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Systematically retrieving research – a case study evaluating seven databases

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Systematically Retrieving Research – A Case Study Evaluating Seven Databases

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Systematically Retrieving Research – A Case Study Evaluating Seven Databases

Abstract

Objective Developing the scientific underpinnings of social welfare requires effective and efficient methods of retrieving relevant items from the increasing volume of research. *Method* We compared seven databases by running the nearest equivalent search on each. The search topic was chosen for relevance to Social Work practice with older people. *Results* Highest sensitivity was achieved by Medline (52%), SSCI (46%) and CINAHL (30%). Highest precision was achieved by AgeInfo (76%), PsycInfo (51%) and Social Services Abstracts (41%). Each database retrieved unique relevant articles. *Conclusions* Comprehensive searching requires the development of information management skills. The Social Work profession would benefit from having a dedicated international database with the capability and facilities of major databases such as Medline, CINAHL and PsycInfo.

Systematically Retrieving Research – A Case Study Evaluating Seven Databases

Introduction

Developing the scientific underpinnings of social welfare requires effective and efficient methods of retrieving the increasing volume of relevant research (Reid, 1997). Almost every research report, professional journal article and PhD thesis begins with a review of “previous work on the topic”. However the neutrality and comprehensiveness of such reviews are being questioned increasingly. How can bias be avoided in literature reviews? The challenge of undertaking a comprehensive review of literature has become ever greater with the growth of available information, which has progressed exponentially since the lament of Olive Stevenson (1971) about the “information explosion” in Social Work.

The surge of interest in evidence-based practice (Gambrill, 2006; Pollio, 2006) seems to be linked to the “information age” in which we live as the range of information sources grows increasingly rapidly. The accumulation of research findings makes the integration of knowledge into practice based on best evidence increasingly complex for the practitioner (Macdonald, 2001), and more systematic approaches to this are now required (Higgins and Pinkerton, 1998) in order to develop the most effective social services. Basing practice on best evidence requires systematic approaches to information retrieval.

A systematic approach to reviewing and synthesizing the results of previous research is used in order to minimise bias and random errors (Cook et al., 1997; Dempster, 2003) and to set studies in their proper context (Clarke & Chalmers, 1998). The process of a systematic review is planned and documented so that it has the validity of being reproducible (Chalmers, 1994). Health sciences have been at the vanguard of the rising interest during the 1990s, with a focus on

evaluating the effectiveness of interventions. However, the early references to the systematic pooling of research results (Light & Smith, 1971) and the use of the term “meta-analysis” to refer to the statistical aggregation of data (Glass, 1976; Glass et al., 1981; Hunt, 1997) seem to have been in the field of social and educational sciences. The term “meta-synthesis” has been used in various ways in relation to synthesising the results of qualitative studies (Sandelowski et al., 1997). The Campbell Collaboration (<http://campbell.gse.upenn.edu>) is now developing an international partnership to coordinate systematic reviews in the fields of social welfare, criminological and educational interventions (Schuerman et al., 2002), paralleling and drawing on the sister Cochrane Collaboration (<http://cochrane.org>) for health and social care. There are particular challenges for Social Work in all aspects of systematic reviewing: searching (Matthews et al, 1999; Taylor et al, 2003), quality appraisal (Popay & Roen, 2003; Taylor et al, in press) and synthesis of diverse research designs (Fisher et al, 2006). Our focus here is on searching only.

Searching is an important stage in the process of conducting a systematic review (Snowball, 1997) and embodies particular challenges in social sciences because of the diversity of language, style and structure used within publications and their abstracts. A poorly conducted search may fail to retrieve relevant publications and may retrieve such a plethora of unwanted items that the process becomes unnecessarily cumbersome (Haynes et al, 2005). This article reports on the appropriateness and effectiveness of a methodology for accessing relevant research. Social Workers can identify relevant studies much more efficiently and comprehensively than by manual methods by using nationally networked electronic databases that are designed to meet the needs of professionals and academics, and which are accessible through the World Wide Web (Counsell, 1997; Avenell et al., 2001; Taylor, 2003).

Seven electronic databases that provide abstracts of journal articles of interest to Social Work professionals, managers, researchers and educators were evaluated by carrying out a searching

task. The task was to retrieve research related to the question “*how are decisions made about the entry of people aged 65 years and over into institutional care?*” The question was designed to require the retrieval of research using a range of methods, both quantitative and qualitative, as is common in social welfare research. Very often systematic reviews seek to retrieve research using experimental designs that address questions of effectiveness. Databases for health care often have facilities specifically designed to retrieve randomised controlled trials. Thus a search for a question about effectiveness might have given a biased perspective for the purpose of this exercise, as most professionals are likely to be interested in research using a wider range of methods.

