The Consonance Between Medical Practitioners and Pharmacists Regarding Antimicrobial Stewardship Practices - An Observational Study

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ABSTRACT

Objective: To determine the consonance between medical practitioners and clinical pharmacists about antimicrobial resistance and stewardship in their practices.

Study Design: Descriptive cross-sectional study.

Place and Duration of the Study: Department of Pathology and Department of Pharmacology, Jinnah Sindh Medical University, Karachi, Pakistan, from September 2023 to January 2024.

Methodology: Medicinal and Clinical Pharmacy professionals were included in the study through purposive sampling technique. The study employed a methodological approach using a predesigned questionnaire administered through Google Forms, based on a 4-step scale strategy. Through an extensive literature review, item development, expert validation, and pilot testing, the questionnaire aimed to assess medical practitioners' and pharmacists' knowledge and perceptions regarding antibiotic practices and antimicrobial stewardship (AMS). Following a pilot test involving 30 participants and a Cronbach's alpha analysis yielding a value of 0.7 for internal consistency, minor modifications were implemented before dissemination to the participants. The responses were analysed using descriptive statistics, Chi-square test, and Kappa index.

Results: Out of the total 200 participants, 130 responded within the stipulated timeframe, resulting in an overall response rate of 65%. Among the respondents, medical practitioners constituted 60% (n = 78), while clinical pharmacists comprised 42% (n = 52) of the total. The general agreement level between medical practitioners and clinical pharmacists was determined to be 0.39, indicating a fair level of concordance between the two cohorts.

Conclusion: The present investigation emphasised the agreement level between medical practitioners and pharmacists, the two key components of the AMS programme. Nevertheless, a consistent deficiency in knowledge was observed across both cohorts, underscoring the necessity for a heightened level of consensus among the study participants.

Key Words: *Antimicrobial stewardship, Antimicrobial resistance, Anti-bacterial agents, Pharmacists.*

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INTRODUCTION

Antimicrobial resistance (AMR) has now been acknowledged as a global threat to public health by the World Health Assembly in 2015 and was further endorsed by the high-level meeting of the General Assembly in 2017.[1] The UK government's review on AMR stipulated that AMR would potentially kill 10 million people per year by 2050.[2] In 2019, 4.5 million deaths were associated with bacterial AMR throughout the world.[2] AMR can substantially burden healthcare systems with collateral damage to sustainable development goals (SDGs).

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Data from the Centres for Disease Control And Prevention (CDC) highlight the severe threat levels for ESKAPE pathogens (*Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumonia, Acinetobacter baumannii, Pseudomonas aeruginosa,* and *Enterobacter species*), which contribute notoriously to various infections, especially in low-and middle-income countries (LMICs) where the burden of AMR is gigantic.[3] A recent analysis quoted the increase in global consumption of daily defined doses (DDD) of antibiotics by 65% in the previous decade, and this upsurge was primarily driven by increased expenditure of antibiotics in LMICs, with India, China, and Pakistan as the foremost consumers of the antibiotics.[4] To address this emerging threat of AMR, the concept of antimicrobial stewardship (AMS) was propounded by the Infectious Diseases Society of America (IDSA) in 2007 which was further advocated by the World Health Organization (WHO).[5]

AMS is a succinct strategy that can be framed by 6Ds: Diagnosis, drug, dose, duration, de-escalation, and debridement / drai-

nage.[6] Today, AMS constitutes one of the three essential components in a comprehensive strategy for enhancing the healthcare systems. The remaining two elements include infection, prevention and control (IPC), medicine, and patient safety.[7] AMS is a clear policy for patient safety, management support, and accountability, which ultimately consolidates long-term success goals for combating AMR by executing national action plans (NAPs) on AMR, particularly emphasising AMS. Despite the presence of a scientific foundation for AMS and the availability of national, regional, and global guidance documents, there is a rising demand for more concise guidance regarding the development, implementation, and evaluation of effective AMS initiatives, particularly in LMICs.[8]

