

Engagement in research: an innovative three-stage review of the benefits for health-care performance

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Scientific summary

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Background

This review responds to a 2010 call, by the National Institute for Health Research (NIHR) Service Delivery and Organisation (SDO) programme, for a theoretically and empirically grounded synthesis to map and explore plausible mechanisms through which research engagement might improve health services performance at clinician, team, service or organisational levels. There is a widely held assumption that research engagement improves health-care performance at various levels, but little direct empirical evidence had been collated prior to this review to support this assumption.

Objectives

In scoping the review, much depended on how key phrases such as 'research engagement', 'engagement in research', 'performance', and 'mechanisms' were interpreted. Driving the invitation to tender (ITT) was a concern to improve understanding of the impact of engagement in health research. With this in mind, 'engagement *in* research' was taken to mean a deliberate set of intellectual and practical activities undertaken by health-care staff (including conducting research and playing an active role in the whole research cycle) and organisations (including playing an active role in research networks, partnerships or collaborations and ensuring the research function is fully integrated into organisational structures). 'Performance' reflected the consequences of clinical activity, and was therefore primarily taken to mean improvements in the processes and outcomes of care, rather than other measures of performance such as efficiency. 'Mechanisms' were seen in relatively simple terms as levers that instigate and sustain activity, for example, research collaborations between researchers and health-care staff who are potential users of the findings.

One important influence was an earlier review of the effects on patients of their health-care practitioner's or institution's participation in clinical trials, published after the proposal for this review had been submitted. This identified 13 relevant papers, and, overall, suggested that the evidence that research engagement improves health-care performance was less strong than some thought. This evidence synthesis updates that earlier review, drawing on more recently published literature and including other types of research engagement than just participation in clinical trials.

This evidence synthesis also explores what the literature can tell us about the mechanisms involved in promoting research engagement. To facilitate detailed analysis, a matrix was developed to characterise the circumstances in which research engagement might improve health-care performance and the mechanisms that might be at work, identifying two main dimensions along which to categorise the studies. These were *the degree of intentionality* and *the scope of the impact*.

Least intentionality is when the improvement in health-care performance resulting from engagement in research is a by-product of research that is conducted with the primary aim of testing a specific therapy or approach. Research networks are broadly in the middle of this spectrum, and greatest intentionality is when there is an explicit intention to produce improvements in health-care performance as a direct consequence of research engagement by health-care staff through interventions such as collaborations, participatory research, and/or organisational approaches. Broader impact refers to those who have engaged in research becoming more willing and/or able to provide evidence-based care that is not related to the specific findings of the research on which they are engaged. Specific impact refers to those who have engaged in research becoming more willing and/or able to provide evidence-based care that is related to the specific findings of the research on which they are engaged.

Methods

The hourglass review

Responding to the challenges presented by the review question, an innovative approach was developed. This approach, named an hourglass review, consisted of three stages. The first stage involved a broad mapping exercise exploring a large number of bodies of literature that might contain empirical evidence relating to the question and any mechanisms and theoretical perspectives that might be relevant. The second stage was a focused (or formal) review that concentrated on the core question of whether or not research engagement improves health care. The final stage involved a wider (but less systematic) review of papers identified during the two earlier stages that were relevant to the review question. This stage included many papers that did not meet the inclusion criteria for the focused review.

The hourglass shape refers to the scope of the analysis at each stage, and to the number of papers considered in detail; in terms of the volume of titles and abstracts processed, the throughput of the review was greatest in the second stage.

Stage 1: Planning and mapping

For this exercise the team drew on existing knowledge, initial scans of the literature, team meetings and brainstorming sessions, and consultation with the advisory group. This helped inform the search terms for the next stage. Many theoretical perspectives were also identified, and the selection of ones to inform the matrix development was strongly influenced by the decision after the initial broad exploration that the review should focus on the term 'engagement *in* research' and not additionally include the wider term 'engagement *with* research'. This meant that theories were selected, such as collaborative research theories, which related to research processes but not just research utilisation.

Stage 2: Focused review

Search strategy

This was developed by members of the review team and an information scientist. It involved a comprehensive search of as many of the relevant databases as time allowed and sought to identify empirical research studies covering a whole range of research approaches – quantitative and qualitative (i.e. not limited to clinical trials). The search sought to identify studies where the concept of 'engagement *in* research' was an input and some measure of 'performance' was an output, and the initial broad interpretation of these terms tightened as the review progressed. The search strategy covered the period 1990 to March 2012. MEDLINE, EMBASE, PsycINFO, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, Applied Social Sciences Index and Abstracts (ASSIA), British Nursing Index, Health Management Information Consortium (HMIC) and System for Information on Grey Literature in Europe (SIGLE) databases were searched. The database searches were supplemented by hand-searching five journals that specialise in this area, by papers suggested by the advisory group, and by snowballing. To address the likely bias towards the publication of studies with positive results, a search of the grey literature was conducted and key authors in the field were contacted to identify unpublished literature.

The database searches identified 10,239 papers, and 159 were identified from other sources. The focused review involved an initial examination of the title of each paper (and the abstract when the title provided too little detail) to exclude documents that were clearly not relevant. As a second step, two or more reviewers studied the titles and full abstracts in greater depth to assess the eligibility of each paper. A further relevance and quality check on 473 papers was undertaken to determine whether or not they were suitable to proceed to the data extraction stage. Determining the inclusion criteria at this third step was complicated because the relationship between research engagement and improved health care had to be demonstrated in some way, and preferably in a way that allowed some measure of control in the study.

