KNOWLEDGE AND PRACTICE OF ANTIBIOTICS USE AND SOME RELATED FACTORS AMONG PEOPLE IN MINH LANG COMMUNE, VU THU DISTRICT, THAI BINH PROVINCE IN 2023

Vu Viet Trung[1*], Pham Duc Phuc[2], Nguyen Dang Vung[3], Pham Nhat Sinh[4]

1.Thai Binh University of Medicine and Pharmacy
2.Hanoi University of Public Health
3.School of Preventive Medicine and Public Health – Hanoi Medical University
4.Vinh City General Hospital

ABSTRACT

Objectives: To describe the knowledge and practice of people on antibiotics use and analyze some related factors to knowledge and practice of people on antibiotics use in Minh Lang commune, Vu Thu district, Thai Binh province in 2023

Methodology: The study employed a cross-sectional study design with the study sample size of 366 people.

Results: Results indicated moderate knowledge prevalence (48.9%) and predominantly high-level antibiotic usage practices (67.5%). Factors influencing knowledge and practices included familial ties to healthcare, exposure to health education campaigns, and proximity to healthcare facilities. Targeted educational interventions are crucial for enhancing understanding and promoting responsible antibiotic usage practices, particularly in rural communities vulnerable to antibiotic resistance.

Keywords: antibiotics, antibiotics resistance, antibiotic use, KAP, related factors.

1. INTRODUCTION

Antibiotics resistance is one of the biggest threats to global health, food security, and development. In recent decades, the overuse and misuse of antibiotics has contributed significantly to the emergence of drug-resistant strains of bacteria, rendering many commonly used antibiotics ineffective in treating infections. The "first-generation" antibiotics are almost not the choice in many cases. The more expensive and newer generation antibiotics, even some of the "last choice" antibiotics such as carbapenem and colistine, etc., are losing their effectiveness [1]. This has led to increased morbidity, mortality, and healthcare costs, and threatens to undo the progress made in controlling infectious diseases over the past century.

The World Health Organization (WHO) emphasizes that "without urgent action, we are heading for a post-antibiotic era, in which common infections and minor injuries can once again kill.". According to the report, ABR is already responsible for an estimated 700,000 deaths annually, and this number is expected to rise to 10 million deaths per year by 2050 if interventions are not taken to curb the problem [2]

Higher ABR rates have been documented in several low- and middle-income countries (LMICs) including Vietnam compared to rates in high income countries, despite a lower per-person consumption of antibiotics in the former [3]. In Vietnam, a study conducted by the Ministry of Health in 2017 found that resistance to common antibiotics, such as amoxicillin and ceftriaxone, among gram-negative bacteria, had reached over 50%. The study also found that many people in Vietnam are not aware of the risks associated with ABR, and that antibiotics are often prescribed for viral infections such as the common cold, which they are ineffective at treating [4].

Understanding the knowledge and practices on antibiotic use among communities is critical to optimize antibiotic use and contain resistance. Minh Lang commune is a rural community with a high prevalence of infectious diseases in humans and

animals, where people rely heavily on agriculture and animal husbandry for their livelihoods. It is therefore likely that the use of antibiotics for both humans and animals is high in this area, which could contribute to the emergence of antibiotic-resistant strains of bacteria. With the desire to explore the knowledge and practice of communities regarding the use of antibiotics, to identify potential interventions that promote responsible use, study "Knowledge and practice of antibiotics use and some related factors among people in Minh Lang commune, Vu Thu district, Thai Binh province in 2023" is conducted with the following objectives:

To describe the knowledge and practice of people on antibiotics use and analyze some related factors in Minh Lang commune, Vu Thu district, Thai Binh province in 2023

2. MATERIALS AND METHODS

2.1. Research participants, research sites and time

2.1.1. Research participants: People are living in Minh Lang commune, Vu Thu district, Thai Binh province.

Inclusion criteria: The study selected the participants who are present during the study period and have enough health to undertake the research.

Exclusion criteria: The study excluded the participants who are under 18 years old and unwilling to participate and living less than 1 year continuously in Minh Lang commune.

2.1.2. Research sites: Minh Lang commune, Vu Thu district, Thai Binh province, Vietnam

2.1.3. Research time: The study was conducted from July 2023 to April 2024

2.2. Research method

2.2.1. Research design

The study employed a cross-sectional study design.

2.2.2. Sample size and sampling

- Sample size

Using formula for estimating a population proportion with specified absolute precision

$$n = Z^2_{1-\alpha/2} \frac{p(1-p)}{d^2}$$

With:

n: Sample size

Z = 1.96 for 95% CI (Value from standard normal distribution corresponding to desired confidence level)

d = 0.05 (margin of error)

If taking p = 0.611 (The prevalence of participants with moderate and high knowledge when asked about antibiotic use according to the study by Hidayah Karuniawati, et al in 2021 [5] → n = 366.

