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Quality Standards in Medical Education Research

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SUMMARY

This paper highlights the importance of using the best evidence available when choosing teaching or assessment methods. It describes three stages to help us get started with research in medical education:

- understanding methodology,
- data collection,
- evaluating results.

Approaches to presentation or publication are discussed and a note of helpful resources provided.

Keywords: Medical education, research studies, data collection

RIASSUNTO

Questo articolo riassume la lettura tenuta il 14 novembre 2012 durante il XVI Congresso Nazionale SIPeM a Garda, circa gli standard di qualità per la ricerca in Pedagogia Medica. La ricerca che riguarda i metodi di insegnamento e valutazione deve essere indirizzata a produrre prove di efficacia (evidence) e può essere schematicamente suddivisa in tre fasi: comprensione della metodologia di ricerca, raccolta dei dati, valutazione dei risultati.

La ricerca in Pedagogia Medica è importante, perché è indirizzata a produrre un miglioramento continuo della formazione nelle professioni sanitarie e perché mira anche a influenzare le politiche educative locali ed internazionali. I prodotti di ricerca sono riconosciuti in molti Paesi come mezzo di valutazione per la carriera accademica.

Si possono distinguere 4 approcci principali: studi esploratori mirati a produrre modelli, studi sperimentali giustificativi, studi osservazionali predittivi, studi translazionali mirati all'implementazione di teorie e modelli. Ogni tipo di studio si può giovare di metodi qualitativi o quantitativi, per la cui selezione è essenziale che sia correttamente posta la "domanda di ricerca", destinata ad esplicitare gli scopi e le finalità. Le migliori domande di ricerca nascono dal riferimento a contesti teorici e concettuali.

L'articolo infine indica una struttura standard per la stesura di un buon progetto di ricerca, i mezzi migliori per la diffusione dei risultati e suggerisce risorse utili, come le Guide AMEE e la web community MedEdWorld.

Parole chiave: Formazione medica, progetti di ricerca, raccolta dati

I am honoured to have been invited to address the XVth Congress of SIPeM in Garda and to contribute this paper to the Journal. Other conference sessions provided detailed discussion on particular issues on the topic so I hope this paper will encourage junior colleagues now to make a start in medical education research.

To do this I thought we might begin by asking ourselves five questions:

1. Why is research in medical education important?
2. How can I plan a research study?
3. How can I present or publish my work?
4. What resources are available to help me?
5. What should I do next?

1. WHY IS RESEARCH IN MEDICAL EDUCATION IMPORTANT?

Research in medical education is important because it provides an evidence-base for medical education essential for good teaching and because it can measure the effectiveness of one method of teaching or assessment compared to another. Todres and colleagues [1] observed that the practice of medical education appears to be “founded on the basis of nothing more than pragmatism, fashion and whim”. In saying this they highlight a professional discrepancy because which of us would prescribe a drug or a course of treatment based on a hunch, a prejudice, an opinion or a guess? And yet, when it comes to teaching, assessment or deciding on a programme or curriculum our choices may often be directed by these thoughts rather than by considering the best evidence available. Best evidence medical education (BEME) “relies on the judicious examination and application of evidence in the published literature” [2]. The BEME collaboration [3] is committed to:

“the dissemination of information which allows teachers and stakeholders in the medical and health professions to make decisions on the basis of the best evidence available;

the production of systematic reviews which present the best available evidence and meet the needs of the user;

the creation of a culture of best evidence education amongst individuals, institutions and national bodies.

For example, in BEME Guide 11, “The educational effects of portfolios on undergraduate student learning: a Best Evidence Medical Education (BEME) systematic review” [4] Buckley and colleagues seek to produce a collated summary of the evidence for the educational effects of the use of portfolios in undergraduate education.

The increased interest in medical education and the move to evidence-informed practice in the last two decades have been associated with a greater recognition of scholarship in teaching [5]. The number of papers published on the subject of medical education has increased at a higher rate than in any other field in medicine [6]. Being a good user of educational research demonstrates our scholarship of teaching. This is one of the five domains of a medical educator as proposed by the Academy of Medical Educators in the UK [7]. Their Domain 4, “Educational research and evidence-based practice” describes the requirement of a medical educator to “critically evaluate the educational literature and apply this learning to his or her educational practice”.

