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Original Research Article

Knowledge, attitude and practices regarding antimicrobial use and resistance among community members of Mtendere Township in Lusaka, Zambia: findings and implications on antimicrobial stewardship

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ABSTRACT

Background: Antibiotic resistance is a public health problem affecting all countries and leads to an increase in morbidity and mortality rates. In Zambia, there is little information on the knowledge, attitude, and practices of community members about antibiotic use and resistance. This study assessed the knowledge, attitude and practices (KAP) regarding antimicrobial use (AMU) and antimicrobial resistance (AMR) among community members in Mtendere township of Lusaka Zambia.

Methods: This was a cross-sectional study that was conducted from May 2020 to August 2020 using a structured questionnaire among 369 Mtendere residents. The data were analyzed using Statistical Package for Social Sciences (SPSS) version 22.0.

Results: Of the 369 participants, 50.9% were male and 62.1% were aged between 18 and 29 years. Overall, this study found a poor KAP (38% good knowledge, 58% positive attitudes, and 52% good practices) regarding AMU and AMR. More than half of the participants 66.7% (246/369) had heard of antibiotics, 33.6% heard of AMR, and 23% heard of antimicrobial-resistant infections. Most of the participants 48.2% were not aware that AMR is a public health issue. A total of 52.8% (195/369) of the participants said they did not take antibiotics without consulting a doctor or pharmacist, translating into a prevalence of self-medication of 47.2%.

Conclusions: This study showed that Mtendere residents had poor KAP towards antibiotic use and resistance. There is a need to implement community-based interventional campaigns including antimicrobial stewardship programmes address the gaps in KAP identified in this study.

Keywords: Antibiotic resistance, Antibiotic use, Antimicrobial resistance, Antimicrobial stewardship, Knowledge, Lusaka, Practices, Zambia

INTRODUCTION

The discovery of antibiotics was of great importance in the practice of medicine because they are used to treat

infectious diseases.¹ However, their inappropriate use has contributed to the emergence and spread of antimicrobial resistance (AMR).¹ Antimicrobial resistance (AMR) is a public health problem that occurs when microorganisms

resist the lethal effects of antimicrobials to which they were previously susceptible to and has contributed to many deaths and negative impacts on the healthcare system globally.² This problem occurs naturally over time but is accelerated by inappropriate use of antimicrobial use of antimicrobials in humans, animals, agriculture, aquaculture services, and the environment.³ Additionally, lack of access to health services, including diagnostic and laboratory capacity are contributing factors to AMR.^{4,5} Furthermore, in low- and middle-income countries (LMICs), most antibiotics are readily purchased without prescriptions and this may contribute to the ever-growing problem of AMR.⁶⁻⁹

According to the World Health Organization (WHO), AMR is among the ten threats to global public health.¹⁰ Further, it was predicted that some of the common infections and minor health injuries may become a key threat to public health and thus require urgent solutions.¹¹ Evidence has shown that many factors contribute to the emergence and spread of AMR in the general public.^{12,13} While many authors have indicated that the inappropriate use of antibiotics is among the main drivers of AMR; there are still other drivers including the use of antibiotics in the food production industry, in animals, and the environment.¹⁴

Healthcare workers and patients are responsible for the emergence and spread of AMR because there is a direct relationship between the overuse and misuse of antibiotics and the emergence of AMR.¹⁵ For instance, a study in Romania revealed that there were low levels of knowledge among the general population about AMR.¹⁶ Most participants never knew that missing an antibiotic dose during a medical treatment could contribute to AMR.¹⁶ And few participants also knew that the use of antibiotics no matter for what purpose, outside the indication of a doctor also contributed to antibiotic resistance.¹⁶ A study on antibiotic use, knowledge and health literacy among the general population showed that individuals with sufficient health literacy were 0.57 times less likely to have had a recent history of antibiotic use than those with insufficient health literacy.¹⁷ Further evidence has shown that a lack of knowledge, awareness, negative attitudes, and poor practices are key drivers to the misuse of antibiotics thereby leading to the emergence of AMR.¹⁸

