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RESEARCH ARTICLE

The Relationship Between Soil-Transmitted Helminths (STH) Infection and the Stunting Incidence in Toddlers at the Kedai Durian Community Health Center, Medan, Johor, in 2023

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ABSTRACT

Background:
Worldwide, around 1 in 4 toddlers experience stunting. Stunting can cause disorders in the form of stunted brain growth and immune system disorders in toddlers. Malnutrition at an early age is found to occur in the first 1000 days of life can increase the risk of infant and child mortality. It is known that chronic STH infection can cause stunting in children.
Purpose: *this study was to determine whether there is a relationship between Soil Transmitted Helminths (STH) infection and the incidence of stunting in toddlers at the Kedai Durian Health Center, Medan Johor in 2023.*
Research Method: *this was carried out in an analytical observational manner with an approach using a cross-sectional design, which is only momentary or sees the relationship between soil transmitted helminths infection and the incidence of stunting in toddlers at the Kedai Durian Health Center, Medan Johor in 2023 when the study was taking place. The sampling technique used purposive sampling. Which is to obtain a sample of 35 respondents based on inclusion and exclusion criteria.*
Results: *from this study, the most respondents were children infected with STH worms, as many as 19 respondents (54.3%), and those who were not infected were 16 respondents (45.7%), it was obtained that the most children who were stunted were 17 respondents (48.6%), and those who were not stunted were 18 respondents (51.4%). and There is a relationship between STH worm infection and stunting with (chisquare count 10.493> chisquare table (0.05(1)) 3.841, P value 0.01 and RP (3.8). [95% CI 1.37 - 11.28]. From these results, it was also found that children who suffer from STH infection have a prevalence of stunting 3.8 times more than those who are not infected with STH, so that STH infection is a high risk factor for stunting in toddlers.*
Conclusion: *The results of the study found a relationship between STH infection and the incidence of stunting.*
Keywords: Worms, Infection, Stunting

INTRODUCTION

Stunting is a condition of growth and development failure in children due to chronic malnutrition, resulting in the child being too short for their age. According to the World Health Organization (WHO), a child is considered stunted when their height

(H) or length (L) for age (H/A) is <-2 standard deviations (SD) of the median growth standard for children. 1

Worldwide, approximately 1 in 4 toddlers experiences stunting. According to WHO data, in 2020, Indonesia had the second highest prevalence of stunting in toddlers in Southeast Asia, reaching 31.8%. Timor Leste had the highest prevalence of stunting at 48.8%. Laos was third with 30.2%. Cambodia was fourth with 29.9%. Singapore had the lowest prevalence of stunting at 2.8%. 2 In Indonesia, the prevalence of stunting at the provincial level remains very high. According to 2018 Basic Health Research and Assessment (Riskesda) data, stunting was still around 30.8%. This equates to one in three toddlers experiencing stunting.1

Stunting can lead to impaired brain growth and immune system impairment in toddlers. Early malnutrition, which occurs during the first 1,000 days of life, has been found to increase the risk of infant and child mortality, making sufferers susceptible to illness and having poor posture, thus increasing the risk of health problems in children, such as allergies, diabetes mellitus, hypertension, and autoimmune diseases in adulthood.3

Stunting is caused by limited access to nutritious food, low vitamin and mineral intake, and poor dietary diversity and animal protein sources. Other factors that can contribute to stunting are recurrent or chronic infections.3 One infectious disease that can cause stunting in children is worm infestation.4 The most common worm infection is an intestinal parasitic worm from the intestinal nematode group, which is transmitted through the soil, or called Soil-Transmitted Helminth (STH).1

Worm infestation in Indonesia varies from 2.5% to 62% and can occur at any age. Meanwhile, in plantation and rice field areas, the prevalence ranges from 40% to 60%. According to data from the 2021 Indonesian Nutritional Status Survey (SSGI) by the Ministry of Health, the proportion of children under five suffering from worms was 2.8 percent. 5 Data obtained from BAPPENAS and UNICEF in 2015 showed that North Sumatra Province had 5.3 million young people, or 38% of the total population, with nearly 800,000 (14%) children living below the poverty line. 6

Previous research conducted by Wan Hendra in 2023 at the Kampar Community Health Center found no significant association between worm infections and stunting. 1 However, this study contrasts with that conducted by Dewi Astuti in Pinrang Regency, which found a significant association between worm infections and the nutritional status of elementary school children in Pinrang Regency. 4

Chronic STH infections are known to lead to malnutrition in children. Chronic STH infections can worsen an individual's nutritional status by depriving them of nutrients, leading to iron deficiency anemia, which causes iron loss, protein loss, eosinophilia, and diarrhea.7

In Medan, one area where stunting occurs is the Kedai Durian area, where data from 2021 showed a prevalence of stunting of approximately 15 cases. Furthermore, because the area is predominantly rice fields and plantations, STH infections are still common in the community health center (Puskesmas) working area.3

Based on this description, researchers plan to conduct research on the relationship between chronic STH infections and stunting in

toddlers at the Kedai Durian Community Health Center in Medan Johor in 2024.