The search of the databases was limited to publications of research or reviews of research. Government documents, policy or theoretical material were excluded. The search was limited to articles that were published in peer-reviewed journals in the English language during a ten-year period. The research team developed an approach that they had used previously (Taylor et al, 2003), which itself had built on previous work on search methodology (Adams et al, 1994; Dickersin et al, 1994; Hay et al, 1996; Meade & Richardson, 1997; Brettell, 2001).

The facilities available on each database were used to improve the quality of the search on that database. A key challenge was to achieve good sensitivity and precision of searching. Good sensitivity means that a search of a database retrieves a high proportion of the total articles available on a given topic. Good precision means that a search of a database retrieves a low number of articles that are irrelevant to the topic. These terms and other aspects of the methodology are explained more fully in the Methods section below. Overall, the approach was to appraise the comparative usefulness of each of the seven databases in terms of the comprehensive retrieval of studies on a given topic relevant to Social Work, commenting on facilities available on each to assist in this task.

Method

Choosing the Search Question

The question addressed by the search was framed as “*how are decisions made about the entry of people aged 65 years and over into institutional care?*” The question had to be capable of being clearly defined; defining a question clearly and in operational terms is a key activity in every literature review. This definition formed the basis of the search strategy and helped developing inclusion criteria for the Selection Form that was applied to the title and abstract of each article retrieved. Decisions relating to a client’s life and their health in an institution were excluded as were decisions relating to transfers between different institutional facilities and research that described the development of a methodology. The search was limited to peer reviewed papers that were published during the ten years from 1st January 1994 to 31st December 2003, covering a major period of development in community care services for adults which is likely to have generated many research publications on the question. The search was confined to publications in the English language, as access to translation facilities was not available. The search question focused on admission to institutional care and the following categories were excluded in order to increase the precision of the search: respite care, intermediate care, step down beds, palliative care, mental health (including addiction), terminal care, learning disorders and hospice care.

Selection of Databases

Previous research suggests that relying solely on one database is inadequate for retrieving all the relevant literature (Hopewell et al. 2002; Stevinson & Lawlor, 2004; Greenhalgh & Peacock, 2005). The following seven databases were compared in this study: Medline, Cumulative Index of Nursing and Allied Health Literature (CINAHL), CareData, Social Science Citation Index (SSCI), Social Services Abstracts, AgeInfo and PsycInfo. The main criterion for selection of databases was availability and access. The above databases are available in the USA and the UK and they can generally be accessed in universities. These databases have a policy of including abstracts for the papers for which they provide bibliographic data, and this feature served as the second selection criterion, as citations alone are much less helpful than abstracts in identifying eligible studies (Petrosino et al. 2000).

Each database also had particular features that recommended it for inclusion in the study. Medline, CINAHL and PsycInfo were selected because they are large international databases and are the main databases for medicine, nursing and psychology respectively. The most widely known generic English language Social Work databases were included: Social Services Abstracts (North American focus) and CareData (dedicated Social Work database for the UK). This latter is provided as part of Social Care Online (<http://www.scie.org.uk/sco/>) (formerly the national Electronic Library for Social Care) through the Social Care Institute for Excellence (SCIE). The Social Science Citation Index was selected as the major general database for the social sciences. AgeInfo is a dedicated database for health and social welfare of older people, and is also now provided free to the public through SCIE. A preliminary scoping study indicated that all of these databases contained substantial material relevant to the search question. The web platform can also affect the effectiveness of a database. The databases, their web platforms and abbreviations used in this article are: Social Services Abstracts (Cambridge Scientific Abstracts) (A); AgeInfo

(Social Care Online, UK) (Age); CareData (Social Care Online, UK) (C); Medline (Ovid) (M); CINAHL (Ovid) (N); PsycInfo (Ovid) (P); and SSCI (ISI Web of Knowledge) (S).

Basic Principles of Developing Search Formulae

At their simplest level, electronic bibliographic databases work like electronic library catalogues in searching for titles and authors using “text terms”. However bibliographic databases of journal articles can search abstracts (and sometimes additional keywords) as well as titles, and are also able to work with combinations of terms using developments of standard Boolean algebra (Taylor, 2003). In addition, of the seven databases that were used, all except SSCI have the feature of a thesaurus of terms that is used to index articles on the database. This indexing facilitates retrieval of articles even where terminology differs between publications. By contrast, the search of SSCI (which does not have an indexing system) required the development of terms to cover different spellings and parts of speech (e.g. “care manager” and “care management”), and the varied uses of language across countries and professional disciplines. A key challenge is to develop an approach to searching that will retrieve all relevant abstracts and yet not retrieve unwanted items, that is, a search that is both sensitive and precise.

Sensitivity and Precision of Searching

The *sensitivity* of a search refers to its capacity to identify as many as possible of the total available relevant articles. More specifically, “sensitivity” can be defined as the number of studies identified by the search of a particular database divided by the total number of known studies. For this exercise, the total number of studies that were retrieved across all seven

databases was used as the measure of the total number of known studies. This ratio was employed to compare the usefulness of the databases using the best feasible search formula on each.