Therefore, it is critical to develop interventional strategies to address the identified gaps above. Antimicrobial stewardship (AMS) programs are very essential in promoting rational prescribing, dispensing, and administration of antibiotics.^{19,20} Further, AMS programs are critical in educating healthcare workers and the general population on AMU and AMR.²¹ To strengthen the fight against AMR, for instance, the WHO developed the Global Action Plan (GAP) on AMR to increase the awareness and knowledge of AMU and AMR, promote rational use of antibiotics and reduce the emergence of AMR.¹¹ To build on this, WHO member-state countries were requested to develop National Action Plans (NAPs) on AMR to address

this global problem.¹¹ Other strategies that have been developed to address AMR include the implementation of the WHO Access, Watch, and Reserve (AWaRe) classification of antibiotics as a part of AMS as a way to promote rational use of antibiotics and reduce the emergence of AMR.^{22,23}

Some studies conducted in Zambia revealed that there were high antimicrobial-resistant pathogens isolated in healthcare facilities reflecting the burden of AMR in the country.²⁴⁻²⁷ Additionally, some knowledge, attitude and practices (KAP) studies have been conducted on AMU and AMR among students and healthcare workers in Zambia.²⁸⁻³³ However, there is a paucity of information on the general population's KAP on AMU and AMR in Zambia. Therefore, this study assessed the KAP of AMR among community members of Mtendere Township in Lusaka, Zambia.

METHODS

Study design, site and population

This study was a cross-sectional study that utilized quantitative research methods and was conducted among Mtendere residents from May 2020 to August 2020 using a structured questionnaire. Mtendere Township is a highly populated area located in Lusaka province, 10 kilometres from Lusaka city. To be eligible, an individual was supposed to be an adult (18 years and above), a resident of Mtendere Township and provided informed consent to be part of the study.

Sample size estimation and sampling technique

The sample size was estimated using Cochran's formula as previously guided by Charan and Biswas.³⁴ With no previous study done in Zambia in this population, a conservative prevalence of 50%, a margin of error of 5%, and a confidence level of 95% were used to estimate the desired minimum sample size. This resulted in a minimum of 385 participants to be enrolled in the survey. Participants were sampled using a simple random sampling method.

Data collection tool

A structured questionnaire was used to collect data from Mtendere residents during the data collection stage of this study. The questionnaire contained closed-ended questions and was composed of FOUR sections namely; Section A which had FIVE questions on sociodemographics, Section B which had FOUR questions on knowledge, Section C which had FIVE questions on attitude, and Section D which had FIVE questions on Practices. We distributed 400 questionnaires across the adult population in Mtendere Township.

Data presentation and analysis

The collected data were entered in Microsoft Excel 2013 and assigned numerical codes. Data were analysed using Statistical Package for Social Sciences (SPSS) version 22.0. The findings were presented in the form of frequency tables and charts. A KAP of 80% and above was considered good while that below 80% was considered poor. This cut-off point has been used in previous KAP studies on AMR.^{35,36} Statistical significance was conducted at a 95% confidence level and 5% margin of error.

Ethical approval was obtained from the University of Zambia School of Health Sciences Research Ethics Committee (UNZAHSREC) with an approval number of 2019217037. Permission to collect data from the general public was obtained from the Lusaka District Health Office. All the participants provided informed and written consent to be part of the study. Finally, participation in the study was voluntary.

RESULTS

Socio-demographic characteristics of participants

This study enrolled a total of 369 participants of which 50.9% were male and aged between 18 and 29 years (Table 1). Most of the participants had reached secondary (51.8%) and tertiary (36.3%) levels of education (Table 1).

Table 1: Socio-demographic characteristics of participants.

Variable	Characteristics	Frequency	Percent	P value
Sex	Male	188.0	50.9	0.755
	Female	181.0	49.1	
Age (years)	18-29	229	62.1	0.001
	30-49	114	30.9	
	Above 50	26	7.0	
Religion	Christianity	366	99.2	0.001
	Islam	3	0.8	
Marital status	Unmarried	213	57.7	0.001
	Married	156	42.3	
Level of education	No education	8	2.2	0.001
	Primary	36	9.8	
	Secondary	191	51.8	
	Tertiary	134	36.3	

Knowledge of participants on antibiotic use and resistance

This study found that most of the participants (66.7%) had heard of the term antibiotics but only 33.6% had heard about antimicrobial resistance (p=0.001) (Figure 1). Further, only 23% had heard about antibiotic-resistant infections and only 27.9% knew that the use of antibiotics

in livestock is a driver of antimicrobial resistance in humans (p=0.001) (Figure 1).

