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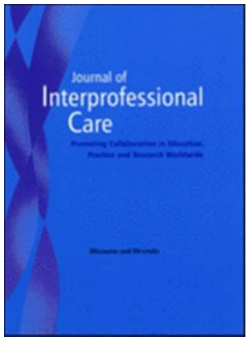

Defining antimicrobial stewardship competencies for undergraduate health professional education in the United Kingdom: A study protocol

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Abstract

Multi-drug resistant infections have been identified as one of the greatest threats to human health. Healthcare professionals are involved in an array of patient care activities for which an understanding of antimicrobial stewardship is important. Although antimicrobial prescribing and stewardship competencies have been developed for healthcare professionals who adopt the role of prescriber, competencies do not exist for other medicine related stewardship activities. Undergraduate education provides an ideal opportunity to prepare healthcare professionals for these roles and activities. This report presents a protocol for a study designed to provide national consensus on antimicrobial stewardship competencies appropriate for undergraduate healthcare professional education. A modified Delphi process will be used in which a panel of Experts, comprising members from across the UK, with expertise in prescribing and medicines management with regards to the education and practice of healthcare professionals, and antimicrobial prescribing and stewardship, will be invited to take part in two survey rounds. The competencies developed will be applicable to all undergraduate healthcare professional education programmes. They will help to standardise curricula content and enhance the impact of antimicrobial stewardship education.

Key words: Antimicrobial stewardship, healthcare professionals, prescribing, undergraduate professional education, interprofessional education, modified Delphi

Introduction

Drug resistant infections have been identified as one of the greatest threats to human health. Longer illnesses, increased mortality, prolonged stays in hospital, loss of protection for patients undergoing medical procedures, and increased costs are all direct consequences of infection with resistant micro-organisms. (World Health Organization (WHO) 2015). In the European Union (EU), around 25 000 patients die each year from infections with antimicrobial resistant bacteria, resulting in health-care costs and lost productivity totalling at least €1·5 billion per year (WHO 2015). Antimicrobial resistance is a multifaceted problem requiring multifactorial interventions to prevent its emergence and further spread (Fishman 2006).

Antimicrobial stewardship (AMS) is an interprofessional effort that involves optimal, prudent antimicrobial use for patients across the continuum of care: acute, inpatient, long-term care, and outpatient settings (Fishman 2006). Although the education of undergraduate healthcare students on AMS is a key activity for the containment of antimicrobial resistance, a survey of undergraduate programmes in human and veterinary medicine, dentistry, pharmacy and nursing in the UK, identified that students receive inconsistent stewardship education, and only around a third of programmes included all the recommended AMS principles (Castro-Sanchez et al 2016).

Background

Over recent years there has been increasing emphasis upon students' capacity to act effectively in complex, diverse, and variable situations and less emphasis upon factual knowledge that learners are expected to acquire. The desired outcomes of the educational

process (i.e. competency-based education (CBE)) emphasizes the capacity of the learner to successfully carry out tasks in the real world, rather than the learner's ability to absorb and recite content (e.g. Gruppen et al 2012). CBE recognizes that quality of care is not improved simply by accumulating and disseminating the best available evidence (e.g. Rathert et al 2012). Instead, with the increasing emphasis on person-centred care, it is necessary for clinicians to respond to patients' needs in a compassionate, knowledgeable, and coordinated fashion (Gachoud et al 2012). This shift toward assessment of quality and outcomes of care has meant that both professional and interprofessional curricular content is now associated with competencies.

Antimicrobial prescribing and stewardship competencies (Public Health England (PHE) 2013), designed to complement the Royal Pharmaceutical Society (RPS) generic competency framework for all prescribers (RPS 2016), have been developed for independent prescribers. This includes medical students (who are able to prescribe upon qualifying) and healthcare professionals such as pharmacists, nurses, physiotherapists, and podiatrists/chiropodists who can prescribe after completing an additional post registration prescribing qualification. However, not all healthcare professionals adopt the role of prescriber, and many are involved in other patient and medicine related stewardship activities for which an understanding of AMS is important. Although undergraduate education provides an opportunity to prepare healthcare professionals for these roles and activities, AMS competencies for undergraduate students have not been established. Additionally, the gradual implementation of new roles such as Nursing Associates in the UK, responsible for delivering direct care likely including tasks related to medication management and whose training will be mainly practical and 'hands on', requires consistent approaches to AMS.

It is increasingly recognised that collaboration and teamwork across health professionals are necessary to improve the quality and safety of health care (Interprofessional Education Collaborative Expert Panel (IPEC 2016). Interprofessional education is important if a workforce is to practice collaboratively. AMS involves interprofessional effort (Fishman 2006, Castro-Sanchez 2016), and resonates with the present emphasis upon interprofessional education and practice. However, AMS knowledge taught on undergraduate healthcare educational degree programmes tends to focus on basic microbiology, the classification and use of antibiotics, as well as practical activities such as the collection of specimens and therapeutic drug monitoring (Castro-Sanchez et al 2016) with very little emphasis on collaboration and teamwork and the complex daily problems faced by patients, families, and healthcare professionals. Whilst it is clear that such domains of AMS education need to be strengthened, optimal skills, attitudes and behaviours are yet to be agreed upon. This paper presents a protocol for a research study that will be undertaken to provide UK national consensus on AMS competencies appropriate for undergraduate healthcare professional education.