So, if we can appreciate the usefulness of medical education research then the next question is how can we contribute to that research-based knowledge ourselves. “Research in medical education seeks to inform continued improvement of medical education locally and to influence medical education policy nationally and internationally” [8]. It may contribute to scholarly debate and promote continuing professional development. Medical education scholarship is therefore grounded in the real world of medical education practice and in turn medical education practice informs work under the heading of scholarship. There is a practical value to being involved in it.

2. HOW CAN I PLAN A RESEARCH STUDY?

Four main categories of research approaches are described by Ringsted and colleagues [9]:

- explorative studies aiming at modelling;
- experimental studies aiming at justifying;
- observational studies aiming at predicting;
- translational studies aiming at implementing.

So how can we start the process? Two publications may help us at this point. Firstly Creswell [10] gives a highly acclaimed overview of approaches to research. Secondly, Ajjawi and colleagues in “Getting started... medical education research” [11] lead us through three steps in planning, executing and reviewing our research activity. We can follow this three stage approach.

Stage 1:

We must begin by thinking of what to do before we actually start our research project. There are two main methods of research, **quantitative** and **qualitative**, as well as those with elements of both, “mixed method approaches” [10]. What does this mean? Put simply it can be said that **quantitative** research stresses objectivity and is concerned with absolute truth and the analysis of quantities and numbers. **Qualitative** research on the other hand stresses subjectivity, is concerned with socially constructed truths and analyses qualities and words. **Quantitative** approaches are used to test a hypothesis, to answer questions about ‘how much’ or ‘how many’. **Qualitative** approaches seek answers to the ‘what’, ‘how’ or ‘why’ of a phenomenon” [8]. Medical education research may appear to be more focused on these **qualitative** approaches than on the **quantitative** approaches we are used to in our research in the clinical or basic sciences.

Quantitative research in medical education may include correlational research; for example we might be looking for a relationship between students’ exam ranking in a knowledge-based assessment (MCQ) and in a performance-based assessment (OSCE) or we may be seeking to compare the exam performance of two groups of students who are exposed to a new topic in two different ways, for instance one group by lectures and the other group by directed self-learning (experimental research). Other examples of **quantitative** research may include causal comparative research and simple or stratified random sampling.

Qualitative research methods on the other hand may include ethnography (writing about people and studying people), phenomenology (looking at the perspectives of different people on a new ex-

perience), grounded theory which builds theories of social phenomena based on experiences, action research which looks at planning, implementing and reflecting on a change, and hermeneutics which takes the lived experience of an individual as a means of understanding their political, historical or sociocultural contexts [12].

Any research project begins with the construction of a good research question. This should make the purpose of our study clear and direct how we will accomplish the project. At an early stage we need to consider what theoretical or conceptual framework we will use to strengthen our conclusions. If we can base our work on an established theory then our arguments will be strengthened and more readily generalised. “Theory can help structure and facilitate all aspects of the research process; it can help us generalise our study results beyond their immediate settings” [13]. We might then seek out colleagues to collaborate with. Collaborative research can contribute to the rigour of the study and facilitate generalizability of the results [14]. Next we must consider the ethical issues of the study and seek ethical committee approval for the project. Now we are ready to write our research proposal together; this may be a lengthy, detailed document. “A research proposal provides a detailed description of the proposed research project. It acts as a plan of action and a contract between the researcher and the superior, the funding source and the ethics committee” [15]. It should include: [10]:

- the title, which should be informative and attention-grabbing
- the introduction, stating the problem, the context and the purpose of the research
- a literature review indicating what is already known on the topic
- the specific research question, indicating the significance of the work and showing what contribution it will make to existing knowledge
- a description of the research method to be used – either **qualitative** or **quantitative** or a mixed method. It should include the study design, the methodology, the sampling strategy and the method of data collection such as focus groups or questionnaire.

- something about how quality has to be assured and ethical issues answered
- details of the budget required and other logistical matters
- a list of relevant references
- an appendix which might contain the questionnaires used, timelines and costings.

It is usually best to write the research proposal early as it helps to develop and organise your thoughts.

Stage 2:

Now comes the hard work!

In **qualitative** research data collection may include observation, structured or semi-structured interviews, focus groups or document analysis. For example a new undergraduate teaching programme in the outpatient department was introduced based on the participation of invited patient volunteers and tutors from community practice. To evaluate the impact of this innovation on all involved, the opinion of all participant groups was sampled by questionnaire and semi-structured interviews.

