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WEB PAPER

Educator perceptions of the relationship between education innovations and improved health

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Abstract

Background: Education innovations by health professions faculty are shaped by faculty conceptualizations of the pathway between their innovations and changes in health of communities.

Aims: We aimed to explore how existing theories about the relationship between education and health are attended to, interpreted, and applied by faculty in different national contexts.

Methods: We compared existing theoretical frameworks to perceptions of "front line" faculty. Fellows in Brazil- and India-based FAIMER faculty development programs were asked via questionnaires about the contribution of their education innovation projects to health improvements.

Results: Faculty identified pathways to improved societal health via increased *quality*, and to a lesser extent *relevance*, of education. Relationships between increased *quantity* of education and improved health were focused on faculty development. Faculty from both countries noted the value for health outcomes of innovations that affect networks and partnerships with other institutions. Faculty from India identified pathways to improved societal health via changes to instructional more than institutional processes.

Conclusions: Results indicate where there are gaps in existing theories, a need to raise awareness about potential pathways to improving health via education changes, and opportunities for more detailed understanding of mechanisms of change via in-depth research.

Introduction

Efforts to design education innovations that have a demonstrable effect on population health (Boelen & Woollard 2009, 2011; Global Consensus for Social Accountability of Medical Schools 2010) are shaped by the faculty conceptualizations of the pathway between their innovations and changes in health of communities. Several proposed frameworks outline the relationship between health professional education and population health (Frenk et al. 2010; Burdick et al. 2011; WHO 2011). In this article, we compare theoretical frameworks to perceptions of "front line" faculty in Brazil and India who are introducing education innovations in their institutions such as new teaching and assessment methods, revised curricula, and enhanced faculty development. We also explore the role of national contexts in shaping thinking about the relationships of education and health.

Globalization, demographic shifts, new technologies, healthcare system changes, and health inequities present challenges for health care professionals worldwide (Houpt et al. 2007). Many have argued that in order to adequately

Practice points

- Education innovations by health professions faculty are shaped by faculty conceptualizations of the pathway between their innovations and changes in health of communities.
- Faculty engaged in education innovations identified pathways to improved societal health via changes to instructional processes more frequently than changes to institutional processes, and focused on the quality of their innovations more so than the relevance to societal health needs.
- Factors affecting a country's health professional education community (e.g., government initiatives) can potentially affect how educators in different countries view the link between health professional education and population health outcomes.
- Identified mechanisms linking education to improved health could be integrated in faculty development programs to drive further innovations.

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prepare trainees to address societal health, changes are needed in faculty development, skills training, and education methods and content. Education institutions need to actively engage with and be accountable to stakeholders (Aretz 2011). And, education and healthcare systems need to change their policies and practices (Wartman & Steinberg 2011; Worley & Murray 2011).

Two recent publications offer comprehensive frameworks for the linkage between health professional education and societal health needs. A recent Lancet review authored by a multi-national commission of professional and academic leaders proposed a "comprehensive framework [that] considers the connections between education and health systems" (Frenk et al. 2010). Their proposed framework includes structure, process, and outcome dimensions. The structure dimension refers to the structure and function of the education system at organizational, systemic, and global governance levels. The process dimension considers instructional factors, including admission criteria, student competencies, teaching-learning methods and media, and career pathways for graduates. Outcomes include transformative learning (due to instructional improvements) and interdependence in education (due to institutional changes), with these outcomes linked to equity in health. The commission also noted in its framework the impact of local and global contexts on the education system.

A second recent framework arose from a collaborative effort between the World Health Organization (WHO) and the United States President's Emergency Plan for AIDS Relief (PEPFAR) which sought to "address the technical requirements essential to make the transformative scale up of health professional education a reality" (WHO 2011). The resulting document reviews evidence and case reports on health worker shortages. Three main categories of outcomes were included in their framework: quality (i.e., improvement in the quality of education and education systems), relevance (i.e., emphasis on relevance of education to priority health needs and most vulnerable populations), and quantity (i.e., increased capacity in terms of education resources and productivity).

