TBM

# Lost in translation: overcoming the barriers to global implementation and exchange of behavioral medicine evidence

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Cite this as: *TBM* 2011;1:252–255
doi: 10.1007/s13142-011-0051-1

Behavior is centrally important to the disease processes and management of almost all communicable and non-communicable health conditions. Key behaviors such as poor hygiene, unsafe sex, tobacco use, excessive alcohol consumption, unhealthy diet and nutrition, physical inactivity, and sedentary lifestyles are also commonly interrelated with mental health [1, 2]. These unhealthy behaviors and related diseases are almost always more common in disadvantaged and more vulnerable populations. Chronic health conditions such as cardiovascular disease, cancers, diabetes, and related risk factor behaviors are becoming more important and prevalent in low- and middle-income countries (LMICs), where the majority of the world's population now live. Furthermore, many LMICs suffer from a double burden of diseases, i.e., they are simultaneously confronted by high prevalence of both communicable and non-communicable diseases. More than 80% of the global burden of chronic disease now occurs in low- and middle-income countries [3]. This double burden is further exacerbated by the fact that most of these countries have limited resources available for prevention and management of such conditions.

Social, behavioral, and community interventions can be effectively used to prevent many of these conditions and/or detect them at an earlier stage, improve their management, increase patient quality of life, and assist with guiding the efficient allocation of limited health care resources [2, 4, 5]. This compelling evidence notwithstanding, there remains a significant evidence gap in relation to the uptake of these kinds of interventions. This is a serious problem in both high income countries and LMICs. As stated by Shonkoff in his report, *Closing the gap between what we know and what we do*, 'the gap between what we know and don't do, is much larger than the gap between what we know and don't know' [6]. The evidence–implementation gap is even greater for more socially disadvantaged and vulnerable communities and societies [7]. While high income countries in North America, Europe, and elsewhere are able to allocate significant national resources to the delivery of health and medical services, even where behavioral medicine and public health programs are not as effectively implemented and supported as they might be, most LMICs can ill afford to have this situation. In order to 'scale up' interventions and to promote and sustain their wider integration into policy and practice, new evidence-based methods and approaches are needed. This special issue provides a series of studies, case examples, and commentaries on these issues within a global context.

Indeed, the planned transfer and exchange of evidence-based behavioral medicine and public health interventions between cultures and countries are important and are urgent challenges for the field of behavioral medicine to address. To date, however, this issue has received little attention. Even though there are now practice and policy guidelines in many areas of behavioral medicine practice, these are largely based on research conducted in developed countries. Subsequently, their relevance and appropriateness to different cultures and countries are often poorly developed and evaluated upon implementation. A range of different issues needs addressing when interventions are introduced into cultures and settings which differ from where the program was developed and originally evaluated. This challenge is made greater by the fact that many of the supports and infrastructure available in high-income settings (e.g., having a large well-trained health workforce, good governance, and a relatively well-funded public sector) are usually less available in low- and middle-income countries [8].

Clearly, if effective public health programs are not widely adopted and implemented, their potential to improve people's health is significantly impaired [1]. This challenge is exacerbated by the different values and perspectives that exist between practitioners, program implementers, policy makers, and researchers. Practitioners often find evidence-based interventions difficult to conduct in community settings especially when there is such limited information about how to adapt programs to the local context [9, 10]. Furthermore, public health decision makers and program implementers are often reluctant to consider 'new' interventions when

effectiveness has not been demonstrated in their particular setting [11]. By contrast, researchers are usually more concerned with the internal validity of their programs as distinct from external validity [12]. Kerner, Rimer, and Emmons (p. 445) [13] summarize 'Efforts to move effective preventive strategies into widespread use, too often have been unsystematic, uncoordinated, and insufficiently capitalised, and little is known about the best strategies to facilitate active dissemination and rapid implementation of evidence-based practices.'

