Accessed November 26, 2012.
- [21] Beyer FR, Wright K. Can we prioritise which databases to search? A case study using a systematic review of frozen shoulder management.

- Health Info Libr J 2013;30:49–58. Available at <http://www.ncbi.nlm.nih.gov/pubmed/23413793>. Accessed March 8, 2013.
- [22] Ekers D, Richards D, Gilbody S. A meta-analysis of randomized trials of behavioural treatment of depression. *Psychol Med* 2008;38(5): 611–23.
- [23] Badri M. *Contemplation: an Islamic psychospiritual study*. Herndon, VA: International Institute of Islamic Thought; 2007.
- [24] Pew Forum on Religion & Public Life. *Mapping the global Muslim population*. Washington, DC: Pew Research Center; 2009:59.
- [25] Dobbs J, Green H, Zealey L. *Ethnicity and religion 2006 edition*. Norwich, UK: Office for National Statistics; 2006:165.
- [26] Wolters Kluwer Health. Articles cited in PubMed but not in Ovid's Medline [Internet]. Accessed December 10, 2012. Welcome to the Ovid Support Center; 2006:Available at [http://ovidsupport.custhelp.com/app/answers/detail/a_id/2141/~articles-cited-in-pubmed-but-not-in-ovid-s-medline](http://ovidsupport.custhelp.com/app/answers/detail/a_id/2141/~/articles-cited-in-pubmed-but-not-in-ovid-s-medline).
- [27] Walpole SC, McMillan D, House A, Cottrell D, Mir G. Interventions for treating depression in Muslim patients: a systematic review. Elsevier. *J Affect Disord* 2013;145(1):11–20.
- [28] McDonald S, Taylor L, Adams C. Searching the right database. A comparison of four databases for psychiatry journals. *Health Libr Rev* 1999;16(3):151–6.