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Description of Mothers' Knowledge, Attitudes, and Behavior Regarding Deworming The Children Against Soil-Transmitted Helminthiasis at The Lampaseh Health Center in Banda Aceh City

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Abstract

Helminth infections are a significant public health problem in developing countries, including Indonesia, where the prevalence ranges from 60% to 90%. One common helminth infection is Soil-Transmitted Helminthiasis (STH), which particularly affects children. One of risk factors is children who lack personal hygiene, especially when they are playing with soil. The increased incidence of STH can be prevented by deworming programs, and the role of parents, especially maternal parenting. This study aims to determine the description of the level of knowledge, attitudes and behavior of mothers on deworming the children against STH at the Lampaseh Health Center, Banda Aceh City, Indonesia. This research is descriptive with a cross-sectional design. The sample consists of mothers with children aged 2-12 years, selected using accidental sampling techniques. Data were collected through interviews using structured questionnaires. The results showed that the level of maternal knowledge of deworming the children against STH categorized as good (95.1%), quite good (3.9%), and less good (1.0%) as well as the attitude of mothers was categorized into good (51.5%), quite good (46.6%), and less good (1.9%). However, the mother's behavior was good (69.9%) and less good (30.1%). The conclusion was that the knowledge, attitudes, and behavior of mothers on deworming the children against STH need to be maintained and improved.

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INTRODUCTION

Worm infection in human is a disease caused by parasite which can be transmitted to human through the soil.[1] A diagnosis of worm infection is confirmed when finding worm eggs in a stool examination.[2] Helminth infections are a significant public health issue in developing countries. This is due to the fact that urbanization and socioeconomic factors in developed countries consistently help in controlling the spread of helminth infections.[3] One common type of worm infection is intestinal worm infection, which involves soil media in its spread and is known as Soil Transmitted Helminth (STH).[4] The types of STH include roundworms (*Ascaris lumbricoides*), whipworms (*Trichuris trichiura*), and hookworms (*Necator americanus* and *Ancylostoma duodenale*).[5]

In general, the incidence of worm infection in Indonesia is still quite high, especially among people who have economic limitations and low levels of sanitation. The prevalence rate of intestinal worm infections ranges from 2.5% to 62%.[3] According to the information from Riskesdas in 2013, the prevalence rate of worm infection in children is 22.6%.[6] The most affected age groups are those between 5-14 years old, with 21% of cases.[7] Aceh Province has the second-highest rate of worm infections in Indonesia, with a prevalence of around 59.2%.[8]

School-age children are susceptible to various infections. This situation arises because children often play on the ground, interact with their friends, share games, hug each other, and involve themselves in various social activities during their development.[9] Children who affected by worm infections and when the symptoms are undetected can cause various health problems. Although helminth infections rarely cause death, they can affect the health and productivity of patients through decreased nutritional status.[10] Long-term effects of infection typically manifest as malnourishment, impaired growth and development and cognitive impairment in children, as the parasites absorb essential nutrients needed during the growth phase.[11] The high prevalence of worm infection in Indonesia is due to the tropical climate that favors the development of endemic diseases, including intestinal worms, and various risk factors such as age, socio-economic environment, behavior, and cultural practices.[12,13] Common transmission routes among children include going barefoot, direct contact of feet with the ground, and neglecting hand hygiene, hence it is necessary to examine and care for them.[14]

To combat this issue, Indonesia has implemented several initiatives aimed at preventing helminth infections. These include campaigns promoting healthy lifestyles and good sanitation, mass deworming treatments, and parental education.[6] One of Indonesia's initiatives in preventing worm infection in children is through the Mass Preventive Drug Administration Program (POPM). Deworming aims to treat, eradicate, and prevent infestations by worms that can inhibit child growth and prevent further infections.[15] The drug used in the implementation of mass deworming programs is a single dose of Albendazole or Mebendazole, which is available as chewable tablets and syrup. Simultaneously, deworming the children under five every two years along with the program of the distribution of vitamin A. Likewise elementary school children are in receive both service twice a year, in February and August at their schools.[16] In addition, the care of the child depends on the parenting style provided by the mother.

Therefore, less positive knowledge, attitudes, and behaviors of mothers can have a negative impact on parenting, especially in an effort to prevent intestinal worms infection.[5]

The working areas of Lampaseh Health Center (Puskesmas Lampaseh) of Banda Aceh City in Aceh Province, Indonesia covers six villages, namely Lampaseh Kota, Merduati, Keudah, Peulanggahan, Gampong Jawa, and Gampong Pande.[17] In the working area of Lampaseh Health Center, especially in Gampong Java, there is a garbage dump land, which is often used by children for playing. The age period of 2-12 years is a period when children tend to enjoy playing, especially on the ground, and the potential for STH infection is closely related to the sanitary conditions of the environment. Therefore, children living around the region are at risk of getting STH infection.

