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Major Article

Thai clinicians' attitudes toward antimicrobial stewardship programs

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Background: Effective hospital-wide antimicrobial stewardship (AMS) programs need multidisciplinary engagement; however, clinicians' attitudes have not been investigated in Thailand where AMS is in early development. The aim of this study was to explore Thai clinicians' (doctors, nurses, and pharmacists) perceptions and attitudes toward AMS.

Methods: A paper-based survey was distributed in a 1,000-bed university hospital in Bangkok, Thailand, between November 9, 2015, and December 21, 2015. A total of 1,087 clinicians participated: 392 doctors, 613 nurses, and 82 pharmacists.

Results: Most participants agreed that improving antimicrobial prescribing would decrease antimicrobial resistance (AMR) and should be a priority of hospital policy. Doctors were less likely to agree with policies that limit antimicrobial prescribing ($P < .001$) than nurses or pharmacists, and were less likely to be interested in participating in AMS education than other clinicians ($P < .001$). Pharmacists indicated higher agreement with the statement, recommending that a specialist team provide individualized antimicrobial prescribing advice ($P < .01$) and that feedback improves antimicrobial selection ($P < .001$). Nurses were less likely to agree that community antibiotic use ($P < .001$) or patient pressure for antibiotics contribute to AMR ($P < .001$).

Conclusions: AMS programs are vital to improving antimicrobial use by clinicians. Understanding clinicians' attitudes and perceptions related to AMS is important to ensure that AMS programs developed address areas relevant to local clinical needs.

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BACKGROUND

Antimicrobial resistance (AMR) is a major health care problem worldwide with significant consequences.¹ Patients with antimicrobial-resistant infections are at greater risk of worse clinical outcomes, recurrent infection, and death than infected patients without AMR.² As many as 25,000 people in Europe die every year because of antibiotic-resistant microorganisms,³ and it is estimated

that >2 million people are infected by antibiotic-resistant pathogens resulting in 23,000 deaths annually in the United States.⁴ It has been estimated that >500,000 people worldwide die every year as a result of AMR.⁴ In Thailand, as many as 90,000 patients are affected by AMR annually and the cost of the therapeutic use of antibiotic medications is >\$200 million per year. The increase in AMR has resulted in approximately 3.24 million extra days of hospital stay and accounted for 38,481 deaths annually in Thailand.⁵ It is estimated that an additional 19,000 deaths are caused by multidrug-resistant (MDR) bacteria in Thailand each year. Mortality attributed to MDR was highest for hospital-acquired MDR *Acinetobacter* bacteremia (41%).⁶

Inappropriate use of antimicrobial medications is a major cause of AMR. In U.S. hospitals, as many as 50% of antibiotics prescribed are unnecessary or inappropriate,⁴ and 47% of antibiotic use in Australian hospitals was found to be inconsistent with antimicrobial guidelines or patients' microbiologic results.⁷ Antimicrobial

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stewardship (AMS) programs have been initiated to respond to the growing problem of AMR. AMS is a process that aims to ensure optimal antimicrobial medicine use and minimize AMR.⁸ For AMS to be effective, hospital-wide AMS programs need the engagement of multidisciplinary professionals who are involved in antimicrobial prescribing and use.⁹ Clinicians need to be aware of the causes and consequences of AMR and current evidence for appropriate antimicrobial use.^{9,10} Differences and similarities between professions will affect the implementation of AMS programs.⁹ Clinician support for AMS programs has been identified in surveys conducted in Europe,¹¹ Australia,⁹ and the United States.¹² However, little is known about the attitudes and perceptions of clinicians toward AMS in Thailand. The aim of this study was to explore the perceptions and attitudes of clinicians. For the purpose of this study, clinician refers to doctors, nurses, and pharmacists.

METHODS

This study was a cross-sectional survey of health professionals at a 1,000-bed university hospital in Bangkok, Thailand. Data were collected between November 9, 2015, and December 21, 2015. A paper-based survey was distributed to 1,753 doctors, nurses, and pharmacists in the following departments: surgery, pediatrics, medicine, operating room, pharmacy, obstetrics and gynecology, orthopedics, ophthalmology, emergency medicine, community health nurses, family medicine, and anesthesiology. The overall response rate was 62.0% (1,087/1,753). The specific response rates per professional group were 41.4% (392/948) for doctors, 86.3% for nurses (613/710), and 86.3% for pharmacists (82/95).

