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Assessing Antibiotic Stewardship Knowledge Among Healthcare Professionals in an Indonesian Teaching Hospital

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Abstract

Background: Hospitals all around Indonesia have adopted antimicrobial stewardship. Hospitals were encouraged to adopt the program through required AMS programs as part of hospital accreditation and the implementation of a national policy. Pharmacists actively contribute to the program's implementation, which has a significant impact on hospitals. Additionally, the involvement of other healthcare professionals is crucial for the program's success.

Method: The study was conducted at UGM Academic Hospital from June 1 to October 31, 2024. This study design is non-experimental research with an analytical cross-sectional approach, and data collection was conducted prospectively using questionnaires. Respondents are specialist, general practitioners, dentists, pharmacists, and nurses working at UGM Academic Hospital, possess a valid practice license, and are willing to participate as respondents in the study.

Result: The questionnaire was collected from healthcare professionals at UGM Academic Hospital. 91 participants, representatives from three professional groups: nurses/midwives (49.5%), physicians (36.3%), and pharmacists 14.3%). High knowledge scores (reaching the maximum score) on antimicrobial stewardship were achieved by 69.2% (63/91) of the respondents. Compared to nurses/midwives and physicians, pharmacists had a greater mean level of antibiotic stewardship knowledge.

Conclusion: Healthcare professionals demonstrated good knowledge of antimicrobial stewardship; however, a few healthcare workers still scored low. A regular training program must be carried out to enhance the antimicrobial stewardship program in the hospital.

Keywords: AMS, antimicrobial stewardship, healthcare professionals

1. INTRODUCTION

Hospitals all around Indonesia have adopted antimicrobial stewardship. Hospitals were encouraged to adopt the program through required AMS programs as part of hospital accreditation and the enactment of a national policy (1). Pharmacists actively contribute to the program's implementation, which has a significant impact on hospitals. Additionally, the involvement of other healthcare professionals is crucial for the program's success (2).

Overcoming the AMR issue in Indonesia is a significant challenge for the government. In fact, the AMR situation in Indonesia has worsened rather than improved. The community's attitudes, knowledge, and behaviors around AM use were inadequate and inaccurate (3). Healthcare professionals differ in their knowledge and beliefs about antibiotic stewardship. Levels of understanding vary among different practitioner groups, and insufficient knowledge can lead to the improper use of antibiotics (4).

The healthcare professionals (HCPs) surveyed in our study demonstrated limited knowledge and practices related to antimicrobial stewardship (AMS), though their attitudes were generally positive. Knowledge, attitudes, and practices (KAP) levels varied among medical doctors, nurses, and pharmacists (5). Most physicians and pharmacists recognized the negative effects of antimicrobial resistance (AMR), though they considered its impact less concerning at the hospital level compared to the national scale. Both professions generally accepted antimicrobial stewardship program (ASP) activities; however, pharmacists showed a greater interest in learning about and participating in ASP initiatives (6).

Healthcare professionals play a vital role in antimicrobial stewardship programs. Doctors prescribe medications, pharmacists prepare and dispense medications and educate patients about their use, and nurses provide direct care and support to patients. According to the 2023 ASP report, the implementation of antimicrobial stewardship has not been optimal, partly due to the limited participation of healthcare professionals in ASP and antimicrobial stewardship activities. Therefore, research on the knowledge and beliefs of healthcare professionals regarding antimicrobial stewardship at UGM Academic Hospital is needed to establish further strategies for optimizing antimicrobial stewardship programs.

2. MATERIALS AND METHODS

The study was conducted at UGM Academic Hospital, after obtaining ethical clearance, with a research period of five months from June 1 to October 31, 2024. This study design is non-experimental research with an analytical cross-sectional approach, and data collection was conducted prospectively using questionnaires. This study used a questionnaire from a similar previous study (4) and obtained permission from the original researcher.

The population in this study includes all healthcare professionals practicing at UGM Academic Hospital. The research subjects consist of physicians, pharmacists, and nurses who meet the inclusion and exclusion criteria. Respondents are specialist, general practitioners, dentists, pharmacists, and nurses working at UGM Academic Hospital, possess a valid practice license, and are willing to participate as respondents in the study. The sampling technique used was stratified simple random sampling from the population of specialist, general practitioners, dentists, pharmacists, and nurses working at UGM Academic Hospital. The study protocol was submitted to the ethics committee of the Faculty of Medicine, Gadjah Mada University, KE/FK/1356/EC/2024 for approval.

3. RESULT

The questionnaire was collected from healthcare professionals at UGM Academic Hospital. 91 participants, representatives from three professional groups: nurses/ midwives (49.5%), physicians (36.3%), and pharmacists 14.3%).