Inclusion criteria

An abbreviated version of the final inclusion criteria is presented below:

- (a) includes empirical data
- (b) explicitly includes engagement *in* research in any way including
 - agenda setting
 - conducting research
 - action research
 - research networks where the research involvement is noted
- (c) includes assessment of health-care processes/outcomes (for example, use of clinical guidelines).

Analysis

A heterogeneous mix of material was identified and a standard meta-analysis was not possible. A detailed data extraction sheet was completed for each paper and key aspects of the included studies were collated in a table. Using the matrix, each paper that reached the final data extraction step was also analysed in relation to:

- Importance of the paper to the review. This was based on quality (especially how well controlled the study was), size of the study, and relevance to the review question – a necessary feature because a number of papers contained information of relevance to the review, but not as the main focus of the paper.
- Whether the findings of the paper were positive or negative in relation to the review question (i.e. positive if they showed research engagement did improve health care, and negative if not). Within each group some were also classified as mixed.
- The degree of intentionality of the link between research engagement and health-care performance (by-product, research network, or intervention).
- The scope of the impact made by research engagement (broader impact/specific impact).
- The level of engagement discussed (clinician or organisational).

Stage 3: Wider review

The informal wider review was intended, in particular, to facilitate an exploration of the mechanisms. The additional papers included at this stage were the most relevant for the analysis of all 440 papers excluded from the final step of the focused review, with the addition of relevant papers identified during the mapping stage and the ongoing snowballing exercises. Relevance was determined in relation to theories and mechanisms.

Results***Results on the main question from the focused review***

Thirty-three papers were included in the focused review. Twenty-eight papers were positive (of which six were positive/mixed) in relation to the question of whether or not research engagement improves health-care performance. Five were negative (of which two were negative/mixed). Seven of the 28 positive papers reported some improvement in health outcomes; the rest reported improved care in the form of improved (usually more evidence-based) processes of care.

Twenty-one of these 33 papers came into the 'by-product' category of least intentionality, and this included all 12 of the 13 papers from the earlier review included in this evidence synthesis. The more recent and wider search therefore produced an additional nine papers in this category. By including papers in the other categories of mid and greatest intentionality (research networks and deliberate interventions such as collaborations) the total number of papers was increased by a further 12, with eight being in network category. All eight were classified as being positive, or positive/mixed, as were three of the four intervention studies.

The earlier review examined two levels of health-care performance: practitioners and institutions. In this review 11 papers were at the clinician level and 22 studies were at higher levels, collectively described as the institutional level. Of the 28 positive papers, 19 were institutional and nine clinician level. Of the five negative papers, three were institutional and two clinician level.

Thus, the focused review collated more evidence than had previously been brought together on the question of whether or not research engagement improves health-care performance, and it was generally positive, but not easy to interpret.

Results from the focused and wider reviews on the analysis of mechanisms and the role of organisations

The mechanisms identified in the focused review papers provided a starting point for an analysis of issues associated with engagement in research, including enhanced clinician attitudes towards research, trust in specific findings, and improved protocols and infrastructure. This analysis was supplemented by the wider review which provided further empirical and descriptive studies, theoretical analyses and previous reviews that were relevant. For example, in the network category the wider range of papers included negative ones, and studies from outside the USA, and allowed a fuller analysis of the mechanisms associated with such networks. In the highest category of intention only four papers were included in the focused review, but others from the wider review demonstrated how collaborative or action research can encourage progress along the pathway from research engagement towards improved health-care performance by involving potential users in some aspects of the whole research process.

Health-care organisations and systems provide the context within which research engagement operates at other levels. The studies in the wider review provided cumulative evidence that organisations in which the research function is fully integrated into the organisational structure can out-perform other organisations that pay less formal heed to research and its outputs. However, at this organisational level, as at other levels, engagement in research is only one of many influences on performance. Disaggregating how these mechanisms operate in complex systems is not straightforward.

Conclusions

- Drawing on the focused review (especially using the by-product and network categories from the matrix) the review suggests that when clinicians and health-care organisations engage in research there is the likelihood of a positive impact on health-care performance. However, this is more likely to be demonstrated through improved health-care processes than through improved patient outcomes.
- There is considerable diversity in the mechanisms through which research engagement might improve health care: there are many circumstances and mechanisms at work, more than one mechanism is often operative, and their effectiveness depends on the context in which they operate. The evidence available for each one is limited. This limits the immediate implications for practice.
- Generally, at lower levels of intentionality (where improved health-care performance is a by-product of a research study) a series of one-off studies were identified in which a diversity of detailed mechanisms was considered. At higher levels of intentionality (e.g. networks and collaborations) mechanisms were more established and research processes themselves became an increasingly important means through which research engagement can improve health-care performance.
- The number of research networks is growing, and these new structures continue to develop and evolve. The contribution of collaborative approaches to research is also developing.
- At an organisational level, the mechanisms through which research engagement promotes performance improvement are often only one facet within a wider, multipronged change strategy. Organisations that have deliberately integrated the research function into organisational structures demonstrate how research engagement can, among other factors, contribute to improvement in health-care performance.

Recommendations for research

1. Further explorations of how particular mechanisms promote research engagement. Evaluations of research networks and of schemes to promote the engagement of clinicians and managers in research would be particularly valuable.
2. Detailed observational research focusing on research engagement within organisations, to build understanding of mechanisms, and to explore potentially negative impacts of research engagement alongside benefits.
3. Organisation-wide interventions designed to promote research engagement also require further research. There are significant methodological challenges in conducting evaluations of these complex interventions and a need for methodological development to improve evaluations of how different mechanisms operate in complex systems.
4. Scoping exercise to identify possibilities of using large databases of research production and hospital performance.
5. There is a role for social theory in developing and understanding the role of research engagement in promoting health-care improvement.

Study registration

This study is registered as PROSPERO CRD42012001990.

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