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Risk Assessment and Control of Stunting in Makassar City, Indonesia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The focus of this research is the problem of stunting in children under five, which has an impact on human productivity and the quality of health in Indonesia. One of the factors that influence stunting is environmental problems that have not been fully resolved. knowledge about infectious diseases and environmental sanitation that contribute to stunting. This study aims to observe and analyze how knowledge about infectious diseases and environmental sanitation relates to stunting control. This study uses a cross-sectional study in which the population is mothers who have children under five. A total of 152 stunted toddlers surveyed were purposive samples. The results showed that there was a significant correlation with $p = (0.012) < (\alpha = 0.05)$ between knowledge about infectious diseases and stunting control behavior. Knowledge of environmental sanitation has a significant correlation with stunting control behavior.

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1. INTRODUCTION

One of the nutritional problems faced by toddlers today is stunting, or the incidence of short toddlers. WHO [1] states that 22.2%, or around 150.8 million children under five worldwide, were stunted in 2018. However, this was a decrease from the 32.6% stunting rate in 2000. In other words, of the 83.6 million stunting children under the age of five in Asia, the largest number came from South Asia (58.7 per cent), such as India, and a small proportion in Central Asia (0.9 per cent) such as Afghanistan. The World Health Organization (WHO) announced that Indonesia is the second country after Laos with the highest rate in Southeast Asia/South-East Asia (SEAR) [2].

Indonesia faces problems with nutrition with the toddler shortage. Because it will affect human resources in the future, stunting is very important. Stunted toddlers are easily infected with diseases and can suffer from degenerative diseases as adults. In preventing and reducing the incidence of stunting, it is not only carried out by the health sector but must involve cross-sectors [3].

According to the PSG survey conducted in the context of monitoring, and evaluating work and the results of a program, it shows that the prevalence of very short toddlers increased from 8.5% to 9.8% (2017) and 19% to 19.8% for short toddlers (2017) [2]. Likewise, the Riskesdas data (2018) showed that the prevalence of short toddlers has increased from 19.2% in 2013 to 19.3% in 2018, while very short toddlers have decreased from 18% in 2013 to 11.5% in 2018. 2018. Based on Riskesdas data (2018) that the prevalence of short toddlers has increased from 19.2% in 2013 to 19.3% in 2018 for very short toddlers has decreased from 18% in 2013 to 11.5% in 2018.

Malnutrition and stunting in children can affect their intelligence and health levels today. Dwarf children can also physically impair cognitive function and cause stunting. This condition, if continued, will lower the quality and productivity of citizens' work in the future of Indonesia [4].

Infectious Diseases and environmental sanitation have an important role in the problem of malnutrition including stunting, where children experience infectious diseases such as diarrhea and ARI, besides that the habit of washing hands properly with soap is still low so that it can affect the occurrence of diarrhea. Stunting that occurs in children is a chronic nutritional disorder from consuming low-quality diets for a long time and often experiencing infectious diseases, so indirectly this will result in a decrease in the child's weight due to inadequate nutritional intake, resulting in stunting and environmental sanitation problems [5].

One of the causes of stunting can be influenced by the mother's knowledge of stunting which is caused by infectious diseases and unhealthy environmental sanitation so it affects the health of children under five and can ultimately affect the nutritional status of these children [6].

We aimed to analyze the relationship between knowledge of infectious diseases and knowledge of environmental sanitation in mothers on stunting control in Makassar City.

2. METHODS

This research is a survey research with a cross sectional approach. This research was conducted in the working area of the Kassi-Kassi Health Center and the Mangasa Health Center. Data collection in this study was carried out from March to April 2022 with a total sample of 152 housewives with stunted toddlers. The sampling technique in this study was purposive sampling based on the inclusion criteria in this study were mothers who had stunted toddlers, knew about stunting in children, could read and write and were willing to be sampled, while the exclusion criteria were housewives who were not at the when the research was carried out and they had moved to other areas/places. In this study using univariate and bivariate analysis. For bivariate analysis, the product moment correlation test was used to see the relationship between the independent variables on knowledge of infectious diseases and knowledge of environmental sanitation with the dependent variable on stunting control behavior.