A search may become more sensitive as more terms are added, but it may also tend to retrieve more irrelevant articles. Therefore the *precision* of a search formula is also important. “Precision” may be defined as the number of articles identified by a search that are relevant (true positives), divided by the total number identified by the search on that database. In other words, precision is a measure of the positive predictive value of the search. It is not appropriate to use *specificity* with its normal meaning as a measure because the total number of false negatives is not determinable. The precision of the searches described here was improved using the techniques described below.

Precision can also be measured from the “opposite direction” (i.e. imprecision), that is in terms of the number of irrelevant articles generated by the search on a database. The results section gives the percentage of “false positives” (equal to 100% minus the precision expressed as a percentage) as well as the precision. A chi-square test was also used to measure the distribution of relevant articles retrieved in relation to the expected number given the total number of articles retrieved. This may be viewed as an alternative tool to measure the precision of the search on that particular database.

Structuring the Search

There were three stages involved in creating the search formulae: (1) creating **concept groups**, (2) **refining the search terms** within each concept group and (3) adding **search filters** with the use of the facilities on the chosen databases. Each stage is described below.

The first stage in developing the search formula was to structure the search question into **concept groups**. The basic concept groups relating to the search question posed here were: (1) Older People, (2) Decision Making, and (3) Institutional Care.

This structure of concept groups broadly corresponds to the widely-used PICO search structure (Booth et al, 2000): (1) Population, (2) Intervention, (3) Comparison Intervention and (4) Outcome, suitably adapted to Social Work. The *Population* was conceptualized as older people. The *Intervention* focus was admission to institutional care and decision-making about admission and related financial aspects. The *Outcome* was residential or nursing homes providing long term care. The PICO Category “Comparison Intervention” was not relevant to this study. A key challenge was to create concept groups that were broad enough to retrieve all relevant articles (high sensitivity) and refined sufficiently (see next section) to reduce the number of irrelevant items retrieved (precision). These concept groups provided the basis for the development of the search formulae that was applied to the databases. The search terms on the databases to operationalize these concepts were incorporated into the search formulae as shown in Figure 1.

<Figure 1 near here>

Refining the Search Terms

Various approaches were used to refine the search terms within each concept group so as to increase precision. The facilities for refining terms varied between databases depending on the facilities available. All the databases had facilities that, in varying degrees, allowed for the root of a word followed by a symbol to be used to search for different forms of that word. By using wild-

card characters (e.g. \$ or *) varieties of a word are retrieved (e.g. admission\$ to search for admission and admissions). Six databases had an index system that enabled users to increase the precision of a search to varying degrees and saved the considerable work required using only text terms on the database that lacked this facility. Four databases had a facility whereby suffixes could be added to text terms (i.e. not index terms) thereby adding precision to a search. For example, on some databases use of the suffix “.ti,ab.” limits the search for the word with this suffix to the title and abstract only. For example, “homes for the aged.ti,ab.” will retrieve articles where the phrase “homes for the aged” appeared in the title or abstract. Avoiding searching keywords in a certain element of the search increased the precision significantly. Six databases had some form of proximity searching. This facility adds precision by enabling a search to be conducted for two or more search terms within a certain number of words of each other, and in any order (e.g. “admission adj5 home” searches for “admission” and “home” within five words of each other).

Search Filters

After creating the concept groups to establish the basic outline structure of the search formula and then refining the terms within each concept group, **search filters** (or “hedges”) were added in order to improve the precision of the search. Search filters are one way of improving the retrieval of relevant and scientifically sound articles from electronic databases (White et al, 2001). The types of search filters that were used in this study were language, date of publication and type of publication if available on the database. The search became more focused by filtering the records for these specific pieces of information.

All databases had a filter for date of publication. The publication limits were defined by the date when a paper was published. Defining the end of a search period by the date that a search was conducted might lead to problems with coverage if databases varied in the time taken to index articles. Searches were limited to articles published between 1st January 1994 and 31st December 2003 inclusive to overcome this problem.

Five databases had a filter that allowed searches to be confined to publications in the English language. The AgeInfo database abstracts only English language publications.

Six databases had a filter to restrict searches to particular document types. The filter facilities available on the databases varied in quality, and were used as far as possible to restrict the search to articles that reported research (using any design or data collection method), or reviews of research.

