Factors related to the incidence of stunting in Nupabomba and Guntarano Villages, Tanantovea District, Donggala Regency

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Abstract People with stunting are generally susceptible to disease, have a level of intelligence below normal and have low productivity. The research objective was to determine the factors associated with stunting in children under. This study was an analytic study with a case control approach, the population in this study of all stunting cases in the villages of Nupabomba and Guntarano, Tanantovea District, Donggala Regency as many as 49 toddlers, the sample in this study was divided into two categories, namely the case group and the control group with comparisons. 1: 1. The bivariate test results showed that there was a relationship between the provision of clean water, toilet ownership and the habit of washing hands with soap in Nupabomba and Guntarano Villages, Tanantovea District, Donggala Regency. The factor of clean water supply, latrine ownership and the habit of washing hands with soap have a significant relationship with the incidence of stunting because the p value obtained is less than 0.05. It is hoped that Wani Puskesmas officers and cadres can provide education about the provision of clean water, ownership of a toilet that meets the requirements and the habit of washing hands with soap and can provide additional information about the relationship between sanitation facilities and stunting.

1. Introduction

According to the World Health Organization (WHO), the prevalence data for children under five, Indonesia is one of the third countries with the highest prevalence in the Southeast Asia/ South-East Asia Regional (SEAR) region. The average prevalence of stunting under five in Indonesia in 2005-2017 is 36.4%.[1] Stunting is a child under five with a z-score of less than -2SD/ standard deviation (stunted) and less than -3SD severely stunted.[2]

Stunting is one of the nutritional problems experienced by toddlers in the world today. In 2017 22.2% or around 150.8 million children under five in the world were stunted. However, this figure has decreased when compared to the stunting rate in 2000, which was 32.6%. In 2017, more than half of stunting children in the world came from Asia (55%) while more than a third (39%) lived in Africa. 83.6 million children under five are stunted in Asia, with the highest proportion coming from South Asia (58.7%) and the lowest proportion in Central Asia 0.9%.[1] Riskesdas 2018 [3] shows an improvement in the nutritional status of children under five in Indonesia. The proportion of stunting or short children under five due to chronic malnutrition fell from 37.2% riskesdas 2013 to 30.8% in riskesdas 2018. The limit of the World Health Organization (WHO) for stunting is <20% and in Indonesia only 7 (seven) districts/cities where the prevalence of stunting is less than 20% (namely Kab. Wakatobi-Sultra, Klungkung-Bali, and Tana Tidung-Kaltara and the City of Pangkalpinang-Babel, Tanjungpinang-Riau, Salatiga-Central Java and Bitung-Sulut.[1] Nutritional Status Monitoring (PSG) in 2017 obtained the prevalence of stunting in Central Sulawesi Province, namely 36.1%. While the results of Basic Health Research (RISKESDAS) data in 2018, the prevalence of stunting in Central Sulawesi Province has
decreased, namely 32.3%. However, the reduction in the prevalence of stunting in Central Sulawesi Province has not met WHO standards. Several regencies that have recorded many stunting are found, including Baggai Islands, Donggala and Morowali.[4]

The Donggala District Office in 2017, the prevalence of stunting in Donggala Regency was 8.4%, while in 2018 the prevalence of stunting in Donggala Regency increased by 24.2%. There are several areas that have recorded a lot of stunting, including Tanantovea District, Labuan District and Pinembani District.[5] According to previous research, there was a relationship between the type of latrine and the incidence of stunting in children under five (p-value = 0.000; Odds Ratio = 0.286; 95% CI 0.177-0.461). The proportion of latrines that used slug toilets in the case group was 18 (40%), while in the control group none of them used slug toilets anymore. With an Odds Ratio value of 0.286, it means that children under five who live in a house with a type of latrine that do not meet the requirements have a 0.3 times greater risk of experiencing stunting than children who live with types of latrines that meet the requirements.[6] 40% of the houses for children who are stunted use goose-neck toilets, while 60% of those who use slug toilets use the toilets. The results of statistical analysis obtained a p-value of 0.000 (<0.05), so it can be concluded that there is a relationship between the incidence of toddler stunting and the type of latrine. Types of toilets that are not suitable (not goose neck) have a tendency to suffer from stunting 0.3 times higher than that of children under five who have proper latrines.[6]