If taking p = 0.834 (The prevalence of participants with moderate and high practice when asked about antibiotic use according to the study by Hidayah Karuniawati, et al in 2021 [5] → n = 204.

The final study sample size is 366 people.

- Sampling:

The researcher coordinated with the People's Committee to make a list of households in the commune, then randomly selected 366 households. Each household had one person selected to participate in the study according to the inclusion and exclusion criteria.

2.2.3. Data collection

Data was collected by interview method through questionnaires. The questionnaire was developed and used in a cross-sectional quantitative survey in Boyolali, Indonesia in 2021 [5]. The research toolkit was used in a pilot testing and then revised and completed before conducting a formal investigation.

2.2.4. Variables and indicators

- The variables of the Objective 1:

Knowledge, practice of respondents on antibiotic use:

Each correct response to a statement on knowledge of antibiotics was given a score of 1, whereas incorrect or "don't know" responses were given a score of 0. The maximum possible score in the knowledge domain was 20. A five-point Likert scale ranging from 1 to 5 was used for scoring the practice questions. Score "1" was given for the least appropriate answer and "5" was given for the most appropriate response. Some of the questions were unfavorable questions, and the scores were inverted. The lowest possible score was 13, and the highest possible score was 65 for the practice section. The scores then were transformed to a scale ranging from 0 (worst possible score) to 100 (best possible score) with the formula (Equation (1) for Knowledge and Equation (2) for Practice). The total score of <50%, 50-70%, and >70% were categorized as low, moderate, and high knowledge and practice, respectively.

$$\text{Total Knowledge Score (\%)} = \frac{\text{Obtained score} - \text{least possible score}}{\text{Maximum score} - \text{least possible score}} \times 100 \quad (1)$$

$$\text{Total Practice Score (\%)} = \frac{\text{Maximum score} - \text{Obtained score}}{\text{Maximum score} - \text{least possible score}} \times 100 \quad (2)$$

- *The variables of the Objective 2:*

+ The relationship between demographic characteristics and knowledge on antibiotic use

+ The relationship between demographic characteristics and practice on antibiotic use

+ The relationship between factors: relationship with health worker, distance to the health facility, health education, promotion in commune and knowledge on antibiotic use

+ The relationship between factors: relationship with health worker, distance to the health facility, health education, promotion in commune and practice on antibiotic use

+ Data processing and analysis

+ The collected data was cleaned, including correct spelling errors, handled missing data and eliminated meaningless information before encryption.

2.2.5. Data was entered into Epidata 3.1

- The statistical analysis was implemented on SPSS 20.0 software.

3. RESULTS

3.1. General characteristics of respondents

Table 1. General characteristics of respondents

Characteristics		Number	(%)
Age	18 – 29 years	38	10.4
	30 – 49 years	181	49.5
	50 years and above	147	40.2
Gender	Male	158	43.2
	Female	208	56.8
Level of education	Illiterate	3	0.8
	Primary or Secondary school	218	59.6
	High school	97	26.5
	College or higher	48	13.1
Average total monthly income	Less than 3 million VND	50	13.7
	3 – 5 million VND	129	35.2
	6 – 10 million VND	166	45.4
	More than 10 million VND	21	5.7
Have child under 5 years old	Yes	97	26.5
	No	269	73.5

Characteristics		Number	(%)
Have chronic patients	Yes	92	25.1
	No	274	74.9
Decide to use medicine/ treatment	Own self	271	74.0
	Other	95	26.0
Number of family member	1 – 4 people	249	68.0
	More than 4 people	117	32

Table 1 describes the general characteristics of respondents. Among these, the age group of 30-49 stands out, constituting the largest proportion at 49.5%. Additionally, women comprise a significant portion, accounting for 56.8% of the total population studied. Regarding educational attainment, individuals with primary and secondary education make up the majority, representing 59.6%. Conversely, those with higher education qualifications such as associate and bachelor's degrees constitute a smaller fraction, standing at 13.1%. In terms of income distribution, the majority fall within the monthly income bracket of 6-10 million, making up 45.4% of the population.

In terms of household demographics and healthcare decision-making, 26.5% of interviewed households have children under the age of 5. A substantial proportion, comprising 25.1% of individuals within these households suffer from chronic illnesses. A notable 32.0% of households consist of more than four members. Furthermore, the majority, at 74.0%, of healthcare decisions regarding treatment and medication usage are made autonomously by individuals themselves.