Grey Literature

The search was confined to publications in peer- reviewed journals so search filters were used wherever possible to exclude articles that did not undergo a blind peer- review process. The main reasons for adopting this approach were firstly that time and resources did not permit a full search of grey literature. Secondly the peer review process is the key mechanism used to appraise the quality of research publications. Ideally, this process should lead to a reduction in the publication of methodologically weak or unoriginal research. Thirdly good research that is published in theses, conference papers or organisational reports is likely to be published also in peer-reviewed journals. And fourthly although political, commercial and confidentiality pressures could prevent the publication of worthwhile material (Smith, 1980), these pressures are unlikely to affect social researchers as much as some medical or health care researchers.

Using the Selection Form

On completion of the database searches using the formulae developed, the next stage in the process was to identify and select out relevant articles from all of those retrieved. Each article was evaluated individually using a Selection Form (copy available from the first author on request) containing a list of inclusion criteria. Two reviewers applied the form to the abstract of each article independently, in order to minimise bias (Meade and Richardson, 1997). Each reviewer had three options: to include or exclude an article or to state undecided. Decisions were based entirely on the information provided by the databases and were guided by the list of inclusion criteria on the Selection Form and a two-page list of Guidance Notes that were created for the purpose. The two reviewers met to discuss their independent decisions, particularly disagreements and “undecided” verdicts. Where uncertainty remained a third reviewer was asked to make an independent decision.

Results

Limitations of the Study

This was a case study utilizing a search question of relevance to decision making in Social Work practice with older people. Rather different search outcomes might have been obtained in relation to other client groups or aspect of service. It should be noted that the thesaurus-based search facility was used on the six databases where this was available. The retrieval rate for these six would almost certainly have been higher if a text term search had been used in addition to the

thesaurus term search. However, that design would not have tested the effectiveness of the thesaurus system, which is a key feature for the user with limited knowledge of information science.

Database Facilities

<Table 1 near here>

Table 1 gives a summary of database facilities. Each database allows the user to truncate words by using wild-card characters (e.g. \$ or *). All except SSCI are indexed databases whereby every article is indexed using a defined thesaurus of terms. This is a very useful feature as it simplifies the task for the user by allowing them to search using index words as well as text terms. In the search presented here suffixes (e.g. “.ti,ab.”) were used on the databases where these were available. AgeInfo, CareData and Social Services Abstracts did not have this feature. Although AgeInfo and Social Services Abstracts allow the user to specify a title search, this is merely a search for a title of an article. Proximity searching is available on all databases except CareData.

All databases allow the user to limit searches by date of publication and all except AgeInfo and CareData allow you to limit the search by language. All except AgeInfo had a filter for type of publication, but the quality of these varied between databases; those on Medline, CINAHL and PsycInfo were more sophisticated.

In terms of outputs from the databases, AgeInfo, CareData and SSCI do not allow the search formula to be printed with your results. The only way to get a printed copy of the search formula on these databases is to print a copy of the screen where the search details are entered and attach

it to the results. AgeInfo allows a user to select all records, like all other databases except CareData. However, it is limited in terms of processing searches that involve large numbers of records. When full details of all records relating to the search in question were requested the following message was generated: – “Error 400 – Bad request”. CareData has no facility to select all records. It will show and print only 20 records at any one time and it lacks a screen icon to select to print the results. Printing must be selected from the computer toolbar (i.e. file-print).

SSCI can sort up to 300 articles alphabetically by first author. Medline, CINAHL and PsycInfo sort up to 200 articles alphabetically by author i.e. results 1-200 were sorted from A-Z, 201-400 were sorted from A-Z and so on. SSA, AgeInfo and CareData lack a facility to allow the records to be ordered alphabetically by author. All databases except CareData have a facility that enables users to e-mail search results which is an important facility for further processing of results.

<Table 2 near here>

Sensitivity and Precision of Searching

A total of 363 relevant articles was retrieved. Table 2 gives the number of articles identified on each database together with the sensitivity and precision of each search. The highest sensitivity was achieved on Medline and SSCI; CINAHL also contained many relevant articles. AgeInfo enabled a much more precise search (i.e. avoiding retrieving unwanted articles) than any other database, rather better than PsycInfo and SSA, and considerably better than the other databases. The chi square test (Table 3) indicates even more strongly the precise searching

available on the small dedicated AgeInfo database, and shows up the weakness of the large SSCI database.

<Table 3 near here>

Unique Articles Retrieved

The data was analysed in terms of the number of unique relevant articles retrieved. The number of relevant articles retrieved on one database only was as follows: SSA (8), AgeInfo (17), Caredata (6), Medline (65), CINAHL (25), PsycInfo (8) and SSCI (76). This gives an indication of how many articles would be missed if a particular database had not been used. It would be a major omission for a search on this topic if it failed to use both SSCI and Medline. Omitting either AgeInfo or CINAHL would fail to retrieve approximately 6% of the articles available. Omitting PsycInfo, Caredata or SSA would lose approximately 2% of the articles.

