KNOWLEDGE AND PRACTICE OF USING ANTIBIOTICS AMONG MOTHERS OF CHILDREN UNDER 2 YEARS OLD WITH DIARRHEA LIVING IN 3 WARDS IN THAI BINH CITY IN 2023

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Abstract

Objective: This study aims to describe the knowledge and practice of using antibiotics among women with children under 2 years old living in 3 wards in Thai Binh city in 2023.

Method: An epidemiological study with a cross-sectional survey was conducted on 380 mothers of children under 2 years old living in 3 wards in Thai Binh in 2023. The descriptive analysis was used to describe the knowledge and practice of using antibiotics among study participants.

Results: This study was conducted on 380 study participants. Of these, 86.3% had heard of antibiotics, and 61.6% used antibiotics to treat their children's diarrhea. The proportion of participants who met the knowledge standard and were aware of important medical guidelines when using antibiotics was 40.5% and 80.5%, respectively. Additionally, 35.9% of study participants demonstrated good practices in using antibiotics.

Conclusion: This study contributes to the ongoing conversation about antibiotic stewardship and the need for better public health initiatives to promote proper medication use, ultimately improving health outcomes and combating the threat of antibiotic resistance.

Keywords: *mother. children under 2 years old, diarrhea, antibiotics, knowledge, practice.*

I. INTRODUCTION

Diarrhea is a common medical condition among children in preschool age and early elementary school years. According to the World Health Organization (WHO), diarrhea is the second leading cause of death in children under 5 years old. This causes the death of more than 500,000 children each year. Diarrhea causes dehydration, and electrolyte loss is dangerous for children. Previously, this condition was the main cause of death due to diarrhea. However, nowadays, deaths from other causes such as bacterial infections are on the rise. Children who are malnourished or immunocompromised are at the highest risk of life-threatening diarrhea [1].

The mortality rate due to infections in children with diarrhea is increasing, partly because antibiotic resistance is becoming more common. Antibiotic resistance has risen to dangerous levels all over the world. New drug resistance mechanisms are emerging and gradually spreading globally, threatening the ability to treat infectious diseases, including common ones. Diarrhea in children due to antibiotic use is increasingly common. Therefore, there is a need to enhance mothers' knowledge and practice of using antibiotics. However, in Vietnam, there are not many studies evaluating mothers' knowledge and practices on antibiotic use. Therefore, we conducted a study entitled "Describe the knowledge and practice of using antibiotics among mothers of children under 2 years old with diarrhea living in 3 wards in Thai Binh city in 2023". This study aims to describe the knowledge and practice of using antibiotics among women with children under 2 years old living in 3 wards in Thai Binh city in 2023.

II. SUBJECTS AND METHODS

2.1. Subjects, locations, and study period

*Target population:

Mothers of children aged under 2 years old had diarrhea.

Inclusive criteria: Individuals who met the below criteria were included in the study.

+ Mothers of children under 2 years old who had diarrhea within 1 year up to the baseline of the study;

+ Mothers lived in the study location at the time of the study;

+ Mothers who agreed and voluntarily participated in the study.

Exclusive criteria:

1.Thai Binh University of Medicine and Pharmacy

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Received date: 15/11/2024

Revised date: 02/12/2024

Accepted date: 15/12/2024

+ Mothers who could not answer the questions and/or did not agree to participate were excluded from the study.

***Study location:** 3 wards in Thai Binh city, including Quang Trung ward, Ky Ba ward, and Tran Lam ward.

***Study period:** from December 2022 to July 2023.

2.2. Method

***Study design:** An epidemiological cross-sectional study.

***Sample size:** This study used the formula below to calculate the sample size:

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

With:

n: sample size;

α: level of statistical significance (this study used α = 0.05)

$Z_{(1-\alpha/2)}$: with α = 0.05, Z = 1.96;

d: desired degree of precision (this study chose d = 0.05)

p: p = 0.443 is the percentage of mothers of children under 2 years old who knew how to use antibiotics [2].

The sample size = 380.

*Sampling:

- Purposefully selected 3 wards in Thai Binh city to conduct the study including: Quang Trung ward, Ky Ba ward, and Tran Lam ward.

