Subsection 3.3 **Barriers**

Chapter 3.3a **Barriers and facilitators**

Strategies for identification and measurement

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Key learning points

- Barriers and facilitators to knowledge use are among the most important elements to be considered by those interested in knowledge implementation.
- A number of taxonomies/frameworks and instruments for assessing barriers and facilitators have been developed and should be used when developing a knowledge-to-action project.
- There is a need for a consensus on existing taxonomies/frameworks and instruments to support valid comparison between diverse contexts.

Knowledge Translation in Health Care: Moving from Evidence to Practice, Second Edition. Sharon E. Straus, Jacqueline Tetroe and Ian D. Graham.

Introduction

The need for the effective knowledge translation in clinical practice is essential if we want to address the following challenges: (a) increased availability of health information [1]; (b) the expanded role of patients in clinical decision making [2]; (c) management of expectations regarding new treatments and technologies [3]; and (d) enhanced patient safety [4].To date, there is consensus in the implementation research community that efforts to translate knowledge at the clinical level have met with little success [5]. Although each phase of the knowledge-to-action cycle is important for ensuring the effective translation of knowledge, the aim of this chapter is to highlight the specific challenges associated with the assessment of barriers and facilitators to knowledge use. The observations in this chapter are based on a search of the Knowledge Translation Resource Clearinghouse of the Keenan Research Centre, a joint program of St. Michael's Hospital and the University of Toronto's Faculty of Medicine (http://ktclearinghouse.ca/tools/science, accessed September 2012).

The first section of this chapter addresses the importance of barriers and facilitators to knowledge use in health care. The second section briefly presents the evolution of a few models in this field in order to highlight the relevance of using conceptual models to assess barriers and facilitators. The next section reviews relevant instruments for measuring barriers and facilitators, and the last section of the chapter summarizes the lessons learned from the various research initiatives cited and identifies areas in need of further research.

Why are barriers and facilitators to knowledge use important?

A search in PUBMED up to August 7, 2012 using the search terms "barriers" and "barriers AND implementation" produced 57,665 and 4359 hits, respectively. The literature often refers to barriers and facilitators to knowledge use in the context of "beliefs about capabilities," of which they are key determinants. "Beliefs about capabilities" includes the concept of perceived behavioral control, a determinant of behavior proposed by the theory of planned behavior (discussed in Chapter 4.2) [6]. In a review of 78 studies using social cognitive theories (theories where individual cognitions/thoughts are viewed as processes intervening between observable stimuli and responses in real world situations) to identify factors influencing health professionals' behaviors, the authors found that the cognitive factors most consistently associated with predicting health care

professionals' intention and behaviors were beliefs about capabilities and intention [7]. Their results led the authors to propose an integrated theoretical framework for the study of health care professionals' behavior and intention, that is based on beliefs about capabilities. They hypothesized that in cases of non-volitional behavior, beliefs about capabilities have the potential to directly influence both intention and behavior. Moreover, a recently published Cochrane Review concluded that "interventions tailored to prospectively identified barriers are more likely to improve professional practice than no intervention or dissemination of guidelines" [8]. In other words, among all the existing socio-cognitive constructs, "barriers and facilitators to knowledge use" is one of the variables that best predicts both health care professionals' behavior and intention.

What are some of the conceptual models for assessing barriers and facilitators to knowledge use?

Conceptual models represent sets of concepts (words describing mental images of phenomena) and the propositions (statements about the concepts) that integrate the former into a meaningful configuration [9]. They may include general guidelines for research, practice, and education. Every world view that has become conventional engenders theories with a narrow focus that must be experimentally refuted [10]. Thus, conceptual models are rarely static and should evolve as new evidence emerges. In the context of barriers and facilitators to knowledge use in health care, relevant conceptual frameworks should help researchers move beyond conventional wisdom on the topic by identifying research questions, generating testable hypotheses, assessing outcomes with valid and reliable instruments, and making inferences from their study results. A useful framework would ensure that researchers can elaborate theory-based interventions with the potential for increasingly effective implementation of knowledge into clinical practice [11].