3. RESULTS

3.1 Univariate Analysis

3.1.1 Characteristics of the research sample

Fig. 1 the percentage of stunted children with short physical conditions was 105 children

(69.5%), while the stunted children with very short physical conditions were 47 children (30.9%). By looking at the description of the condition of toddlers who are short and very short, it shows that the need for nutritional intake is not met. parenting from mothers who are not optimal, such as IMD (early breastfeeding initiation), exclusive breastfeeding, and complementary feeding during the growth period of toddlers.

Fig. 2 shows the sex distribution of children under five who are stunted shows that there are 85 boys (55.9%), while for stunted girls, there are 67 children (44.1%). Boys experience stunting more than girls. This is made possible by the amount of nutritional needs of each person. And of course, the need for energy and protein in men is greater than that of women. This is because men can do heavy work while women sometimes cannot do it. Likewise, women are less likely to experience stunting than boys in infancy or childhood.

Fig. 3 relates to the age of the children, showing that most children who are stunted are children under three years old (12-36), namely 78 children (51.3%). Meanwhile, 45 children (29.0%) were stunted at the age of four (37-48). And children who experienced stunting at the age of 5 years (49 -60) were 29 children (19.1%). Thus, most stunted toddlers are aged (12 -36) months. At this stage, the child has the potential to be deficient in nutritional intake considering that the child is no longer consuming breast milk, of course, the attention of housewives to their children as a result of decreased care provided to children, so children can be vulnerable to infectious diseases, and children's activities that start playing so it is time to sleep began to decrease, besides that because of the child's activities so that the mother no longer pays attention to aspects of hygiene and sanitation when caring for children.

