

The handsearching of 2 medical journals of Bahrain for reports of randomized controlled trials

*Amani A. Al-Hajeri, MD, Zbigniew Fedorowicz, BDS, LDS RCS (Eng),
Fawzi A. Amin, MPH, PhD, Anne Eisinga, BA Comb. Hons. MSc.*

ABSTRACT

Objectives: To identify reports of randomized trials by handsearching 2 Bahrain medical journals, which are indexed in the biomedical database EMBASE and to determine any added value of the handsearching by comparing the reports found by handsearching with what would have been found by searching EMBASE to examine (i) the precision and sensitivity of the EMBASE index term Randomized Controlled Trial (RCT) and (ii) The Cochrane Collaboration's systematic electronic search of EMBASE (which uses 4 index terms and 9 free-text terms).

Methods: All issues of the Bahrain Medical Bulletin (BMB) (1979-2004) and the Journal of the Bahrain Medical Society (JBMS) (1989-2004) were handsearched in February 2005 for reports of RCTs or Controlled Clinical Trials (CCTs), according to Cochrane eligibility criteria.

Results: Out of 395 articles in BMB we found reports of 12 RCTs and 4 CCTs. Distribution by country of corresponding author: Jordan (4 RCTs, one CCT), Bahrain (one RCT, one CCT), India (3 RCTs, one CCT), Kuwait (one CCT), Saudi Arabia (2 RCTs), USA/Bahrain (one RCT), and Oman (one RCT); and by specialty: Anesthesia (8), Surgery (1) Pediatrics (1), Radiotherapy (1), Community Medicine (1), Sports Medicine (1), Obstetrics/Gynecology (3). The Journal of the Bahrain Medical Society included reports of 14 RCTs and 3 CCTs, out of 97 articles. Distribution by

country of corresponding author: Jordan (9 RCTs, 2 CCTs), Bahrain (3 RCTs), Egypt (one RCT), Kuwait (one RCT), and Saudi Arabia (one RCT); and by specialty: Anesthesia (7), General Surgery (3), Obstetrics/Gynecology (1), Radiotherapy (1), Pediatrics (1), Orthopaedic Surgery (1), Education (1) Ear Nose & Throat (1) Ophthalmology (1). Overall, of the 33 reports of trials found by handsearching both journals, only 23 were included in EMBASE of which only 6 had been indexed with the term RCT. Of the 23 reports of trials included in EMBASE, 16 had been identified in the Collaboration's systematic search of EMBASE. Two reports of trials could have been retrieved by this search but there was insufficient information in the title and abstract to code these as trials. The EMBASE records for the remaining 5 reports of trials did not contain terms currently used by The Cochrane Collaboration to identify reports of randomized trials in this database.

Conclusion: The handsearching of these journals will help minimize publication bias by locating randomized trials not previously identified and, through their inclusion in the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, will ensure reports of randomized trials will not remain 'buried' through indexing bias.

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Healthcare decision-making around the world needs to be informed by high quality, up-to-date research evidence. Randomized trials, involving

sufficient numbers of participants are essential to distinguish reliably between the effects of healthcare interventions and the effects of bias or chance.

From the Genetic Department (Al-Hajeri), Salmaniyah Medical Complex, The Bahrain Branch of the UK Cochrane Centre (Fedorowicz), The Ministry of Health (Amin), Kingdom of Bahrain, UK Cochrane Centre (Eisinga), Oxford, United Kingdom.

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Address correspondence and reprint request to: Dr. Zbys Fedorowicz, Directorate of Training and Planning, Ministry of Health, PO Box 2218, Kingdom of Bahrain. Tel. +973 17288836. E-mail: zbyfedo@batelco.com.bh