3.2. Knowledge and practice of respondents on antibiotic use

Table 2. Knowledge and practice of respondents on antibiotic use

Variables	Number of questions	Level (%), n = 366		
		Low (<50%)	Moderate (50-70%)	High (>70%)
Knowledge	20	61 (16.7%)	179 (48.9%)	126 (34.4%)
Practice	13	2 (0.5%)	117 (32.0%)	247 (67.5%)

Table 2 reveals knowledge and practices regarding antibiotic usage. In terms of knowledge levels, the majority of respondents demonstrated a moderate understanding, comprising 48.9%, while 34.4% exhibited high-level knowledge, and a smaller proportion, 16.7%, displayed low-level knowledge.

As for antibiotic usage practices, the study indicates that a significant majority of respondents practiced at a

high level, accounting for 67.5%. Furthermore, 32.0% reported moderate-level practices, with only a negligible 0.2% demonstrating low-level practices.

3.3. Some factors related to the knowledge and practice of respondents on antibiotic use

Table 3. Some factors related to the knowledge of respondents on antibiotic use

The associated factors		Knowledge on antibiotic use		OR (95%CI)
		Low – Moderate (n,%)	High (n,%)	
Age	18-49	126 (57.5%)	93 (42.5%)	2,55 (1.59-4.08)
	≥ 50	33 (22.4%)	114 (77.6%)	
Level of education	Under High school	156 (70.6%)	65 (29.4%)	1.74 (1.12-2.70)
	High school and higher	84 (57.9%)	61 (42.1%)	
Average total monthly income	<6 million VND	134 (74.9%)	45 (25.1%)	2.28 (1.46-3.55)
	≥ 6 million VND	106 (56.7%)	81 (43.3%)	
Distance to the medical facility	5km or more	70 (55.6%)	56 (44.4%)	0.52 (0.33-0.81)
	Under 5 km	170 (70.8%)	70 (29.2%)	
Received information about ABR from commune health workers	Yes	25 (44.6%)	31 (55.4%)	2.81 (1.57-5.01)
	No	215 (69.4%)	95 (30.6%)	

Table 3 unveils notable disparities in knowledge levels across different age groups, educational backgrounds, and income brackets. Firstly, the odds ratio (OR) for the difference in knowledge levels between low-moderate and high levels among individuals aged 18-49 compared to those aged 50 and above stands at 2.55 (95% CI: 1.59-4.08, p<0.05).

Secondly, the OR for the difference in knowledge levels between low-moderate and high levels among individuals with education below high school level compared to those with high school education or higher is 1.74 (95% CI: 1.12-2.70, p<0.05).

Thirdly, the OR for the difference in knowledge levels between low-moderate and high levels among

individuals with an average income of less than 6 million VND compared to those with an income of 6 million VND or more is 2.28 (95% CI: 1.46-3.55, p<0.05).

Fourthly, the odds ratio (OR) for the difference in knowledge levels between low to medium and high levels among individuals living more than 5 kilometers away from the medical facility compared to those living within 5 kilometers is 0.52 (95% CI: 0.33-0.81, p<0.05).

Lastly, the OR for the difference in knowledge levels between low to medium and high levels among individuals who have not received health education campaigns on antibiotic usage compared to those who have received such campaigns is 2.81 (95% CI: 1.57-5.01, p<0.05)

Table 4. Some factors related to the practice of respondents on antibiotic use

The associated factors		Practice on antibiotic use		OR (95%CI)
		Low – Moderate (n,%)	High (n,%)	
Number of family member	1 – 4 people	91 (36.5%)	158 (63.5%)	0.54 (0.33-0.90)
	More than 4 people	28 (23.9%)	89 (76.1%)	
Have relationship with health worker	Yes	86 (29.3%)	208 (70.7%)	0.49 (0.29-0.83)
	No	33 (45.8%)	39 (54.2%)	
Knowledge on antibiotic use	High	21 (16.7%)	105 (83.3%)	3.45 (2.02-5.89)
	Low-Moderate	98 (40.8%)	142 (59.2%)	

Table 4 highlights significant disparities in antibiotic usage practices across different factors. Firstly, the odds ratio (OR) for the difference in practice levels between low-moderate and high levels among households with four or fewer members compared to those with more than four members stands at 0.54 (95% CI: 0.33-0.90, p<0.05)

Secondly, the OR for the difference in practice levels between low to medium and high levels among individuals with relatives working in healthcare (HW) compared to those without HW relatives is 0.49 (95% CI: 0.29-0.83, p<0.05).

Thirdly, the OR for the difference in practice levels between low-moderate and high levels among individuals with high-level knowledge regarding antibiotic usage compared to those with low-level knowledge is 3.45 (95% CI: 2.02-5.89, p<0.05).