The high knowledge score (exceeding the maximum score) on antimicrobial management is 69.2% (63/91) of the respondents. Compared to nurses/ midwives and physicians, pharmacists had a greater mean level of antibiotic stewardship knowledge. Low levels of knowledge regarding antimicrobial stewardship were observed in 17.8% of nurses/midwives and 6.1% of physicians.

Table 1. Characteristics of Respondents

Variable		Professions (N= 91)				
		nurses/ midwives (n=45)	Physicians (n=33)	Pharmacists (n=13)	Total	%
Age	< 31 years	23	18	10	51	56.0
	31 - 40 years	19	12	3	34	37.4

	> 40 years	3	3	0	6	66
	Female	37	26	10	73	80.2
Gender	Male	8	7	3	18	19.8
Education	D3	17			17	18.7
	S1/D4+Profesi	28	25	11	64	70.3
	S2		2	2	4	4.4
	Specialist/ Subspecialist		5		5	5.5
	S3		1		1	1.1
Work	<2 years	14	15	7	36	39.6
experience	2-5 years	10	11	2	23	25.3
	>5 years	21	7	4	32	35.2

Table 2. The Respondents' knowledge classification

Knowledge	Professions (N= 91)						Total	
	Nurses/ midwives		Physicians		Pharmacists			
Classification	n	%	n	%	n	%	n	%
High	24	53.3	26	78.8	13	100	63	69.2
Moderate	13	28.9	5	15.2	0	0	18	19.8
Low	8	17.8	2	6.0	0	0	10	11.0

4. DISCUSSION

The study conducted at UGM Academic Hospital stated that significant variations in antibiotic stewardship knowledge among healthcare professionals. This is in line with other research that highlights a better understanding of antibiotics is linked to positive attitudes and practices that support responsible antibiotic use and help decrease antibiotic consumption (4).

According to a global study in the UK, responses to the knowledge test questions differed among professional groups. Medical doctors exhibited the highest understanding of AMR, with 80% answering all questions correctly, followed by pharmacists (74%), dentists (68%), and scientists (62%). Medical doctors were the only group where all participants scored at least five out of seven correct answers (7). 10.99% of the respondents had low scores in knowledge of antimicrobial stewardship. This is in accordance with other studies, which found that approximately 19% of respondents demonstrated low knowledge of antimicrobial stewardship, scoring below the mean minus one standard deviation. The overall average knowledge score among all respondents was 9.9 (SD = 1.5). Pharmacists and physicians had higher average knowledge scores compared to pharmacy technicians, nurses, and midwives (4).

Most of the respondents had good knowledge, as indicated in other reports, which highlighted that 62.8% of healthcare professionals (HCPs) possessed good knowledge about antibiotics. Most HCPs recognized that inappropriate antibiotic use could cause resistance, treatment failure, increased side effects, and higher medical costs for patients. However, a notable portion of respondents disagreed with these statements, reflecting gaps in fundamental knowledge and inadequate training on proper antibiotic use (8).

On the other hand, the study revealed inadequate knowledge and practices regarding antimicrobial stewardship (AMS) among healthcare professionals (HCPs), though their attitudes were generally positive. Levels of knowledge, attitude, and practice (KAP) varied among medical doctors, nurses, and pharmacists. Key predictors of HCPs' KAP levels included prior exposure to structured AMS training, participation in continuing professional development (CPD) sessions on AMS within the past year, professional roles, and years of work experience (5). Based on a study conducted in Indonesia, a key barrier to implementing antimicrobial stewardship (AMS) in hospitals is the conflict between profit-driven

priorities and the dynamics of interprofessional relationships between doctors, hospital managers, and AMS leaders (1).

Differences in knowledge among healthcare professionals can occur in several places. Italian healthcare professionals demonstrated varying levels of knowledge, attitudes, and behaviors concerning antibiotic use and resistance. These results highlight the need for targeted educational and training programs for specific professional groups (9). The findings suggest that the educational program effectively enhances healthcare professionals' attitudes toward antimicrobial stewardship. Therefore, ongoing efforts to raise awareness and promote positive attitudes should be sustained through various strategies, including regular training initiatives (10). Training that can be conducted to enhance the knowledge level of healthcare personnel includes antibiotic stewardship training. Additionally, this can be achieved through online webinars related to the appropriate selection, dosage of medications, and evaluation of the safety and efficacy of antibiotics.

5. CONCLUSIONS

Healthcare professionals generally demonstrated good knowledge about antimicrobial stewardship; however, a few healthcare workers still scored low. A regular training program must be carried out to enhance the antimicrobial stewardship program in the hospital.

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