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

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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 prioritised by yield of (1) Search Results, (2) Potentially Relevant References identified during screening, (3) Included References contained in the synthesis (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 & 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 team 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.

Keywords: Bibliographic Databases, Information Retrieval, Religion, Depression, Literature Searching, Qualitative Research

What is new?

1. Searching 10 carefully selected health, social science and grey literature databases plus researchers' personal libraries and checking the references of key papers was found to identify the most relevant studies of religion and mental health.

2. Searching databases of religious literature was not effective in identifying unique relevant references in this case study.

3. 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.

4. Citation tracking and searching the personal libraries of individual researchers identifies unique relevant references not found in database searches.

5. Database selection for multidisciplinary 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.

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 recognising 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 website in existence. A manageable and appropriate set of resources must be selected for review searches (8). Searching a variety of websites and databases from different database hosts (e.g. Ovid, EbscoHost) has implications for time and workload. The initial search is adapted or re-written so it can run effectively on other databases. These have different search interfaces, search functions, command symbols (e.g. 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.

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 (e.g. 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 Am Theo Lib Assoc (American Theological Library Association) 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 since 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 Behavioural Activation (BA) psychotherapy. We searched for and synthesised both qualitative and quantitative studies to identify BA interventions that incorporate religion, and treatments for depression in Muslim communities. Descriptive and effectiveness data were synthesised. 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 e.g. 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 paper differs from previous work because it prioritises databases for any study design within a specific subject area, rather than prioritising databases for reports of a particular study design (e.g. RCT). Our results can be generalised 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 since 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.

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).

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 behavioural 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 analysing the number of references identified by each database from the Search Results and the Potentially Relevant References

Methods

1. Search term identification

During 2010 we developed sensitive search strategies to find studies that could help inform the FST manual development since 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 behavioural 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 (e.g. Arabic terms for sorrow) were sought from the groups. A published behavioural activation review (22), relevant papers 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 web appendices 1 and 2 illustrate typical strategies. Full search strategies from all databases can be accessed from the author on request.

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 (see 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 since 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 the records 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 papers and the personal library were added to the EndNote library, labelled 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 papers were categorised 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 behavioural therapies for depression. Once the FST Manual had been completed in 2012 we tracked the database sources of references and created 4 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 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. Evaluating MEDLINE, EMBASE & PsycINFO combined search results

Since 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.

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) e.g. 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).

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 (i) references in the Search Results, (ii) Potentially Relevant References (iii) Included References. The position of databases within each priority list were 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 highest priority in the other two lists.

Results

The PRISMA flow diagram (figure 1) illustrates the number of references identified via searches (3499) and the personal library (41), the number of full text papers 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 (26). The database sources of these references that were not included in the synthesis have not been analysed.

1. *Search terms*

The project advisory group and research team identified 30 terms pertaining to Muslims or low mood in Muslims (figure 2). These are incorporated within search lines 1 to 28 of the Muslim Depression search strategy (web appendix 2). The geographic search filter for Muslim-dominant countries is presented in web appendix 2.

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 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 1071 duplicate references across the databases. We identified 5 'redundant' databases of which did not retrieve any of the Included References plus a further 9 redundant databases which only retrieved duplicates of Included References. The 9 '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 (e.g. MEDLINE) but they picked up the relevant reference in a different database (e.g. CINAHL). Some relevant references were missed because; i) we did not maximize the sensitivity of our search terms, ii) we did not search for 'background' statistical and policy papers and iii) 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 4 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 since there is currently a lack of interventions studies in this field (27).

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 2469 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 5 references that each reported a relevant issue not described in any other study found during the search. ArabPsyNet provided references on 4 unique issues, Am Theo Lib Assoc and Index Islamicus provided references on 2 unique issues while Soc Abs provided a reference on 1 unique issue. Health Mgt Inf Cons was the only supplier of policy document references.

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 (2469/96). Had we conducted the same searches across the personal library and 9 'essential' databases we identified, the NNR would have been 21.1 (2026/96). 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.

Figure 1 box g illustrates the number of documents we were unable to obtain. Dissertations took considerably longer to acquire than other document requests. Since 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.

