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Knowledge Brokering: The missing link in the evidence to action chain?

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Abstract

Transferring health care research into policy and practice is a messy and complex process which both policymakers and researchers can struggle with. A potential solution is to use individuals or organisations as knowledge brokers. Using a range of literature, this paper explains the theory behind knowledge brokering, identifies three models of brokering and explores the challenges of brokering. We suggest that clarifying these factors is a significant step towards planning well designed and rigorously evaluated brokering interventions. We also suggest that a clearly defined theoretical framework could help us to find out more about how brokering works and its effectiveness.

Keywords

Knowledge brokering; knowledge transfer; healthcare; implementation

Introduction

The importance of transferring research evidence into healthcare policy and practice is widely acknowledged, as failing to do so results in health inequities and wasted resources (Berwick 2003; World Health Organization 2004). Finding and using appropriate mechanisms for transferring research into policy and practice has become a major policy driver in the UK and around the world. Lord Darzi's recent reports on the UK Health Service have urged action on improving the uptake of medical research and evidence-based health technologies (Lord Darzi 2007) and research funding councils are beginning to mandate the use of activities which link research-generated evidence to policy and practice (Tetroe, Graham et al. 2008). These activities include involving users in the research process, using innovative and targeted dissemination methods and providing opportunities for continuing professional development.

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However, the process of transferring research knowledge into action is recognised as messy and complex (Graham, Logan et al. 2006). Decision makers and researchers inhabit different worlds (Caplan 1979). Whilst researchers may revere theories and concepts, decision makers want evidence which is relevant and easy to understand. And whilst researchers often take years to complete research studies, decision makers want answers quickly (Mitton, Adair et al. 2007). Each side also speaks its own, highly technical language (Choi, Pang et al. 2005). Given these difficulties, it is sometimes thought that neither researchers nor decision makers are best placed to drive the translation, transfer and implementation of health research evidence.

One proposal is the use of intermediaries or brokers. Positioned at the interface between the worlds of researchers and decision makers, they are seen as the human force behind knowledge transfer, finding, assessing and interpreting evidence, facilitating interaction and identifying emerging research questions (CHSRF 2003).

In this paper we use a range of research and ‘grey’ literature to explicate the concepts of knowledge brokering in more detail, provide examples of knowledge brokering in practice and examine its challenges. The literature was identified as part of a larger review of the knowledge transfer literature (Ward, House et al. in press) which involved an initial scoping review, the development of search terms relating to knowledge transfer and knowledge brokering and searches of 14 different databases including Cambridge Scientific Abstracts, Web of Science and Medline. Search terms specifically related to knowledge brokering included ‘knowledge broker’, ‘intermediary’, ‘boundary spanner’ and ‘research translator’. Comprehensive searches of all databases were carried out until March 2008. In addition, searches on knowledge transfer and knowledge brokering have continued to be carried out in Cambridge Scientific Abstracts on a monthly basis. Up-to-date grey literature has been located via the Canadian Health Services Research Foundation e-bulletins and website and the KUUC e-watch bulletin on innovation in health services. As a result of these searches 21 papers which focused on describing or evaluating knowledge brokering interventions were the identified.

Knowledge brokering theory

The Oxford English Dictionary defines brokers as middlemen, intermediaries or agents who act as negotiators, interpreters, messengers or commissioners between different merchants or individuals (OED online). Brokers traditionally favour neither individual but instead act as go-betweens, serving the needs of both. For our purposes the role of brokers is to make research and practice more accessible to each other. Terms such as boundary spanner, research navigator, research liaison officer, knowledge translator and research broker are used widely. However, the term knowledge broker captures something of the equitable relationship between research and practice which brokering seeks to foster. It also removes the focus from research-generated evidence to encompass other types of evidence including the tacit knowledge that resides in individuals and organisations (Roth 2003).

Knowledge brokerage can reside in individuals, organisations or structures. Early examples of brokering include an informal network of ties that connected the German synthetic dye industry to academic partners in the late 1800s (Lomas 2007) and the use of “county agents” to diffuse innovations to farmers in the USA (Rogers 2003). More recently consultancy has been seen as a promising model for knowledge brokering with its' focus on cross-pollination, matchmaking, translation, dissemination and linkage (Jacobson, Butterill et al. 2005; Sin 2008). However, the presence of a consultant-client relationship can call into question the extent to which consultants can really be impartial.