AMS is a methodical-collaborative approach that emphasises the role of major stakeholders to combat AMR in any healthcare system, including medical practitioners, nursing staff, pharmacists, microbiologists, infection prevention teams, patient safety teams, hospital epidemiologists, and infection control specialists.[9] These stakeholders should be vital in deploying AMS in a healthcare setting. In LMICs, such as Pakistan, the healthcare system is impoverished and saddled with the grave issue of AMR. In these settings, AMS implementation is an exacting job primarily for the medical practitioners and clinical pharmacists. However, there are potential barriers to knowledge, practices, and implementation of AMS in Pakistan. While previous studies from Pakistan have explored the uni-professional perspective of AMS practices, the literature search needed help finding the bi-professional perspective. Therefore, the objective of this study was to determine the level of consonance between medical practitioners and clinical pharmacists, the knowledge about AMR and their stewardship practices.

METHODOLOGY

This descriptive cross-sectional study was conducted at the Department of Pathology, Sindh Medical College, in collaboration with the Department of Pharmacology, Institute of Pharmaceutical Sciences, Jinnah Sindh Medical University, Karachi, Pakistan, from September 2023 to January 2024. An approval from the Institutional Review Board was obtained (ERC No: JSMU/IRB/2023/286, Dated: 1/2/24). The non-probability purposive sampling technique was applied to select participants who could meaningfully meet the study's inclusion criteria. In this regard, medical practitioners and clinical pharmacists were approached who were working in a primary, tertiary, and secondary care hospital facility in urban areas of Karachi, with two or more than two years of working experience in their relevant fields. The clinical pharmacists involved in ward rounds and had expertise in antibiotic dosing and dispensing were included in the study. A cohort of 200 individuals was approached for the study, comprising 100 participants from the medical profession and an additional 100 clinical pharmacists. The enrolled medical practitioners had a dynamic background from various specialities, including general surgery, orthopaedics, nephrology, internal medicine, dermatology, gynaecology, urology, and vascular surgery. All participants were given study information before voluntary participation, and each of them provided written consent. Individuals having experience of less than two years and who did not provide written consent to participate in the study were excluded.

Data were collected by a predesigned questionnaire using the online tool Google Forms. The questionnaire used a 4-step scale strategy, including literature search, item development, expert validation, and pilot testing.[10] In the first step, an extensive literature search was conducted to identify the research gap and topics of interest about the local population. A self-administered questionnaire was designed in English by the principal and co-investigators, incorporating a mixed-type questionnaire design that consisted of both open-ended and multiple-choice questions. The goals of the questionnaire were to assess the knowledge of medical practitioners and pharmacists about antibiotic practices and their perceptions and level of consonance for AMS. The content and construct of the questionnaire were validated by two subject experts, including one consultant microbiologist and one clinical pharmacist, who ensured the items' content, relevance, and clarity. The questionnaire was divided into three parts; the first consisted of nine items related to bio-data, demographic information regarding gender, age, years of experience, area of expertise, qualification, etc. The second part of the questionnaire had six items based on the theme of knowledge and understanding of AMR. The third part consisted of 10 items and focused on participants' perceptions and knowledge regarding the AMS and its implementation in their settings. The survey was subjected to a pilot test involving 30 participants, and the internal consistency of the constructs was assessed using Cronbach's alpha, yielding a value of 0.7. After the pilot test results, minor modifications to the items were made. The questionnaire and a consent form were then shared with the study participants *via* a link on WhatsApp and official email addresses.

The data were extracted from completed questionnaires on Google Forms to the Excel sheets and stored on SPSS (version 22). The data was double-checked to rule out any ambiguity. The frequencies and percentages were measured by using descriptive statistics. The cross tabs determined the consonance between the variables, and the Kappa index and pooled Kappa index were calculated to summarise inter-rater agreement.