One question of interest is how these frameworks compare to faculty conceptualizations of how their education innovations will lead to changes in health outcomes (i.e., theories of change). The Foundation for Advancement of International Medical Education and Research (FAIMER) administers two-year, part-time faculty development fellowships for health professions educators (Burdick et al. 2010). All participants design, implement, and evaluate an education innovation project. Submission of a project proposal is part of the program application, projects are required to have written support from institutional leadership, and the fellowship selection process favors projects with a described link to improved community health. Via development of project theories of change at the start of the fellowship, fellows are asked to think about the connection of their projects to long-term health impacts (Burdick et al. 2011). Programs include on-site contact sessions combined with distance learning. At the first residential session, approximately 6–10 hours of small group mentoring on projects results in a program theory for the project, a refined evaluation plan to assess project outcomes, and a Gantt chart for project implementation for the coming year. The curriculum also provides learning relevant to project implementation, such as leadership and management skills, and focuses on building a community of practice among fellows. There are currently six FAIMER fellowship programs: one international program with on-site sessions held in the United States and five regional institutes (with on-site sessions in India for three programs, Brazil for one, and South Africa for one).

National contexts may shape faculty theories of change. Faculty from Brazil and India work in different national contexts; yet would be expected to share various perspectives as individuals trying to bring education innovations to emerging/developing regions (Gibbs & McLean 2011). Brazil has a universal health care system and a strong central planning authority which oversees national curriculum development and the delivery of health care in conjunction with input from various stakeholders in civil society and the public (Blasco et al. 2008). Over time, significant reductions have been observed in the population's burden of disease: large drops in maternal and infant mortality rates, improved nutrition, and decreases in communicable disease (Kleinert & Horton 2011). Life expectancy at birth is 73 based on 2009 World Bank (2011a) data. India also has a central accreditation authority, which is tasked with reviewing over 300 medical schools, of which a growing number are private (Search Colleges and Courses [Online]; Srinivas & Adkoli 2009). Population health indicators in India remain low, however, with 47% of children under the age of five being underweight (Supe & Burdick 2006). Life expectancy at birth is 64 based on 2009 World Bank (2011b) data.

Within these contexts, we examined perceptions of faculty engaged in innovation projects regarding the link between education innovation and health. Comparing these perceptions to existing theoretical frameworks helps us to understand how existing theories may be attended to, interpreted, and applied at local levels. Such a comparison indicates where there are gaps in existing theories, a need for faculty and leadership development to raise awareness about potential pathways to improving health via education changes, and opportunities for more detailed understanding of mechanisms of change via in-depth research on specific types of education innovations.

Methods

Fellows attending Brazil and India based FAIMER programs (N= 169) were asked to complete a questionnaire at the end of their first year of the fellowship. This included a free-text field question, which asked, "do you think that your project will contribute to the improvement of health or the health system in your country? If yes, describe what possibilities you see or are involved with?"

A literature search looked for existing frameworks that described linkages between health professional education and population health outcomes. PubMed was searched by combining a search of the following MeSH terms and keywords: "education, medical [mh] and education, nursing [mh] and education, public health professional [mh]" with "public health [mh] and keywords "health professional education", "medical

education", "nursing education", and "improvement". ERIC and Google Scholar were keyword searched with the terms "health professional education" and "population health outcomes" along with other specific health professional education terms. Resulting abstracts were hand searched for relevance. Google was also keyword searched with the same keywords for grey literature. These searches provided a number of reviews, of which two were chosen for the relevance and comprehensiveness of their proposed frameworks, these being Global Independent Commission (in Lancet) and WHO frameworks discussed in the Introduction section of this article.

We combined the Commission and WHO frameworks into a two-dimension matrix relating education structures/processes (i.e., what was done; policies or practices) to education programs or services (i.e., what changed in the education system). A preliminary coding scheme was developed based upon this matrix framework. Coding of the exit survey data was done by two independent reviewers. Initial data review developed further codes to capture additional specificity within main categories (e.g., within networks and partnerships, specificity was added as to whether partnerships were with governmental entities or other institutions). Coding proceeded in an iterative manner to develop a final framework and discussion between reviewers to resolve discrepancies.

Results

A total of 139 Fellows (82%) responded to the questionnaire; 67 from Brazilian program Fellows who started the fellowship in 2008, 2009, and 2010; 71 from Fellows who started one of the three different Indian programs in 2009 and 2010. Of these, seven of the Indian fellowship respondents were faculty from countries other than India (Bangladesh, Malaysia, Nepal, Oman, Saudi Arabia, and the United Arab Emirates) – these respondents were not included in the analysis. All Brazilian fellowship respondents were faculty in Brazil.