Until relatively recently, much of what we know about knowledge brokering came from the private sector, where brokering is seen as part of knowledge management - facilitating the spread of knowledge within and between organisations. The process of spreading knowledge is believed to stimulate innovation, leading to the development of new products (Roth 2003). In the last decade theories of brokering have become more tailored to the public sector and several distinct categories or functions of knowledge brokering have now been developed.

As early as 1997 Oldham and McLean proposed three frameworks for thinking about knowledge brokering within the public sector (Oldham and McLean 1997). The *knowledge system framework* relates to the creation, diffusion and use of knowledge and sees brokering as a way of facilitating or managing these activities. It is closest to the private sector view of brokers as knowledge managers. In the *transactional framework* brokering focuses on the interface between the "creators" and "users" of knowledge and seeks to foster links between the two. In this context, brokers are seen as linkage agents. Finally, within the *social change framework*, brokering is designed to enhance access to knowledge by providing training to knowledge users which may lead to positive social outcomes. In this context, brokers are seen as capacity builders. These functions of brokering have become widely accepted and form the basis for much of the practical work on knowledge brokering in the public sector. The following section will explore these functions in more detail using illustrations from the research and 'grey' literature on knowledge brokering and knowledge transfer,

Knowledge brokering in practice

Knowledge management

The knowledge management model is perhaps the best understood and most used aspect of knowledge brokering and has been developed in response to the difficulties associated with navigating, managing and sharing a large body of research and other evidence. For instance, Land & Water Australia have used knowledge brokering as a way of sharing and disseminating knowledge (Morley 2006). Knowledge brokering has also been used to address the language and cultural barriers between the worlds of research and decision making by translating research and other evidence into different vocabularies (Sin 2008), thereby encouraging research use. It has also been used as a way of stimulating research which is relevant to decision makers by transforming policy issues into research questions (CHSRF 2003).

Sharing research evidence with decision makers and practitioners through passive dissemination has been widely acknowledged as ineffective (Grimshaw, Shirran et al. 2001; Kerner 2006; Grimshaw, Eccles et al 2006). In a trial of active vs. passive dissemination Amsallem et al used knowledge brokers to support the active dissemination of research evidence related to the treatment of cardiovascular diseases (Amsallem, Kasparian et al. 2007). Knowledge brokers held a series of meetings with clinicians during which they discussed the research evidence, its consequences for decision making and the gaps between evidence and practice before proposing local solutions. They found that this style of dissemination had a significant effect on clinicians' intent to prescribe but that it had no effect on actual prescription practice.

Whilst recognising that dissemination (even active dissemination) alone is not necessarily sufficient for the successful transfer of research evidence into practice, Armstrong et al nonetheless suggest that knowledge brokers may be one way of increasing successful dissemination practice (Armstrong, Waters et al. 2007). Following an inconclusive evaluation of an evidence-based health promotion resource, they propose knowledge brokering as a way of implementing a structured dissemination strategy which would

include training workshops, professional development opportunities, communication through print and electronic media and personal, face-to-face contact.

Two case-studies of knowledge brokering interventions (Kramer and Cole 2003; Kramer, Cole et al. 2004) used a combination of active dissemination and translation strategies to introduce health and safety research evidence to workplace managers. The process included summarising a body of research into a research message, producing plain-English summaries, slides and handouts, holding one-to-one meetings with key staff members and facilitating group meetings to discuss the research. Whilst Amsallem et al (Amsallem, Kasparian et al. 2007) disseminated a large body of research evidence over a relatively short time scale (6 × 2 hour visits over 12 months), Kramer focused on sustained, intensive engagement to establish positive relationships with the user organisation and tailored the evidence to the workplace context to ensure maximum relevance.

In addition to spreading and supporting the use of research evidence, knowledge brokering can have a significant role to play in the creation of research evidence. A frequently used strategy is to assist decision makers to commission research through identifying and transforming their issues into clearly articulated research questions. Several projects have used knowledge brokering in this way.

The New South Wales Department of Health and the Sax Institute developed a knowledge brokering system that includes a commissioning tool for specifying the requirements of an evidence review, a register of experienced researchers to carry out the review, and a dedicated individual to liaise between policymakers and researchers during the commissioning process (Martinez and Campbell 2007). The system has been reported as a successful way of reducing barriers to the use of research in practice, but there is no evidence of a full-scale evaluation.

The Netherlands Organisation for Health Research and Development (ZonMw) used a knowledge brokering approach as a way of setting agendas and common goals for policymakers and researchers, clarifying information needs, commissioning syntheses of relevant research and packaging research syntheses (van Kammen, de Savigny et al. 2006). In this case, the organisation itself acted as knowledge broker, positioning itself at the interface between health policy, health research and the health system.

