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THE INFLUENCE OF CLEAN WATER SOURCES ON STUNTING INCIDENTS

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ABSTRACT
Stunting is a significant problem that Indonesia must overcome to produce an excellent cognitive and physical development generation. Stunting is a problem in Bireuen Regency, Indonesia, and must be managed because it has long-term impacts on the future generation. This research is very important to carry out, until now there has been no research on the influence of clean water sources on the incidence of stunting, especially in Bireuen Regency. Research conducted in 137 developing countries shows that clean water sources influence the incidence of stunting. Poor access to clean water the incidence of infectious diseases, so that energy and nutrition for growth and development are diverted by the body's resistance to infectious diseases. The purpose of this research was to find out the effect of clean water source and latrine ownership on stunting occurrence. The study used an analytical, quantitative method with a cross-sectional approach. The research approach to analyze the influence of clean water sources on the incidence of stunting in Pandrah District used quantitative analytical methods with a cross-sectional approach. The sampling technique in this research was a total population of 62 people. Data were analyzed univariately and bivariately, univariate analysis was descriptive while bivariate analysis used the chi-square test to analyze the influence of each independent variable and dependent variable. The research results showed that clean water source had a significant influence on stunting occurrence, with a p-value of 0.002 (which is less than the significance level of 0.05). It could be concluded that clean water source significantly influences stunting occurrence.

Keywords: bireuen; clean water source; stunting

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INTRODUCTION

Stunting is an important problem that must be resolved immediately in Indonesia in order to produce a generation that has good cognitive and physical development. The incidence of stunting in Indonesia still really needs attention from multiple sectors, even though there has been a decline in the last decade, the rate is still high among countries in Southeast Asia. Based on data from the 2021 Indonesian Nutrition Status Survey (SSGI), the prevalence of stunting in Indonesia in 2021 was 24.4% (SSGI, 2021). This figure is included in the high category when compared to the World Health Organization (WHO) provision of 20% (WHO, 2018). Currently, the number of children under five who are stunted in Indonesia has reached more than five million spread across 34 provinces. Figure 1 shows the distribution of stunting incidents by province in Indonesia. The highest prevalence is seen in the Nusa Tenggara, Kalimantan and Sulawesi regions. Meanwhile, the Java-Bali and Maluku regions are in the

medium and low categories. Aceh Province on Sumatra Island is in the quite high category, namely 33.18%, so Aceh Province is among the 7 provinces with the highest stunting cases in Indonesia. (SSGI, 2021).

The Indonesian government continues to strive to reduce the number of stunting incidents, one of which is by issuing Presidential Regulation of the Republic of Indonesia Number 72 of 2021 concerning the acceleration of stunting reduction (Perpres, 2021). Stunting is a health problem that can be a genetic problem. Parents, especially mothers, can contribute to stunting by 26%. Apart from that, stunting is also a degenerative disease that must be immediately resolved in Indonesia in order to produce a generation that has good cognitive and physical development (Kemenkes RI, 2018).

Stunting occurs due to growth and development disorders experienced by children caused by malnutrition or poor nutrition, repeated infections, and psychosocial stimulation provided by parents that is not appropriate for the child's age. Children who experience stunting are more susceptible to disease and when children grow up they are at risk of developing degenerative diseases (WHO, 2018). Apart from that, stunting in toddlers can have short-term impacts such as disruption of brain development, intelligence, physical growth disorders and metabolic disorders in the body. The long-term impact is decreased cognitive abilities and learning achievement, low immunity so that the body is susceptible to disease and is at high risk for the emergence of diabetes, obesity, heart and blood vessel disease, cancer, stroke and disability in old age (Sandjojo, 2017).