Inter-Rater Reliability

The similarity of the decisions by the two raters (inter-rater reliability) was measured using a weighted kappa score. This measurement was chosen because disagreements between the raters are not equal in magnitude between the three options. An “include-exclude” disagreement is more significant than an “include-undecided” or an “exclude-undecided” disagreement. This gives a more conservative estimate of inter-rater reliability. Inter-rater reliability is illustrated in Table 4, which gives weighted kappa scores and the percentage agreement between raters for each database.

<Table 4 near here>

On this occasion an extremely high inter-rater reliability was achieved. It is likely that this level of reliability between raters is attributable to the team having previous experience of searching on a similar topic; defining the search question in clear, specific terms; and the refinement of the Selection Form together with detailed Guidance Notes for raters. The high concordance confirms the usefulness of the methodology adopted for this study.

Discussion and Application to Social Work

The facility to undertake systematic retrieval of abstracts of articles from electronic bibliographic databases is an essential component of evidence based practice. Systematic reviews of research require facilities for sophisticated searching that is both sensitive and precise despite the challenges presented by the diversity of social science literature. The modern development of Boolean algebra employed in electronic databases was used to create searches that were as sensitive and as precise as possible on each database given their respective facilities. A search question was chosen that could be clearly defined and seven databases relevant to social services were compared in order to judge the comparative advantages and disadvantages of each. Further research is required to explore the comparative search outcomes in relation to different client groups, settings and aspects of practice. For this study we chose a search question that did not relate to the effectiveness of interventions because we wanted to explore retrieval in relation to other types of questions. Filters (hedges) for retrieving studies using specific research methods, such as randomized controlled trials, are available on some databases. Research is also required

regarding the development of appropriate classification of research methods for indexing Social Work research on databases.

The facilities available on the databases were considered in relation to three aspects: tools for refining search terms; search filters; and database outputs. Specific tools within each of these aspects were selected for evaluation in terms of their usefulness for systematic searching. In terms of facilities Medline, CINAHL and PsycInfo were decidedly superior to the other databases.

Search outcomes were considered in terms of sensitivity, precision and the number of unique articles retrieved. The high sensitivity of SSCI, Medline and CINAHL compared to the others seems to reflect the size and international scope of these databases. AgeInfo gave the highest level of precision of the databases used as emphasized by the results of the chi square test, which probably reflects the specialist focus of the index terms. In terms of unique articles retrieved, the databases show a similar pattern to that found for the sensitivity of the searches. In order to avoid omitting articles, a searcher on this topic using a more limited number of databases would choose SSCI and Medline as top priority and AgeInfo and CINAHL as second priority in order to maximize the number of relevant articles retrieved.

This study achieved high inter-rater reliability across all databases. The variation across databases was too small to merit comment, and the high consistency probably reflects the clarity achieved in refining the search question and the tools used to identify relevant studies, based on previous experience of this type of exercise using similar databases and search questions.

In order to develop evidence based practice Social Workers, researchers, managers and educators need to develop skills in retrieval of research as well as in other stages of systematic reviewing. The skills of information scientists also need to be effectively deployed within a team effort. An infrastructure of systems and training to support such developments is required if

rigorous systematic reviews of Social Work research are to become a regular tool to inform professional practice and policy formulation. The retrieval of research relevant to Social Work on which this depends would benefit greatly from a dedicated database with comparable capability and facilities to the major databases such as Medline, CINAHL and PsycInfo. Progress with indexing is a key aspect for development. However international professional consensus on terminology is required for substantial progress to be made.

References

- Adams, C.E., Power, A., Frederick, K. & Lefebvre, C. (1994). An investigation of the adequacy of MEDLINE searches for randomized controlled trials (RCTs) of the effects of mental health care. *Psychological Medicine*, 24, 741-748.
- Avenell, A., Handoll, H. H. G. & Grant, A. M. (2001). Lessons for search strategies from a systematic review, in *The Cochrane Library*, of nutritional supplementation trials in patients after hip fracture. *American Journal of Clinical Nutrition*, 7, 505-510.
- Booth, A., O'Rourke, A. & Ford, N. (2000). Structuring the pre-search reference interview: A useful technique for handling clinical questions. *Bulletin of the Medical Library Association*, 88 (3), 239-246.
- Brette, A. J. (2001). Comparison of bibliographic databases for information on the rehabilitation of people with severe mental illness. *Bulletin of the Medical Library Association*, 89(4), 353-362.
- Chalmers, I. (1994). Foreword. In I. Chalmers & D. G. Altman (Eds.) (1995). *Systematic Reviews*. BMJ Publishing Group.
- Clarke, M. & Chalmers, I. (1998). Discussion sections in reports of controlled trials published in general medical journals: Islands in search of continents? *Journal of the American Medical Association*. 280, 280-282.
- Cook, D. J., Mulrow, C. D. & Haynes, R. B. (1997). Systematic reviews: Synthesis of best evidence for clinical decisions. *Annals of Internal Medicine*, 126(5), 376-380.
- Counsell, C (1997). Formulating questions and locating primary studies for inclusion in systematic reviews. *Annals of Internal Medicine*, 127, 380-387.