All of the projects outlined above have taken research and other evidence as their focus. Packaging, translating, spreading and commissioning research are brokering strategies which have been developed in response to the overwhelming quantity of research evidence and its lack of relevance to decision makers. An alternative is to focus more directly on the relationship between researchers and decision makers, in an approach which has become known as linkage and exchange.

Linkage and exchange

The linkage and exchange model focuses on the development of positive relationships between researchers and decision makers. It is based on the understanding that involving decision makers in the research process is the best predictor for seeing it used (Lomas 2000), one-to-one encounters are the most efficient mechanisms for transferring research (Lomas 2000) and relational strategies such as networks, partnerships and collaboratives can enhance successful knowledge exchange (Greenhalgh, Robert et al. 2004). Knowledge brokers act as intermediaries or linkage agents, using interpersonal contacts to stimulate knowledge exchange, the development of new research and the application of solutions (CHSRF 2003; Thompson, Estabrooks et al. 2006).

In a large-scale project run by the Scottish Executive and NHS Scotland (Clark and Kelly 2005), a dedicated team was responsible for carrying out a range of brokering activities including consultation and research mapping exercises, developing networks and communities of practice and facilitating knowledge sharing events. In addition to evaluating mechanisms for linking policymakers and academics, the project provided more information about the challenges of bringing the two communities together, such as the negative perceptions of academics about policymakers and vice versa. The final report from the project recommends the use of knowledge brokers as go-betweens, linking the policy, public sector, industry and academic communities.

A Canadian study examined the effectiveness of using knowledge brokers for increasing exchange between stroke researchers and the users of stroke research (Lyons, Warner et al. 2006). In a series of locations knowledge brokers worked with teams of policymakers and researchers to increase support for a new system of integrated stroke care. Their work included forming multi-sectoral advisory committees, facilitating communication and clearing up misunderstandings. The project encountered barriers including the time taken to establish partnership teams, the divergent mandates of partners and financial limitations. However, the authors of the study concluded that knowledge brokers can enhance partner interactions but need excellent communication skills and a clear understanding of both the policy issues and research evidence.

Using knowledge brokers to link the users and producers of research is not limited to the public sector. In a conference paper Lind and Persborn describe a project to enhance interaction between a questioner (an organisation which needs knowledge) and a knowledge resource (an organisation that can deliver the knowledge) (Lind and Persborn 2000). The LINK Center is a business which supports the creation of contacts between questioners and knowledge resources. However, although the aim of the Center is to form linkages, there is less emphasis on interaction or interpersonal processes. As such the model is perhaps best described as a ‘matchmaking’ service.

One further public sector project demonstrates how knowledge brokering can be used to facilitate communication. In the context of a research programme on hospitalization and help-seeking experiences of minority ethnic groups Baumbusch et al developed a collaborative model of knowledge translation (Baumbusch, Kirkham et al. 2008). Their aim was to break down the barriers between research and practice by encouraging researchers to become credible messengers and decision makers to become research champions. Knowledge brokering was used as a way of combining these two roles through the judicious use of language and reframing issues to make them accessible to both researchers and practitioners.

The linkage and exchange model emphasises the use of interpersonal contacts and good communication skills in the context of partnerships and research collaborations. Although it is a relatively widely-used strategy amongst dedicated knowledge brokers (Lomas 2007) and there are many reports of it being used in practice, there are few reports of its effectiveness in promoting a more equitable relationship between researchers and decision makers. However, there is good evidence that linking researchers with users in the early stages of a research project may lead to the successful uptake of the research into policy and practice (Innvaer 2002; Greenhalgh, Robert et al 2004; Conklin, Hallsworth et al. 2008).

Capacity building

The capacity building model is less well articulated and evidenced in the literature, perhaps because it often employs a deficit model of knowledge transfer which seeks to address shortcomings in the ability of decision makers to interpret and use research evidence.

Strategies such as educational outreach are particularly popular in the dissemination and behaviour change literature (Grimshaw, Eccles et al. 2006; Doherty 2006) which tends to focus on the one-way transfer of research to practice. A more positive way of viewing the capacity building model is in fostering self-reliance in both the researcher and the decision maker, developing the knowledge transfer and communication skills and developing the analytical and interpretive skills of decision makers. However, the few examples of capacity building interventions by knowledge brokers have focused on educating and developing the skills of decision makers, not researchers.