MATERIALS AND METHODS

This study used an analytical method with a cross-sectional study design to determine the relationship between chronic STH infection and stunting in children aged 2 years at the Kedai Durian Community Health Center, Medan Johor in 2024. The sampling technique used purposive sampling with inclusion criteria in the form of patients with children aged 2-5 years who came for treatment at the Kedai Durian Community Health Center, Medan Johor and patients whose medical records were complete, and exclusion criteria in the form of patients whose medical records were incomplete. The number of samples that met the criteria was 35 people. The dependent variable in this study was cases of stunting in children at the Kedai Durian Community Health Center, Medan Johor. Meanwhile, the independent variable in this study was STH infection in children at the Kedai Durian Community Health Center, Medan Johor. This study was conducted using the Chi-Square Test.

RESEARCH RESULT

Table 1. Frequency Distribution

Jenis Kelamin	**N**	**%**
a. Laki - laki	15	42,9
b. Perempuan	25	57,1
Total	35	100

By Gender

From table 1, it is known that the respondents who were female were 25 respondents (57.1%), while the number of male respondents was 15 respondents (42.9%).

Table 2. Frequency Distribution by Age

Umur	**N**	**%**
a. Usia (12-17 Bulan)	2	5,7
	4	11,4
b. Usia (18-23 Bulan)	9	25,7
	8	22,9
c. Usia (24-30 Bulan)	8	22,9
	3	8,6
d. Usia (31-37 Bulan)	1	2,8
e. Usia (38-44 Bulan)		
f. Usia (45-51 Bulan)		
g. Usia (52-57 Bulan)		
Total	35	100

From table 2, it is known that respondents aged (12-17 months) were 2 respondents (5.7%), aged (18-23 months) were 4 respondents (11.4%), aged (24-30 months)

were 9 respondents (25.7%), aged (31-37 months) were 8 respondents (22.9%), aged (38-44 months) were 8 respondents (22.9%), aged (45-51 months) were 3 respondents (8.6%) and aged (52-57 months) were 1 respondent (2.8%).

Table 3. Frequency Distribution of Research Respondents Based on

Stunting	**N**	**%**
a. Iya	17	48,6
b. Tidak	18	51,4
Total	35	100

Number of Patients Infected with STH Worms

Table 5. Distribution of STH Worm Infection with Stunting

Infeksi Cacing STH	***Stunting***					
	Stunting		**Tidak *Stunting***		**Total**	
	N	**%**	**N**	**%**	**N**	**%**
Terinfeksi	14	40`	5	14,3	19	54,3
Tidak Terinfeksi	3	8,6	13	37,1	16	45,7
Total	17	48,6	18	51,4	35	100

Based on table 5. the most respondents were those infected with STH worms and stunting, namely 14 (40%) respondents.

Based on the Chii-Squareid (X^2) test, the results can be known, there is a relationship between the STH effect and the incidence of stunting (chiisquarei count 10.493> chiisquarei tabeil (0.05(1)) 3.841, P valuei 0.01 and RP (3.8). [LK 95% 1.37 -11.28]. From these results, it was also found that children who had STH infection experienced 3.8 times more stunting than those who did not have STH infection, so that STH infection was a high risk factor for stunting. Toddler.

DISCUSSION

In this study, it was found that most respondents were female. From table 4.1, it is known that the respondents of this type of research were female, amounting to 25 respondents (57.1%). Research from Yuniingsiih (2022) revealed that the incidence of stunting was more common in boys compared to girls. This stunting condition is due to the existence of different variations in food and nutrition. Which makes boys have a greater chance of experiencing stunting. However, the results of this impairment do not mean that the birth child's natural type is predisposed to the occurrence of stunting, therefore the chances of stunting occurring for both male and female children are the same. The formation of peineiliitian results is solely due to the deindication of peineiliitian through cross-seictional techniques. Theory states that the type of naturalness is not a factor in stunting.

Seen from table 4.2 in this study, most respondents were middle-aged (31-40 months).