Dissemination and integration of the trials' results through systematic reviews of the findings provides a basis for informed decision-making about the effects of different interventions. The Cochrane Collaboration is an international organization dedicated to improving healthcare for the world's population by preparing, maintaining and promoting the accessibility of systematic reviews of the evidence of the effects of healthcare interventions. The validity of the results of a systematic review is highly dependent on the data included and it is therefore, necessary to identify as unbiased and complete set of relevant studies as possible. Study identification by The Cochrane Collaboration has focussed on the systematic electronic searching of MEDLINE and EMBASE and the systematic handsearching of currently more than 2000 general and specialized healthcare journals.^{1,2} The handsearching involves reading each document in a journal to decide, according to the set Cochrane eligibility criteria,³ if it might be a report of a randomized trial. The efforts of the many volunteers working within The Cochrane Collaboration have added a substantial number of previously 'buried' reports of randomized controlled trials to the Cochrane Central Register of Controlled Trials (CENTRAL) published in The Cochrane Library and led to improved indexing of records in databases such as MEDLINE. Some of these reports of trials may have been 'buried' as a result of inconsistencies in indexing (indexing bias), lack of cover-to-cover indexing resulting in some sections of a journal not being indexed (which appears to be a particular problem with supplements and conference abstracts⁴) or more commonly because they have been published in journals not indexed in the major healthcare databases such as MEDLINE and EMBASE (database bias).⁵ The latter is especially true for journals published in languages other than English (language bias). For example, a study of 68 Spanish journals in general medicine found that only 6 were indexed in MEDLINE⁶ and a similar study in specialized healthcare journals found that nearly half of reports of randomized controlled trials in dentistry published in German were not included in MEDLINE.⁷

A Bahrain Branch of the UK Cochrane Centre was established in March 2005 to act as a focal point for Arabic speaking countries to co-ordinate the development and provision of training and support to Cochrane systematic review authors in the region. One of the activities of the Branch is a program of study identification to minimize the effects of bias through a comprehensive handsearching program of journals published in the Arab world. Bahrain, a small

independent Kingdom located in the Arabian Gulf, is a world renowned site for buried archaeological treasures. Described in the Epic of Gilgamesh as "the land of immortality and eternal youth", it is recognized as the largest necropolis in the world with 120,000 burial mounds scattered within its borders. These burial mounds, which date back to the Sumerian civilization 2000 BC, have been identified as a major source of archaeological artefacts for this historical period. Regrettably, much of what has been unearthed has little relevance to health care. However, the recent handsearching of 2 of Bahrain's English language medical journals, the Bahrain Medical Bulletin (BMB) and the Journal of the Bahrain Medical Society (JBMS), has revealed a treasure trove of reports of randomized trials of healthcare interventions. The Bahrain Branch seeks to identify reports of randomized trials by handsearching the Bahrain Medical Bulletin and the Journal of the Bahrain Medical Society, which are indexed in EMBASE, but not in MEDLINE. This report describes that work and also seeks to determine the added value of the handsearching in minimizing the effects of indexing bias by comparing the reports found by handsearching with what would have been found by searching EMBASE to examine (i) the precision and sensitivity of the EMBASE index term Randomized Controlled Trial and (ii) The Cochrane Collaboration's systematic electronic search of EMBASE. This systematic search involves the checking of titles and, where available, abstracts of records retrieved by the search to identify reports of trials which are then added to CENTRAL.

Methods. In February 2005, all issues of the BMB (1979 to December 2004) and the JBMS (1989 to October 2004) were searched by hand from cover to cover for reports of trials. These were classified as randomized controlled trials (RCTs) or controlled clinical trials (CCTs) according to the Cochrane eligibility criteria for reports, which require that the participants in the study were definitely or possibly assigned prospectively to one of 2 or more alternative forms of health care using random allocation or some quasi-random method of allocation such as alternation, date of birth or medical record number.³ The handsearcher classified reports of trials as RCTs if the groups compared in the trial were established by random allocation. If the author(s) did not state explicitly that the trial was randomized, but randomization could not be ruled out, the report was classified as a CCT. Controlled clinical trial was also applied to quasi-randomized studies where the method of allocation was known, but not considered strictly random (such as date of birth), and to studies

that may have been quasi-randomized. Photocopies of the relevant pages of the reports were identified, to provide bibliographic details and the study design informations were sent to the UK Cochrane Centre for verification and to be processed for submission to the US Cochrane Center for inclusion in CENTRAL in The Cochrane Library. EMBASE (via OvidWeb) and CENTRAL (Issue 1, 2005) were also searched to identify if the reports found by the handsearching were already included in either of these databases.