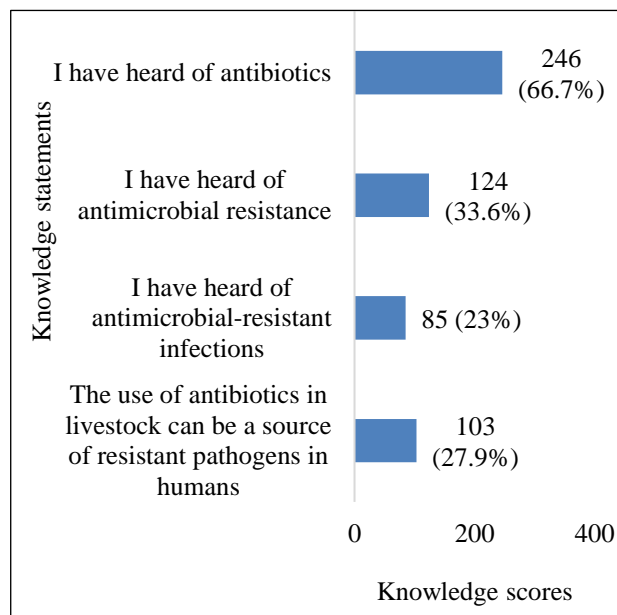


Figure 1: Knowledge of participants on AMR.

Attitudes of participants towards antibiotic use and resistance

This study found that most participants (48.2%) were neutral about AMR being a public health problem. Additionally, most participants (56.2%) were neutral about developing antibiotics being a solution to address AMR. Furthermore, most participants (58%) agreed that it is important that patients are advised about complying with treatment whenever antibiotics are prescribed and dispensed to them. Finally, most participants (38%) disagreed that they kept antibiotics for future use in case they experience similar signs and symptoms of a disease (Figure 2).

Practices of participants regarding antibiotic use and resistance

This study revealed that more than half of the participants 58% strongly disagreed that they informed other people about AMU and AMR-related issues (p=0.001), 52.8% of the participants said they strongly disagreed that they took antibiotics without consulting a doctor or a pharmacist (p=0.001) and 83.2% strongly disagreed that they took part in antibiotic stewardship campaigns. More than half of the participants 61.5% strongly disagreed that they learnt about AMR in class (p=0.001).

Further, 26.3% strongly agreed that they finished the course of antibiotics when on treatment (p=0.007) (Figure 3). The prevalence of self-medication in this study was found to be 47.2%.