The uptake of health promotion and prevention evidence into policy and practice reflects a dynamic interaction between the features of a program, its users, and the setting [14]. The need to understand more about wider program dissemination and implementation, or what is now often called, the 'scaling up' of interventions, has been recently highlighted by Gaglio et al. 'Few intervention studies discuss details of how they translate theory into practice or how they integrate different modalities and collaborating institutions, but such integration is critical for project success' [15]. To meet this challenge, Glasgow has developed the RE-AIM model to systematically guide the dissemination and wider implementation of evidence-based social and behavioral interventions, and the model has evolved into a tool for guiding the process of 'real-world' translation [16]. These kinds of models are extremely valuable because they can also provide a framework for facilitating exchanges between researchers, program implementers, and policy makers [17], and increasingly needed as governments and other agencies are starting to place greater emphasis on the importance of knowledge translation. Indeed, some OECD countries (e.g., UK, Finland, Canada, New Zealand, and Japan) have now developed and implemented structures for applying knowledge translation approaches to prevention and disease control [18, 19].

The focus of this special issue on the topic of the global implementation and exchange of behavioral medicine evidence is consistent with the rapidly developing interest in the field of 'dissemination and implementation science'. 'Dissemination' refers to the targeted distribution of information and intervention materials to a specific public health or clinical practice audience with the intent being to spread knowledge and the associated evidence-based interventions. 'Implementation' refers to the use of strategies to adopt and integrate evidence-based health interventions and change practice patterns within specific settings. 'Translation' refers to applying or adapting research findings or evidence to different community or population settings. This also includes 'translation' to other countries or cultures from where the original program was developed and evaluated.

Effective dissemination, implementation, and translation for public health and behavioral medicine interventions require the triangulation of evidence from formal trials with case studies, expert opinion, network analysis, systems thinking, as well as assessments of the local context [15, 20]. It combines information about scale, resources, and structuring with the practical experiences of the end users [21]. This combination of evidence from different fields and perspectives is essential.

The articles in this special issue describe examples of this process across different settings, contexts, and countries and cover such diverse areas as HIV/AIDS, malaria, tobacco control, and diabetes prevention. The articles present and discuss models and frameworks such as diffusion theory and the RE-AIM framework and how they were able to assist with the exchange and transfer process. The articles variously address questions such as: (1) How can evidence-based, behavioral medicine interventions best be tailored to different communities, settings, cultures, and countries? (2) How can researchers evaluate both the adequacy of contextualization and the success with which active intervention ingredients were preserved? (3) What does treatment fidelity mean when interventions are to be implemented in diverse cultural contexts? In addressing these kinds of questions, each of the articles also illustrates the complexity and challenges associated with addressing complex health behaviors in 'real-world' settings and the related issues of dissemination, implementation, and evidence transfer between cultures and countries.

Young and others [22] describe a couple of decades' work on translating evidence from research into effective tobacco control. According to their analysis, a central challenge to translation is that researchers, program implementers, and practitioners have different "practical ontologies". While researchers aim to generalize from specific contexts to universal principles, conversely, practitioners use the generalizations to inform specific situations. Neglecting the need to translate from the general to the particular means that much research and evidence development is not framed to meet practitioners' needs. They argue that traditional approaches to knowledge brokering should be extended to better align these different needs and perspectives of researchers and practitioners.

Oldenburg et al. [23] describe the complex processes and steps that have occurred in the translation and exchange of evidence from diabetes prevention programs between Finland and Australia. They utilize the diffusion of innovations model to identify key factors that enabled the sound adaptation and implementation of research findings into real-world settings in both countries. The authors further identify key components which have contributed to the broader system-wide uptake and diffusion to other settings and key exchanges that have led to uptake in other countries.

Palmer et al. [24] present a case study concerning the development and adoption of evidence-based tobacco control strategies in China which has

utilized a collaborative network linking Chinese public health and academic institutions with US researchers. This approach aims to translate evidence-based interventions and approaches to tobacco control from developed countries to the context of China by incorporating local knowledge, culture, and capacity.

Similarly, Winter et al. [25] describe the transfer and contextualization of chronic disease prevention and health promotion findings from the USA to the Kingdom of Saudi Arabia. They use a multi-level, socio-ecological framework to describe the processes and steps at the individual, sociocultural, organizational, environmental, and policy levels. They also identify and provide examples of intervention strategies that may be culturally appropriate at each level.