RESULTS

Of the 200 participants, 130 responded within a given timeline. Hence, the overall response rate was 65%. The participation by medical practitioners accounted for 60% (n = 78), and clinical pharmacists were found to be 42% (n = 52). The details of participants' characteristics are given in Table I. The mean age of the participants was found to be 38.03 ± 9.16 years. The frequency of male and female subjects was 76 (58.5%) and 54 (41.5%), respectively. About half (n = 66, 50.7%) of the professionals had more than 10 years of experience in their respective fields. Most (n = 84, 64.6%) of the enrolled subjects had a master's degree / specialisation as a terminal qualification and worked in tertiary care settings (n = 76, 58.4%).

Table I: Participants' attributes (n = 130).

Participants attributes		Medical practitioners (n, %)	Clinical pharmacists (n, %)	Total (n, %*)	p-value
Age (years)		38.55 ± 9.57	37.26 ± 8.54	38.03 ± 9.16	0.23
Gender	Male	46 (60.5)	30 (39.5)	76 (58.4)	0.51
	Female	32 (59.3)	22 (40.7)	54 (41.6)	
Working experience	<10 years	38 (48.7)	26 (50.0)	64 (49.3)	0.51
	>10 years	40 (51.3)	26 (50.0)	66 (50.7)	
Level of qualification	Bachelors	21 (26.9)	22 (42.4)	43 (33.0)	0.12
	Masters / specialisation	57 (73.1)	27 (51.9)	84 (64.6)	
	Doctorate	0 (0)	3 (5.7)	3 (2.4)	
Level of care	Primary	12 (15.4)	3 (5.8)	15 (11.5)	0.15
	Secondary	20 (25.7)	19 (36.6)	39 (30.1)	
	Tertiary	46 (58.9)	30 (57.6)	76 (58.4)	

Table II: Antibiotic practices and perception of antimicrobial resistance.

Theme	Medical practitioners (n, %)	Clinical pharmacists (n, %)	Total (n, %)	Kappa index
Frequency of prescribing or dispensing antibiotics				
<5 antibiotics / day	13 (16.7)	6 (11.5)	19 (14.6)	0.69
5-10 antibiotics / day	23 (29.5)	15 (28.8)	38 (29.2)	
>10 antibiotics / day	42 (53.8)	31 (59.6)	73 (56.2)	
Preferred treatment option in case of suspected infection				
Prescribe empirical antibiotics and advise relevant culture and sensitivity test	29 (37.2)	16 (30.8)	45 (34.6)	0.45
Prescribe broad-spectrum antibiotics without culture and sensitivity test	49 (62.8)	36 (69.2)	85 (65.4)	
Most critical factor that should be considered for empirical and antibiotic selection.				
Observations of the patient (history, physical examination, and laboratory test results)	46 (59.0)	31 (59.6)	20 (25.6)	0.84
Past clinical experience	12 (15.4)	7 (13.5)	19 (14.6)	
Hospital treatment guidelines	20 (25.6)	14 (26.9)	34 (36.2)	
The most common reason to advise broad-spectrum antibiotics.				
Provides good coverage	48 (61.5)	32 (61.5)	80 (61.5)	0.84
Unreliable laboratory culture results	10 (12.8)	8 (15.4)	18 (13.8)	
Unavailability of local guidelines for an antibiotic prescription	10 (12.8)	2 (3.8)	12 (9.2)	
Patient's poor financial status	10 (12.8)	10 (19.2)	19 (14.6)	
Most important cause of increasing antimicrobial resistance in the region.				
Frequent use of antimicrobials in minor ailments	46 (59.0)	24 (46.2)	70 (53.8)	0.07
Availability of antimicrobials without prescription	16 (20.5)	18 (34.6)	34 (26.2)	
The presence of unlicensed practitioners and pharmacists	10 (12.8)	4 (7.7)	14 (20.5)	
Improper dosing and poor patient compliance	3 (3.8)	2 (3.8)	5 (7.6)	
Prescribing antimicrobials without culture and sensitivity results	3 (3.8)	4 (7.7)	7 (11.5)	
Consider hospital antibiograms or local guidelines in prescribing or dispensing antimicrobial drugs.				
Always	20 (25.6)	11 (21.2)	31 (23.8)	0.90
Sometimes	19 (24.4)	22 (42.3)	41 (31.5)	
Never	39 (50)	19 (36.5)	58 (44.6)	