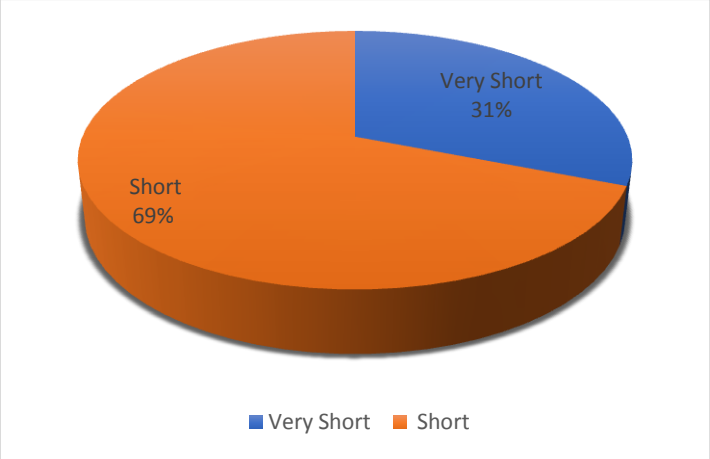

Fig. 1. Physical characteristics of stunted toddlers

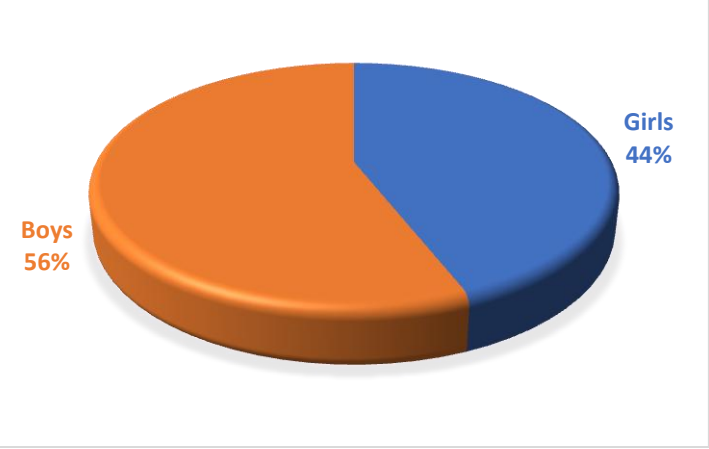

Fig. 2. Gender of toddlers

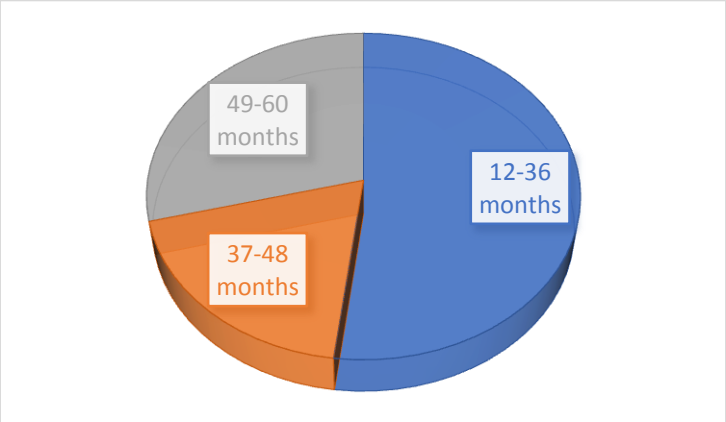

Fig. 3. Characteristics of toddler age

Fig. 4 From a total of 152 respondents, it shows that the ages of the respondents were divided into three categories, namely at the age of under 20 years by 20 people (16.4%), then at the ages of 20-35 by 94 people (61.8%) and for the age of 35 years and over obtained by 33 people (21.7%). Age showed that the most or the largest age is in the 20-35 age range, which is quite productive at this age. Besides that, housewives are still in good and healthy physical condition, so that at this age it is sufficient to understand the pattern of food consumption needed and efforts to improve the nutrition needed.

Fig. 5 shows that at the education level, there are four levels or categories owned by the respondents, namely Elementary School (Elementary School), Middle School (Junior High School), High School (Secondary School, and DIII/S1). Based on the level of education, there were 8 respondents with elementary education (5.3%). For junior high school, there were 96 people (63.2%), for high school, there were 45 people (29.8%), and for DIII/S1 level, there were 3 people (2.0 %). The results above show that the education of stunting toddler housewives is at the junior high school level. Education for housewives under five is expected to be able to develop themselves and their abilities inside and outside of education that can be used optimally for survival. Education can influence attitudes in making decisions and acting to change healthier lifestyles.

Fig. 6 of the husband's occupation in this study shows several categories, namely, private workers, daily workers, and fishermen/sellers. This category describes the type of husband's work from information on housewives who have stunted toddlers as many as 152 people. In the type of work as private workers, there were 61 people (40.1%) in the category of Labor Jobs, and there were 84 people (55.3%). For the Seller category, 7 people (4.6%) were obtained. It can be concluded that most of the jobs of the husbands of the respondents obtained in this