In describing how their education project would improve health, respondents either described a structure/process (e.g., "Yes, my project on PBL will contribute to the improvement of health system in our country."), described a structure/process and a linked education outcome as an intermediate change (e.g., "Guided Participatory Learning (GPL) will help our future physicians to be an empathetic competent doctor for the society. Society will be benefited by their knowledge, skill and empathy."), or described just an education outcome with no mention of the process/structure that would lead to achievement of this outcome (e.g., "Will be able to raise the competence level of the undergraduates and hence competent basic doctors who will deliver primary health care.").

Table 1 depicts frequency of responses endorsing each structure/process category. Structure and process dimension components (instructional and institutional) were derived from the Commission's framework (Frenk et al. 2010). Each structure/process is listed in Table 1, and responses with linked education outcomes (quality, quantity, and relevance) are listed where there was more than one response of this nature. The training outcomes categories of quantity, quality, and relevance are derived from the WHO framework, which we found to be salient for capturing the content of responses (WHO 2011). While the Commission framework included "career pathways" for graduates as an instructional process, we considered it to be more appropriate for the "training outcomes" dimension. In fact, the Commission review describes career pathways as "options that graduates have… as a result of" the training process. As shown in Table 1, responses detailing both a process and educational outcome were more common than responses including only a structure/process or only an educational outcome.

Figure 1 provides a summary of results in the form of a theoretical framework. Factors mentioned by more than one respondent are shown in bold text in Figure 1; relationships described by more than one respondent are shown with arrows, with the width of the arrows corresponding to the number of relationships noted (e.g., there were more links noted between education process factors and training quality than between process factors and training quantity).

The linkage between structure/process and health outcomes was most often via improvement in the *quality* of training. Relevance had the next most linkages; responses indicated health outcomes were supported through increases in the relevance of resources generated, services provided, and education methods and content. Notably, respondents did not describe many education innovations that would improve health via changes in the quantity of training. The exception to this was changes in resource generation (most commonly via faculty development), which were linked to improved health via increasing the quantity of training.

Fellows' responses within the process dimension more frequently focused on instructional factors over institutional factors. These were also pronounced differently over countries (see "Country Differences" section). The following describes specific linkages that were found by the analysis of the data.

Instructional structures/processes

Fellows noted changes in techniques employed in instruction and assessment as a means to improve health, most often via improvements in quality and relevance of training. One fellow, for example, highlighted the relevance of community health internships as an education method that resulted in a community intervention.

Fellows responded that their projects improved relevance and quality of training via changes to education content. This included increased relevance focused on clinical skills training, along with non-clinical training in areas such as teamwork, leadership, professionalism, and holistic care.

No responses mentioned changes related to candidates (e.g., improvements to achievement-based admissions criteria).

Institutional: Systemic structures/processes

The vast majority of systemic institutional linkages alluded to projects improving health via changes to faculty development resources. Common responses described improvements in the quality and effectiveness of teaching, or the development of

Table 1. Structures and processes by which faculty perceive their education innovations will contribute to health improvement: conceptual model categories with representation of response frequency.

Dimension	Structure/process	TOTAL	Brazil faculty	India faculty
Instructional	Candidates: project changes admissions process/criteria			
	Educational methods: project changes educational methods			
	…and increases education *Quality*			
	…and increases education *Relevance*			
	Educational content: project changes educational content			
	…and increases education *Quality*			
	…and increases education *Relevance* (focus on topics as defined in the curriculum design)			
	…and increases education *Relevance* (focus on other skills salient to health professional practice, e.g., teamwork, leadership)			
Institutional - systemic	Financing: project increases finances available for training			
	Resource generation: project increases availability of faculty development and training			
	…and increases education *Quality*			
	…and increases education *Quantity*			
	…and increases education *Relevance*			
	Service provision: project changes the educational service delivered or environment provided (e.g., development of assessment systems, curriculum changes)			
	…and increases education *Quality*			
	…and increases education *Relevance*			
	Stewardship and governance: project changes stewardship and governance (e.g., policies, governance structures)			
	…and increases education *Quality*			
	Internal structure: project changes an aspect of internal institutional structure (e.g., departmental structure, mandates)			
	…and increases education *Quality*			

(*continued*)

Table 1. Continued.