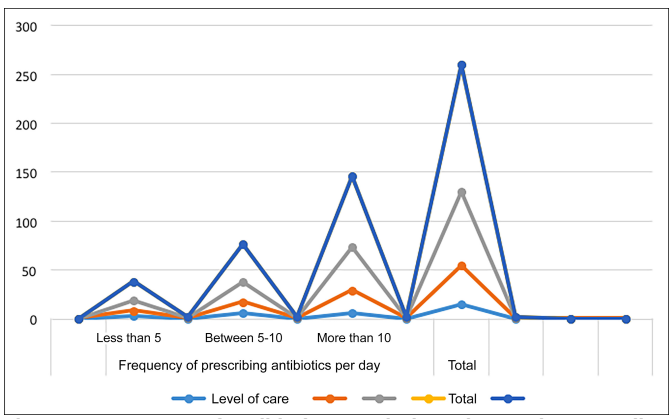

Figure 1: Frequency of antibiotic prescription / despensing according to level of care.

Table II highlights the antibiotic practices of study participants and their perception of AMR. According to the enrolled subjects, 57.5% (n = 42) of medical practitioners routinely prescribed antibiotics at a frequency exceeding 10/day. Similarly, 59.6% (n = 31) of clinical pharmacists dispensed more than 10 antibiotics daily. The highest proportion of antibiotics (n = 76, 58.4%) was prescribed or dispensed in tertiary-level care settings (Figure 1). Around 62.8% (n = 49) of medical practitioners mentioned that, in cases of suspected infection, the preferred treatment approach involved prescribing broad-spectrum antibiotics without advising culture and sensitivity testing. A similar idea was shared by clinical pharmacists with 69.2% (n = 36) agreeing with this perspective. Regarding the primary determinant for empiric antibiotic treatment, 59% (n = 46) of medical doctors considered the "observation of the patient's signs and symptoms" the most fundamental factor. Clinical pharmacists (59.6%, n = 31) agreed with this opinion. The most common rationale for advising broad-spectrum antibiotics was for their considerable coverage against infections as perceived by 61.5% (n = 48) of medical doctors and 61.5% (n = 32) of clinical pharmacists. Medical practitioners (n = 46, 59%) and clinical pharmacists (n = 24, 46.2%) alike considered the frequent use of antimicrobials for minor ailments as the primary cause of AMR in the country.

Table III: Knowledge about the AMS programme.