Results. We checked 395 articles in BMB and found 12 RCTs and 4 CCTs. Of the 97 articles in JBMS, we found 14 RCTs and 3 CCTs. The overall distribution by country of the corresponding author was highest for Jordan (16), followed by Bahrain (5) (Tables 1 & 2). Distribution by specialty was highest for anesthesia (15) (Tables 1 & 2). A full list of the 33 articles is available from the contact author. Overall, of the 33 reports of controlled trials found by the handsearch, there were records for 23 in EMBASE, but only 6 (26%) of these had been given the index term RCT (Figures 1 & 2). The overall added value of the handsearch in relation to EMBASE, defined as the total number of reports of trials published in these journals, but not indexed as randomized controlled trials in EMBASE and therefore, not easily identified without checking the journals themselves, was 27 of 33 (82%). Of the 23 reports found by the handsearching that were included in EMBASE, 12 were also in CENTRAL (Issue 1, 2005) (Figures 1 & 2). The overall added value of the handsearch in relation to CENTRAL at that time, defined as the total number of reports of trials published in these journals, but not

yet in CENTRAL and therefore, not easily identified without checking the journals themselves, was 21 of 33 (64%). Of the 11 reports (out of 23, 48%) found by our handsearching for which there was a record in EMBASE, but not in CENTRAL, 4 were published in 2004 and had been identified by the Collaboration's systematic search of EMBASE, but not yet submitted for CENTRAL. These were added to CENTRAL from Issue 4, 2005. Two reports could have been retrieved by the systematic search of EMBASE, but contained too little information in the title and abstract to be coded as controlled trials (namely the full paper had to be read to determine the study design). The remaining 5 reports did not contain terms currently used to identify reports of randomized trials in the systematic search of EMBASE.

Discussion. To minimize the bias due to the selective availability of data, systematic reviewers need to identify as much of the relevant evidence as possible. It has been shown previously that the identification of trials from bibliographic databases can be problematic.⁸ Our study confirmed that the precision of the EMBASE index term RCT was poor. It retrieved only 6 of the 23 (26%) reports of trials which were in EMBASE, even though only 2 of the reports (from 1989 and 1990) were published before this index term was introduced to EMBASE in 1994. Of the 10 reports not indexed in EMBASE, only one was published before the journal (BMB) was added to EMBASE. It is unclear why there are no records for the other 9 reports in EMBASE as they are all research articles and are not the type of report

Table 1 - Total number of reports of trials (n=16) found by the handsearch by country of principal investigator and specialty: Bahrain Medical Bulletin.

Bahrain Medical Bulletin	RCTs	CCTs
Country		
Bahrain	1	1
India	3	1
Jordan	4	1
Kuwait	-	1
Oman	1	-
Saudi Arabia	2	-
USA/Bahrain	1	-
Specialty		
Anaesthesia/Analgesia	7	1
Community Medicine	1	-
Obstetrics & Gynaecology	2	1
Paediatrics	1	-
Radiotherapy	-	1
Sports Medicine	1	-
Surgery	-	1

Table 2 - Total number of reports of trials (n=17) found by the handsearch by country of principal investigator and specialty: Journal of the Bahrain Medical Society.

Journal of the Bahrain Medical Society	RCTs	CCTs
Country		
Bahrain	3	-
Egypt	1	-
Jordan	9	2
Kuwait	1	-
Saudi Arabia	1	-
Specialty		
Anesthesia/Analgesia	6	1
Ear Nose and Throat	-	1
Education	1	-
Obstetrics & Gynecology	1	-
Ophthalmology	1	-
Pediatrics	1	-
Radiotherapy	1	-
General Surgery	3	-
Orthopaedic Surgery	1	-

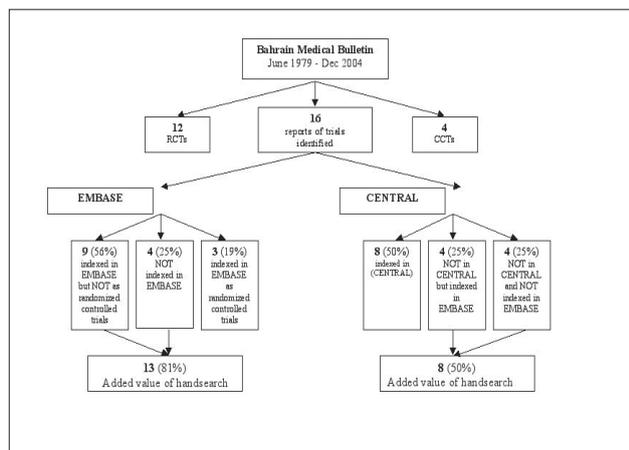


Figure 1 - Bahrain Medical Bulletin. Added value of handsearch is defined as the total number of trials not indexed as randomized controlled trials in EMBASE or CENTRAL and therefore not easily identified except through the handsearch of this journal.