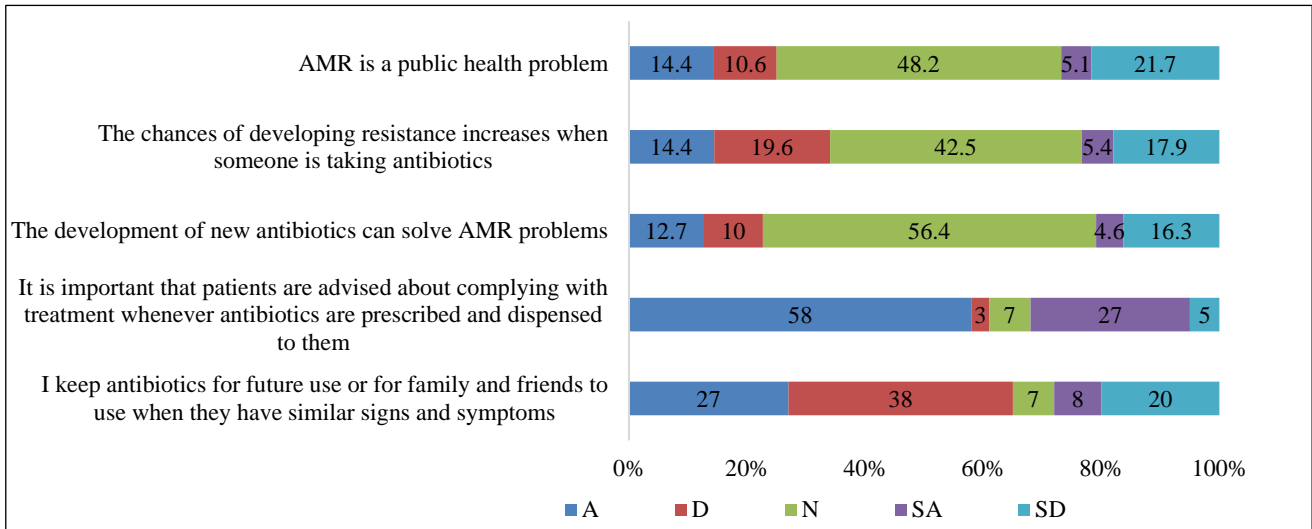


Figure 2: Attitudes of participants towards AMU and AMR.

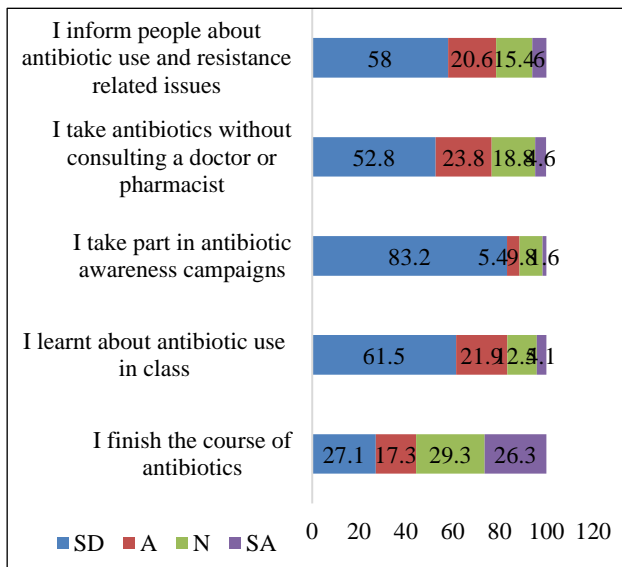


Figure 3: Practices of participants towards antibiotic use and resistance.

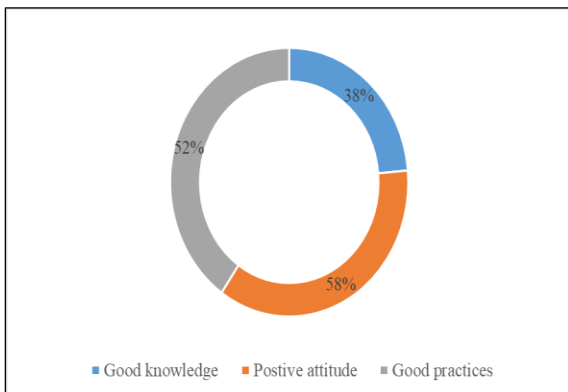


Figure 4: Participant's knowledge, attitude, and practice level scores concerning antibiotic use and resistance.

Overall knowledge, attitude, and practices of community members regarding antibiotic use and resistance

This study found an overall poor KAP regarding AMU and AMR among the participants with only 38% having good knowledge, 58% having positive attitudes, and 52% having good practices (Figure 4).

DISCUSSION

To the best of our knowledge, this was the first study that assessed the knowledge, attitude and practices of Mtendere community members regarding antibiotic use and resistance in Lusaka, Zambia. The current study found a poor KAP on AMU and AMR among the study participants.

The present study found poor knowledge of AMU and AMR among the study participants. Our findings corroborate with reports from previous studies in which the majority of the general population had poor knowledge of AMU and AMR.^{16,18,37} The present study found that most of the participants (66.7%) had heard of the term antibiotics but only 33.6% had heard about AMR. Further, only 23% had heard about antimicrobial-resistant infections and only 27.9% knew that the use of antibiotics in livestock is a driver of AMR in humans. Similar findings were reported in Thailand where only 17.8% of the general population had heard and knew about the proper use of antibiotics and AMR.³⁷ Our findings differ from those that were reported in Sweden where the majority of the Swedish population knew that AMR and antimicrobial-resistant infections occurring from inappropriate use of antibiotics.³⁸ However, a study conducted in Saudi Arabia found that the majority of community members had good knowledge of AMU and AMR.³⁵ The good knowledge reported in Saudi Arabia could have been due to the participants knowing what antibiotics were, their use, causes of AMR.