The distribution of deworming at Lampaseh Health Center to primary and preschool age children has reached a satisfactory level, which is 91.9%.[18] Therefore, the description of mothers' knowledge, attitudes, and behavior on deworming the children against STH in the operational areas of Lampaseh Health Center, Banda Aceh City, is needed to be reported which can be used as a reference for mothers in other areas in assisting government programs for the treatment and prevention of STH infections in Indonesia.

MATERIALS AND METHODS

This research is a descriptive approach by applying a cross-sectional research design. The focus of this study was on collecting variable data at one point in time by only once observations and analysis. Measurements were made against certain characteristics or variables at the time of examination. The purpose of this study was to collect data on the description of mothers' knowledge, attitude, and behaviors on deworming the children against STH at the operational areas of Lampesh Health Center. The Subjects of this study involved mothers who had children aged 2-12 years who lived within operational areas or visited the Lampaseh Health Center and met the established inclusion criteria. The sampling method used was incidental sampling. The research was carried out in the operational area of the Lampaseh Health Center in Banda Aceh City. The survey was carried out from October to November 2023, involving a total of 103 respondents. In this study, the measurement scales for knowledge and behavior were assessed using the Guttman scale, where respondents received a score of 1 for correct answers and 0 for incorrect answers. Meanwhile, the attitude measurement scale used the Likert scale, where respondents received a score of 5 for strongly agreeing and a score of 1 for strongly disagreeing. The collected data were then summed and classified into three categories: less good (<56%), quite good (56-75%), and good (76-100%).[19] The income variable was subsequently divided into two categories: high income for those earning more than Rp. 750,000 and low income for those earning less than Rp. 750,000.[20] The data was analyzed using an univariate approach, especially descriptive analysis.

The formula used to calculate the percentage of data is as follows:

$$P = \frac{F_1}{n} \times 100\%$$

where P is percentage; $f1$ is the observed frequency; n is number of respondents.

RESULTS AND DISCUSSION

Characteristics of Respondents

The general characteristics of respondents are shown in Table 1 below.

Table 1. Characteristics of Respondents

Category	Frequency (n=103)	Percentage (%)
Mother's Age		
24-30	34	33
31-40	60	58.3
41-48	9	8.7
Education		
Junior high school	1	1
Senior high school	63	61.2
Undergraduate	39	37.9
Working Status		
Working	19	18.4
Not Working	84	81.6
Income		
High	22	21.4
Low	81	78.6

Based on the data in Table 1, 60 mothers (58.3%) are in the age group of 31 to 40 years old. The majority of respondents achieved the high level of education in their educational journey (61.2%). Meanwhile, the majority of respondents, consisting of 84 mothers (81.6%), stated that they were unemployed. Of the total respondents, 81 mothers (78.6%) have a relatively low income level.

Research findings related to maternal age characteristics indicated that most mothers are in the age group of 31-40 years (Table 2). Age is one of the determining factors in determining a person's health behavior. Individuals who follow a conventional lifestyle may be considered to have an edge in experience, knowledge, skills, and decision-making abilities as they age. The results of the study on the education level of respondents showed that the majority, as many as 63 people, had high school education. This reflects that most participants have a relatively high level of education. A person's level of education can have an impact on his ability to understand information, and the achievement of that level of education has a direct correlation with the quality of education received.[21] In addition, parents who have a high level of education and awareness of hygiene and health practices tend to provide better education and health attention to their children than children who have parents with lower levels of education.[22] Based on characteristic of occupation showed that the majority of mothers, 84 respondents, were unemployed. Type of work has a significant correlation with the incidence of helminthiasis because work has a close relationship with family income, and family conditions have a major impact on the level of hygiene and sanitation in the home environment.[23] The characteristics of income showed that 81 respondents have a relatively low income. The socioeconomic characteristics of a person have a major impact on the prevalence of helminthiasis, and the socioeconomic factors have an effect on a person's well-being, involving financial resources, housing conditions, access to nutritious food, and adherence to hygiene standards.[24]

Maternal knowledge related to the characteristics of respondents on deworming the children against STH showed that 57 respondents (95%) had good knowledge in the age range of 31-40 years, 60 respondents (95.2%) had good knowledge with the last level of high school education, 81 respondents (96.4%) had good knowledge and did not work, and 78 respondents (96.3%) had good knowledge with a low-income level.