A systematic sampling method was applied to this study. First, we made a list of all mothers of children under 2 years old with diarrhea within 1 year before the time of the study. After that, we divided the total number of mothers in the list by the sample size of 380 to get the distance coefficient "k". The study sample size was 380, so 127 study participants needed to be interviewed in each ward. We randomly selected the first study participant from the list of all mothers of children under 2 years old in each ward using the random drawing method. Then, we determined the next study participant by adding the serial number of the previous participant with the distance coefficient "k" until there was a sufficient sample size.

Study variables and indicators:

+ Variables on demographic characteristics of study participants: age, sex, education level, occupation, …

+ Variables on knowledge of antibiotics use among study participants: knowledge of when to use antibiotics, the proper duration of use, etc.

+ Variables on practice of using antibiotics among study participants: time of use, adherence to instructions while using antibiotics, management of side effects during antibiotic use, etc.

+ Indicators: the proportion of study participants with satisfactory knowledge of antibiotics and the proportion of study participants with good practice in using antibiotics.

*** Data collection method:**

- The questionnaire was developed based on references and expert opinions in the field of public health to align the study objectives. A pilot survey was conducted to refine and finalize the questionnaire before this study began.

- Staff involved in the study received thorough training on the study objectives and data collection methods.

- Study participants were fully informed about the objectives and content of the study. Interviews were conducted only after participants agreed to participate in the study. If the study participant was not at home, the interviewer would schedule an appointment to return and conduct the interview with the participant. If the interviewer was unable to meet the participant after a third attempt, the participant was removed from the study sample.

*** Data processing method:**

- Questions on knowledge of antibiotic use were numbered from question 8 to question 18. Each correct answer was worth 1 point, and the maximum possible score was 19 points. Participants who answered at least 70% of the questions correctly (equivalent to 13 points or more) were considered to have good knowledge.

- Questions on antibiotic use practices included 13 single-choice and multiple-choice questions. Each correct answer was worth 1 point, and the maximum possible score was 16 points. Those who answered at least 70% of the questions correctly (equivalent to 11 points or more) were considered to have good practice

- Data was managed and cleaned using Epidata 3.1 software. Statistical tests were performed using

SPSS 22.0 software. In this study, quantitative variables were described as mean values and standard deviations; qualitative variables were described as numbers and percentages (%).

2.3. Study ethics

- The study was approved through the outline review board of Thai Binh University of Medicine and Pharmacy in Decision No. 55 dated January 10, 2023 and was permitted by the authorities in the study area.

- Study ensures the right to "voluntary participation" of study participants. Interview information is used for study purposes only. The results and suggestions are used to improve and strengthen community health care.

III. Results

Table 1. Demographic characteristics of study participants (n = 380)

		n	%
Age group	<30	86	22.6
	30-39	186	49.0
	40-42	108	28.4
Education level	High school	27	7.1
	College/University or higher	353	92.9
Occupation	Worker	135	35.5
	Officials/Civil servants	29	7.6
	Housewife	84	22.1
	Self – employed	14	3.7
	Farmer	118	31.1
Number of children	1	144	37.9
	2	227	59.7
	≥3	9	2.4
Family members working in the medical/pharmacy field	No	209	45.0
	Yes	171	55.0
Family economic conditions	Near poor	5	1.3
	Average	370	97.4
	Rich	5	1.3

Table 1 shows that the study population was predominantly in the 30-39-year-old age group (49.0%), while the group under 30 years old had the lowest percentage (22.6%). A significant majority of the mothers interviewed (93.0%) gad an education level at least secondary school. The most common occupations among participants were workers and farmers, comprising 35.5% and 31.1% of the study sample, respectively. Only 3.7% of participants were self-employed. In terms of family size, 60.0% of the mothers had 2 children, and 55.0% had family members working in the medical or pharmaceutical industry. 97.4% of study participants reported average economic conditions.

Table 2: Proportion of study participants who have ever heard information about antibiotics and sources of information

Information about antibiotics		n	%
Never heard		52	13.7
Ever heard		328	86.3
Source of information	Doctors	317	83.4
	Pharmacists	285	75.0
	Friends	230	60.5
	Internet, TV, radio	204	53.7

Table 2 shows that the majority of mothers interviewed had heard information about antibiotics (86.3%). Among different sources of information, doctors were the most common (83.4%), followed by pharmacists (75.0%). Additionally, approximately 54.0% of study participants reported accessing information about antibiotics through the Internet, TV, or radio.

