Cochrane update

Evidence-based public health: the importance of finding ‘difficult to locate’ public health and health promotion intervention studies for systematic reviews

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Background

Systematic reviews are used to assess and summarize research, and therefore are instrumental to decision-making in public health and health promotion policy and practice. The validity of the results of a systematic review is highly dependent on the data collection methods used.1 This includes a systematic search to locate all relevant studies, which is often a difficult and challenging task. A great deal of public health and health promotion research has been conducted, but only some of it is available in the public domain, and overall the literature is widely dispersed.2

This paper aims to highlight some of the issues surrounding publication bias, including database bias, language bias and grey literature bias, and to illustrate these issues with public health examples where available. Publication bias is defined here as the publication or non-publication of research findings based on the nature and direction of results.3–6 Methodology to prevent or minimize publication bias is described, including an outline of the role of the Cochrane Health Promotion and Public Health Field (the HP&PH Field) in improving access to ‘difficult to locate’ health promotion and public health intervention studies and effectiveness reviews.

What are the consequences of publication bias in public health and health promotion reviews?

Reviews have been described as an efficient way of becoming familiar with state-of-the-art research and practice in specific topics in public health.7 However, publication bias imposes limitations on the conclusions that can be drawn from reviews if the search strategy employed fails to identify an unbiased sample of relevant studies. This may lead to inappropriate or inadequate decisions being made regarding policy, practice and future research. The consequences of such decisions include the unavoidable suffering of individuals (whether healthy populations or patients8,9) and a waste of limited resources.4 Within health promotion, concurrent reviews have often overlapped in the questions they address and the primary studies they examine.9 Non-publication of trial results has been described as scientific misconduct,5 unethical8 and as breaking the contract that investigators make with trial participants, funding agencies and ethics boards.10

Types of publication bias

Poor access to, and therefore the non-inclusion of, studies or journals that are not indexed in databases, studies in non-English language publications and those from the unpublished (grey) literature can lead to bias being introduced into systematic reviews. This will occur if the results in the ‘difficult to locate’ sources are systematically different from those found in the easily accessible sources.4,11

Database (indexing) bias

Studies that are published in non-indexed journals are to some extent hidden from reviewers.5 This is of particular importance for the dissemination of findings from research in less developed
countries, as approximately only 2 per cent of journals originating in these countries (e.g. India) are indexed in MEDLINE. What proportion of health promotion and public health journals are indexed in MEDLINE? Consider the following two lists of public health journals. The Lamar Soutter Library list compiled by the University of Massachusetts Medical School consists of 614 journals. Thirty-eight per cent (n = 235) of these are not indexed in MEDLINE. The Core Public Health Journals list consists of 560 journals (86 of which do not appear on the Lamar Soutter Library list). Forty-four per cent (n = 246) of these are not indexed in MEDLINE. Some of the non-indexed journals may not include intervention studies or reviews. However, it is believed that because of the way the lists were compiled, it is unlikely that they cover the full complement of non-English language or developing country public health and health promotion journals. Thus reviewers are likely to have difficulty in accessing many more journals and intervention studies.

Language bias

English is the predominant language in contemporary medical research. Whether this also applies to health promotion and public health is unquantified and is likely to be topic dependent. For example, trials published in languages other than English and trials not indexed in MEDLINE are important to locate and consider for inclusion in psychiatry, rheumatology and orthopaedics reviews, and trials in complementary medicine are frequently difficult to locate.

Gregoire et al. (1995) determined that 26 out of 36 (72 per cent) meta-analyses restricted their searches to English only. Although factors such as the logistical and cost barriers of translation may, at least in part, explain this, it may also reflect reduced accessibility to non-English language studies.

Grey literature bias

Grey literature is generally assumed to include literature that has not been published, has limited distribution or is not available through conventional channels. For example, an examination of the fate of doctoral theses from the School of Hygiene and Public Health, Johns Hopkins University, found that one-third of graduates had not published from their thesis. The importance of unpublished trials also appears to vary across medical specialties; for example, unpublished trials are particularly prevalent in oncology. A recent publication concluded that bias against publishing non-significant results is an issue even for large (sample size over 200), phase III, randomized controlled trials in cancer research.

Other issues to consider

Publication bias in narrative systematic reviews

The problem of publication and publication-related biases has been examined more often in reviews containing a meta-analysis. There is a lack of methods that can be used to detect such biases in narrative systematic reviews. This is of particular relevance to public health and health promotion, as a large proportion of reviews lend themselves better to a narrative technique. Of the 142 health promotion and public health-related Cochrane reviews posted on the HP&PH Field’s website (at September 2003, www.vichealth.vic.gov.au/cochrane/activities/reviews.htm), 35 (25 per cent) adopted a narrative synthesis. Outside of Cochrane reviews, the number of reviews using this technique is even higher. Ninety-one per cent (361/398) of the health promotion effectiveness reviews identified by Peersman et al. summarized their results narratively.

Methodological quality of ‘difficult to locate’ studies

Debate continues in the literature regarding the methodological quality of trials published in non-English language journals and therefore whether their inclusion or exclusion will (statistically) significantly affect the results of meta-analyses. Unpublished trials often have not undergone peer review. As relevant data may be incomplete or missing, their methodological quality can be difficult to assess, and thus inclusion decisions are problematic. The finding that trials that are difficult to locate are often of lower quality raises the possibility that rather than preventing bias through extensive searching, bias could be introduced by including trials of low methodological quality. The quality of primary studies and reviews in public health and health promotion has already been identified as an issue. Only one-third of the public health-related randomized controlled trials identified by Fahey et al. made efforts to control bias at entry, after entry and at outcome assessment, and the overall quality of studies did not improve over time. In a review of reviews of health promotion in schools, the quality of the reviews was found to vary, with less than half the reviews gaining a quality score of 10 or more out of 16. As the validity of the results of systematic reviews is also dependent on the methodological quality of the component studies, thorough quality assessments must be undertaken by reviewers.