Table 2. Distribution of Knowledge Frequency Based on Respondent Characteristics

Category	Knowledge						Total	
	Good		Quite good		Less good			
	n	%	n	%	n	%	n	%
Mother's Age								
24-30	32	94.1	2	5.9	0	0	34	100
31-40	57	95	2	3.3	1	1.7	60	100
41-48	9	100	0	0	0	0	9	100
Education								
Junior high school	1	100	0	0	0	0	1	100
Senior high school	60	95.2	2	3.2	1	1.6	63	100
Undergraduate	37	94,9	2	5.1	0	0	39	100
Working Status								
Working	17	89.5	2	10.5	0	0	19	100
Not Working	81	96.4	2	2.4	1	1.2	84	100
Income								
High	20	90.9	2	9.1	0	0	22	100
Low	78	96.3	2	2.5	1	1.2	81	100

Knowledge Frequency Distribution

Table 3 shows that the distribution of respondents' level of knowledge regarding deworming the children showed that 98 out of 103 participants (95.1%), answered questionnaire that reflected a high level of knowledge. Based on the results of questionnaires filled out by respondents regarding knowledge on deworming the children against STH are categorized as good.[19] Knowledge that is considered good in mothers is assumed to come from several factors that affect the level of knowledge. Factors that can affect a mother's knowledge include education level, occupation, experience, income, age, and the amount of information she has. The existence of higher education in a person can affect the way the individual receives information, which in turn can increase their insight and understanding of a disease.[25] The higher a person's level of education, the easier it is for them to access and receive information, which in turn increases the amount of knowledge he has.[26] A person's knowledge is influenced by age, which plays a role in influencing the individual's comprehension ability and thinking patterns. Increasing age causes an increase in the ability to capture information and develop a more complex mindset, supported by a growing body of experience. Therefore, the productive age category, which is the stage of active adulthood, tends to have a high level of recall of information.[27] Thus, parents who have a high level of education, extensive experience, and older age tend to impart more abundant and measurable knowledge than parents who are younger and have a low level of education. [28]

Table 3. Level of Knowledge Frequency Distribution

Knowledge	Frequency (n)	Percentage (%)
Good	98	95.1
Quite good	4	3.9
Less good	1	1.0
Total	103	100.0

In addition, employment and income also affect a person's knowledge.[29] The type and context of work can play a role in influencing the incidence of helminthiasis, and having good knowledge can help lower the incidence rate of the disease. Work also has a close relationship with family income level, which is an important

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Table 4. Distribution of attitude frequency based on respondent characteristics

Category	Attitude						Total	
	Good		Quite good		Less good			
	n	%	n	%	n	%	n	%
Mother's Age								
24-30	17	50	16	47.1	1	2.9	34	100
31-40	33	55	26	43.3	1	1.7	60	100
41-48	3	33.3	6	66.7	0	0	9	100
Education								
Junior high school	1	100	0	0	0	0	1	100
Senior high school	31	49.2	30	47.6	2	3.2	63	100
Undergraduate	21	53.8	18	46.2	0	0	39	100
Working Status								
Working	10	52.6	9	47.4	0	0	19	100
Not Working	43	51.2	39	46.4	2	2.4	84	100
Income								
High	10	45.5	12	54.5	0	0	22	100
Low	43	53.1	36	44.4	2	2.5	81	100

factor in forming a healthy lifestyle in the family environment. A nutritious diet and personal hygiene can be preventive measures against diseases, including intestinal worm infections.

Based on the age of mothers who categorized into the productive age, the knowledge of mothers at the Lampaseh Health Center are relatively obtained from high level of maternal education, such as a high school, and from various sources of information, including health workers at Public Health Center, Integrated Healthcare Center, and educational institutions such as elementary schools. Good knowledge in a mother is expected to be able to reduce the incidence of worm infection in her child and encourage her to be more concerned in deworming. This knowledge involves an understanding of healthy and clean-living behaviors as well as in-depth knowledge of deworming and drug administration.

Attitude frequency distribution

Table 4 shows that the distribution of the mother's attitude on deworming the children against STH children is that 33 respondents (55%) aged 31–40 years have a good attitude; 31 respondents (49.2%) who were high school-educated had good attitudes; 43 respondents (51.2%) who did not work had a good attitude; and 43 respondents (53.1%) who had low incomes had good attitudes.