Table 3: Study participants' knowledge about precautions when using antibiotics

Knowledge	n	%
Must see a doctor	289	76.1
Only use with doctor's prescription	306	80.5
Use medication as prescription	323	85.0
Check medicine before using	316	83.2
Monitor reactions after taking medicine	214	56.3

Table 3 shows that more than 50.0% of the study participants correctly understood the precautions for using antibiotics. Among them, 85.0% believed it was necessary to use medicine as directed by healthcare professionals, and 83.2% agreed that it was important to check the medicine before use. Additionally, 56.3% of the mothers interviewed knew they should monitor for children's reactions after taking the medicine.

Table 4: The rate of using antibiotics among study participants at the latest time their children had diarrhea

Practice		n	%
Using antibiotics	No	146	38.4
	Yes	234	61.6
Time of using antibiotics	1-4 days	78	33.3
	5-7 days	119	50.9
	8-10 days	37	15.8
Instructors	Doctors	96	41.0
	Pharmacist	72	30.8
	Self-teaching	71	30.3
Adjust the dose themselves	No	136	58.1
	Yes	98	41.9

As shown in the results, 61.6% of study participants used antibiotics during their child's most recent episode of diarrhea. Over half of the mothers administered antibiotics for 5-7 days, while the proportion of mothers who used antibiotics for more than 7 days was the lowest, at 15.8%. Additionally, 42.0% of participants adjusted the antibiotic dose themselves. Among the mothers who used antibiotics to treat their children's diarrhea, the highest proportion (41.0%) followed the doctor's instructions. The proportions of participants using antibiotics according to the pharmacist's instructions or based on self-guidance were similar, at 30.8% and 30.3%, respectively.

Table 5: The rate of children who experienced side effects of antibiotics and how their mothers managed

		n	%
Got side-effects	No	225	97.6
	Yes	9	2.4
How to deal with the side-effects	Self-monitoring within 24 hours	2	22.2
	Went to meet the doctors	5	55.6
	Others	2	22.2

Of the 234 children who were given antibiotics during their most recent episode of diarrhea, 2.4% experienced side effects. Among the mothers whose children experienced side effects, 55.6% sought medical attention, while 2.2% chose to self-monitor their child's condition within 24 hours.

Table 6: General knowledge and practice of using antibiotics among study participants

		n	%
Knowledge of antibiotic use	Good	154	40.5
	Poor	226	59.5
Antibitotic use practices	Good	84	35.9
	Poor	150	64.1

Table 6 shows that two-fifths of the study participants had good knowledge of using antibiotics for children with diarrhea. The results also revealed that the proportion of participants who did not follow proper antibiotic use for children was 1.5 times higher than those with good practice (64.1% and 35.9%, respectively).

IV. DISCUSSION

This epidemiological study, conducted through a cross-sectional survey, involved 380 mothers with children under 2 years old who had diarrhea, across 3 wards in Thai Binh city in 2023. Of these participants, 49.0% were aged between 30 and 39 years. A significant majority (93.0%) of the mothers had at least a secondary school. These findings are higher than those reported by Hoang Thi Hai Van, whose study found that only 30.6% of participants had an education level above high school [2]. The most common occupations among the participants were workers and farmers, accounting for 35.5% and 31.1%, respectively. Three-fifths of the mothers interviewed had two children, and slightly more than half had family members working in the medical and pharmaceutical industries. The majority (97.4%) of participants reported having average economic conditions.

Table 2 shows that 86.3% of interviewed mothers had heard information about antibiotics. Additionally, 83.4% of study participants often sought knowledge about antibiotics from healthcare professionals, including doctors and nurses, while more than one-half of the participants referred to information from media sources such as the Internet, television, and radio. Despite regulations on prescribing and selling prescription drugs, patients can still purchase antibiotics and many other medications directly from pharmacies and retail outlets. Self-treatment is common, though self-diagnosis is often inaccurate.

Our study found that 80.5% of participants used antibiotics with a prescription from a doctor. These results are similar to those from a study conducted in Tamale, Ghana, where 44.1% of households reported using at least one antibiotic in the past month, and 30.9% used antibiotics without a prescription [3]. A 2007 community-based study also found that nearly 80.0% of antibiotics were purchased from private pharmacies without a prescription. Buying medicine directly is often seen as a way to save both money and time compared to visiting a doctor [4]. However, according to Ho Tat Phuong Uyen, 78.0% of people who purchase antibiotics still require a prescription. This could be viewed as a positive step toward limiting antibiotic resistance in the community [5]. On the other hand, more than 80.0% of people engage in self-medication for themselves or their relatives, with 51.4% using antibiotics without proper guidance [6].