In **quantitative** research student rankings in different class examinations might be studied to compare their performance in a traditional exam compared to the one newly introduced. If further information was sought then **qualitative** research approaches may be added such as questionnaires, structured-interviews or focus groups to collect as much additional information as possible (mixed research model) [10]. Once you have collected your raw data it is time to analyse it. Statistical software is available to help with the analysis of numerical data from **quantitative** research. A useful study by Dembe and colleagues [16] aims to identify the statistical software applications most commonly employed for data analysis in health services research studies in the U.S. Results from **qualitative** research may be analysed by grouping them into themes or by indexing or charting to construct a framework or map by which they can be linked to similar studies identified in the literature.

Stage 3:

Now it is time to evaluate your research activity. **Qualitative** research is judged by internal coher-

ence (consistency between the purpose, the methodology and the methods used), its credibility and by its evaluative and procedural rigour. It is important that the opinions of the researcher do not bias the wording of the questionnaire or the answers an interviewee gives (reflexivity). **Quantitative** research is judged by the size of the study group and the rigour of the sampling and the statistics as well as by the measurement instrument used and the reliability and validity of the work.

Finally you should ask yourself about the transferability / generalizability of your work; how useful will the research findings be to anyone else in a similar situation?

3. HOW CAN I PRESENT OR PUBLISH MY WORK?

Decide first whether your work is to be presented or published. Is it to be at a local, national or international level? Departmental meetings are good venues for your first oral presentation and are less threatening occasions than presentations elsewhere. At a larger conference you may be able to submit your work for presentation as a short communication, a poster or as an e-poster. Poster presentations may also include a short time to present the key findings orally. Wherever you are going to present your work it is important to practice the presentation repeatedly. Well-rehearsed, clear descriptions and simple tables or illustrations are required, but it is still important to practice the presentation and have constructive feedback on your performance from a colleague. Remember there will be a strict time limit for you to speak and that it is important to leave the time requested at the end for questions and discussion. You might rehearse the answers to possible questions in advance.

Publications may be in a peer-reviewed journal of medical education, in an e-journal section of an established journal or in an entirely web-based journal. Some journals favour papers on theoretical issues while others favour papers with more practical implications so you should carefully consider where to submit your paper. The impact factor of a journal may also influence your choice. Take an objective look at your work, read your target

journal and read the journal's advice to author. It has to be said though that the majority of medical publications are in English so, if this is not your first language, find someone to help [17]. When a paper is submitted for peer review it will be sent to three or more reviewers who may ask themselves the basic screening question, "Who cares?" They will decide whether your manuscript should proceed along the editorial process further. Features they will be looking out for include: originality, timeliness, grounding in current knowledge, relevance to the journal's readership, the use of appropriate methods and procedures, the standard of presentation of the paper and adherence to appropriate scientific and professional standards [5]. Journals on average are only able to accept <10% of the manuscripts they receive. As a response to this the new MedEdWorld Publish website [6] offers an opportunity for unpublished, unreviewed material to be presented to a wider audience online where a range of comments and discussion can then be expected.

4. WHAT RESOURCES ARE AVAILABLE TO HELP ME?

The AMEE organisation [3] can support researchers in medical education in many ways. The annual conference spotlights international speakers on educational research and facilitates networking or collaboration with like-minded colleagues. Posters at the conferences provide a good opportunity for presentation and discussion with a group of people interested in the same topic. The AMEE research committee offers research grants and can support researchers by review and feedback on submitted material. The biennial Ottawa conference focusses on assessment and forms a specialist network opportunity [3]. The AMEE Guides cover research-related topics; for example in AMEE Guide No. 60: Building bridges between theory and practice in medical education using a design-based research approach Dolmans and Tigelaar [18] discuss the role of design-based research. The new website MedEdWorld [6] offers special-interest groups with online discussion on different topics and again provides a support network for researchers.

5. WHAT SHOULD I DO NOW?

"Use your ideas and hunches from the real world of medical education practice (in which you work) to inform the work you undertake under the heading of scholarship" [8]. Choose something that you would like to know the answer to, check the literature, find research colleagues to discuss your idea with and see what other resources are available to support you. You can now begin to take the first steps in exploring your research ideas and contributing your findings for on-going discussion in the medical education literature.

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