Institutional - organizational	Ownership: project uses some aspect of organizational ownership (private, public, etc.)	
	Affiliations: project uses aspects of institutional affiliation (e.g. with religious organization or as part of larger institution)	
Institutional - global	Stewardship and governance (governmental): project involves some aspect of stewardship or governance at the governmental level	
	Stewardship and governance (education of public): project involves stewardship in ensuring education of public	
	Networks and partnerships (institutions): project implements network or partnership with other institutions	
	Networks and partnerships (disciplines): project implements network with other disciplines	
Outcomes (no structure/process)	Quality: project improves quality of education	
	Quantity: project increases quantity of education	
	Relevance: project increases relevance of education	

Notes: Key.

***N* of participants endorsing**	0–1	2–5	6–9	10+
Graphic representation				

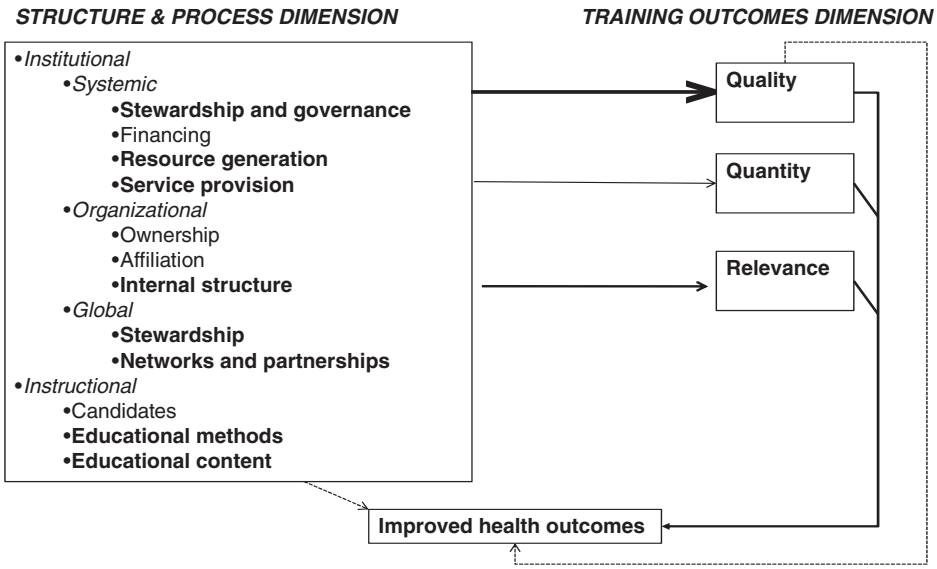

Figure 1. Theoretical framework for relationships between education structures and processes, education outcomes, and health outcomes.

workshops or materials to improve the relevance of subject matter.

Fellows also felt that their project would affect health outcomes by changing education services provided by the institution. Different from education methods or content, these responses tended to focus on the logistics of delivering training – usually alluding to improved assessment systems or development of more relevant curriculum structures.

Fellows noted changes in policies and norms (i.e., institutional stewardship and governance) to improve quality of training as a route to improved health. Examples of responses of this nature included the use of regulatory agencies and administrators to rectify problems faced by faculty, or the development of a "culture of policy/values" at one fellow's institution.

Respondents tied improved health to changes in the depth or breadth of department mandates in order to improve quality of training. One respondent noted the creation of "a line of research in the Graduate Program in Nursing".

No responses mentioned changes in institutional financing (e.g., spending to improve the quality or quantity of institutional material and human resources, or the targeting of resources to specific local priorities).

Institutional: Organizational structures/processes

Respondents did not tend to refer to organizational level factors such as institutional ownership or affiliations as factors linking their education innovations to health improvement.

Institutional: Global structures/processes

Respondents expressed that the relationship between projects and improved health was supported by government stewardship as well as networks/relationships with other institutions, disciplines, and the public (public education efforts).

Country differences

Within the process dimension, there were country differences in identified linkages: Indian faculty responses focused almost wholly on instructional content and methods improvement, with little emphasis on institutional change. By contrast, Brazilian faculty responses largely gave attention to institutional and instructional changes equally. Among institutional factors noted by Brazilian (and not Indian) faculty as supporting a project's ability to improve health were government stewardship and interdisciplinary networking.