Methods

Where there is an absence of research evidence or the desire to gather opinion, structured or formal methods are commonly used to reach consensus. We will therefore employ the Delphi technique, a commonly used formal consensus method which uses an iterative series (or rounds) of questionnaires to gather data and achieve group consensus. A classic Delphi survey begins with a questionnaire containing open ended questions from which subsequent questionnaires are developed (Day & Boveva 2005). However, our work will

adopt a modified Delphi survey, whereby competency domains and descriptors, developed previously (see Table 1), will form the content for the first round of the Delphi study. These domains and descriptors, reflecting an integrative approach (Roegiers 2007, and Peyser et al 2006), were informed by available prescribing and stewardship competency frameworks (RPS 2016, PHE 2013), AMS principles (PHE 2015), evidence of the key AMS principles delivered on undergraduate health professional education programmes (Castro-Sánchez et al 2016), and interprofessional competencies (Canadian Interprofessional Health Collaboration (CIHC) 2010).

INSERT TABLE 1 ABOUT HERE

Recruitment

'Experts' are employed as panel members in the Delphi technique as opposed to a representative random sample of the target population. There is a lack of agreement as to what constitutes an 'expert' and participants are selected with regards to explicit criteria (Trevelyan &Robinson 2015). 'Expert' in this study will be defined as; individuals reflecting expertise in prescribing and medicines management with regards to the education and practice of healthcare professionals, and antimicrobial prescribing and stewardship.

Identification of expert panel members

Purposive and snowball sampling methods will be used to recruit expert panel members across the UK. Individuals in Royal Colleges and Societies, national groups and organisations, and those reflecting expert criteria and identified from the literature, will be identified and contacted by the researchers. Other potential participants, identified by these individuals, will also be followed up by the researchers i.e. snowball sampling.

Sample size

There is a lack of agreement as to the optimum number of participants to include on a Delphi panel, and sample size is dependent on what is being investigated, the complexity of the problem, the homogeneity or heterogeneity of the sample and availability of resources (Keeney et al 2011). In-line with sample size recommendations for a homogenous sample i.e. around 15 participants (Skulmoski et al 2007), we will aim to recruit between 15-20 participants. All those who express an interest to participate and fulfilled our 'expert' definition, will be included.

Data collection and analysis

In round one, participants will be asked to use a 6 point Likert scale (1=strongly agree to 6 =strongly disagree) to rate AMS competency statements and each associated descriptor with regards to the extent to which they consider it to be important. Space will also be provided for panel members to list any additional descriptors they think are missing. The strength and extent of agreement for each item will be determined by the median and interquartile range (IQR). Responses where the median is more than or equal to 5 (i.e. a high level of agreement that participants viewed it as important) with a small IQR (less than or equal to 1.5), will be considered important descriptors that have reached consensus. Content analysis will be used to explore qualitative responses. Only descriptors for which there is a lack of agreement, descriptors that are amended in the light of qualitative feedback, and additional descriptors identified by panel members, will be included in round two questionnaire.

Ethical considerations

Ethical approval for the study will be sought through the School of Healthcare Sciences Research Governance and Ethics Committee, Cardiff University.

Discussion

The aim of this study is to provide national consensus on AMS competencies appropriate for undergraduate healthcare professional education. By starting with a predetermined list of competency statements and descriptors, the traditional round one of the Delphi survey, i.e. item generation will be unnecessary. The competencies developed will address a gap in AMS education for UK healthcare professional undergraduate programmes. They will provide a foundation for those healthcare professional students who will become prescribers, and also provide guidance for healthcare professionals who do not go onto prescribe, but, who are involved in the array of patient care and medicines management activities for whom an understanding and engagement with AMS is important. They will help to standardise curricula content and enhance the impact of AMS education and Improve suboptimal practice.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article. The views expressed are those of the authors and not necessarily those of the National Health Service, the National Institute of Health Research, the Department of Health, or Public Health England.

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Table 1: Competency domains, and examples of their associated descriptors

Domain	Descriptor examples
Domain 1: Infection prevention and control	Describe the different types of organisms that may cause infections
	Describe what a micro-organism is
Domain 2: Antibiotics and antimicrobial resistance	Recognise the symptoms of infection
	Describe at least two different ways that antibiotics may kill bacteria
Domain 3: The diagnosis of infection and the use of antibiotics	Explain how microbiology samples may aid diagnosis of infection
	Discuss the use of rapid point-of-care diagnostic testing in infection diagnosis
Domain 4: Antimicrobial prescribing practice	Describe why, and how, it is important to switch from IV antibiotics to oral therapy
	Explain how you would recognise and manage sepsis
Domain 5: Person centred care	Support participation of patients/carers as integral partners when planning/delivering their care
	Share information with patients/carer in a respectful manner and in such a way that is understandable, encourages discussion, and enhances participation in decision-making
Domain 6: Interprofessional collaborative practice	Demonstrate an understanding of the roles, responsibilities, and competencies of other health professionals involved in antimicrobial treatment policy decisions
	Explain why it is important that healthcare professionals, involved in the delivery of antimicrobial therapy, have a common understanding of antimicrobial treatment policy decisions, the quality of antimicrobial use, and effective patient/client outcomes

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