Our study revealed that most participants had negative attitudes towards AMR. The present study findings are in line with studies that found poor/negative attitudes of the majority of the general population towards AMU and AMR.³⁵ This could be due to a lack of information regarding AMU and AMR.

Of noteworthy, the present study found that most participants (48.2%) were neutral about AMR being a public health problem. Additionally, most participants (56.2%) were neutral about developing new antibiotics being a solution to address AMR. Furthermore, most participants (58%) agreed that it is important that patients are advised about complying with treatment whenever antibiotics are prescribed and dispensed to them. Finally, most participants (38%) disagreed that they kept antibiotics for future use in case they experience similar signs and symptoms of a disease. Consequently, the low scores obtained in the attitude statements could be the reasons for the negative attitudes of most participants regarding AMU and AMR. A study in Ethiopia also reported that most community members never kept antibiotics to be used in the future.³⁹

The present study found that most of the participants had poor practices regarding AMU and AMR. Our findings are in tandem with those reported by other scholars in which most of individuals in the general population had poor practices concerning AMU and AMR.¹⁸ This could be due to a lack of knowledge and poor medical-seeking behaviour among the general population. However, this finding of our study is in contrast to the findings reported in Saudi Arabia where most community members had good practices regarding AMU and AMR, with most of the general population knowing the use of antibiotics, not giving their prescribed and dispensed antibiotics to friends and family members, aware of AMR, not practising SM based on recommendations from their Ministry of Health, and majority accessing antibiotics with a prescription.³⁵

The current study revealed that more than half of the participants 58% strongly disagreed that they informed other people about AMU and AMR-related issues, 52.8% of the participants said they strongly disagreed that they took antibiotics without consulting a doctor or a pharmacist and 83.2% strongly disagreed that they took part in antibiotic stewardship campaigns. More than half of the participants 61.5% strongly disagreed that they learnt about AMR in class. Further, 26.3% strongly agreed that they finished the course of antibiotics when on treatment. Similarly, a study in Malaysia found that the practice of stopping antibiotic courses was very common.¹³

The prevalence of self-medication (SM) in this study was found to be 47.2%. This prevalence of SM found in our study is lower than that reported in Ethiopia at 65.3% [39]. Additionally, an SM prevalence of 66.9% was reported among the general population in Jordan.⁴⁰ These practices of SM indicate an inappropriate use of antibiotics is among

the key drivers of AMR. Therefore, there is an urgent need to address this problem in the community.

Since most people obtain their antibiotics from public and private healthcare facilities like hospitals and clinics, there is a need for healthcare workers to provide adequate information on AMU and AMR among patients who visit their facilities for medical services.^{12,37} Additionally, since there is much evidence of a lack of knowledge on AMU and AMR among the general population, there is a need to extend AMS programs and initiatives in communities so that the general public is educated on AMU, AMR, and associated causative factors.¹² We believe our findings may be used to intensify the implementation of the Zambia Multi-sectoral National Action Plan (NAP) on AMR which recommends increasing awareness and knowledge among HCWs, students, and the general population.

This study has some limitations. This study was conducted in one area in Lusaka (Mtendere Township); therefore the obtained results may not be generalized to the community members across the country. However, the obtained findings can be used to strengthen the existing strategies to increase awareness of AMU and AMR, promote rational use of antimicrobials, and reduce the emergence of antimicrobial-resistant infections.

CONCLUSION

The study revealed a poor KAP regarding AMU and AMR among most community members of Mtendere Township in Zambia. Generally, this study found that there was insufficient information provided to the general public and patients in Zambia. Therefore, there is an urgent need to develop strategies to share information on antibiotics, AMU, AMR, and associated causative factors in Zambia. The community-based interventional campaigns may eventually help to reduce the emergence and spread of AMR in communities.

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