- Dempster, M. (2003). Systematic reviews. In R. Miller & J. Brewer J (Eds.) *The A to Z of Social Research*. London: Sage.
- Dickersin, K., Scherer, R. & Lefebvre, C. (1994). Identifying relevant studies for systematic reviews. *British Medical Journal*, 309, 1286-1291.
- Fisher, M., Qureshi, H., Hardyman, W. & Homewood, J. (2006). *How Knowledge Works in Social Care Report 9: Using qualitative research in systematic reviews: Older people's views of hospital discharge*, London: Social Care Institute for Excellence.
- Gambrill, E. (2006). Evidence-based practice and policy: Choices ahead. *Research on Social Work Practice*, 16(3): 338-357.
- Glass, G. V. (1976). Primary, secondary, and meta-analysis of research. *Educational Researcher*, 5, 3-8.
- Glass, G. V., McGaw, B. & Smith, M. (1981). *Meta-Analysis in Social Research*. Newbury Park: Sage Publications.
- Greenhalgh, T. & Peacock, R. (2005). Effectiveness and efficiency of search methods in systematic reviews of complex evidence: Audit of primary sources. *British Medical Journal*, 2005 Nov 5; 331(7524), 1064-1065.
- Hay, P. J., Adams, C. E. & Lefebvre, C. (1996). The efficiency of searches for randomized controlled trials in the International Journal of Eating Disorders: A comparison of handsearching, EMBASE and PsychLIT. *Health Libraries Review*, 13, 91-96.
- Haynes, B. R., McKibbin, A. K., Wilczynski, N. L., Walter, S. D. & Were, S. R. (2005). Optimal search strategies for retrieving scientifically strong studies of treatment from Medline: Analytical survey. *British Medical Journal*, 330, 1179.

- Higgins, K. & Pinkerton, J. (1998). Literature Reviewing: Towards a More Rigorous Approach. In D. Iwaniek & J. Pinkerton (Eds.), *Making Research Work: Promoting Child Care Policy and Practice*. Chichester: Wiley.
- Hopewell, S., Clarke, M., Lusher, A., Lefebvre, C. & Westby, M. (2002). A comparison of handsearching versus Medline searching to identify reports of randomized controlled trials. *Statistical Medicine*, 21, 1625-1634.
- Hunt, M. (1997). *The Story of Meta-Analysis*. New York: Russell Sage Foundation.
- Light, R. J. & Smith, P. V. (1971). Accumulating evidence: Procedures for resolving contradictions among different research studies. *Harvard Educational Review*, 41, 429-471.
- Macdonald, G. (2001). *Effective Interventions for Child Abuse and Neglect: An Evidence-based Approach to Planning and Evaluating Interventions*. Chichester: Wiley.
- Matthews, E. J., Edwards, A. G. K., Barker, J., Bloor, M., Covey, J., Hood, K., Pill, R., Russell, I., Stott, N. & Wilkinson, C. (1999). Efficient literature searching in diffuse topics: Lessons from a systematic review of research on communicating risk to patients in primary care. *Health Libraries Review*, 16(2), 112-1120.
- Meade, M. O. & Richardson, W. S. (1997). Selecting and appraising studies for a systematic review', *Annals of Internal Medicine*, 127, 531-537.
- Petrosino, A., Boruch, R. F., Rounding, C., McDonald, S. & Chalmers, I. (2000). The Campbell Collaboration: Social, Psychological, Educational, and Criminological Trials Registry (C2-SPECTR) to facilitate the preparation and maintenance of systematic reviews of social and educational interventions, *Evaluation and Research in Education*, 14(3&4), 206-219.
- Pollio, D. E. (2006). The art of evidence-based practice. *Research on Social Work Practice*, 16(2), 224-232.