5. *Determining if ranking databases at earlier stages is useful*

Most databases maintained a similar ranking in priority whether we analysed the databases for Search Results, Potentially Relevant References or Included References. In each priority list the same 5 databases (PsycINFO, EMBASE, MEDLINE & Medline in Process, CINAHL and FRANCIS) appeared within the top 6 rankings. NHSEED, Cochrane Db Sys Revs, PakMediNet, and Db Abs Revs Effects were always in the bottom 6 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 even though they may perform poorly in term of initial numbers 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 (e.g. OpenSIGLE) should be assessed carefully first for potentially relevant studies before committing to undertaking a systematic search.

Conclusions

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 review'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 (for example HMIC) did not produce evidence relevant to faith sensitive interventions for depression, this is likely to be because policy document often address 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 papers 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 analysed 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 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 generalised 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 (web appendix 1). 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 prioritising databases for studies of depression. Since the literature searches and evidence synthesis were not limited to a particular study design for example qualitative studies or trials, our results can be generalised 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.

Prioritising 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

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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 recognise 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 since our studies were synthesised 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 (for example 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 though 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 to 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 our search terms and strategies were sensitive enough to identify most studies since 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.

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Figure 1 PRISMA Flow Diagram

a) 3499 records identified from searching 23 databases

b) 41 references identified from personal libraries

c) 2428 records after duplicates removed

d) 2469 titles & abstracts screened

e) 2098 titles & abstracts excluded

f) 371 titles & abstracts identified as potentially relevant

g) 52 full-text articles not acquired. Some were unavailable from British Library. Others incurred costs and had similar content to other freely available abstracts.

h) 319 full-text articles assessed for eligibility

i) 223 articles excluded as ineligible studies or for providing similar information to existing themes and issues

j) **96** studies included in Faith Sensitive Treatment Manual

l) 100 studies included in Faith Sensitive Treatment Manual

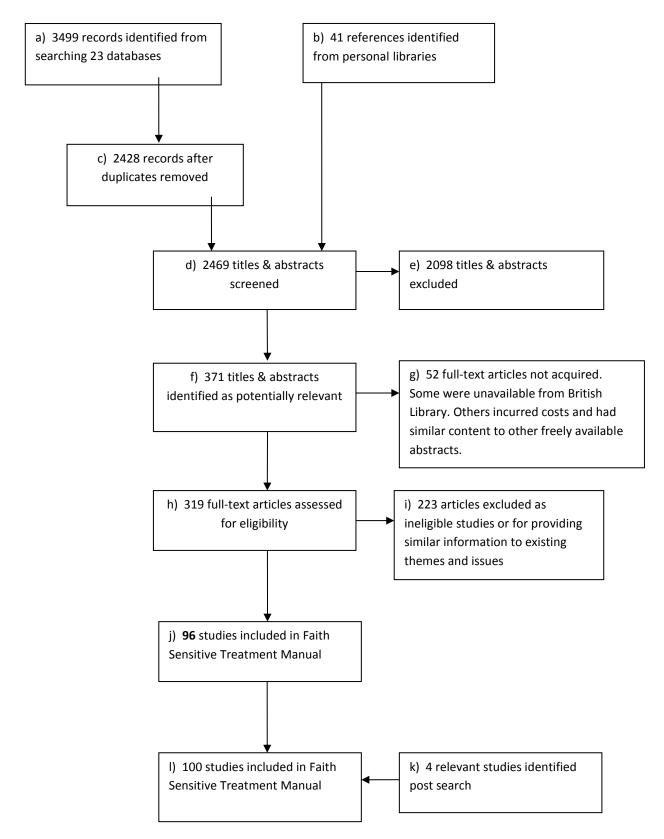k) 4 relevant studies identified post search

Figure 2 Search terms pertaining to Islam or Muslims with low mood

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

Table 1 Characteristics of Databases Searched

Database Short name	Database	Host (Search Interface)	Subject Speciality
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 Database 1949 - present	EBSCOhost	Religion
CINAHL	Cumulative Index to Nursing & Allied Health 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	Dissertations and Theses	ProQuest Databases	Grey Literature
EMBASE	EMBASE Classic + EMBASE 1947 to 2010 April 26	OvidSp	Health
FRANCIS	FRANCIS 1984 to present	OCLC First Search	Religion / Social Science
Global Health	Global Health 1973 to 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 to 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 to April Week 2 2010	OvidSp	Health
Soc Serv Abs	Social Services Abstracts 1979 to present	Cambridge Scientific Abstracts	Social Science
Soc Abs	Sociological Abstracts1952 to present	Cambridge Scientific Abstracts	Social Science