Theme	Medical practitioners (n, %)	Clinical pharmacists (n, %)	Total (n, %)	Kappa index
Understanding of the AMS programme				
Programme to improve antimicrobial use at the different healthcare levels	48 (61.5)	34 (65.4)	82 (63.1)	0.84
Programme which ensures the prescription of the right drug in the right dose for the right duration	22 (28.2)	15 (28.8)	37 (28.5)	
A programme that allows appropriate antimicrobial use at the individual level	8 (10.3)	3 (5.8)	11 (8.5)	
Healthcare professionals need to understand AMS.				
Prescribing doctor	58 (74.4)	31 (59.6)	89 (68.5)	0.03
Clinical pharmacist	2 (2.6)	5 (9.6)	7 (5.4)	
Microbiologist	0 (0)	2 (3.8)	4 (3.1)	
Infection control committee	2 (2.6)	1 (1.9)	1 (0.8)	
All of the above	16 (20.5)	13 (25.0)	29 (22.3)	
Frequency of communication with an infectious disease consultant to improve antimicrobial use.				
Always	19 (24.4)	20 (38.5)	39 (30.0)	0.07
Sometimes	35 (44.9)	17 (32.7)	52 (40.0)	
Never	24 (30.8)	15 (28.8)	39 (30.0)	
Strategy used for the safe distribution of antimicrobials?				
Reporting adverse reactions to the pharmacist or drug control authority	43 (55.1)	20 (39.2)	63 (48.8)	0.07
Following the recall medicine protocol	21 (26.9)	20 (39.2)	41 (31.8)	
Sending antimicrobials for drug testing laboratory	6 (7.7)	9 (17.6)	15 (11.6)	
None	8 (10.3)	2 (3.9)	10 (7.8)	
Implementation of AMS programme in your hospital or workplace				
Yes	27 (34.6)	12 (23.1)	39 (30.0)	0.31
No	33 (42.3)	24 (46.2)	57 (43.8)	
Maybe	18 (23.1)	16 (30.8)	34 (26.2)	
The important factor that causes the barrier to implementing the AMS programme in Pakistan.				
Lack of awareness among health professionals	36 (46.2)	21 (40.4)	57 (43.8)	0.62
Overburden work schedules	37 (47.4)	26 (50.0)	63 (48.5)	
Financial constraints of the hospitals	4 (5.1)	2 (3.8)	6 (4.6)	
Unavailability of hospital guidelines and antibiograms	1 (1.3)	3 (5.8)	4 (3.1)	
Preferred hospital setting for AMP implementation?				
Primary care	60 (76.9)	18 (34.6)	93 (71.5)	0.08
Secondary care	16 (20.5)	33 (63.5)	34 (26.2)	
Tertiary care	2 (2.6)	1 (1.9)	3 (2.3)	
The critical first step before the implementation of AMP.				
Training of healthcare professionals	40 (51.3)	37 (71.2)	77 (59.2)	0.00
Building ASP committee	30 (38.5)	8 (15.4)	38 (29.2)	
Formulary restriction with feedback from infectious disease physician	8 (10.3)	7 (13.5)	15 (11.5)	
Challenges in implementing the AMS in Pakistani hospitals.				
Maintaining a proper audit system	22 (28.2)	22 (42.3)	41 (31.5)	0.15
Lack of resources	10 (12.8)	4 (7.7)	14 (10.8)	
Coordination among healthcare professionals	44 (56.4)	19 (36.5)	66 (50.8)	
Patient education	1 (1.3)	2 (3.8)	3 (2.3)	
Provide training for healthcare professionals	1 (1.3)	5 (9.6)	6 (4.6)	
The most important future benefit of AMP				
Can help in reducing antimicrobial resistance	55 (70.5)	36 (69.2)	91 (70.0)	0.34
Can help in the rational prescribing of antimicrobials	13 (16.7)	2 (3.8)	15 (11.50)	
Control of drug cost and overall financial burden	6 (7.7)	12 (23.1)	18 (13.8)	
Patient safety	4 (5.1)	2 (3.8)	6 (4.6)	

Half of the enrolled doctors acknowledged that they had never considered hospital antibiograms or guidelines to prescribe antibiotics. Likewise, 36.5% (n = 19) of clinical pharmacists agreed with the findings above.