- Popay, J. & Roen, K. (2003). *Using evidence from diverse research designs: SCIE Report 3*, London: Social Care Institute for Excellence
- Reid, W. J. (1997). Long-term trends in clinical social work. *Social Service Review*, 71(2), 200-213.
- Sandelowski, M., Docherty, S. & Emden, C. (1997). Qualitative metasynthesis: Issues and techniques. *Research in Nursing & Health*, 20, 365-371.
- Schuerman, J., Soydan, H., Macdonald, G., Forslund, M., deMoya, D., Boruch, R. (2002) The Campbell Collaboration. *Research on Social Work Practice*, 12(2), 309-317.
- Smith, M. L. (1980). Publication bias and meta-analysis. *Evaluation in Education*, 4, 22-24.
- Snowball, R. (1997). Using the clinical question to teach search strategy: Fostering transferable conceptual skills in user education by active learning. *Health Library Review*, 14(3), 167-172.
- Stevenson, O. (1971). Knowledge for social work. *British Journal of Social Work*, 1(2), 225-237.
- Stevinson, C. & Lawlor, D. A. (2004). Searching multiple databases for systematic reviews: Added values or diminishing returns? *Complementary Therapies in Medicine*, 12(4), 228-232.
- Taylor, B. J. (2003). Literature searching. In R. Miller & J. Brewer (Eds.), *The A to Z of Social Research*. London: Sage.
- Taylor, B. J., Dempster, M. & Donnelly, M. (2003). Hidden gems: Systematically searching electronic databases for research publications for social work and social care. *British Journal of Social Work*, 33, 423-439.
- Taylor, B.J., Dempster, M. & Donnelly, M. (in press). Grading gems: Appraising the quality of research for social work and social care. *British Journal of Social Work*, doi:10.1093/bjsw/bch361

Taylor, B. J., Wylie, E., Dempster, M. & Donnelly, M. (2006). *An Evaluation of the AgeInfo Database*. London: Social Care Institute for Excellence [<http://www.scie.org.uk/>]

White, V.J., Glanville, J. M., Lefebvre, C. & Sheldon, T. A. (2001). A statistical approach to designing search filters to find systematic reviews: Objectivity enhances accuracy. *Journal of Information Science*, 27, 357-370.

Table 1: Database facilities

Functions available on the databases	A	Age	C	M	N	P	S
<u>Refining search terms</u> (see 3.1.1)							
Does the database use Truncation symbols?	Y	Y	Y	Y	Y	Y	Y
Does the Database have an Index System?	Y	Y	Y	Y	Y	Y	N
Can Suffixes be used?	N	N	N	Y	Y	Y	Y
Is Proximity Searching a feature of the database?	Y	Y	N	Y	Y	Y	Y
<u>Search filters</u> (see 3.1.2)							
Can you limit by Language?	Y	N*	N	Y	Y	Y	Y
Can you limit by Date of Publication?	Y	Y	Y	Y	Y	Y	Y
Can you limit by Type of Publication?	Y	N	Y	Y	Y	Y	Y
<u>Database outputs</u> (see 3.1.3)							
Can the search formula be printed with the results?	Y	N	N	Y	Y	Y	N
Can you mark all/ select all records at once?	Y	Y	N	Y	Y	Y	Y
Can you sort the results alphabetically by author?	N	N	N	Y	Y	Y	Y
Can you e-mail your results?	Y	Y	N	Y	Y	Y	Y

In this Table:

A = Social Services Abstracts, Age= AgeInfo, C= CareData, M= Medline, N= CINAHL, P= PsycInfo, S=SSCI.

* = AgeInfo abstracts English language publications only.

Table 2 Articles identified, sensitivity and precision of searches

	Articles Identified	Relevant Articles	Sensitivity	Precision	False Positives
SSA	80	33	9.1%	41.3%	58.7%
AgeInfo	63	48	13.2%	76.2%	23.8%
CareData	53	16	4.4%	30.2%	69.8%
Medline	664	189	52.1%	28.5%	71.5%
CINAHL	339	110	30.3%	32.4%	67.6%
PsycInfo	84	43	11.8%	51.2%	45.3%
SSCI	805	168	46.3%	20.1%	79.9%
Total "hits"	2088	607			
Total removing duplicates	1645	363			

Table 3 Chi Square Test for Retrieved Articles

	Relevant Articles Retrieved (X)	Expected Number of Relevant Articles on basis of Total Number of Articles Retrieved (Y)	Residual (X-Y)
SSA	33	23.1	9.9
AgeInfo	48	18.2	29.8
CareData	16	15.2	.8
Medline	189	193.0	-4.0
CINAHL	110	98.3	11.7
PsycInfo	43	24.9	18.1
SSCI	168	234.3	-66.3
Total	607		

Table 4 Inter-rater reliability results

	Caredata	Medline	CINAHL	SSCI
Rater 1 Include	16	186	104	162
Rater 2 Include	16	178	100	154
Rater 1 Undecided	0	2	1	0
Rater 2 Undecided	0	19	10	14
Rater 1 Exclude	37	456	211	615
Rater 2 Exclude	37	447	206	609
Weighted Kappa score	1.00	0.96	0.96	0.97
Percentage agreement	100%	96.4%	96.2%	97.7%

	SSA	AgeInfo	PsycInfo
Rater 1 Include	35	49	42
Rater 2 Include	30	46	39
Rater 1 Undecided	2	0	0
Rater 2 Undecided	6	4	5
Rater 1 Exclude	43	14	32
Rater 2 Exclude	44	13	30
Weighted Kappa score	0.88	0.95	0.96
Percentage agreement	88.8%	93.6%	93.2%

[EDITORIAL AND PRINTER'S NOTE: This is one table which has been extended to two "lines" here (with the headings repeated) because of the constraints of page width. When printing, a single table format would be desirable omitting the repeated headings.]