The study found that 61.6% of the interviewed mothers used antibiotics during their child's most recent treatment for diarrhea. The rate is higher than the 37.2% reported in Nguyen Van Thien's study at Tay Ninh General Hospital in 2020 [7]. In our study, the duration of antibiotic treatment for diarrhea varied: 50.9% of cases involved treatment lasting less than 5 days, 33.3% lasted 5-7 days, and nearly 16.0% lasted more than 7 days. When asked about the correct duration for antibiotic treatment, half of the participants form Hoa Hai ward in Da Nang city indicated that treatment should last between 3 to 5 days. Only 3.1% of participants selected 7-10 days as the appropriate treatment duration [5]. A study conducted in Ha Nam province found that 54.3% of mothers had a good general knowledge of antibiotic use, and 37.9% knew the correct duration for antibiotic treatment [2]. Furthermore, 41.9% of study participants used antibiotics for their children during the most recent treatment for diarrhea and also self-adjusted the antibiotic dose during treatment. This is lower than the 62.7% observed in a study by Hoang Thi Hai Van, where participants reported arbitrarily adjusting the antibiotic dose, typically stopping the medication once the child's symptoms improved [2].

The rate of children experiencing unwanted effects when using antibiotics was 2.4%. Among children who experienced side effects, 77.8% of mothers who used antibiotics to treat their children for the most recent episode of diarrhea knew it was necessary to either take their children to see a doctor or monitor them for the next 24 hours.

Table 6 shows that 40.5% of study participants had good knowledge about using antibiotics, while 59.5% had poor knowledge. Our findings are consistent with those of Tran Thi Mai Hung's study conducted in some regions of Vietnam in 2018-2019, which reported that 39.0% of participants had good knowledge about antibiotic use [8]. Similarly, a 2007 study assessing knowledge of antibiotic use in rural areas of Vietnam found that, despite the existence of guidance documents, knowledge about antibiotics remained limited, and healthcare providers often prescribed antibiotics unnecessarily for common colds. Additionally, the type, dose, and duration of treatment frequently did not adhere to prescribed guidelines [7].

Table 6 also shows that 35.9% of study participants had good practices regarding antibiotic use, while 64.1% had poor practices. Our study results are higher than those of Tran Thi Mai Hung's study, where only 16.7% of participants had good practices in antibiotic use. When a family has a child with acute diarrhea, caregivers need to have adequate knowledge and practices [8]. A study of 94 mothers at the gastroenterology department of Nghe An Obstetrics and Pediatrics Hospital found that 56.4% of mothers did not follow proper dietary practices for their children's acute diarrhea. Furthermore, 39.4% of mothers failed to mix Oresol correctly, and only 33.0% administered Oresol as instructed by the doctor [9]. A study at Hai Phong Hospital also revealed that 70.9% of mothers practiced proper care, with 79.1% correctly using Oresol, 55.7% following the right nutritional guidelines, and 88.4% washing their hands with soap before feeding their children [10].

The study offers valuable insights into the knowledge and practices among mothers related to antibiotic use for children with diarrhea. One key advantage of our study is its ability to compare its findings with similar studies, such as Tran Thi Mai Hung's study in Vietnam, providing context and relevance to the results. Our study results also demonstrate a significant portion of the population with poor knowledge and practices of antibiotic use, including self-adjustment of antibiotic doses and adherence to medical instructions. These findings can further contribute to the growing body of evidence regarding antibiotic stewardship. However, there are several limitations to consider. First, the study's reliance on self-reported information may cause biases, as participants could overestimate their knowledge and practices. Additionally, the cross-sectional design limits the ability to establish causal relationships between knowledge and practices among study participants.

V. CONCLUSION

The study was conducted on 380 mothers with children under 2 years old who had diarrhea in 3 wards of Thai Binh city in 2023. Study results showed that 40.5% of study participants had good knowledge of using antibiotics. 86.3% of mothers participating in the study had heard about antibiotics with doctors and pharmacists being the two most common sources of information (83.4% and 75.0% respectively). Besides, 85.0% of the study participants understood the need to use medication exactly as prescribed by the doctors. Our study findings emphasize the importance of improving educational efforts to ensure that caregivers, especially mothers, are better informed about the correct use of antibiotics and other treatments for diarrhea.

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