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Postgraduate education in transfusion medicine in the absence of formal residency training: Assessment of factors needed to develop and sustain a postgraduate diploma program

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ABSTRACT

Background: Quality education in transfusion medicine is key to delivering a safe and cost-effective blood service, yet postgraduate residency programs are lacking in many resource-limited countries and regions. The first formal, accredited, postgraduate training program in transfusion medicine aimed at medical doctors was developed and implemented at the University of the Free State in Bloemfontein, South Africa, in 2008. In the context of high demand and limited resources, ensuring sustainability of postgraduate training programs is essential.

Study design and methods: A formal qualitative and semi-quantitative research approach was followed to determine and test the factors considered important in program sustainability, and consisted of a literature survey, followed by semi-structured interviews and a Delphi survey.

Results: Fifty-five factors were identified from the semi-structured interviews. During the Delphi survey, consensus was reached on 41 and stability declared on a further 13. These factors formed the basis of a structured model informing the sustainability aspects of a postgraduate program in transfusion medicine.

Conclusion: Literature on program sustainability in the field of transfusion medicine is very limited. This study identified the key factors essential to the long-term viability of a postgraduate program in transfusion medicine and should find broad applicability in other resource-limited countries and regions. It is envisaged that this will enable such programs to reach a state of self-sufficiency while not being overly reliant on external funding and support.

1. Introduction

Postgraduate education in transfusion medicine is crucial to blood safety, blood banking practice and research. In many countries, this need for postgraduate education is met by residency programs. In countries without residency programs, especially those that are limited in available resources, alternatives are required. According to the most recent World Health Organization (WHO) Global Database on Blood Safety of 2004–2005, only 47 (49%) out of 96 countries had a formal educational program in transfusion medicine leading to a university degree or diploma [1]. In South Africa, this issue was addressed by developing the first, formal, nationally accredited,

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postgraduate diploma in transfusion medicine in English for Africa at the University of the Free State in 2008 [2]. This program is aimed at medical doctors from both urban and rural areas, with a balanced focus on both blood banking and clinical transfusion medicine. Students follow a two-year curriculum, part-time, with two to three contact sessions of 4 days each per year. Written assignments relevant to the student's environment are completed and electronically submitted every 2–3 weeks and a formal research project in the form of an audit of transfusion practice is conducted in the second year.

With an increasing demand for training while functioning in a resource-poor environment, sustainability was identified as a key issue in ensuring long-term viability of this program. Thus, concurrent with the development of the program, a formal research initiative was launched to study this and other aspects of the development of a postgraduate diploma in transfusion medicine.

Sustainability has been defined as "using a resource so that the resource is not depleted or permanently damaged" [3]. Sustainability in programs related to healthcare has been defined in various ways, with some definitions emphasizing sustained health promotion capacities [4] as being at the core of a program, while others focus more on the persistence or "institutionalization" of the program [5]. Shediac–Rizkallahand Bone [6] have pointed out that these definitions are not synonymous and that "institutionalization" may be associated with "inflexibility and adaptation of a program *in toto*" while Pemba and Kangethe [7] from the Moi University in Kenya emphasized innovation, research, service provision and responsiveness to globally competitive knowledge markets in contexts where government support is declining. Sterling has commented on the importance of moving from a transmissive to a transformative paradigm, with sustainability requiring "vision, image, design, and action from all concerned" [8].Warburton has shown the importance of deep learning and interdisciplinary thinking in fostering sustainability [9].

Education in transfusion medicine has a number of unique challenges in that the practice of transfusion medicine takes place in a variety of very different contexts, for example, the blood bank, general medical practice and medical specialties, and both rural and urban settings. Careful reflection, planning and thoughtful consideration of a variety of factors are required to ensure that these programs meet the needs of a diverse student population drawn from the contexts and settings noted above, while simultaneously ensuring that such a program retains its appeal, relevance and status of being value-adding. These variables remain largely elusive with regard to the transfusion medicine context, as almost no literature is available on the factors required to ensure the sustainability of a formal university-level postgraduate education program aimed at medical doctors in this field.

This study investigated factors necessary to develop and sustain this and similar programs, which will enable the provision of strategic guidance and direction for the future. Despite being focused on the South African setting, the findings should have applicability to most other countries and regions without residency programs.

2. Methods

2.1. Experimental design

Approval for the research project was obtained from both the Dean and the Ethics Committee of the Faculty of Health Sciences at the University of the Free State. The study comprised three phases. A literature review formed the basis of the study in order to contextualize the problem and gain deeper insight into the most relevant issues that are important in terms of program sustainability. From this a questionnaire was developed which was used in semi-structured interviews during which a large number of factors related to program sustainability were identified. Finally, these factors were tested in a Delphi survey to confirm the usefulness and value of each of these criteria. Written, informed consent was obtained from all participants. Experts were viewed as individuals with at least 10 years' experience in medical education, as well as knowledge of and more than 10 years' experience in clinical blood transfusion medicine. All of them had to have at least a postgraduate specialist medical degree.

2.2. Literature survey

The literature related to sustainability in postgraduate medical education and transfusion medicine was studied making use of PubMed, Medline and Google Scholar searches. Also, the references from articles thus identified were used to find further articles to elucidate the topic.

2.3. Semi-structured interviews

Semi-structured interviews comprising a number of open-ended questions were conducted with three South African and five international experts in transfusion medicine (one each from Belgium, India, Tunisia, the United Kingdom and the USA). Interviews were done in person, voice-recorded and transcribed. Statements were extracted from the transcriptions and categorized in themes. Finally, the collected data were integrated, summarized, classified and used to compile the statements used as criteria in the Delphi survey.

2.4. The Delphi survey

The Delphi survey was conducted in order to establish a set of criteria needed for the development of a model for a postgraduate diploma in transfusion medicine, and to determine their relevance, importance and practical application. After evaluating the literature related to the execution of Delphi surveys, it was determined that 12 experts would form a statistically adequate number to provide useful information in the context of an *a priori* level of consensus set at 80%. This also ensured completion within a reasonable time period. The survey population thus included 12 national and international experts in the field of transfusion medicine education. The 12 participants on the Delphi panel were experts who had been trained in South Africa, and several of them had done postgraduate