Figure 1 Search Formulae for the Databases

Search Formula for AgeInfo

Keywords = “OLDER PERSONS@”

AND

Keywords = “ADMISSION [NURSING HOMES]”/ “ADMISSION [RESIDENTIAL HOMES”

NOT

Keywords = “TERMINAL CARE@”/ “RATIONAL PROCESSES DISORDERS@”

AND

Year of Publication = 1994~2003

Search formula for CareData

(KEYWORDS: (older people) and (assessment/ decision making/ admission to care) and (nursing homes/ residential care/ long term care) and (research))

(YEAR: 1994:2003)

(RECORD TYPE: journal article)

Search formula for CINAHL

1. exp aged/
2. exp needs assessment/
3. (admission\$ adj5 home\$).ti,ab.
4. (institutionali?ation\$ adj5 home\$).ti,ab.
5. (placement\$ adj5 home\$).ti,ab.
6. exp judgment/
7. exp decision making/
8. 1 and (2 or 3 or 4 or 5 or 6 or 7)
9. exp nursing homes/
10. exp long term care/
11. homes for the aged.ti,ab.
12. 9 or 10 or 11
13. 8 and 12
14. limit 13 to (english and (aged<65 to 79 years> or “aged <80 and over>”) and yr=1994-2003 and (book or book chapter or case study or clinical trial or historical material or journal article or legal cases or research or research instrument or “review”))
15. *hospices/
16. *learning disorders/
17. *palliative care/
18. *terminal care/
19. 15 or 16 or 17 or 18
20. 14 not 19

Search formula for Medline

1. exp aged/

2. exp needs assessment/
3. (admission\$ adj5 home\$).ti,ab.
4. (institutionali?ation\$ adj5 home\$).ti,ab.
5. (placement\$ adj5 home\$).ti,ab
6. exp judgment/
7. exp decision making/
8. 1 and (2 or 3 or 4 or 5 or 6 or 7)
9. exp nursing homes/
10. exp long term care/
11. exp homes for the aged/
12. 9 or 10 or 11
13. 8 and 12
14. limit 13 to (english language and (“aging (65 to 79 years)” or “all aged (65 and over)”) and yr=1994-2003 and (clinical trial or controlled clinical trial or journal article or meta analysis or randomized controlled trial or “review” or review, academic or “review literature”))
15. *hospices/
16. *learning disorders/
17. *palliative care/
18. *terminal care/
19. 15 or 16 or 17 or 18
20. 14 not 19

Search formula for PsycINFO

1. aged.mp.
2. exp geriatric patients/
3. exp aging/
4. 1 or 2 or 3
5. exp needs assessment/
6. (admission\$ adj5 home\$).ti,ab.
7. (institutionalization\$ adj5 home\$).ti,ab.
8. (placement\$ adj5 home\$).ti,ab.
9. exp judgment/
10. exp decision making/
11. 5 or 6 or 7 or 8 or 9 or 10
12. 4 and 11
13. exp nursing homes/
14. exp long term care/
15. homes for the aged.ti,ab.
16. 13 or 14 or 15
17. 12 and 16
18. limit 17 to (human and english language and (“380 aged <age 65 yrs and older>” or “390 very old <age 85 yrs and older>”) and (“0800 empirical study” or “0820 clinical case report” or “0840 followup study” or “0850 longitudinal study” or “0851 prospective study” or “0852 retrospective study” or “0870 clinical trial” or “0880 qualitative study” or “0890 quantitative study” or “0891 double blind design” or “0892 single blind design” or “1300 literature review” or 1400 meta analysis) and peer reviewed journal and yr=1994-2003)

19. *hospices/
20. *terminal care/
21. *palliative care/
22. *learning disorders/
23. 19 or 20 or 21 or 22
24. 18 not 23

Search formula for Social Science Citation Index

(elder* OR geriatric OR old age OR old* people) AND (admit* OR admission* OR enter* OR entry OR institutionalization OR placement* OR decision* OR judgment) AND (care home* OR home* for the aged OR institutional care OR long-term care OR long term care OR nursing home* OR old peoples home* OR old people's home* OR out of home placement*) NOT (hospice* OR learning disabilit* OR mental* disorder* OR mental* handicap* OR palliative care OR terminal care OR terminal illness); DocType = Article, Bibliography, Database Review, Review; Language =English; Databases = SSCI; Timespan = 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003.

Search formula for Social Services Abstracts

KW= (elderly or aging or geriatrics) and KW=(needs assessment) or decision making or admissions) and KW= (nursing homes or long term care or residential institutions)
 Year=1994-2003, Limits = English only and Journal Articles only.