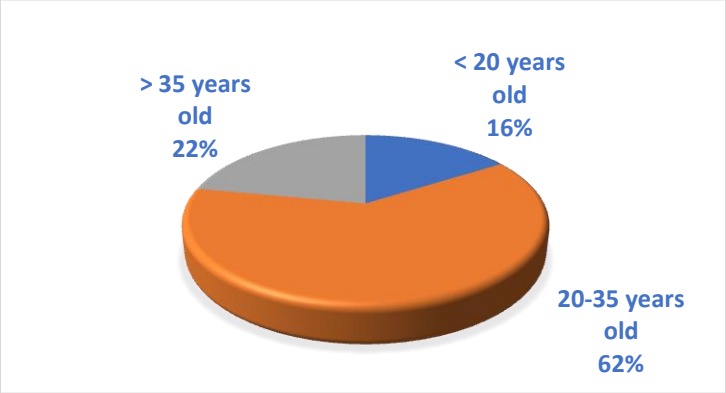

Fig. 4. Age characteristics of housewives

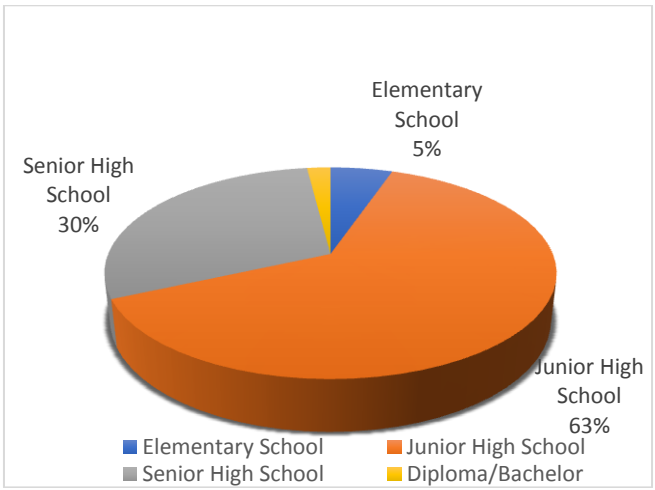

Fig. 5. Educational characteristics of housewives

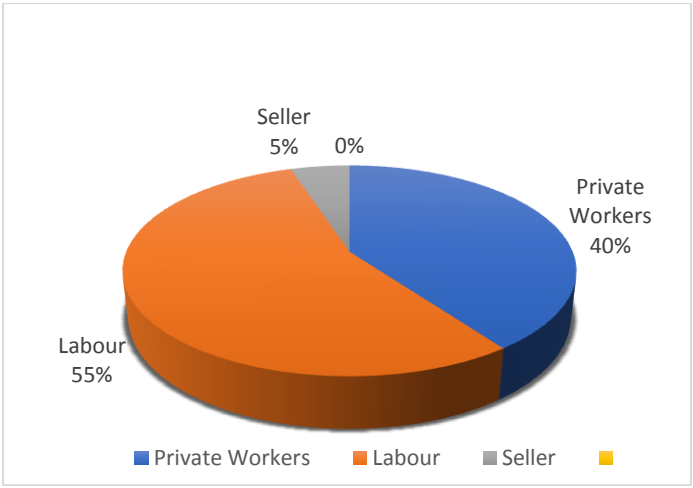

Fig. 6. Occupational Characteristics of the Head of the Household

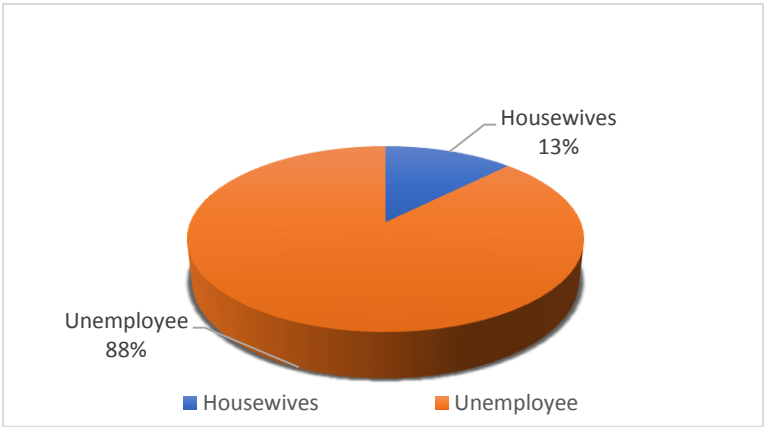

Fig. 7. Respondent's occupational characteristics

study were daily laborers. The level of well-being in the family will of course be influenced by employment status and how much income the working husband earns. The amount of income generated is of course closely related to the employment status of a husband/head of household.

Fig. 7 Respondents' occupations in this study show that 19 (12.5%) housewives work. While those who did not work were 133 people (87.5%). Respondents who work have great potential for their children to experience stunting compared to mothers who do not work or do not work. Thus, it shows that more housewives do not work than those who work.

3.2 Bivariate Analysis

Table 1. Shows that the frequency distribution of knowledge of infectious diseases is in the medium category, namely 88 people or 58%.

Table 2. Shows that the frequency distribution of knowledge about Environmental Sanitation is in the medium category. Then, respondents with knowledge in the medium category were 92 people or 60.5%.

Table 3. shows that the frequency distribution of stunting control housewives' behavior is in the moderate category, namely 129 people or 84.9%.

Table 4 shows that knowledge of infectious diseases and stunting control behavior with the results obtained P value (0.012) < (α = 0.05) states that there is a strong relationship between infectious diseases and stunting control behavior in toddlers. Whereas knowledge of environmental sanitation with stunting control behavior resulted in a P value (0.089) > (α = 0.05) which stated that there was no significant difference between knowledge of environmental sanitation and stunting control behavior.