Discussion

Faculty respondents identified pathways to improved societal health via changes to instructional more than institutional processes. The greater emphasis on instructional versus institutional changes was true more so among Indian faculty than Brazilian faculty. Indian faculty tended to focus on instructional content and methods improvement as means for health improvement. Brazilian faculty by contrast focused on both institutional and instructional changes. It is notable that institutional factors noted by Brazilian (and not Indian) faculty included government stewardship and interdisciplinary networking. Faculty from both countries noted the value for health outcomes of innovations that affect networks and partnerships with other institutions. Faculty respondents identified pathways to improved societal health via increased *quality*, and to a lesser extent *relevance*, of education. The few relationships noted between increased *quantity* of education and improved health focused on faculty development.

Greater emphasis among faculty respondents on instructional versus institutional changes is significant given the recognized need for institutional and systemic changes in addition to instructional changes to support social accountability, with faculty as potential advocates for such changes (Marmot 2005). This emphasis was more evident in the perceptions of Indian faculty. By contrast, Brazilian faculty noted government stewardship and interdisciplinary networking as factors facilitating the relationship between education innovations and societal health improvement. This suggests that Brazilian government efforts to support the relationship between education and health and promote interdisciplinary collaboration may have influenced the direction of faculty education innovation projects (many of which are connected to government programs) and faculty perceptions of the relationship between their work and improvements in societal health. Brazil's centralized health planning authority has several national health initiatives as well as national curriculum standards with an emphasis on linking education to improvement in national health outcomes, particularly in priority health areas. These include emphasis on community-based education. Government support of such explicit linkages between education and health is in contrast to India where health professions education has traditionally been more fragmented with less centralized commitment of resources to explicit linkage of education and health (Ananthakrishnan et al. 2012; Sood & Ananthakrishnan 2012). Thus, one suggested future direction is further investigation of what role national contexts and policies do and can have in shaping the relationship of education innovation to health improvement.

Another path forward is exploration of inter-institutional partnerships as levers to connect education innovations to societal health improvement. Faculty from both countries noted the value of partnerships with other institutions. Networks and partnerships, including partnerships with communities and other social service systems, can serve as conduits for exchange of best practices, knowledge of growing health challenges, and innovation (Wartman & Steinberg 2011).

Perhaps as interesting as factors that were endorsed by respondents are those factors from existing frameworks that respondents did not endorse. Among these are changes to admissions criteria, financing, and organizational ownership and affiliations. This could perhaps be influenced by certain characteristics of this sample. The fellowship application process requires fellows to have secured adequate project funding and to have institutional support for their projects, perhaps making finances and organizational factors less

prominent as potential routes for change. For the absence of admissions/candidate factors as a route to change, aspects of the fellowship do not seem to offer an explanation. However, for all of these factors, further research would be needed to better understand the reasons for their relative presence or absence in faculty conceptualizations.

Adequate quality and relevance have been identified as important outcomes for not only education but also health care. While it is perhaps understandable (and even somewhat circular) logic to connect better quality education with better quality health, faculty respondents focus on quality more so than relevance suggests a need for more emphasis on relevance to guide innovations in institutional policies and practices. Other aspects of health care that have been identified as important are equity of access to health service benefits and cost-effectiveness in the use of healthcare resources (Boelen & Woollard 2011). It could be that a new model is needed to integrate the proposed frameworks quantity/quality/relevance with quality/relevance/cost-effectiveness/equity for health workforce development. It is interesting to note that the two aspects that these frameworks share (quality, relevance) are also those that faculty most frequently endorsed in their responses. Another future direction could be development of more conceptual clarity and heightened awareness about the role of quantity, cost-effectiveness, and equity for workforce development.

While this study included a relatively small and non-representative sample of faculty from two countries, the intent was to undertake a qualitative exploration, not a large-scale generalizable study. Development of general theories about the relationship of health professional education to the health of communities also needs to include awareness of how such theories may be attended to, interpreted, and applied at local levels. Perceptions of linkages between education and health may impact what types of education innovations are implemented, or even conceived. Along with painting an overall picture of how a subset of faculty perceive the relationships between their work as education innovators and health outcomes, these findings also point to the importance of context (specifically national context) in shaping these beliefs.

Further consideration should be given to ensuring that these broad concepts of linkages between education innovations and health improvement are implemented in faculty development programs. In addition, each education process area could be further detailed in terms of the mechanisms that link it to improved health. For example, Burdick et al. (2011) offered a framework linking faculty development to social accountability and improved health. Such detailed frameworks can guide future planning for faculty development and education innovation.

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