Table III presents the knowledge about the AMS programme. Approximately 61.5% (n = 48) of medical practitioners believed that AMS was the programme to improve the use of antimicrobials at tertiary-level care settings, and 65.4% (n = 34) of clinical pharmacists agreed with the notion. Similarly, a significant number (n = 58, 74.4%) of the medical doctors believed that the prescribing doctor was the most crucial person to understand AMS. This was equally endorsed by clinical pharmacists (59.6%, n = 31). On asking, how often participants communicate with infectious disease consultants to enhance the quality of antimicrobial use, about 44.9% (n = 35) of medical practitioners responded with occasional communication. Among clinical pharmacists, approximately 40% (n = 52) responded the same. On inquiring about strategy for the safe distribution of antimicrobials, a majority (n = 43, 55.1%) of medical practitioners used to notify adverse reactions to pharmacists or drug control authorities. In this regard, 39.2% (n = 20) of clinical pharmacists believed the same. When asked about AMS implementation in the participants' workplace, only 34.6% (n = 27) of medical practitioners responded affirmatively. Similarly, only 23.1% (n = 12) of clinical pharmacists believed the same.

A notable number (n = 37, 47.4%) of medical practitioners believed that lack of awareness among health professionals was the most concrete barrier to implementing AMS in Pakistan. Conversely, half (n = 26, 50%) of the clinical pharmacists believed that workload and time management were the fundamental reasons for implementing stewardship activ-

ities. Regarding the view on the most preferred setting for AMS implementation, 76.9 (n = 60) medical practitioners indicated the primary care facility as the ideal setting for AMS implementation, while a large number (n = 33, 63.5%) of clinical pharmacists considered secondary care as the best facility for the same reason. Training healthcare professionals was the most critical first step in implementing AMS in Pakistan; this opinion was endorsed by most medical practitioners (n = 40, 51.3%) and clinical pharmacists (n = 37, 71.2%). According to medical practitioners, coordination among healthcare professionals was the most challenging step in AMS implementation. However, clinical pharmacists believe that maintaining a proper audit system is more taxing. Approximately 70.5% (n = 55) of medical practitioners agreed that AMS implementation would be critical in reducing AMR in Pakistan. Most (n = 36, 69.2%) of clinical pharmacists agreed with doctors. The overall level of consonance between medical practitioners and clinical pharmacists was found to be 0.39, showing a fair agreement level between the two groups.

DISCUSSION

Pakistan ranks as the third highest antibiotic-consuming country among LMICs.[11] Therefore, AMS implementation and adherence bear a vital role in controlling emerging AMR. This study sought to lighten the consonance between the perspectives of medical practitioners and clinical pharmacists, the cornerstone of AMS.

This study identified several perceptions and practising routines by medical practitioners and clinical pharmacists. An overwhelming number of medical practitioners (53.8%) and clinical pharmacists (59.6%) demonstrated consonance in advising / dispensing antibiotics at a rate exceeding 10/day. The frequency of antibiotic prescriptions / dispensing was notably high among professionals working in a tertiary care setting. According to Torumkuney *et al*.,[11] a significant escalation was noted in the use of WHO watch group antibiotics in the last decade; this has placed Pakistan in the mid-table position in the list of 71 countries, and the major contributors were tertiary care hospitals.[12] A study from Italy also demonstrated heightened usage of antibiotics in large hospital environments, among which, a substantial number (34.2%) of prescriptions were inappropriate.[13] Another noteworthy finding in the current study was that a considerable number (62.8%, 69.2%) of enrolled participants prescribed or dispensed antibiotics without advising or considering culture and sensitivity testing. This could be a reason why inappropriate advisory of antibiotics ultimately increases the risk of AMR. A considerable number (62.85%) of medical practitioners prescribed empirical antibiotics without culture and sensitivity testing. This practice is associated with an increased rate of AMR. An exciting finding was sought by Haseeb *et al*. and Spaulding *et al*., who mentioned that culture and sensitivity reports helped in the de-escalation of antimicrobial therapy, hence reducing the prescribing of broad-spectrum antibiotics, which led to the spread of AMR by enhancing the uptake of bacterial genetic elements, including plasmids encoding antibiotic resistance genes.[14,15] In this study, medical practitioners and clinical pharmacists unanimously considered 'observations of the patient' as the most critical factor for empirical antibiotic selection. Considering hospital guidelines was the least selected option by study subjects.

