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Knowledge, Attitudes, and Behaviors of Pharmacists Towards the Use of Antibiotics: Literature Review

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ABSTRACT

Pharmacists have an important role to play in the safe use of antibiotics and there appears to be no research evaluating pharmacists' knowledge, attitudes, and practices towards antibiotics and antibiotic resistance in Indonesia. An assessment of pharmacists' knowledge, practices and attitudes about antibiotics and their resistance will be useful to identify problems to create effective interventions. The databases used in the literature search are Google Scholar, Pubmed, and ScienceDirect, with inclusion criteria including the year of journal publication from 2010 to 2024, full text, the research sample is pharmacist, the research uses questionnaires, and the method used is cross-sectional, focusing on pharmaceutical knowledge, attitudes, and behaviours on the use of antibiotics. The exclusion criteria include duplication, not full text, inappropriate titles, samples taken that are not pharmacists or included other than pharmacists, only including 1 or 2 of the 3 bound variables, namely knowledge, attitudes, and behaviours, the methods used are not cross-sectional, do not use questionnaires, and files cannot be opened. (n=769) 10 literature met the inclusion criteria, and 8 out of 10 literature stated that sociodemographic factors, namely age, gender, place of residence, employment status, length of work, level of education, and the number of antibiotics administered, affected the knowledge, attitude, and behaviour of pharmacists towards the use of antibiotics without a prescription. 8 out of 10 literature is declared to be of good quality. The results of these 10 kinds of literature for the percentage of pharmacists who have good knowledge are 40%-90% of the sample, the percentage of a good attitude is 50%-90%, and the percentage of good behaviour is 20%-60%. Sociodemographic factors influence the knowledge, attitudes, and behaviours of pharmacists towards the use of antibiotics without prescriptions.

Introduction

The impacts of antibiotic resistance include increased resource use, clinical or economic burden, as well as increased use of broad-spectrum antibiotics, morbidity, and mortality (Mudenda et al., 2022). Nearly one in six deaths worldwide is caused by infectious diseases, with few new antimicrobials in the development stage, antimicrobial resistance continues to grow to be the biggest threat to public health globally (Hadi et al., 2016).

The use of antibiotics without a prescription is an important factor related to this irrational use, as more than 50% of antibiotics worldwide are purchased without a prescription (Hamdani, Nuari, & Rahayu, 2021). Due to the growing problem of antibiotic resistance, many researchers have studied the contribution of healthcare providers to this problem Pharmacists, as the main antibiotic providers, can be a major contributor to antibiotic resistance in Palestine and the world (Al-Halawa, Seir, & Qasrawi, 2023).

Therefore, pharmacists need to be ready to take on their role in educating patients about the correct use of medications. Few studies have looked at the role of pharmacists in terms of antibiotic resistance. In this role, good knowledge related to the use of antibiotics is needed and balanced with good attitudes and practices related to the administration of antibiotics to patients (Meinitasari, Yuliastuti, & Santoso, 2021). The use of inappropriate antibiotics, such as antibiotics given to patients with the flu, can be the cause of antibiotic resistance.

Research Methods

Literature Search and Selection Criteria

The databases used in literature searches are Google Scholar, Pubmed, and ScienceDirect. The search was carried out on each database using keywords (knowledge) AND (attitude) AND (practice) AND (antibiotic stewardship) OR (antibiotic resistance) AND (pharmacist) OR (community pharmacist) OR (pharmacy), with inclusion criteria including the year of journal publication from 2010 to 2024, full text, the research sample was pharmacist, the research used questionnaires, and the method used was cross-sectional, focusing on knowledge, attitudes, and behaviours of pharmacists on the use of antibiotics (Kurniasari & Ichsan, 2023). The exclusion criteria include duplication, not full text, inappropriate titles, samples taken that are not pharmacists or included other than pharmacists, only including 1 or 2 of the 3 bound variables, namely knowledge, attitudes, and behaviours, the methods used are not cross-sectional, do not use questionnaires, and files cannot be opened.

Study Options

Titles and abstracts are filtered according to the inclusion criteria that have been determined, to obtain the literature that is desired. Then the selected literature is re-screened and the feasibility of the analysis is determined.

Results and Discussion

From the search results with the 2010-2024 limit, 769 literatures were obtained. After duplication screening, 723 results were obtained, with a total of 46 duplicate literature. Then 723 kinds of literature were screened for titles, filtering literature that could not be opened and not the full text was obtained from 23 literature with appropriate titles. Then a full-text literature screening is carried out to find literature that meets the inclusion criteria of this review literature. The inclusion criteria include the year of publication of the literature from 2010 to 2024, full text, the research sample is pharmacists, the research uses questionnaires, and the method used is cross-sectional, focusing on the knowledge, attitudes, and behaviours of pharmacists on the use of antibiotics. After screening, 10 kinds of literature that met the inclusion criteria were obtained, and 13 kinds of literature were excluded because there was one of the exclusion criteria. In Table 1, the results of these 10 kinds of literature for the percentage of pharmacists who have good knowledge are 40%-90% of the sample, the percentage of a good attitude is 50%-90%, and the percentage of good behaviour is 20%-60%. Only 2 out of 10 studies did not provide the results of the conclusions obtained at the level of knowledge, attitudes, and behaviours of the pharmacists who were sampled.