One of the conceptual frameworks often cited regarding barriers to knowledge use in health care is the Clinical Practice Guidelines Framework for Improvement [12]. This framework was based on an extensive search of the literature about barriers to physician adherence to clinical practice guidelines and was designed to measure physicians' knowledge, attitudes, and behavior [6]. Based on a systematic approach to evidence [13], clinical practice guidelines are defined as systematically developed statements to assist practitioners and patients with decisions about appropriate health care in specific circumstances [14]. Out of a total of 5658 potentially eligible articles, Cabana and his colleagues (1999) identified 76 published studies

describing at least one barrier to adherence to clinical practice guidelines. Taken together, the articles that were included reported a total of 293 potential barriers to physician guideline adherence, including awareness of the existence of the guideline (i.e. ability to correctly acknowledge the existence of the clinical guideline) (n = 46), familiarity with the guideline recommendations (i.e. ability to correctly answer questions about the guideline content) (n = 31), agreement with the recommendations (i.e. consenting to the recommendations) (n = 33), self-efficacy (i.e. feeling one is able to carry out the recommendations) (n = 19), outcome expectancy (i.e. perception that one's performance following the use of the recommendations will lead to improved patient outcome or process outcome) (n = 8), ability to overcome the inertia of previous practice (i.e. feeling one is able to modify one's routine) (n = 14), and absence of external barriers to following recommendations (i.e. perception of factors external to oneself that would impede the use of the recommendations) (n = 34) [12].

The Clinical Practice Guidelines Framework for Improvement has been extended further by researchers assessing barriers to knowledge use in specific clinical contexts [15, 16]. For example, in one study, barriers were defined as factors that would limit or restrict implementation of shared decision making in clinical practice. Each type of barrier was given a specific definition and potential facilitators of knowledge use were added [16]. Facilitators were defined as factors that would promote or help implement shared decision making in clinical practice. The consideration of facilitators was an important development because we tend to forget that the same factor may sometimes be identified both as a barrier and as a facilitator to knowledge use, demonstrating the importance of developing a more comprehensive understanding of both at once [17, 18]. Table 3.3a.1 presents the definition of each of the potential barriers and facilitators to knowledge use (in this case, shared decision making) in the health care context. This list can be used to guide a content analysis of individual interviews or focus groups collected during qualitative studies on research utilization.

Another conceptual framework frequently mentioned with regard to barriers and facilitators to research knowledge use in health care is "Promoting Action on Research Implementation in Health Services" (PARiHS). The PARiHS framework includes the three core elements of evidence, context, and facilitation, each positioned on a continuum from high to low. The proposition is that for implementation of evidence to be successful, there needs to be clarity about the nature of the evidence being used, the nature of the context, and the type of facilitation needed to ensure a successful change process. It was initially published in 1998 as an unnamed framework inductively developed from the authors' experience with practice

Table 3.3a.1 Taxonomy of barriers and facilitators to knowledge use (in this case, shared decision making) and their definitions[a] [16]

Knowledge	
Lack of awareness	Inability to correctly acknowledge the existence of shared decision making (SDM)
Lack of familiarity	Inability to correctly answer questions about SDM content, as well as self-reported lack of familiarity
Forgetting	Inadvertently omitting to implement SDM [49]
Attitudes	
Lack of agreement with specific components of shared decision making	
• Interpretation of evidence	Not believing that specific elements of SDM are supported by scientific evidence
• Lack of applicability	
Characteristics of the patient	Lack of agreement with the applicability of SDM to practice population based on the characteristics of the patients
Clinical situation	Lack of agreement with the applicability of SDM to practice population based on the clinical situation
• Asking patient about his/her preferred role in decision making	Lack of agreement with a specific component of SDM such as asking patients about their preferred role in decision making
• Asking patient about support or undue pressure	Lack of agreement with a specific component of SDM such as asking patients about support and/or undue pressure
• Asking about values/clarifying values	Lack of agreement with a specific component of SDM such as asking patients about values
• Not cost-beneficial	Perception that there will be increased costs if SDM is implemented
• Lack of confidence in the developers	Lack of confidence in the individuals who are responsible for developing or presenting SDM
Lack of agreement in general	
• "Too cookbook" – too rigid to be applicable	Lack of agreement with SDM because it is too artificial
• Challenge to autonomy	Lack of agreement with SDM because it is a threat to professional autonomy
• Biased synthesis	Perception that the authors were biased
• Not practical	Lack of agreement with SDM because it is unclear or impractical to follow

(*continued*)

Table 3.3a.1 (*continued*)