Stunting incidents can also occur due to direct and indirect factors. Direct factors in the occurrence of stunting are maternal nutrition during pregnancy, toddler nutrition, and infectious diseases. Toddlers who experience stunting find it difficult to improve their growth and development which will continue until adulthood (Apriluana G & Fikawati S, 2018). Therefore, it is necessary to regularly monitor growth and development during the golden period so that growth and development abnormalities that occur in toddlers can be detected early (Liviana et al, 2019). Apart from that, parents need to carry out stimulation from the time the fetus is in the womb so that the fetus can grow and develop optimally (Nuraina *et al*, 2022). In addition, research (Nuraina et al, 2023) shows that personal hygiene has an effect on the incidence of stunting with a p-value of 0.001 (<0.05), personal hygiene has a significant influence on the incidence of stunting.

Based on this, it is not only the Indonesian government that continues to strive to reduce the prevalence of stunting. Aceh Province, by involving multi-sectors, also continues to strive to reduce the prevalence of stunting. One of them is by recruiting a stunting task force as a convergence action to reduce stunting in the implementation of Presidential Regulation of the Republic of Indonesia Number 72 of 2021 concerning the acceleration of stunting reduction. Furthermore, Bireuen Regency, one of the regencies in Aceh Province, also continues to strive to accelerate stunting reduction by determining stunting focus locations (lokus). Based on the Bireuen Regent's Decree (2022), the stunting focus locations (lokus) are 50 villages spread across 12 Districts. Based on research (Nuraina et al, 2023) he results showed that the prevalence of stunting from 2021-2023 was very high in 2022, namely there were 3 villages with a percentage (>40%) spread across Jeumpa and Peusangan Regencies. However, the largest number of locus villages were found in 2023 with 50 villages. The Bireuen Regency Government continues to strive to prevent stunting so that the next generation in Bireuen Regency becomes a smart and qualified generation capable of

competing globally. This research is very important to carry out, until now there has been no research on the influence of clean water sources on the incidence of stunting, especially in Bireuen Regency. Research conducted in 137 developing countries shows that clean water sources influence the incidence of stunting. Poor access to clean water the incidence of infectious diseases, so that energy and nutrition for growth and development are diverted by the body's resistance to infectious diseases. (Prendergast & Humphrey, 2014).

METHOD

The research was carried out in Pandrah District, Bireuen Regency. The research approach to analyze the influence of clean water sources on the incidence of stunting in Pandrah District used quantitative analytical methods with a cross-sectional approach. The sampling technique in this research was a total population of 62 people. Data were analyzed univariately and bivariately, univariate analysis was descriptive while bivariate analysis used the chi-square test to analyze the influence of each independent variable and dependent variable. The significance limit for statistical calculations is p value (0.05). If the calculation results showed a p value < p value (0.05) then Ho is rejected, meaning that both variables statistically have a significant influence.

RESULTS

Based on the results of the analysis, the following research results were obtained:

Characteristics of mothers of toddlers

Table 1.
Characteristics of mothers of toddlers based on age, education level and occupation

Characteristics	f	%
Age (y.o)		
15-25	10	16,1
26-35	36	58,1
36-45	14	22,6
46-55	2	3,2
Education Level		
Elementary school (SD)	11	17,7
Junior High School (SMP)	15	24,2
High School (SMA)	27	43,5
Bachelor	9	14,5
Occupation		
Farmer	27	43,5
Housewives	29	46,8
Civil servants	6	9,7

Based on table 1 above, it can be seen that the majority of mothers' age was in the range of 26-35 years category as much as 36 people (58.1%), the mother's education level was in the high school category at 27 people (43.5%) and the mother's occupation was in the housewives category, numbered 29 people (46.8%).

Characteristics of toddlers

Based on table 2 above, it can be seen that the majority of toddlers are in the 37-48 months old category. 33 people (53.2%) and the majority of toddlers are in the female category, 37 people (59.7%).

Tabel 2.
Characteristics of toddlers menurut based on age and gender

Characteristics	f	%
Toddlers' age (m.o)		
13-24	12	19,4
25-36	17	27,4
37-48	33	53,2
Gender		
Male	25	40,3
Female	37	59,7

Frequency Distribution of Stunting Incidence

Table 3.
Frequency Distribution of Stunting Incidents on Toddlers

Stunting Incidence	f	%
Stunting	13	21
Normal	49	79

Based on table 3 above, the results of research measurements of toddlers who experience stunting in Pandrah District, Bireuen Regency by measuring height divided by age with a Z-score < -2 SD, namely 13 people (21%).