Table 1
Characteristics and Validity of Research

Author and Year	Country	Method	Sample	Validation and Number of Questionnaires	Reliability	Result				
						Knowledge	Attitude	Behaviour	Socio-demographic factors	Knowledge-Attitude-Behavior Correlation
M Sudhir., *et al*, 2020	India	*Cross-sectional*	30	Validated, 22	+	Height: 47% Low: 53%	Height: 60% Low: 40%	Height: 66% Low: 34%	-	-
Mudenda S., *et al*, 2022	Zambia	*Cross-sectional*	178	Validated, 24	+	Keep	Good	Keep	Length of work and residence affect attitude	There is a correlation between knowledge-attitude-behavior
(Mudenda et al., 2020)	Lusaka	*Cross-sectional*	144	Validated, 18	-	Height: 93.8%	High: 67.4%	Height: 25% Low: 75%	Age affects attitudes and behaviours, and length of work affects knowledge and behaviour.	-
Mohamed A., *et al*, 2023	Mogadishu	*Cross-sectional*	410	Validated, 36	-	Height: 47.6%	High: 52.4%	Low: 48%	Gender influences behaviour	-
Al-Halawa A., *et*	Palestine	*Cross-section*	152	Validated, 38	+	Tall	Good	Low	Residence affects knowl	-

al, 2022		*al*							edge, attitudes, and behaviours, education level affects attitudes and behaviours, whereas gender only affects knowledge.	
Mthombeni C., *et al*, 2024	Limpopo	*Cross-sectional*	35	Developed from review literature, 43	-	Height: 82.4%	Good	Low	Gender affects knowledge	There is a correlation between knowledge and attitudes
(Khan et al., 2021)	Pakistan	*Cross-sectional*	180	Validated, 27	+	High: 65.6%	Height: 90%	Keep	Length of work and gender affect knowledge	-
Hadi A., *et al*, 2016	Saudi Arabia	*Cross-sectional*	189	Validated, 28	-	-	-	-	The amount of antibiotics given and the place of origin affect behaviour.	-
Haile T., *et al*, 2022	Ethiopia	*Cross-section*	158	Validated, 23	+	-	-	-	Length of employment,	-

		al						employment status, and education level affect behaviour.	
Hussain A., *et al*, 2020	Sudan	*Cross-sectional*	1.217	Validated, 28	-	Medium: 61.7%	Good: 98.9%	Good: 51.2%	Length of work affects knowledge	-

Table 2
Quality of Literature

N	Kriteria	M Sudhir., *et al*, 2020	Mudenda S., *et al*, 2022	Mudenda S., *et al*, 2020	Mohamed A., *et al*, 2023	Al-Halawa A., *et al*, 2022	Mthombeni C., *et al*, 2024	Khan U., *et al*, 2021	Hadi A., *et al*, 2016	Haile T., *et al*, 2022	Hussain A., *et al*, 2020
1	Was there a clearly defined research question?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	Did the authors select samples that well represent the population to be studied?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

N	Kriteria	M Sudhir., *et al*, 2020	Mudenda S., *et al*, 2022	Mudenda S., *et al*, 2020	Mohamed A., *et al*, 2023	Al-Halawa A., *et al*, 2022	Mthombeni C., *et al*, 2024	Khan U., *et al*, 2021	Hadi A., *et al*, 2016	Haile T., *et al*, 2022	Hussain A., *et al*, 2020
3	Did the authors use designs that balance costs with errors?	?	?	?	?	?	?	?	?	?	?
4	Did the authors describe the research instrument?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	Was the instrument pretested?	✓	✓	✓	✓	✓	x	✓	✓	✓	✓
6	Were quality control measures described?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7	Was the response rate sufficient to	✓	✓	✓	✓	✓	x	✓	✓	✓	x

N	Kriteria	M Sudhir., *et al*, 2020	Mudenda S., *et al*, 2022	Mudenda S., *et al*, 2020	Mohamed A., *et al*, 2023	Al-Halawa A., *et al*, 2022	Mthombeni C., *et al*, 2024	Khan U., *et al*, 2021	Hadi A., *et al*, 2016	Haile T., *et al*, 2022	Hussain A., *et al*, 2020
	enable generalizing the results to the target population?										
8	Were the statistical, analytic, and reporting techniques appropriate to the data collected?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
9	Was evidence of ethical treatment of human subj	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

N	Kriteria	M Sudhir., *et al*, 2020	Mud enda S., *et al*, 2022	Mude nda S., *et al*, 2020	Moha med A., *et al*, 2023	Al-Hala wa A., *et al*, 2022	Mthomb eni C., *et al*, 2024	Khan U., *et al*, 2021	Hadi A., *et al*, 2016	Hail e T., *et al*, 2022	Hussai n A., *et al*, 2020
	ects provided?										
10	Were the authors transparent to ensure evaluation and replication?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Quality of survey studies		High	High	High	High	High	Low	High	High	High	Medium

Table 2 shows the results of the analysis of whether the literature used in this review literature is of high quality or vice versa, the results obtained from Table 2 are 1 literature from (Mthombeni, Burger, Lubbe, & Julyan, 2024), and research from (Abdelrahman Hussain, Osman Mohamed, Sandel Abkar, Siddig Mohamed, & Khider Elzubair, 2022) has medium quality, while others have high quality.

In the results of the study, only 1 out of 10 studies stated that sociodemographic factors had no effect on pharmacists' knowledge, attitudes, and behaviours towards antibiotics, while the other 9 stated that sociodemographic factors affected pharmacists' knowledge, attitudes and behaviours towards antibiotics. Sociodemographic factors that influence pharmaceutical knowledge, attitudes, and behaviours include gender, place of residence, position occupied, number of workers, length of work, and level of

education. Only 1 study examined the correlation between knowledge, attitudes, and behaviours, while the others only focused on the influence of sociodemographic factors on the knowledge, attitudes, and behaviours of pharmacists.

Conclusion

The results obtained from this study, 8 out of 10 kinds of literature stated that sociodemographic factors affect the knowledge, attitudes, and behaviours of pharmacists towards the use of antibiotics. Influential sociodemographic factors include age, gender, place of residence, employment status, length of employment, level of education, and the amount of antibiotics given.

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