Table 5. Distribution of Attitude Frequency

Attitude	Frequency (n)	Percentage (%)
Good	53	51.5
Quite good	48	46.6
Less good	2	1.9
Total	103	100.0

Table 5 presents the distribution of the frequency of maternal attitudes on deworming the children against STH. The data revealed that out of 103 respondents, as many as 53 people (51.5%) gave positive responses to the questionnaire that showed a good attitude. A competent mother's attitude is believed to be formed by personal experiences, cultural factors, and the influence of important individuals, such as health professionals and mass media, including health worker brochures and billboards. The experience that respondents have is closely related to the knowledge they gain because later this experience will have a direct effect on what can be realized. Educational institutions are also related to the respondents' personal experiences. Through educational institutions, respondents can find out about worms and how to prevent them, so that respondents' can lead to good behavior that can prevent worms from occurring.[30] But there are still those who have a pretty good and less good attitude. This is because respondents lack awareness or sensitivity to moral principles, despite having good knowledge. Acquiring extensive knowledge can enhance an individual's understanding, while cultivating a positive attitude includes both emotional and social factors.[30] A mother's attitude refers to her perspective and beliefs about the purpose and benefits of deworming the children. The attitude of the mother also plays an important role in the prevention of intestinal worms in children. Attitudes are influenced by knowledge, therefore assessing attitudes needs to consider respondents' knowledge. Therefore, having the power of knowledge is closely related to a positive attitude.[31]

Frequency Distribution of Behavior

Table 6—shows the distribution of maternal behavior on deworming the children against STH based on the characteristics of respondents. A total of 39 respondents (65%) showed good behavior in the age range of 31-40 years; 41 respondents (65.1%) behaved well with their level of high school education; 57 respondents (67.9%) showed good behavior despite not working; and 54 respondents (66.7%) behaved well despite having low incomes.

Table 6. Distribution of Frequency of Behavior Based on Respondent Characteristics

Category	Behaviour				Total	
	Good		Less good		Total	
	n	%	n	%	n	%
Mother's Age						
24-30	26	76.5	8	23.5	34	100
31-40	39	65	21	35	60	100
41-48	7	77.8	2	22.2	9	100
Education						
Junior high school	1	100	0	0	1	100
Senior high school	41	65.1	22	34.9	63	100
Undergraduate	30	76.9	9	23.1	39	100
Working Status						
Working	15	78.9	4	21.1	19	100
Not Working	57	67.9	27	32.1	84	100
Income						
High	18	81.8	3	18.2	22	100
Low	54	66.7	27	33.3	81	100

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Table 7. Distribution of Behavioral Frequencies

Behaviour	Frequency (n)	Percentage (%)
Good	72	69.9
Less good	31	30,1
Total	103	100,0

Table 7 provides an overview of the frequency distribution of maternal behavior related to the deworming the children. The data showed that 72 out of 103 respondents (69.9%) answered the questionnaire with a good level of maternal behavior. Maternal behavior plays an important role in a child's life in maintaining health. Mothers who are not used to deworming their children will have a higher risk of experiencing worms compared to mothers who are used to deworming their children.[32] Effective maternal behavior is expected to be achieved through good understanding, adequate information support, availability of resources, and implementation of worm eradication programs launched by the government.

Of the total number of respondents, 31 people showed poor behavior. In detail, 24 respondents did not deworming periodically every 6 months as a preventive measure, while 4 respondents did not deworming at all. In addition, 4 respondents did not carry out deworming, either at the recommended time or as a preventive measure. This is due to the mother's dependence on deworming from the staff during counseling and not deworming the child. They only rely on clean and healthy living practices and only seek medical help at the Health Center when symptoms become severe.

STRENGTH AND LIMITATION

This study serves as an additional reference source and basis for further investigations in the field of public health, especially regarding efforts to eradicate worm infections in the age group of children. A weakness to note in this study is the inability of researchers to directly observe the practices carried out by respondents. As a result, the data collected can only depend on the perceptions reported by respondents through questionnaires. The use of different measurement scales, particularly the Guttman scale and Likert scale, creates obstacles in comparing variables, potentially leading to inaccuracies in responses and lack of clarity in interpreting the overall score of the questionnaire.

CONCLUSIONS

Mothers' knowledge on deworming the children against STH at Lampaseh Health Center is mostly at a good level, covering 98 respondents (95.1%). Mothers' attitudes on deworming the children against STH at Lampaseh Health Center were mostly in the positive category, with 53 respondents (51.5%) showing very good attitudes. Meanwhile, maternal behavior on deworming the children against STH at Lampaseh Health Center where 72 respondents (69.9%) are categorized as good behavior.

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ETHICAL CLEARANCE

This research was carried out after obtaining approval from the Health Research Ethics Committee of the Faculty of Medicine, Syiah Kuala University with ethical approval number 154/EA/FK/2023. As a follow-up to the ethical approval, researchers maintain the confidentiality of data by not including the full name of the research subject. All subject data are used only once, for the purposes of this research alone and not used for other purposes.

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CONFLICT OF INTEREST

We affirm that there are no conflicts of interest between authors in this study

AUTHOR CONTRIBUTION

SU and TRM designed the study. RY was responsible for data collection, analysis, and interpretation. RY also wrote the original manuscript. TM, NM, and TAZ contributed to proofreading the manuscript. All authors read and approved the final version of the manuscript.

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