Survey instrument

The survey for this study was based on a survey used in an Australian study.⁹ There were 26 items in the Australian survey of which 24 were retained: the 2 items deleted were related to Australian guidelines and not relevant to the Thai context. Because antibiotics can be purchased without prescription in Thailand and therefore are widely used, 2 additional questions related to patient influences on antibiotic prescribing decisions and patients' ability to buy over-the-counter antibiotics were added by the researchers, because these are important contextual issues for Thai health care.

To ensure content and face validity, the survey was reviewed by the research team to determine that survey items were clear and that survey content examined the correct concepts.¹³ The English version was translated into Thai by 1 researcher. A nurse educator from a Thai University who holds a PhD in Nursing (written in English) performed a back translation from Thai to English. The consistency of meaning between the Thai and the back-translated English versions was determined by 1 researcher (N.S.). This comparison identified only minor differences that were corrected. The content and face validity relevant to the Thai context and language were established by a Thai panel consisting of specialists in infection prevention and control. These specialists were infectious disease physicians, an AMS specialist pharmacist, and a prevention and control specialist nurse who evaluated the items for relevance and accuracy. They independently rated the relevance of each item to calculate a Content Validity Index. The Content Validity Index was 0.90. To ensure internal consistency, a pilot test of the Thai version was conducted with 10 health care professionals at the hospital before the study commenced, and coefficient α was calculated as 0.89. Head nurses, senior doctors, and senior pharmacists of each department and ward were asked to distribute the survey to clinicians and remind them to complete the survey within a 4-week period. The study was approved by the Human Research Ethics Committees of Deakin University and the surveyed hospital.

Data analysis

Data were analyzed using SPSS version 23.0 for Windows (IBM, Chicago, IL). Descriptive statistics (frequencies, percentages, means, and SDs) were used to summarize the study data. Because the data did not conform to the normal distribution, medians and first and interquartile range are presented. For survey items that were categorical in nature, clinicians' responses are presented as frequencies, and comparisons were made using the χ^2 test. For continuous data, the Kruskal-Wallis test was used to compare the responses of different professional groups (doctors, nurses, and pharmacists).

RESULTS

A total of 1,087 clinicians completed the survey: 392 (36.1%) were doctors, 613 (56.4%) were nurses, and 82 (7.5%) were pharmacists. Overall, 80.9% ($n = 879$) of clinicians were women: 52.6% of doctors ($n = 206$), 97.7% of nurses ($n = 599$), and 90.2% of pharmacists ($n = 74$). **Table 1** shows that clinicians were most commonly working in the areas of surgery (20.8%), pediatrics (18%), and medicine (17.6%). The median age was 29 years (interquartile range, 26–35), and ages ranged from 22–70 years. Almost half the clinicians (42.3%) had 1–5 years of clinical experience ($n = 460$).

Clinician perceptions of AMR

Clinician perceptions in relation to AMR are presented in **Table 2**. Compared with nurses, more doctors and pharmacists perceived that patients' ability to buy antibiotics over-the-counter was a significant influence on AMR ($P < .001$). Clinicians, particularly doctors, considered that AMR was a serious problem worldwide, in Thai hospitals, and at the surveyed hospital ($P < .001$). AMR in the Thai community was considered less important, particularly by nurses ($P < .001$). Clinicians, particularly doctors, believed that antimicrobial use in Thai hospitals contributed to AMR.

Clinicians' responses toward AMS programs

Clinicians' attitudes toward AMS programs are presented in **Table 3**. Most clinicians from all professions agreed AMR would be reduced by improving antimicrobial prescribing and it should be a priority of the hospital and supported by a hospital-endorsed policy. Clinicians perceived that local antimicrobial guidelines and protocols, and a computer application to guide selection and duration of antimicrobial therapy, would be clinically useful. However, doctors were less likely than nurses and pharmacists to agree with a policy that limits antimicrobial prescribing ($P < .001$). Doctors were also less likely to be interested in participating in AMS education and training than nurses and pharmacists ($P < .001$). Pharmacists were more likely than doctors and nurses to agree that a team consisting of an infectious disease specialist physician and pharmacist to provide individualized antimicrobial prescribing advice and feedback would assist with antimicrobial selection ($P < .001$).

Previous involvement and experience with AMR and AMS

Clinicians' responses to questions related to previous involvement and experience with AMR and AMS are presented in **Table 4**. Most clinicians had previously been involved in the care of patients with an antibiotic-resistant infection (88.1%). However, there were less pharmacists involved in the care of patients with resistant infections than doctors or nurses (59.8% vs 93.1% vs 88.7%, respectively; $P < .001$). Most clinicians perceived increasing numbers of antimicrobial-resistant infections over the last 5 years. Again, fewer pharmacists perceived this change over time than doctors or nurses

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