• Overall lack of agreement with using the model (not specified why)	Lack of agreement with SDM in general (unspecified)
Lack of expectation	
• Patient outcome	Perception that performance following the use of SDM will not lead to improved patient outcome
• Health care process	Perception that performance following the use of SDM will not lead to improved health care process
• Feelings	Perception that performance following the use of SDM will provoke difficult feelings and/or does not take into account existing feelings
Lack of self-efficacy	Belief that one cannot perform SDM
Lack of motivation	Lack of motivation to use SDM or to change one's habits
Behavior	
External barriers	
• Factors associated with patient	
Preferences of patients	Perceived inability to reconcile patient preferences with the use of SDM
• Factors associated with shared decision making as an innovation	
Lack of trialability	Perception that SDM cannot be tested on a limited scale
Lack of compatibility	Perception that SDM is not consistent with one's own approach
Complexity	Perception that SDM is difficult to understand and to put into use
Lack of observability	Lack of visibility of the results of using SDM
Not communicable	Perception that it is not possible to create and share information with one another in order to reach a mutual understanding of SDM
Increased uncertainty	Perception that the use of SDM will increase uncertainty (for example, lack of predictability, of structure, of information)

Not modifiable/way of doing it	Lack of flexibility to the extent that SDM is not changeable or modifiable by a user in the process of its adoption and implementation
• Factors associated with environmental factors	
Time pressure	Insufficient time to put SDM into practice
Lack of resources	Insufficient materials or staff to put SDM into practice
Organizational constraints	Insufficient support from the organization
Lack of access to services	Inadequate access to actual or alternative health care services to put SDM into practice
Lack of reimbursement	Insufficient reimbursement for putting SDM into practice
Perceived increase in malpractice liability	Risk of legal action is increased if SDM is put into practice
Sharing responsibility with patient[b]	Using SDM removes responsibility from the health professional because it is shared with patient

[a]Revised in 2009 by author.
[b]Only for the facilitator assessment taxonomy.
Source: Modified from [16] Legare F, O'Connor AM, Graham ID, *et al.* Primary health care professionals' views on barriers and facilitators to the implementation of the Ottawa Decision Support Framework in practice. *Patient Educ Couns* 2006; 63: 380–90 with permission from Elsevier. Copyright

improvement and guideline implementation efforts [19]. In 2002, the original authors published a refined version of this framework containing the first published use of the PARiHS label. A conceptual exploration of evidence was published in 2004 [20], which rounded out the PARiHS team's review of their framework's three core elements. Kitson and colleagues published a further clarification of PARiHS in 2008 [21, 22] which focused on the need to develop diagnostic and evaluative tools based on PARiHS [22]. PARiHS has since been put into practice in instruments built to assess barriers and facilitators during implementation planning as well as to determine the effectiveness of intervention strategies [23–25].

More recently, based on a systematic review of 19 frameworks, Michie, van Stralen, and West proposed a Behavior Change Wheel which represents another attempt to establish a comprehensive framework for identifying the factors promoting behavior change [26]. Unlike other taxonomies, the Behavior Change Wheel uses broader categories and provides suggestions about interventions for addressing identified factors affecting behavior change. The three essential conditions at the centre of the Behavior Change Wheel are capability, opportunity, and motivation (what the authors term the "COM-B system"). The middle circle represents nine overarching intervention functions: education, persuasion, incentives, coercion, training, restriction, environmental restructuring, modeling, and enablement. The outer circle represents seven policy categories: fiscal measures, guidelines, environmental/social planning, communication/marketing, legislation, service provision, and regulation. This framework captured the full range of mechanisms that may be involved in behavior change, including those that are internal (psychological and physical) and those that involve changes to the external environment [26].

What are some methods and tools for assessing barriers and facilitators to knowledge use?

Although interventions tailored to prospectively identified barriers are more likely to improve professional practice than no intervention or dissemination of guidelines, the authors of the recently published Cochrane Review on this topic also highlighted the need for further development of the methods used to identify barriers and tailor interventions to address them [8]. To identify barriers and facilitators (also called determinants) to knowledge use, researchers frequently use qualitative study methods, such as one-on-one and/or focus group interviews with health professionals or other relevant knowledge users [27–31]. Various other methods include workshop discussions, observation of facilitators, internet surveys,