Similarly, a large number of the study participants believed that broad-spectrum antibiotics provide good coverage against the majority of infections. A study conducted in Jordan found that only 13.6% of infection cases were treated efficiently with empirical antibiotics.[16] However, empirical treatment failed to gain successful outcomes in the significant proportion of infections. When the most important cause of increasing AMR was asked from the patients, most medical practitioners (59%) and clinical pharmacists (46.2%) depicted harmonisation and considered irrational use of antimicrobials, even in minor ailments. Another intriguing result from the current study pertained to the consideration of hospital anti-biograms. Approximately half of the medical practitioners asked had never incorporated anti-biograms into their antibiotic prescribing practices.

Similarly, 36.5% of clinical pharmacists aligned with their study participants. Similar results were also reported from Nepal, India, Bangladesh, and Kenya where a lack of awareness, unavailability of hospital guidelines, and antibiograms were reported.[17-19] The LMICs need more trained professionals and standardised inclusive approaches to establish local guidelines and the problem is consistent among these groups of countries.

With time, the importance of understanding, practising, and implementing AMS has become a concrete fact. AMS programmes (ASPs), led to a 10% reduction in antibiotic prescriptions and a 28% reduction in antibiotic consumption.[20] The current study highlighted the opinion that prescribing doctors are the most important personnel in ASPs. The challenges of implementing AMS are gruesome and multifactorial globally. This study elaborated on various factors, according to the professionals which cause hurdles in AMS implementation. Around 47.4% of medical practitioners considered a lack of knowledge and cooperation regarding the existence of the AMS programme and strategies, on the contrary, half (50%) of clinical pharmacists believed in the lack of time and overburdened duty schedules of the professionals. Similar results were presented according to which 60% of pharmacists have limited time to participate in AMS due to other daily chores.[21]

The current study highlighted the biggest challenge for the implementation of AMS in hospitals of Pakistan was the difficulty in coordination among healthcare professionals.

This factor was also mentioned by Setiawan *et al.* and Wong *et al.* in their studies.[22,23] According to their observations, coordination among all stakeholders of AMS (ID physicians, pharmacists, clinicians, microbiology testing services, and IT services for electronic record management) was lacking.[22,23] The lack of coordination is often complex due to hierarchical structures in the different working environments, which can be overcome by defining the duties and developing a committed team. The overall level of consonance was low among the participants in the two groups, indicating a significant gap in their knowledge and perceptions, as per the guidelines endorsed by the World Health Organization (WHO) regarding stewardship, the crux of effective implementation of AMS strategies lies in team development. This achievement is contingent upon ensuring alignment across all pillars of AMS, encompassing knowledge, actions, and implementation.

In response to the World Health Assembly's Global Action Plan for AMR in 2015, Pakistan developed its own National Action Plan (NAP). The Pakistani government formed an intra-sectorial committee on AMR and developed a vision for the NAP that aims to prevent patients from infections due to AMR in the future. However, its implementation at the grass-root level still needs to be determined.

CONCLUSION

The current study highlighted the consonance level between the two pillars of the AMS programme, i.e., medical practitioners and pharmacists. However, a lack of knowledge was consistent among both groups; overall, there was a need for a higher level of agreement among the study subjects.

ETHICAL APPROVAL:

The study was approved by the Institutional Review Board of Jinnah Sindh Medical University, Karachi, Pakistan (ERC No: JSMU/IRB/2023/286, Dated: 1/2/24).

PARTICIPANTS' CONSENT:

Informed written consent was taken from each participant for taking part in the study, and publication of the study results.

COMPETING INTEREST:

The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

FZ: Concept, literature search, ethical approval, conduct of the study, data analysis, manuscript writing, and editing.
RM: Literature search, ethical approval, conduct of the study, and manuscript editing.
BAS, ZI: Literature search, conduct of the study, and manuscript editing.
All authors approved the final version of the manuscript to be published.

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