Bauman's [26] commentary reminds us of the complex set of contextual factors related to culture, language, and globalization that present challenges for researchers, communities, and the populations being studied. Her valuable and practical insight arises from research in type 2 diabetes management in Uganda and Vietnam.

Williams's [27] systematic review brings into focus mental health promotion. The authors describe the translational process whereby the Williams' LifeSkillsR program and products for reducing psychosocial risk factors have been developed and tested in clinical trials in the USA and Canada and then adapted for use in other cultures and tested in clinical trials in other countries around the world. Their review of the research demonstrates that the program can be an effective vehicle for the delivery of stress reduction and mental health services in diverse cultural settings around the world.

A review by Rotheram-Borus and colleagues [28] considers the evidence base for interventions for families affected by HIV. Despite dramatic variation in many environmental factors, the authors identify common health, mental health, transmission, and relationship challenges that face the majority of families. Commonalities are also found in the evidence-based interventions in terms of theoretical frameworks, behavior change principles, and implementation processes. However, these require tailoring of intervention content and delivery processes to local contexts and populations. Within different communities and context, intervention development teams utilize a series of structural decision points: mainstreaming HIV with other local health priorities or not; selecting an optimal delivery site (clinics, homes, community centers); identifying ways to facilitate difficult behavior changes; creating strategies for sustaining social support for behavior change over time; and addressing appropriate environmental barriers.

Weiss et al. [29] describe a series of interventions for secondary HIV prevention with both format changes and cultural adaptation strategies to refine and tailor the intervention for various cultural groups in the USA, Zambia, South Africa, and India. Interestingly, the translational process has occurred both within the program itself (feasibility to clinical study to community to national dissemination) as well as across various cultural venues within a country as well as across national boundaries.

Leerlooijer et al. [30] make a case for the use of their intervention mapping program to systematically address the complexity of program adaptation as they describe the transfer of HIV prevention and sexual education program from Uganda to Indonesia. The approach was used to systematically address the complexity and challenges of program adaptation. This allowed a distinction to be made between key program elements that need to be preserved for program effectiveness and elements that may be adapted to increase feasibility and acceptability in different settings.

Elder [31] describes a controlled trial to promote the use of bed nets for the prevention of malaria in Ghana. The intervention was highly successful and the authors identify the availability of nets and the provision of support for their proper use as key requirements. They conclude that extensive formative and qualitative research is needed to tailor programs to specific populations. Policy makers must support these efforts by ensuring that sufficient resources are allocated for communication to target groups, e.g., both mass and interpersonal communication. Furthermore, this study, as Bauman's commentary highlights the associated measurement issues, which need to take into account the cultural requirements.

Del Castillo et al. [32] present case studies from Latin America to understand physical activity policy process. They describe how most policies conducive to program development and sustainability were developed outside the health sector by multisectorial collaboration of sports and recreation, urban planning, environment, and transportation. They also highlight the role of governments in the development of these programs.

At least four key lessons and themes emerge from the articles in this special issue. First, there is an important need to understand and identify differences in logic models and approaches between (a) different settings and cultures and (b) researchers, program implementers, practitioners, and policy makers. Secondly, there is a need to have a systematic approach and framework for evidence or program translation as this underpins informed and explicit choices regarding the tradeoffs between internal and external validity. Thirdly, system-wide uptake and evidence diffusion between countries and cultures require a long-term orientation and coordinated approach between researchers, implementers, and policy makers. Fourthly, it is important to be able to measure and track evidence diffusion as well as feasibility and acceptability of public health programs in low- and middle-income countries. Developing the appropriate research, evalua-

tion, and intervention capabilities of individuals and relevant institutions in LMICs is important for effective evidence transfer and long-term sustainability of programs. One solution is offered by Best and Saul [33] who propose in their commentary that systems thinking offer a fresh perspective on how to bridge research and evidence development in higher income countries to low- and middle-income countries.

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