4. DISCUSSION

Our research produced results indicating that the respondents' knowledge regarding antibiotic use exhibited the highest prevalence at a moderate level, at 48.9%. High-level knowledge was observed in 34.4% of respondents, while low-level knowledge was evident in 16.7%. The findings are consistent with previous study in Indonesia, which used the same validated questionnaire and following WHO guidelines: A total of 46.9% of respondents to this study had a moderate level of antibiotics knowledge. This result is lower than the research findings of Nguyen Thi Hai Ha (2019), where good knowledge about antibiotic usage accounted for 67.8%; and lower than the research findings of Nguyen Ngoc Nghia (2023), where good knowledge accounted for 37.5% [6], [7].

Our study yielded results indicating that a substantial majority of participants engaged in high-level antibiotic usage practices, constituting 67.5% of the sample. Additionally, 32.0% reported engaging in practices at a moderate level, while a negligible 0.2% demonstrated low-level practices. These findings suggest a higher level of antibiotic usage correctly among the study population compared to similar research conducted in Indonesia (38.4%), as well as higher findings from studies conducted in Yen Bai, Vietnam in 2023 (41.5%), and Hanoi, Vietnam in 2018 (42.6%) [5], [6], [7].

The study reveals several significant findings regarding some factors related to the knowledge and practice on antibiotic use among individuals in Minh Lang commune. Firstly, there is a substantial correlation between knowledge levels and antibiotic usage practices. Individuals with high levels of knowledge regarding antibiotic usage are 3.45 times more likely to exhibit high levels of antibiotic usage practices compared to those with low-level knowledge (OR: 3.45, 95% CI: 2.02-5.89, p<0.05). This highlights the pivotal role of knowledge in shaping antibiotic usage behaviors within the community and emphasizes the necessity of targeted educational interventions to enhance understanding among community members.

Secondly, familial ties to the healthcare sector significantly influence antibiotic usage practices. Individuals with relatives in healthcare are less likely to exhibit high antibiotic usage practices compared to those without such connections (OR: 0.49, 95% CI: 0.29-0.83, p<0.05). This suggests that access to specialized knowledge and guidance regarding antibiotic usage through familial connections may contribute to more responsible practices.

Thirdly, the study demonstrates the impact of health education campaigns on antibiotic knowledge levels. Individuals who did not receive health education campaigns are significantly more likely to possess lower levels of knowledge concerning antibiotic usage compared to those who received such initiatives (OR: 2.81, 95% CI: 1.57-5.01, p<0.05). This underscores the importance of targeted educational interventions in promoting informed decision-making and responsible antibiotic usage practices within the community.

Finally, proximity to healthcare facilities is associated with antibiotic knowledge levels. Individuals residing more than 5 kilometers away from healthcare facilities are less likely to possess adequate knowledge about antibiotics compared to those living within 5 kilometers (OR: 0.52, 95% CI: 0.33-0.81, p<0.05). This highlights the significance of accessibility to healthcare services in facilitating antibiotic education and awareness, as limited access may hinder exposure to educational campaigns and consultations with healthcare providers, consequently affecting health literacy regarding antibiotic use.

5. CONCLUSIONS

Our investigation into the knowledge and practices surrounding antibiotic usage among residents of Minh Lang commune has revealed several crucial insights. Despite a notable proportion of respondents demonstrating a moderate level of knowledge, there remains room for improvement in understanding antibiotic use, particularly concerning optimal practices. Interestingly, a significant correlation was found between knowledge levels and actual usage practices, emphasizing the pivotal role of education in fostering responsible antibiotic utilization within the community.

Furthermore, familial ties to the healthcare sector emerged as a significant factor influencing antibiotic usage practices, suggesting that access to specialized guidance through familial connections may contribute to more prudent practices. This underscores the importance of leveraging existing networks within communities to disseminate accurate information and promote responsible antibiotic use.

Our study also underscores the effectiveness of health education campaigns in enhancing antibiotic knowledge levels, indicating a need for sustained efforts in delivering targeted educational interventions. Additionally, the proximity to healthcare facilities emerged as a critical determinant of antibiotic knowledge, highlighting the necessity of improving access to healthcare services to facilitate education and awareness regarding antibiotic usage.

In summary, our findings underscore the importance of multifaceted approaches, including educational interventions and improved healthcare accessibility, in promoting informed decision-making and responsible antibiotic practices within communities. Addressing these factors is essential to mitigate the growing threat of antibiotic resistance and safeguard public health in the long term.

6. RECOMMENDATIONS

Targeted educational initiatives should be implemented to address misconceptions surrounding antibiotic usage. These initiatives could involve community workshops, informational campaigns, and educational materials distributed through local healthcare facilities and community centers.

Secondly, there is a need to strengthen regulations and enforcement regarding the sale of antibiotics without a prescription.

Lastly, efforts should be made to improve access to healthcare facilities. This could involve expanding healthcare infrastructure, implementing mobile health clinics, or providing transportation subsidies to facilitate access to medical services.

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