4. DISCUSSION

4.1 Knowledge of Infectious Diseases

Knowledge of infectious diseases among housewives in controlling stunting is still moderate, namely 88 people or 58%. This condition indicates that the knowledge possessed by housewives still needs to be improved. Infectious diseases caused by poor hygiene and sanitation (eg diarrhea and ISPA) can interfere with the absorption of nutrients in the digestive

Table 1. Frequency distribution of respondents based on knowledge of infectious diseases

No.	Knowledge disease infection	Frequency	Percentage (%)
1.	Very low	0	0
2.	Low	3	2
3.	Currently	88	58
4.	Tall	60	39,3
5.	Very high	1	0.7
Total		152	100

Source: Primary Data 2022

Table 2. Frequency distribution of respondents based on knowledge of environmental sanitation

No.	Knowledge sanitation environment	Frequency	Percentage (%)
1.	Very low	0	0
2.	Low	0	0
3.	Currently	92	60.5
4.	Tall	60	39.5
5.	Very high	0	0
Total		152	100

Source: Primary Data 2022

Table 3. Frequency distribution of respondents based on stunting control behavior

No.	Control behavior stunt	Frequency	Percentage (%)
1.	Very low	0	0
2.	Low	0	0
3.	Currently	129	84.9
4.	Tall	21	13,8
5.	Very high	2	1,3
Total		152	100

Source: Primary Data 2022

Table 4. Analysis of the sanitation knowledge on stunting control behavior relationship between infection researcher knowledge and environmental

Analysis	Stunting Control Behavior		
	Product moment (r)	p-value	n
Knowledge of Pen. infection	0.159	0.012	152
Sanitary knowledge environment	0.159	0.089	152

Source: Primary Data 2022

process. Some infectious diseases that babies suffer from can cause babies to lose weight. If this condition occurs for a long time and is not accompanied by adequate intake for the healing process, it can result in stunting [7].

Infection is a direct causative factor because the infection can cause nutrients to be used for the process of repairing damaged tissues or cells. Infections that often occur include 1) gastrointestinal infections (diarrhea) caused by viruses, bacteria, or parasites. 2) respiratory infections (ARI), and 3) infections caused by worms (worms). Between infectious diseases and nutritional status there is a back-and-forth interaction where infectious diseases cause decreased food intake, interfere with nutrient absorption, cause direct loss of nutrients, and increase metabolite requirements, and malnutrition can increase the risk of infectious diseases [8].

Mothers with better knowledge of children's nutritional health and prevention of infectious diseases will have awareness in providing better health care for their children and better prevention treatment of infective diseases. It can be concluded that the better the mother knows about the health status of her child, the lower the stunting rate in her child [9]. Increased knowledge of infectious diseases in housewives can be obtained from various sources such as posyandu activities which are one of the means for mothers of toddlers to increase their knowledge.

4.2 Environmental Sanitation Knowledge

Knowledge of environmental sanitation regarding the behavior of housewives towards stunting control is in the moderate category, namely 92 or 60.5%. This shows that the knowledge of sanitation among housewives is generally quite good and some mothers have sanitation facilities but their toddlers are in stunting nutritional status. A person's behavior may be not only judged by his knowledge but there are still attitudes and actions that influence a person's behavior. Having good knowledge does not guarantee that someone will have good attitudes and actions too. This study is in line with Rahmayani's study [10] that adequate knowledge and behaviour about hygiene practices and good sanitation can affect the behavior of a householder with small children or young people in applying good hygienic practices to reduce the risk of stunting of a baby or young person.

The occurrence of stunting can be influenced by several factors such as environmental sanitation, food processing, and also the mother's knowledge of stunting. Environmental sanitation conditions that do not meet healthy requirements will affect the health of children under five which of course can affect the nutritional status of these toddlers. This is because they do not have healthy sanitation facilities and have the potential to cause various infectious diseases that can interfere with the process of absorption of nutrients which in turn will interfere with the growth and development of toddlers. This study shows that parents' awareness of stunting prevention, especially mothers, has a huge influence on the occurrence of stunts in young people. Therefore, it is necessary to increase the knowledge of mothers about environmental hygiene in order to be able to maintain the hygiene of every mother who has a baby so that the issues of physical hygiene, health maintenance, hygiene and sanitation can be improved. Food and the environment can also be well awake [11].