brainstorming by implementation researchers, reviews of records, analysis of the barriers and facilitators, and consensus of opinion leaders [8, 32]. Most of these studies use one or two qualitative methods to assess the barriers and facilitators; primarily they use methods oriented toward understanding phenomena rather than measuring them. Data collection of interviews and focus groups are often designed to be open-ended so that research participants feel free to express themselves in their own words. Some studies identify and validate barriers and facilitators in their respective knowledge-use contexts using the Delphi procedure [33, 34]. Some quantitative methods, such as survey questionnaires associated with multivariate analysis, may also use observational datasets to identify barriers and facilitators to knowledge use with respect to potential determinants [35, 36]. Meta-analyses that statistically analyze potential determinants accounting for the heterogeneity of effects across studies may also be helpful in identifying barriers and facilitators of knowledge use [8]. Each knowledge use environment presents organizational, professional, individual, and cultural particularities. The identification of specific barriers and facilitators represents an approach for identifying the determinants of knowledge translation to practice and decision making. It is in this context that there is considerable interest today in developing instruments that can perform valid and reliable assessments of barriers and facilitators to knowledge use that can be used by various end-users trying to implement knowledge.

Based on the Clinical Practice Guidelines Framework for Improvement, a tool named Attitudes Regarding Practice Guidelines to assess barriers to adherence to hand hygiene guidelines was developed and tested on a group of 21 infectious disease clinicians [37]. The tool uses a 6-point Likert scale and has two sections: attitudinal statements about practice guidelines in general and specific statements regarding the Hand Hygiene Guideline. The survey was administered twice, at two-week intervals. The tool was found to have a test-retest reliability coefficient of 0.86 and a standardized Cronbach alpha of 0.80 [37]. However, the authors concluded that their tool needed further testing and adapting if it were; old english needed here to measure potential barriers to adherence to clinical practice guidelines in general [37].

Wensing and Grol reported the development of another instrument designed to assess barriers and facilitators to knowledge use [38]. This instrument was applied to 12 different implementation studies in the Netherlands [38]. First, they used literature analyses and focus group interviews with implementation experts to identify possible barriers to change. Second, they performed validation studies to test the psychometric characteristics of the questionnaires. Questions pertained to characteristics of the innovation (i.e. clinical practice guidelines), care provider characteristics,

patient characteristics, and context characteristics. In a study on the prevention of cardiovascular diseases in general practice involving 329 physicians, they found that the self-reported barriers identified using their questionnaire explained 39% of the self-reported performance. This instrument is available in Dutch and English.

In the mental health field, G.A. Aarons has explored the role of attitudes in acceptance of innovation and proposes a model of organizational and individual factors that may affect or be affected by attitudes toward adoption of evidence based practice (EBP) [39]. This Evidence Based Practice Attitude Scale (EBPAS) includes four domains: attitudes related to the appeal of an EBP, requirements to adopt an EBP, openness to innovation in general, and perceived divergence between current work processes and those required by an EBP [40]. The overall Cronbach's alpha reliability for the EBPAS is good (alpha = 0.77) and subscale alphas range from 0.90 to 0.59 [39].

In nursing clinical practice, the BARRIERS scale was developed to assess barriers to research utilization based on four key dimensions: (a) nurse, (b) setting, (c) research, and (d) presentation [41]. The scale is composed of 29 items and is comprised of four subscales that map the four key dimensions. Each subscale is labeled in accordance with the theory of diffusion of innovation: (a) characteristics of the adopter (i.e. the nurse's research values, skills and awareness); (b) characteristics of the organization (i.e. barriers and limitations of the setting); (c) characteristics of the innovation (i.e. qualities of the research); and (d) characteristics of the communication (i.e. presentation and accessibility of the research). The BARRIERS scale has been translated and tested in German, Thai, Korean, French, Turkish, and Swedish [42, 43]. Interestingly, the group of researchers who translated this scale into Swedish added an additional item that covers the English language as a barrier for Swedish nurses, thus pointing out the need for cultural adaptation of barrier assessment tools. The scale is methodologically useful as it identifies some types of barriers to research utilization, but the barriers identified are general and wide-ranging, making it difficult to apply in specific knowledge use contexts [42]. In addition, it does not identify organizational barriers, while organizational context is widely considered to be an important influence on the successful implementation of research evidence in health care settings [20, 44].