In a trial of knowledge brokering in healthcare Dobbins et al used a range of brokering activities to enable evidence-informed decision making (Dobbins, De Corby et al. 2007). A series of one-to-one interactions with a knowledge broker were used to develop and maintain relationships with decision makers, facilitate their capacity for evidence informed decision making and assist them in promoting organisational change (Robeson, Dobbins et al. 2008). Early results have shown that interaction with the knowledge broker resulted in a trusting relationship which facilitated evidence-informed decision making (Dobbins, DeCorby et al. 2007). However, these results also showed that interactions with the knowledge broker were not as effective as the provision of targeted messages based on research evidence. The reasons for this remain unclear, but many of the challenges of the study appeared to be associated with the time taken to build and maintain relationships and the lack of guidance available for planning and evaluating knowledge brokering interventions (Robeson, Dobbins et al. 2008).

In addition to using knowledge brokering to enhance knowledge sharing and dissemination, Land & Water Australia (Morley 2006) have recognised the potential for brokering to build capacity for organisations to access and apply knowledge. In their report they propose a range of training activities including information literacy (e.g. searching and accessing web-based sources), how to get knowledge needs onto the scientific agenda and how to transform management issues into research questions. They also describe a project which is designed to provide access to research and other information in a single authoritative source in the form of a web-based database.

The scarcity of published work which uses and assesses the capacity development model of knowledge brokering means that its use is most often supported by anecdote rather than by rigorous evaluations. However, this lack of evidence has not acted as a barrier to other projects which aim to develop the capacity of researchers and decision makers to transfer knowledge into action, suggesting that it remains a popular model in practice. Examples of ongoing projects include Melanie Barwick's knowledge transfer training course for scientists (see http://melaniebarwick.com/training.php) and Calgary Health Region's program of grants and mentoring to increase research use (see http://www.chsrf.ca/promising/html/pp16_e.php).

Challenges of knowledge brokering

Whilst knowledge brokering has been championed as a mechanism for transferring research evidence into policy and practice, it is not without its challenges. These have been touched on in previous sections and include the time and resources needed for effective brokering, the range of skills that brokering requires and the lack of evidence about the effectiveness of knowledge brokering.

The first challenge is the time and resources required for effective brokering. Although the literature suggests that it is not necessary for knowledge brokers to be individuals who are solely dedicated to the task of brokering (CHSRF 2003), brokering is a time-consuming activity. For instance, the knowledge management model of brokering requires significant

time and resources for identifying, capturing and sharing research evidence, especially when the pool of available evidence is large and unwieldy (Amsallem, Kasparian et al. 2007). The resource requirements for this model might include access to research databases, journals and information management software. Similarly, the linkage and exchange model of brokering often requires that a considerable amount and period of time should be dedicated to building relationships and creating partnerships (Bowen and Martens 2005). In a similar vein, the capacity development model of brokering also requires a large amount and period of time to be dedicated to such tasks as role modelling and mentoring and it has been suggested that a one-year time period is probably too short to achieve significant gains in capacity development (Robeson, Dobbins et al 2008).

The second challenge is the lack of distinction between brokering roles. Although there are three distinct models of knowledge brokering, aspects from different models are often used together. For instance, whilst the primary focus of Kramer's brokering approach was on disseminating a research message to workplace managers (Kramer and Cole 2003), she also focused on relationship and partnership development between the broker and managers and between managers and scientists. Similarly Dobbins et al's study used brokering to build capacity amongst decision makers but also included the development of relationships and dissemination of research evidence (Dobbins, DeCorby et al. 2007; Robeson, Dobbins et al. 2008).

The third challenge is the range of skills which are required to fulfil the different roles of a knowledge broker. For information management roles the ability to gather, critically appraise, synthesise and tailor research and other evidence are key skills along with the ability to hear, understand and structure decision making issues (CHSRF, 2003; Robeson, Dobbins et al. 2008). For linkage and exchange roles communication skills, mediation skills, networking skills and the ability to establish credibility are equally important (CHSRF 2003; Lomas 2007). For capacity development roles teaching skills, communication skills and mentoring skills are crucial (Robeson, Dobbins et al. 2008). In addition to these specific skill sets, the literature suggests that good interpersonal skills and personal attributes such as flexibility, curiosity and self-confidence are the key to successful knowledge brokering (CHSRF 2003; Thompson, Estabrooks et al. 2006, Lomas, 2007; Robeson, Dobbins et al. 2008)..