Rasio Pravalensi	**P value**
3,8	0,01

From table 4.2, it is known that respondents aged (31-40 months) were 12 respondents (34.3%). This is in accordance with the fact that nutritional disorders in children in the first 1000 days of life can cause stunting. According to researchers, the results of this study are caused by the increasing age of the child, the increasing need for nutrients needed for energy combustion in the body. Age is an internal factor that determines that at the age of under 6 months, most babies are still in a good condition, whereas the number of toddlers with good nutritional status has clearly decreased to 50%.2

It is known from table 4.3 that this species contains the most STH worm infections. From table 4.4 it can be seen that out of 35 research findings, children were found to be infected with STH worms. The high level of STH investment in this area is due to the area where the area is located in agricultural areas and plantation areas. Thus facilitating the spread of the many worm species included in the STH there. In addition, STH infections can be influenced by a number of factors, including climate, social and economic status, age, social characteristics, hand washing, nail habits, individual characteristics and behavior, food preferences, and sanitation. water source. Children spend a significant portion of their time playing, but the prevalence of STH infections in schools can be influenced by parental emphasis on the need for good personal hygiene practices, such as handwashing with soap. 9. Table 4.4 shows that 17% of children with stunting (48.6%) are stunted. Stunting in toddlers can result in a shorter body size during adolescence. Children who are stunted at an early age (0-2 years) and remain stunted at 4-6 years have a 27-fold risk of remaining stunted before entering puberty. Conversely, children with normal growth at this age who experience stunted growth between 4 and 6 years of age are 14 times more likely to experience stunted growth in pre-puberty. To support toddler growth and balance, both physically, psychologically, and motorically, optimal nutritional intake is essential for optimal growth and balance. Table 4.8 presents data regarding the statistical relationship between STH worm infection and stunting. The results of this study showed a P value of 0.01. These results indicate that there is a relationship between STH worm infection and stunting. From these results, it was also found that children who had STH infection had 3.8 times more stunting than those who did not have STH infection, so that STH infection was a high risk factor for stunting in children under five. This research aligns with the research conducted by Deiwii Astuti, entitled "The Relationship Between Diarrhea and Children's Nutritional Status at Muhammadiyah Jampu Elementary School, Lanriisang District, Piinrang Regency," which showed a significant relationship with a p-value of 0.01. Diarrhea is an infectious disease caused by parasites in the form of worms. Infections can range from mild to severe. Worm infections are infections caused by intestinal nematode worms, especially those transmitted through the soil, including Ascaris lumbriicoiideis (Geilang Worm), mine worms (Ancylostoma duodeinalei and Neicator ameiriicanus) and Triichuriis triichiiura (Whip Worm). Infections such as diseases are a cause of malnutrition which then have the same effect and cause stunting, and they are also factors which further impair the body's resistance to various types of infections. 10

The results of this research are not in line with the results of research by Wan Heindara (2023) regarding the relationship between

worm infections and the incidence of stunting in toddlers in 2 stunting loci in the work area of the Kampar Public Health Center, Kampar Regency. This could be caused by the results of the disease being found, which means that it cannot yet be confirmed that the infection of worms can cause stunting in toddlers. Worm infections may not yet have a significant impact on the nutritional status of toddlers in both Siingkuang Island Village and Jambu Island Village.

The results of this research are in line with the research carried out in Peiru by Boluiin

CONCLUSIONS AND SUGGESTIONS

In accordance with the description of the characteristics related to the relationship between chronic STH infection and the occurrence of stunting in toddlers at Puskeismas Keidaii Duriian Meidan Johor in 2023, the following conclusions can be drawn:

1. From the results of this research, the highest number of cases of children infected with STH worms was 19 cases (54.3%), and those who were not infected were 16 cases (45.7%).
2. From the results of this training, the highest number of children who were stunted was 17 (48.6%), and those who were not stunted were 18 (51.4%).
3. There is a relationship between STH infection and the occurrence of stunting (chi square calculated 10.493> chi square table (0.05(1)) 3.841, P value 0.01 and RP (3.8). [95% CI 1.37 -11.28].

   From these results, it was also found that children who were infected with STH had a 3.8 times greater risk of stunting compared to those who were not infected with STH, so that STH infection became a high risk factor for stunting in toddlers.

Based on the conclusions of the study above, there are several suggestions that can be conveyed to further researchers, such as the hope that in the future they can take the number of respondents. More and more, the community is able to understand the factors that cause and how to prevent STH infection and stunting, and can conduct further research on stunting and STH infection.

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