Distribution of Clean Water Sources

Table 4.
Frequency Distribution of Clean Water Sources

Clean Water Source	f	%
Protected	49	79,03
Unprotected	13	20,97

Based on table 4 above, it shows that the majority of respondents who use protected clean water sources were 49 people (79.03%).

The Effect of Clean Water Sources on Stunting Incidence

Table 6.
The Effect of Clean Water Sources on Stunting Incidence

Clean Water Source	Stunting Incindence				Total		p Value
	Stunting		Not Stunting				
	f	%	f	%	f	%	
Protected	1	1,61	48	77,42	49	79,03	0,002
Unprotected	12	19,35	1	1,61	13	20,97	

Based on table 6, the results of the chi square statistical test analysis obtained a p-value of 0.002 (<0.05). Thus it can be concluded that clean water sources influence the incidence of stunting.

DISCUSSION

Based on research conducted in Pandrah District, the results showed that clean water sources had an effect on the incidence of stunting in accordance with the results of the chi square statistical test, which obtained a p-value of 0.002 (<0.05). This is in line with research conducted (Ardiyanti & Besral, 2014) that children who come from families whose clean water sources are not protected and toilet that do not meet the standards are more at risk of stunting. Other research also stated that the use of clean water sources greatly influences the incidence of disease. Because water is a very important element in the aspect of public health,

where water can be a source and breeding place and a medium for the disease germs. Thus, to prevent the occurrence of disease, people are expected to take water from clean water sources and maintain or protect water sources from pollution by humans and animals (Syam *et a*l, 2017).

Other research also stated that the use of protected clean water sources influences the incidence of stunting. Access to clean water is generally not only used for drinking and cooking purposes, but also for bathing and other purposes. Meanwhile, access to drinking water is specifically for family drinking needs. Access to clean water sources was measured using yes/no and protected/unprotected questions. Sources of clean water and protected drinking water are those that flow to the household level through pipes including tap water (taps), public taps, public hydrants, water terminals, Rainwater Storage, or protected springs and wells, drilled wells or pumps that are at least 10 meters away from sewage, waste storage and rubbish dumps (Hasan & Kadarusman, 2019).

Sources of clean and safe water that are suitable for human consumption must come from clean and safe sources. The boundaries of a clean and safe water source include: 1) Free from contamination by germs or pathogen, 2) Free from dangerous and toxic chemical substances, 3) Tasteless and odorless, 4) Can be used to meet domestic and household needs, 5) Meet the minimum standards determined by WHO or the Indonesian Ministry of Health (Kemenkes, 2018).

Other research also revealed that households that consume drinking water sourced from tap water can increase the incidence of stunting in children compared to households that use tank and well water. This can happen if the quality of tap water used by households does not meet the physical quality requirements compared to tank and well water. Based on Indonesian Minister of Health Regulation No. 32/2017, the physical quality of drinking water must meet health requirements, namely not cloudy/clear, tasteless, odorless, not contaminated with chemicals and free from various microorganisms that can cause children to experience stunting. (Otsuka *et al*, 2019).

Apart from that, this research is also in line with research conducted abroad which revealed that unimproved water increases the incidence of stunting in toddlers. Findings in Ethiopia reveal that drinking water sources are related to the incidence of stunting in children under five (Kwami., et al, 2019). Research by Batiro et al, (2017) in Ethiopia showed that consuming water from unimproved sources has a seven-fold risk of increasing the incidence of stunting in children. Other research says unsafe drinking water sources, distance of the water source from the disposal site, quantity, quality, storage, processing and accessibility of water are related to the incidence of stunting in toddlers (Cumming & Cairncross, 2016; Dodos et al, 2017).

CONCLUSION

Based on the research results and discussion above, it can be concluded that clean water sources influence the incidence of stunting according to the results of the chi-square statistical test, with a p-value of 0.002 (<0.05).

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