Table 2 Databases priority lists. Databases are ranked by order of % of references found

	List 1		List 2		List 3		List 4	
	% of the 2469 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

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

Appendix 1

Example Search Strategy for Depression AND Religions AND Behavioural Therapies

Ovid MEDLINE(R) 1950 to April Week 4 2010

1   exp *depression/ (31464)

2   exp *depressive disorder/ (48814)

3   *mood disorder/ (5043)

4   *Stress, Psychological/ (37928)

5   Grief/ (6353)

6   exp guilt/ (4205)

7   Depression/pc, th [Prevention & Control, Therapy] (7846)

8   exp depressive disorder/pc, th [Prevention & Control, Therapy] (12338)

9   mood disorder/pc, th [Prevention & Control, Therapy] (1104)

10   Stress, Psychological/pc, th [Prevention & Control, Therapy] (7213)

11   (depression or depressed or depressive or dysthym* or dsyphor*).tw. (219377)

12   (melancholi* or emptiness or grief or grieve* or sorrow* or remors* or "low mood").tw. (6156)

13   (stress adj3 (psych* or emotion*)).tw. (11961)

14   or/1-13 (288824)

15   (littlewood ra or kleinman a*).au. (143)

16   14 or 15 (288954)

17   religion/ (9875)

18   anthroposophy/ (159)

19   buddhism/ (685)

20   exp christianity/ (12994)

21   hinduism/ (261)

22   islam/ (2827)

23   judaism/ (2083)

24   "religion and medicine"/ (8923)

25   exp "religion and psychology"/ (9739)

26   "religion and science"/ (916)

27   "religion and sex"/ (563)

28   exp religious philosophies/ (1946)

29   theology/ (1081)

30   spiritual therapies/ or faith healing/ or homeopathy/ or magic/ or medicine, african traditional/ or mental healing/ or occultism/ or radiesthesia/ or shamanism/ or therapeutic touch/ or witchcraft/ (8766)

31   ((belief* or cultural*) adj8 (behavio* or cope or coping or activit* or based)).ti. (1211)

32   ((christian* or catholic* or jewish* or judaism or hindu* or sihk* or buddh* or taoism or shinto or paganism or rastafari* or sikh* or zoroastrianism or humanist) adj8 (behavio* or cope or coping or activit* or based)).tw. (482)

33   ((islam or islamic or quran* or koranic* or koran or muslim* or moslem* or moslim* or muslem* or mosque* or nafs* or shuhud* or dhikr* or zikr or fitrah or qalb or islamization or ghummah or ruh or imam or tibb or sabr or fiqh or jinn) adj8 (behavio* or cope or coping or activit* or based)).tw. (178)

34   ((god or gods or godly or holy or religio* or faith* or spiritual* or pray or prayers or worship or soul) adj8 (behavio* or cope or coping or activit* or based)).tw. (2978)

35   ((Imam or priest* or vicar or rabbi or rabi or minister or chaplain* or preacher or church* or temple* or chapel* or mosque* or synagogue*) adj8 (behavio* or cope or coping or activit* or based)).tw. (556)

36   (("black magic" or "evil eye" or "baha i" or "al Ghazali" or "al Kindi" or "ibn Sina") adj8 (behavio* or cope or coping or activit* or based)).tw. (7)

37   or/17-36 (51640)

38   Behavior Therapy/ (20543)

39   behavio?r*.ti. (148964)

40   (cope* or coping).ti. (12513)

41   (behavio* adj3 activit*).tw. (7198)

42   (behavio* adj3 (treatment* or intervention* or therap* or modif* or psychotherap* or psycholog* or psychosocial*)).tw. (32170)

43   (activit* adj3 (daily or life or living or regular* or change* or routine* or schedul* or pleasant or monitor*)).tw. (64750)

44   ((task* or chore* or habit*) adj5 (behavio* or daily or life or living or regular* or change* or routine*)).tw. (15888)

45   (pleasant adj3 event*).tw. (79)

46   (Goal* adj3 (setting or assess* or clarify* or clarification or important)).tw. (5919)

47   (Value* adj3 (assess* or clarify* or clarification or important)).tw. (14672)

48   mindful*.tw. (1105)

49   (contingency adj3 manage*).tw. (420)

50   (reinforce* adj3 (positive or negative)).tw. (1706)

51   ("functional analysis" or "functional assessment").tw. (14729)

52   or/38-51 (306260)

53   16 and 37 and 52 (365)

NB. Littlewood RA and Kleinman A* were identified by the project team as key authors in the respective fields of behavioural adaption and ethnic minority mental health The author search (line 15) and later search line combinations (lines 16 and 53) attempted to identify all papers by Littlewood RA and Kleinman A* containing religion and behavioural terms.

