

## Research in medical education is not just on telling a story

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There is no doubt that medical education research has contributed to a better understanding of assessment, curriculum design, students' learning, and staff training and development.<sup>1</sup> However, there are many concerns raised on the quality, nature, and scope of medical education research.<sup>2</sup> The aim of this paper is to highlight challenges facing medical education research, contributing factors to these problems, and future directions.

A number of challenges face medical education research. These may be summarized as follows: i) Despite the progressive increases in the number of medical education research publications over the last 20 years many key questions have not yet been adequately answered, and a small number of studies are the product of mutual collaboration between several universities that can reliably examine research issues from a wide range of angles with minimal limitations to the research design.<sup>3</sup> ii) Currently, most published research in medical education is on self experience, focusing on immediate stakeholder needs. In most instances, repeating what is already known in a particular area without carefully addressing new insights that could add to our knowledge. Some are not written as scholarly work, and one could feel they are not well designed or carefully planned.

iii) the methodologies employed in medical education research need to be improved. There is a need for creative methods that can provide evidence-based answers to a number of key questions. There are concerns on the reporting of data, the analyses used, and the way by which the discussion and conclusions are formatted. Qualitative and/or quantitative methods should be selected to match with the overall design of the study and its research questions. Todros et al,<sup>3</sup> found very few medical education research papers that reported studies using experimental designs, with case-controlled studies and randomized controlled trials (RCT) each accounting for less than 3% of the sample. Although these findings might raise several questions regarding methods used in medical education research, and whether the progress in this area of research is related to specific types of research methods. If the answer is yes, how can we be sure, and what evidence do we have for this assumption? Do RCT studies have more impact on medical education research outcomes? Looking into the 10 RCT studies identified by Todros et al,<sup>3</sup> we find that only 2 of them were cited 16 and 52

times while the other 8 were cited in the range of 1-9 times (Table 1). On the other hand, some observational research papers, textbooks, and review papers are highly cited, for example, Barrows & Tamblyn's book,<sup>4</sup> is cited according to Google Scholar, 1628 times. Also, it might be of more interest if Todros et al,<sup>3</sup> looked into other methodologies used in medical education research other than RCT and controlled studies. For example, correlational research, case studies, action research, longitudinal, cross sectional, trend studies, and ex post facto research. Such analysis is essential before making any judgment on methods used in medical education research. My aim here is not to suppress any new initiatives for developing new research methodologies in medical education but rather to open the discussion for this concern, and explore new insight into this debate. With these concerns in mind it might be useful to assess the causes for these problems and highlight any contributing factors that might be linked to these concerns.

Firstly, research in medical education, as is the case with other research is carried out by academics within the university, and should be based on scientific principles, and valid methodologies. However, researchers need to realize that there are major differences between designing research in biomedical sciences compared to designing research in education, or social sciences. This includes the type of research questions to be proposed, the methods to be used to test these research questions, the design and planning of the project, conflicting, or interfering factors, and the meaning of the results in light of the literature. These differences require a shift in the way basic biomedical scientists conduct medical education research. Therefore, there is a need for a lot of training to successfully achieve this shift. In most universities, methodologies for research in basic biomedical sciences, and clinical medicine have been well established, but this is not necessarily the case in medical education research. For example, there are journals specialized in the area of methodologies used in conducting research in biomedical sciences, and there are opportunities for researchers to travel and learn new techniques from other researchers, who have proved leadership in a particular area of research. These could add more opportunities for innovation and creation in research in basic biomedical sciences. However, this is not the case with medical education research. The aim is not comparing these 2 different types of research but rather highlighting opportunities available to researchers to enhance their research in their areas of expertise. With these limitations in mind, medical education researchers strive to undertake research in this area hoping to prove their scholarship, and leadership in medical education.

Secondly, research in medical education should be based on an educational basis established in the literature. Research is defined as “the creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies, and understandings. This could include synthesis and analysis of previous research to the extent that it is new and creative.”<sup>5</sup> Therefore, medical education research should build on these principles, explore them, and demonstrate deep links with these principles. It is interesting to note that this is not the case in many published research papers where the focus is usually on personal experience, local issues of concern, changes introduced to the curriculum, or assessment without examining the educational basis established in the literature. The question here is how can we shift this trend in medical education research and invest more on research that has an educational basis, and explore issues on fundamentals rooted in the literature. How can we shift the research from fragmented ideas and personal experiences to more meaningful research that adds value to the literature, highlight links to educational basis, and provides evidence-based answers? How can we invest more in research that generates new concepts, methodologies, and better understanding? The aim is not minimizing the value of research targeting personal experiences, but rather raising the need for research that addresses the big picture and provides more meaningful

outcomes. Therefore, the main purpose in medical education research should not be on telling a story, or sharing experiences or discussing changes introduced that were valuable to a particular program. The main focus should aim at looking at the needs of the profession and the overall meaning of the research outcomes. The point that needs to be emphasized here is that medical education research journals are not looking for studies with limited scope, but rather are willing to publish studies that reflect the needs of the broader profession and can provide better answers to challenges commonly faced by the medical education profession. There is definitely a need for studies that move knowledge forward, raise new questions that can challenge the medical profession, and allow medical educators to see new perspectives to current and old problems. In other words, the aim is to end with a study that contributes to the advancement of medical education in a meaningful way, demonstrates creation of new knowledge and/or the use of existing knowledge in a creative way.<sup>6</sup>