The final and probably the biggest challenge to knowledge brokering is the lack of knowledge about how it works, what contextual factors influence it and its effectiveness (Conklin, Hallsworth et al. 2008). Answers to these questions are needed both to win support for and justify the commitment of resources to knowledge brokering and to develop the theory and practice of brokering further. To answer these questions we need high-quality evidence generated from rigorous evaluations. Whilst funding has been provided to at least six knowledge brokering demonstration sites in Canada (CHSRF 2005), the evaluations which were due to be undertaken remain unpublished and it is unclear when they will become available. This means that much of the evidence which is currently available remains anecdotal and inconclusive (Conklin, Hallsworth et al. 2008). Reasons for this lack of evidence include a general lack of agreement about the key functions and skills of brokers, the multiplicity of brokering models and the practice of combining aspects of different models within one brokering intervention. In addition, knowledge transfer and knowledge brokering can be conceptualised as complex social activities which are difficult to evaluate (Ward, House et al. 2009). Key questions are what type of brokering outcomes can and should be measured (i.e. increased evidence use, relationships and interactions between researchers and users, increases in capacity to use evidence) and how can they be adequately captured (i.e. via survey, interview, documentary analysis)? Related issues and difficulties are the extent to which experimental methods are appropriate for evaluating

complex interventions which depend on the actions and a skills of a variety of actors (Davies, Nutley et al. 2000). One potential solution to this difficulty is to use a clearly defined theoretical framework to both design and evaluate knowledge transfer interventions such as knowledge brokering (Eccles, Grimshaw et al. 2005). This type of approach, based on realist evaluation, is now beginning to be widely recognised as a valuable way of examining and evaluating complex interventions such as knowledge brokering (Berwick 2008; MRC 2008). However, although there are a large number of theories, models and frameworks of knowledge transfer, these are rarely used to plan or evaluate knowledge transfer activities such as knowledge brokering (Mitton, Adair et al. 2007; Graham and Tetroe 2007; Ward, House et al. in press). Instead, finding effective evaluation tools remains a high priority for those involved in knowledge transfer and knowledge brokering (Jackson-Bowers, Kalucy et al. 2006).

Discussion & Conclusion

Knowledge transfer and knowledge brokering are complex activities. According to the aims of individual researchers and users, knowledge brokering can fall into one of three types – information management, linkage and exchange and capacity development. However, the boundaries between these are often blurred and many brokering projects combine elements of all three types to meet the needs of researchers and decision makers. This is often done without recourse to any underlying model or framework of knowledge transfer or knowledge brokering and causes difficulties when evaluating individual brokering interventions. Although it is not always feasible to use one type of brokerage in isolation, we suggest that the types and choices of brokering tools need to be better articulated and that brokering interventions should be planned more consistently. We see the alternative models of brokering outlined in this paper as a significant tool for planning and implementing brokering interventions.

However, an additional, and perhaps more robust tool for planning, implementing and evaluating knowledge brokering would be the application of a broader framework of knowledge transfer. This would mean that evaluative efforts could move beyond focusing on the different types of activities which could be performed by a knowledge broker towards a broader, more process oriented approach based on the underlying principles and processes of transferring knowledge into action. Such a framework forms the basis of our ongoing research on the processes and practices of knowledge brokering in a mental health context (Ward, House et al. 2009). Part of the research has involved developing a broad conceptual framework of the knowledge transfer process which is then being used as the basis for evaluating a knowledge brokering intervention. The framework focuses on five broad areas which are deemed crucial to the knowledge transfer process. These are identifying, communicating and refining the problem at hand; considering the key attributes of the knowledge which might contribute to its use in practice; analysing the context in which the knowledge is to be used; planning and implementing specific knowledge transfer activities or interventions; and considering the ways in which the knowledge is likely to be used (Ward, House et al. in press). We propose that using this kind of framework to design and evaluate knowledge brokering is likely to have several benefits. First, a broad framework could allow future projects to integrate different brokering models within a single intervention and to more clearly account for the use of more than one model. Second, future projects could use this framework as a guide to the types of activities which could be performed by knowledge brokers. Third, the framework will enable a broader understanding of exactly what goes on in a knowledge brokering intervention and how it fits within the knowledge transfer process. Finally, using the framework to consistently design and implement a range of knowledge brokering interventions would result in a critical mass of data and increase the possibility of evaluating the effectiveness of knowledge brokering.

Although knowledge brokering has been proposed as a positive mechanism for transferring research evidence into policy and practice, we have identified several challenges which threaten its development. The greatest of these is the lack of evidence about how brokering works, the factors that influence it and its effectiveness. Using a clearly defined framework to plan and implement knowledge brokering interventions more consistently would be a significant step towards generating more evidence about the use of brokering in practice. It would also enable us to add significantly to the evidence-base on the effectiveness of brokering, leading to the growth and development of brokering theory and practice.

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