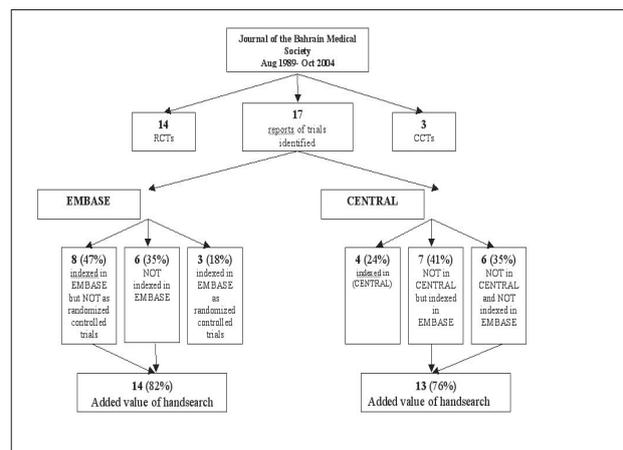


Figure 2 - Journal of the Bahrain Medical Society. Added value of handsearch is defined as the total number of trials not indexed as randomized controlled trials in EMBASE or CENTRAL and therefore not easily identified except through the handsearch of this journal.

which is sometimes not indexed, such as author correspondence, news items, meeting abstracts or contributions to separate supplements.⁴

In an effort to overcome problems due to the lack of appropriate indexing terms and inconsistencies in indexing (indexing bias), The Cochrane Collaboration has carried out systematic electronic searches of MEDLINE and EMBASE using extensive search strategies designed to be sensitive (namely to avoid missing reports of trials).^{9,10} However, despite such extensive searching, handsearching still provides additional reports of trials missed by the electronic searches.¹¹ We searched CENTRAL for the reports of trials found by our handsearch of these journals to examine the potential added value of the handsearch over the systematic searching that has already been done of EMBASE.

Our study confirmed that 11 reports (out of 23, 48%) were found by the handsearch for which a record was found in EMBASE, but which had not found their way into CENTRAL as a result of the Collaboration's systematic search of EMBASE. Four were published in 2004 and had been identified by the systematic search, but had not yet been published in CENTRAL. Two reports could have been retrieved by the search, but the full paper was needed to determine the study design as there was insufficient information in the title and abstract for these to be coded as reports of controlled trials. The remaining 5 reports did not contain terms currently used in the systematic search of EMBASE to identify reports of randomized trials.

The development of the Collaboration's sensitive search strategy for retrieving reports of randomized

trials in EMBASE is ongoing and our findings are a useful contribution to the investigation of additional terms, which might be of value in retrieving reports of trials not found by electronic searches. Our study shows that relying on the index term RCT on its own for searching EMBASE will miss relevant articles. Researchers wishing to increase the likelihood that reports of their randomized trials will be found easily should report their study designs clearly, comply with published guidance CONSORT (Consolidated Standards of Reporting Trials)¹² on reporting randomized trials, and mention their study design in the title of the article. This would also help people indexing the article for inclusion in bibliographic databases to apply appropriate index terms and improve retrieval of reports in electronic searches. Further research is required to assess the quality of the trials we identified¹³ and to assess how many of these trials had also been published elsewhere. Further research could also compare the quality of trials and the effects of interventions in randomized trials reported in Arabic with those reported in English. This would help identify any differences that might introduce bias to reviews if they do not search for trials published in Arabic.^{14,15} The handsearching program of the newly established Bahrain Branch of the UK Cochrane Centre is already providing a valuable and unique contribution from the Arab region to the global effort of The Cochrane Collaboration to make reports of randomized trials accessible to people wishing to make well-informed decisions about the effects of healthcare interventions. This

work will also contribute to a more comprehensive assessment of the biomedical research output of Arab countries. The handsearching of the first 2 journals in this program, the Bahrain Medical Bulletin and the Journal of the Bahrain Medical Society, should help minimize the effects of publication biases by facilitating access to reports of trials not previously identified. Although these journals are indexed in EMBASE, the handsearch has ensured that reports of trials will not remain 'buried' because of inconsistent indexing.

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