Methods available to prevent or minimize publication bias

Investigators, reviewers and editors can all play a role in reducing publication bias. For example, reviewers need to make a concerted effort to locate all relevant studies and update their reviews when new studies become available. Assistance in this area exists in the form of trial or studies registers. These can be broadly defined as retrospective registers (see below), and prospective registers (such as Current Controlled Trials, www.controlled-trials.com/). Investigators need to be encouraged to publish their studies, regardless of outcome. Equally, editors could make a concerted effort to include studies based on methodological criteria only and to increase the breadth of study origin. It is encouraging that journals, including the
The role of the HP&PH Field in assisting reviewers to locate relevant studies

Identifying sources of unpublished studies can be time consuming and involve considerable cost and effort. Cochrane reviewers are assisted in this process by the development of topic-specific, retrospective trial registries compiled by Cochrane Review Groups, Fields and Networks. The trials identified by the Cochrane Collaboration’s handsearching activities form part of an international register of controlled trials: the Cochrane Central Register of Controlled Trials (CENTRAL). Over 1700 journals have been or are being handsearched by individuals within the Cochrane Collaboration. The generation and maintenance of these registries is achieved, in part, by the handsearching of published and unpublished sources to ensure the identification of as many relevant studies as possible. Although many Cochrane Review Groups undertake handsearching to varying degrees, which will inevitably include some journals covering health promotion and public health intervention studies, potentially there is a myriad of studies relevant to public health and health promotion that are being missed.

The Cochrane Health Promotion and Public Health Field wishes to expand its activities to identify studies to be included in the HP&PH Field’s specialized register. Currently this register (known as TRoPHI, http://www.epi.ie.ac.uk/EPPIWeb/home.aspx) consists of the studies collected and coded by the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI Centre) in the United Kingdom. This is generated from the comprehensive searches the EPPI Centre conducts whilst undertaking its own systematic reviews. The HP&PH Field is particularly interested in locating randomized controlled trials, controlled clinical trials (quasi-randomized controlled trials) and effectiveness reviews in journals that are not indexed in electronic databases including seminal non-English language journals, and conference abstracts. A handsearching strategy is currently being prepared to undertake these activities.

Conclusion

Further research is required to determine the quantity and quality of public health and health promotion intervention studies that exist in non-indexed English and non-English language journals and in the grey literature. It is then that the impact of including or excluding these studies in systematic reviews can be evaluated.

Accessibility to all relevant studies, regardless of results, language or publication status, is important in improving the quality and relevance of systematic reviews. The HP&PH Field is developing a strategy to assist reviewers in identifying all relevant public health and health promotion-related intervention studies. As studies identified outside of widely used databases and readily accessible journals may be of lower quality than studies that are easier to access, readers and reviewers must take due care to assess the quality of the study or review. The HP&PH Field believes that increasing access to all relevant studies and reviews will not only assist researchers interested in undertaking a systematic review but will also add to the information base available to decision-makers and assist in the prevention of duplication of effort. Ultimately, the identification of these ‘difficult to locate’ studies will depend on a collaborative effort across the breadth of health promotion and public health-related disciplines.

Update of Cochrane protocols and reviews of relevance

Issue 4, 2003 of The Cochrane Library was released in October. Below are new health promotion and public health oriented reviews and protocols from Issues 3 and 4, 2003.

New reviews

- Post-license driver education for the prevention of road traffic crashes.
- Family and carer smoking control programmes for reducing children’s exposure to environmental tobacco smoke.
- Fluoride mouthrinses for preventing dental caries in children and adolescents.
- Heroin maintenance for chronic heroin dependents.
- Interventions for improving communication with children and adolescents about a family member’s cancer.
- Screening programmes for the early detection and prevention of oral cancer.
- Modification of the home environment for the reduction of injuries.
- Lactational amenorrhea for family planning.
- Smoking cessation for the secondary prevention of coronary heart disease.
- Topical fluoride (toothpastes, mouthrinses, gels or varnishes) for preventing dental caries in children and adolescents.
- Impact of tobacco advertising and promotion on increasing adolescent smoking behaviours.

New protocols

- Community-based interventions for the prevention of burns and scalds in children.
- Competitions and incentives for smoking cessation.
- Health care financing systems for increasing utilization of tobacco dependence treatment.
- Helmets for preventing injury in motorcycle riders.
- Interventions for promoting use of booster seats for children aged 4–8 travelling in cars.
- Interventions for smokeless tobacco use cessation.
- Pharmaceutical policies: effects on rational drug use.
- Printed educational materials: effects on professional practice and health care outcomes.
• School-based education programmes for the prevention of child sexual abuse.
• Vaccines for measles, mumps and rubella in children.
• Family-based programmes for preventing smoking by children and adolescents.
• Domestic violence screening and intervention programmes for adults with dental or facial injury.
• Home visits during pregnancy and postpartum for women with an alcohol and/or drug problem.
• Influence of comprehensive versus partial information on consumers’ screening choices.
• Information and support interventions for carers of people with dementia.
• Population-based interventions for the prevention of fall-related injuries in older people.
• Interventions for the prevention of relationship and dating violence in adolescents and young people.
• Stage-based interventions for smoking cessation.
• The ‘WHO safe communities’ model for the prevention of injuries in whole populations.
• Influence of comprehensive versus partial information on consumers’ screening choices.
• Low glycaemic index diets for coronary heart disease.
• Nutritional interventions for reducing morbidity and mortality in HIV infected individuals.

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References