4.3 Behavior Stunting Control

Because of behavior control of maternal stunting House ladder is in the category moderate (129, or 84.9%), obviously the Mother and toddler understand and behave Good For maximizing the decline stunting rate. because it is a necessary effort continuously from society, from a mother who has a toddler, to increase behavior Mother For stunting control and making them more ready.

Behavior Mother House Ladder in study produces 6 good results or demonstrates

behavior that Mother House Ladder needs ongoing attention _ from officer health, incl nurse, midwife, section sanitation and nutrition, still give attention to society, in particular Mother House stairs that have toddlers, in matter stunting control.

The national strategy in the effort to reduce stunting is an integrated intervention to control stunting in young children [12]. Sensitive intervention, special nutrition, and environmental opportunities are three effective ways to control stunting As is well known, parents, in this case the housewife, are the primary indicators of the growth of the child.

Housewives who have good behavior in terms of knowledge, time, and habits will be decisive in preventing malnutrition in children, one of which is stunting. Therefore, housewives with toddlers must continue to improve stunting control behavior for their children by seeking information and sharing their experiences with health workers, posyandu cadres, and other mothers with toddlers. Different health statuses affect children's development, and the inability to meet balanced nutritional needs hinders children's development.

4.4 Relationship between Knowledge of Infectious Diseases and Knowledge of Environmental Sanitation on Stunting Control Behavior

Based on the research results obtained, it was shown that mothers with knowledge of infectious diseases and stunting control behavior obtained a P value (0.012) < (α = 0.05). This shows that there is a significant relationship between knowledge of infectious diseases and the stunting control behavior of housewives. This is in line with other studies which show the same results where there is a relationship between mother's knowledge and behavior in preventing stunting with p = (0.007) < (0.05) [13].

Infectious diseases experienced by toddlers, according to the research conducted, stated that toddlers who often experience diarrhea will be more at risk of experiencing stunting compared to toddlers who do not experience diarrhea. Widari 2019. The effect is in the form of decreased height growth as a result of the zinc mineral in the body which is lost in large quantities, so it is necessary to keep toddlers healthy so they can recover from diarrhea by giving zinc to reduce the severity of toddlers. Likewise in ARI infections that affect eating patterns where there is a decrease in appetite in toddlers if they often experience ARI. The thing that can influence a mother's knowledge and behavior is education. Where the mother's education is sufficient and high so that it will be easier to receive and filter the right information, especially about preventing stunting in children.

The mother's knowledge of stunting control behavior from the research results obtained showed that the mother's knowledge was in the moderate category and most stunting control behaviors were in the moderate category. So the knowledge of mothers who are moderate can produce a fairly good nutritional status for toddlers with good stunting control behavior.

Environmental sanitation knowledge with stunting control behavior shows that a P value (0.098) > (α = 0.05) is obtained. This shows that environmental sanitation knowledge has no significant relationship. This shows that poor sanitation and environmental hygiene can trigger digestive tract disorders, which divert energy for growth to the body's resistance to infection. The research results found that the more often a child suffers from diarrhea, the greater the threat of stunting for him. In addition, when children are sick, their appetite usually decreases, resulting in lower nutritional intake. To break the chain of poor sanitation and hygiene and its link to stunting, pregnant women and children need to live in a clean environment. Research carried out in Banua Rantau village of Banua Lawas district of Tabalong showed that bad sanitary behavior has a relationship of hygiene behaviour with stunting incidents, growth is P value (0,040) > (α = 0,05) [14].

Thus the knowledge possessed by a mother is expected to be able to show a good attitude to carry out a positive action following the knowledge she has mastered, but because many factors influence where a person who has high knowledge does not have a bad attitude, this is due to the conditioning environment that influences a person's actions.

5. CONCLUSIONS AND RECOMMENDATIONS

Knowledge of Infectious Diseases is in the moderate category, as well as knowledge of environmental sanitation is in the moderate category. There is a relationship between

knowledge of infectious diseases and stunting control behavior. There is no relationship between environmental sanitation and stunting control.

Health workers and cadres should be more active in providing information to mothers related to health and environmental issues and related stunting.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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