C. A. Estabrooks and her collaborators developed another instrument based on the PARiHS framework, the Alberta Context Tool (ACT), an eight-dimension measure of organizational context for health care settings. An initial validation of the English version of ACT was completed by 764 nurses (752 valid responses) working in seven Canadian pediatric care

hospitals. ACT has two versions with 5- and 6-point Likert responses for each item; the original version includes 76 items and a reduced version includes 56 items. The eight core context dimensions of ACT include: (1) leadership, (2) culture, (3) evaluation, (4) social capital, (5) structural and electronic resources, (6) formal interactions, (7) informal interactions, and (8) organizational slack (comprised of three sub-concepts: staffing, space, and time resources) [45]. Cronbach's alpha for the 13 factors included in ACT ranged from 0.54 to 0.91 with four factors performing below the commonly accepted alpha cut off of 0.70. Each factor also showed a trend of increasing mean score ranging from the lowest level to the highest level of instrumental research use, indicating construct validity. The tool's strengths are its brevity (allowing it to be completed in busy health care settings) and its focus on dimensions of organizational context that are modifiable [24].

In 2007, J. Wright and colleagues presented an instrument to identify contextual indicators that enable or hinder person-centered continence care and management in rehabilitation settings for older people [46]. In 2009 this instrument was named the Context Assessment Instrument (CAI) [23]. CAI contains 37 items with a 4-point Likert response format. A total score is calculated to represent an environment's receptivity to change. The five domains of CAI include collaborative practice, evidence-informed practice, respect for persons, practice boundaries, and evaluation. The Cronbach's alpha score for the complete questionnaire was estimated at 0.93. All five factors achieved a satisfactory estimated level of internal consistency in scoring, ranging from 0.78 to 0.91. Test–retest scores indicate reliability of the findings, and the feedback from focus group participants suggests that the instrument has practical utility [23].

The Organizational Readiness to Change Assessment (ORCA) is also worthy of mention. ORCA contains 77 items with 5-point Likert responses for each item. It was developed for use in quality improvement activities by researchers from the Veterans Affairs Ischemic Heart Disease Quality Enhancement Research Initiative to assess site readiness. Also based on the PARiHS framework, ORCA includes three domains: evidence, context, and facilitation. With a few exceptions, adequate estimates of reliability and validity were reported for most factors and subscales [25]. Cronbach's alphas for scale reliability were 0.74, 0.85 and 0.95 for the evidence, context and facilitation scales, respectively. Low reliability was observed for three evidence subscales [25, 45].

Assessing for barriers and facilitators through direct input from knowledge users about their perceptions of the determinants of knowledge use is considered an integrated KT approach because of: (1) the participatory

nature of the exercise, and (2) the desire to understand and appreciate the knowledge users' perspectives. Taking the process a step further may involve asking potential knowledge users to suggest interventions they think might address the barriers and facilitators they have identified. This input could be used to help map the intervention and is further described in Chapter 3.3b.

Future research

Although numerous current research initiatives focus on assessing determinants of knowledge use in health care practices, many challenges remain that will require rigorous research. Firstly, the use of multiple frameworks and tools may hamper the ability of researchers to make valid comparisons between diverse contexts. Therefore, there is a need to standardize the reporting of barriers and facilitators to translating research into practice and decision making [12, 47, 48]. We also need to distinguish between "barriers and facilitators to knowledge use" understood as beliefs about capabilities, a specific socio-cognitive construct, and understood as any factors influencing knowledge use. Secondly, models that identify barriers alone are not sufficient, since a factor perceived as a barrier can be identified as a facilitator at the same time. Thirdly, implementation researchers should use standardized, valid and reliable instruments in their assessments of barriers and facilitators to knowledge use. However, there is still a need to adapt and test existing instruments in diverse clinical as well as cultural contexts. Lastly, in line with the Behavior Change Wheel, more research is needed on choosing the right intervention for addressing a specific barrier and/or facilitator. Only then will the gap between research and practice be adequately addressed.

Summary

Of all the existing socio-cognitive constructs, "barriers and facilitators to knowledge use" may be the factor that can best predict both health care professionals' behavior and intention. Although there are many current research initiatives assessing determinants of knowledge use, the reporting of barriers and facilitators to translating research into clinical practice urgently needs to be standardized. Also, implementation researchers should consider using standardized, valid and reliable instruments in the assessment of barriers and facilitators to knowledge use. Further research is needed on how to choose the right intervention to address a specific barrier and/or facilitator and the work initiated by the Behavior Change Wheel may provide an interesting avenue.

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