



Evaluation of the understanding of antibiotic resistance among Malaysian pharmacy students at public universities: An exploratory study



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KEYWORDS

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Summary

Background: Infectious diseases are a great threat to humankind, and antibiotics are a viable proposition to numerous pathologies. However, antibiotic resistance is a global concern. Therefore, the aims of this survey were to explore the understanding and attitudes of pharmacy students regarding antibiotic use and resistance.

Methods: This is a cross-sectional study conducted on final-year undergraduate pharmacy students from 5 public universities. A validated, self-administered questionnaire written in English was used to collect data. It was made up of six domains and forty-five questions. Raosoft software was used to determine the minimum required sample size. Descriptive and inferential data analyses were carried out using SPSS version 20 software.

Results: Out of 346 students, only 59.5% showed a strong understanding of antibiotic usage, while 84.4% of students demonstrated a good level of understanding regarding the issue of antibiotic resistance. However, only 34.1% of students demonstrated a positive attitude toward this issue.

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Conclusion: This survey reveals that final-year pharmacy students at Malaysian public universities have a relatively good understanding of antibiotic resistance. However, their attitudes did not strongly correlate to their knowledge.

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Introduction

Antibiotics are a powerful medication that target microorganisms such as bacteria and fungi. They kill bacteria or stop them from reproducing and are thus often given to treat infections caused by bacteria. However, there is a concern globally that antibiotics are misused and overused, leading to the emergence of antibiotic resistance [1].

Antibiotic resistance (ABR) is considered to be a type of drug resistance where some or all populations of a bacterial species survive after exposure to antibiotics [2]. One of the major factors causing ABR is the inappropriate prescribing of antibiotics over the years. A single dose of a particular antibiotic can increase bacterial resistance risk to that antibiotic in a person for up to a year [3]. ABR has also been shown to increase with patients' non-compliance to antibiotic protocols. In all cases, an insufficient treatment course of antibiotics can lead to relapse of the infection whereby it is now more antibiotic resistant [4]. It is evident that patients' expectations of antibiotics can influence prescribing practice, but there is a scarcity of data on whether patients' knowledge of and attitudes toward ABR are sufficient to achieve a positive health outcome. A number of studies were conducted to investigate the perception of the public regarding the use of antibiotics. It was identified that the public generally lacked knowledge in vital aspects and had negative attitudes toward the rational use of antibiotics [5–7]. However, there have been no studies completed so far on pharmacy students, who will have an iconic role in drug handling.

Infections due to resistant bacteria often fail to respond to standard treatment, as ABR reduces the effectiveness of treatment. To effectively combat and prevent ABR, pharmacists are generally the key personnel, as antibiotic regimens are becoming more complex. The decline in the number of novel replacement medications further emphasizes the importance of preserving currently available antibiotics [8]. A well-trained pharmacist would be able to maximize the efficacy and utility of an available medication while reducing the chances of developing an opportunistic infection by resistant bacteria.

Looking at the fact that pharmacists have an integral role in the rational use of antibiotics, it is obvious that the education of pharmacy students can greatly impact the effort to reduce ABR incidence. As a gateway practitioner, the most vital role of pharmacists in preventing ABR is that of an educator [9]. Pharmacy students are expected to be educated well to address the public's concerns. Several studies have been completed to determine the understanding and perception of the medical profession and medical students, including physicians, pharmacists and nurses [10–14]. All of these studies highlighted the fact that educational programs need to be developed to enable students or even healthcare professionals to reflect on their knowledge of antibiotics, as it can influence patients' behaviors and outcomes.

Directly or indirectly, the level of understanding and attitudes of students can have significant impacts on safeguarding one of the most imperative medical advances of the past century. However, there is limited data on the way ABR topics are handled at pharmacy schools and in what manner the concept of these topics is incorporated into their attitudes [10]. No studies have been completed so far to evaluate the understanding of antibiotic resistance in future pharmacy practitioners. Except for a single study from Jordan, there is no other study from any developing countries that encompasses the knowledge and attitudes of pharmacy students toward antibiotic resistance [15]. Therefore, the aims of this survey were to explore the understanding and attitudes of pharmacy students on antibiotic use and ABR.

Methodology

Study design, study site and sampling

This cross-sectional study was carried out among final-year undergraduate pharmacy students by using a self-administered questionnaire. It was conducted as a classroom survey. Students from five public universities were included in this study to gain an understanding of pharmacy students' attitudes toward ABR. Prior approval from the

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