Appendix 2

Example of Sensitive search strategy for Muslims AND Depression

Ovid MEDLINE(R) <1950 to April Week 2 2010>

1   Islam/ (2817)

2   islam.tw. (520)

3   islamic.tw. (1340)

4   quran*.tw. (59)

5   koranic*.tw. (20)

6   koran.tw. (64)

7   muslim*.tw. (1982)

8   moslem*.tw. (465)

9   moslim*.tw. (7)

10   muslem*.tw. (3)

11   mosque*.tw. (90)

12   nafs*.tw. (23)

13   shuhud*.tw. (0)

14   dhikr*.tw. (0)

15   zikr.tw. (1)

16   fitrah.tw. (1)

17   qalb.tw. (24)

18   islamization.tw. (3)

19   ghummah.tw. (0)

20   ruh.tw. (25)

21   imam.tw. (102)

22   tibb.tw. (45)

23   sabr.tw. (9)

24   fiqh.tw. (1)

25   jinn.tw. (9)

26   "al Ghazali".tw. (2)

27   "al Kindi".tw. (5)

28   "ibn Sina".tw. (158)

29   or/1-28 (5469)

30   religion/ (9857)

31   "religion and medicine"/ (8906)

32   exp "religion and psychology"/ (9716)

33   exp religious philosophies/ (1942)

34   theology/ (1080)

35   spiritual therapies/ or faith healing/ or magic/ or medicine, african traditional/ (3144)

36   mindful*.tw. (1087)

37   (god or gods or godly or holy or religio* or faith* or spiritual* or soul).ti. (10636)

38   (pray or prayers or worship).tw. (507)

39   ("black magic" or "evil eye").tw. (99)

40   (belief* or cultur*).ti. (163334)

41   or/30-40 (197725)

42   asia, western/ or africa, northern/ or algeria/ or libya/ or morocco/ or tunisia/ or bangladesh/ or middle east/ or afghanistan/ or iran/ or iraq/ or jordan/ or lebanon/ or oman/ or qatar/ or saudi arabia/ or turkey/ or united arab emirates/ or yemen/ or pakistan/ (65388)

43   (bangladesh* or "s asia*" or "south asia*").ti,in,jn. (6089)

44   ("n africa*" or "north africa*" or "middle east*").tw,in,jn. (7084)

45   (Afghan* or Algeria* or Iran* or Iraq* or Jordan or Libya* or Morocc* or Oman or Pakistan* or Qatar or Arab* or Tunisia* or Turkey or turkish or Yemen).tw,in,jn. (209766)

46   Western Sahara.tw,in,jn. or gaza strip.ti,in,jn. (119)

47   or/42-46 (236943)

48   41 and 47 (3361)

49   littlewood ra.au. (9)

50   kleinman a*.au. (132)

51   49 or 50 (141)

52   exp depression/ (55331)

53   exp depressive disorder/ (64641)

54   (depression or depressed or depressive).tw. (218009)

55   mood disorder/ (8325)

56   melancholia.tw. (1005)

57   Stress, Psychological/ (65795)

58   Grief/ (6335)

59   exp guilt/ (4180)

60   (emptiness or grief or griev* or sorrow* or remors* or "low mood").tw. (5323)

61   (stress adj3 (psych* or emotion*)).tw. (11903)

62   (dysthym* or dsyphor*).tw. (2150)

63   or/52-62 (326700)

64   29 or 48 or 51 (8299)

65   63 and 64 (304)

66   animals/ not (humans/ and animals/) (3378480)

67   65 not 66 (302)

NB. Littlewood RA and Kleinman A* were identified by the project team as key authors in the respective fields of behavioural adaption and ethnic minority mental health The author search (lines 49-51) and later search line combinations (lines 64, 65 and 67) attempted to identify all papers by Littlewood RA and Kleinman A* containing a depression search term.