Therefore, good medical education research should:

- 1) Answer key questions raised in medical education rather than present reflections on personal or limited local experiences.
- 2) Build new insight and knowledge that can move boundaries and add meaningful outcomes to the literature.
- 3) Contribute to the advancement of medical education, synthesis of new knowledge, and ultimately lead to improved patient care.
- 4) Cover

**Table 1** - The number of citations for 10 randomized controlled trials papers identified by Todres et al,<sup>3</sup> (citations were checked using ISI Web of Knowledge<sup>SM</sup> on 31 October 2009).

Study	Number of citations
Tamayo G, Santibañez M, Javier Meana J. Evaluation of a pharmacology educational activity based on a research project: a randomized, controlled and blind analysis of medical students' perceptions. <i>Med Teach</i> 2005; 27: 53-60.	2
Bradley P, Oterholt C, Herrin J, Nordheim L, Bjørndal A. Comparison of directed and self-directed learning in evidence-based medicine: a randomised controlled trial. <i>Med Educ</i> 2005; 39: 1027-1035.	9
Westberg K, Sandlund M, Lynöe N. The effect of giving information in advance on the clinical training of medical students. <i>Med Educ</i> 2005; 39: 1021-1026.	1
Jünger J, Schäfer S, Roth C, Schellberg D, Friedman Ben-David M, Nikendei C. Effects of basic clinical skills training on objective structured clinical examination performance. <i>Med Educ</i> 2005; 39: 1015-1020.	16
Spickard A 3rd, Smithers J, Cordray D, Gigante J, Wofford JL. A randomised trial of an online lecture with and without audio. <i>Med Educ</i> 2004; 38: 787-790.	7
Ochsendorf FR, Boehncke WH, Böer A, Kaufmann R. Prospective randomised comparison of traditional, personal bedside and problem-oriented practical dermatology courses. <i>Med Educ</i> 2004; 38: 652-658.	5
Margolis PA, Lannon CM, Stuart JM, Fried BJ, Keyes-Elstein L, Moore DE Jr. Practice based education to improve delivery systems for prevention in primary care: randomised trial. <i>BMJ</i> 2004; 328: 388. Epub 2004 Feb 6.	52
Qayumi AK, Kurihara Y, Imai M, Pachev G, Seo H, Hoshino Y, et al. Comparison of computer-assisted instruction (CAI) versus traditional textbook methods for training in abdominal examination (Japanese experience). <i>Med Educ</i> 2004; 38: 1080-1088.	7
Schol S, Goedhuys J, Notten T, Betz W. Individualised training to improve teaching competence of general practitioner trainers: a randomised controlled trial. <i>Med Educ</i> 2005; 39: 991-998.	2
Bridgemohan CF, Levy S, Veluz AK, Knight JR. Teaching paediatric residents about learning disorders: use of standardised case discussion versus multimedia computer tutorial. <i>Med Educ</i> 2005; 39: 797-806.	5

the needs of the medical education profession at a wider scale. 5) Provide strong evidence to support the overall conclusions highlighted. 6) Be original, and demonstrate the ability of using current knowledge in a creative way and enable the reader with a framework that helps in making decisions and resolving concerns. 7) Guide the way for future directions and help in closing the gaps and deficiencies in the understanding of concepts or issues related to medical education, and 8) Demonstrate strong basis and links to educational principles and the literature. This might be through testing application of knowledge in relation to a theory or testing a hypothesis.

Thirdly, medical education research will improve if researchers go deeper into what they are examining. This might be challenging, as most researchers are not necessarily adequately trained in medical education research or educational research. They are usually clinicians or academics, who are engaged in their primary area of expertise. However, many areas in education are “complex”, for example, learning. “Complex” meaning there are many inter-dependant and interrelated factors that cannot be separated, and analyzed in isolation or on their own and therefore, cannot be understood in terms of single specific values, and need deeper understanding of interrelated factors. One approach to enforce research outcomes, particularly in complex areas, is to work collaboratively with academics from other disciplines such as education, psychology, business, economics, information technology, management, and leadership. This approach will provide new ideas, and better insight as researchers design their research, and link it to the literature and educational principles. It will also allow researchers to address issues at a deeper level than designing their research to cover one side of the problem.

Fourthly, medical education researchers need to spend more time in refining their research question.<sup>1</sup> This requires preparation and the use of open-ended questions such as: What are the questions that have been answered in this area? How will this study add

to what is already known? What are the key research questions that need to be highlighted in this work? This series of questions will sharpen the research question, will enable researchers to select their methodologies, and will allow researchers to visualize the whole picture and assess possible outcomes of the work. Examining the educational roots and the basis of the work at this stage are vital for optimizing the value of the work.

In conclusion, the focus of the research is not just on telling a story of the challenges faced and how the faculty dealt with such challenges. Research should be on the big picture and the wider medical education profession that can benefit from the work. This will only be possible if the work is based on educational principles that are rooted in the design, and targets the key characteristics of good medical education research.

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