According to the results of Besral's (2014) study, [7] it shows that children who come from families with unprotected water sources and types of latrines that are not suitable have a 1.3 times higher risk of suffering from stunting compared to children who come from families with protected water sources and types proper latrine. The results showed that there were 87.9% of respondents who washed their hands poorly in the case group, while 45.5% of respondents in the control group had poor hand washing habits. The proportion of the case group was higher, 42.4% of the respondents who used to wash their hands less well than the control group. The results of the chi-square test showed that the p-value of hand washing habits on the incidence of stunting was 0.000. This shows that there is a relationship between the habit of washing hands and the incidence of stunting in the working area of the Kotakulon Community Health Center, Bondowoso Regency. Respondents with poor hand washing habits have a 0.12 times the risk of their children experiencing stunting. [8] Children who have a malnutrition or poor status (underweight) based on measurements of body weight for age (BW / U) and short or very short (stunting) based on measurements of height for age (TB/U) which are very low compared to WHO standards have a risk of loss level of intelligence or Intelligence Quotient (IQ) of 10-15 points. [9] Tanantovea District is an area of Donggala Regency in Central Sulawesi with the highest incidence of stunting in 2019 with 49 stunting cases in Nupabomba and Guntarano Villages. Based on the results of observations made by Wani Health Center officers, there are still many people who do not know about the causes of stunting, where one of the causes of stunting is an indirect factor, namely water, sanitation and hygiene, which consists of drinking water sources, physical quality of drinking water, ownership, latrines and hygiene, namely hand washing habits.

2. Methodology

This research was analytic with a case control approach to study the relationship between effects and certain risk factors. The sample size in this study was divided into two categories, namely the case group and the control group. The case group that was taken from all stunting cases, namely 49 children under five with a ratio of 1: 1, the number of control groups was 49 children under five, so that the number of samples in this study was 98 children with age matching (in the same village). Exclusion criteria: cases of stunting and unwillingness to become respondents, cases of stunting not being cared for by their own parents. The sampling technique is that all those who meet the criteria are taken as samples by: listing the respondent's name, address, gender and age and visiting the respondent's house.

3. Results and Discussion

a. Univariate Analysis

1. Nupabomba Village
Provision of clean water in Nupabomba Village, Tanantovea District, Donggala Regency obtained from observations and the results can be seen in table 1 below:

| No | Clean water provision | f | %  |
|----|-----------------------|---|----|
| 1. | Qualify               | 21| 40.4|
| 2. | Not eligible          | 31| 59.6|
| Total |                      | 52| 100|

Based on table 1, the frequency distribution of clean water supply in Nupabomba Village, Tanantovea District, Donggala Regency shows that of the 52 respondents who have clean water supply that does not meet the requirements, 31 (59.6%) are respondents.

Ownership of latrines in Nupabomba Village, Tanantovea District, Donggala Regency obtained from observations and the results can be seen in table 2 below:

| No | Latrine Ownership | f | %  |
|----|-------------------|---|----|
| 1. | Qualify           | 17| 32.7|
| 2. | Not Eligible      | 35| 67.3|
| Total |                  | 52| 100|

Based on table 2, the distribution of latrine ownership frequency in Nupabomba Village, Tanantovea District, Donggala Regency shows that of the 52 respondents who have latrines that do not meet the requirements, 35 (67.3%) are respondents.

The habit of washing hands with soap in Nupabomba Village, Tanantovea District, Donggala Regency which is obtained from the results of observations and the results can be seen in table 3 below:

| No | Latrine Ownership | f | %  |
|----|-------------------|---|----|
| 1. | Qualify           | 16| 30.8|
| 2. | Not Eligible      | 30| 69.2|
| Total |                  | 52| 100|

Based on table 3, the frequency distribution of the habit of washing hands with soap in Nupabomba Village, Tanantovea District, Donggala Regency shows that of the 52 respondents who used to wash their hands with soap that did not meet the requirements, 36 (69.2%) are respondents.

2. Guantarano Village

Provision of clean water in Guantarano Village, Tanantovea District, Donggala Regency obtained from observations and the results can be seen in table 4 below:

| No | Clean water provision | f | %  |
|----|-----------------------|---|----|
| 1. | Qualify               | 23| 46.9|
| 2. | Not Eligible          | 23| 46.9|
| Total |                      | 46| 100|

Based on table 4, the frequency distribution of clean water supply in Guantarano Village, Tanantovea District, Donggala Regency shows that of the 46 respondents who have clean water supply that does not meet the requirements, 23 (46.9%) are respondents.
Ownership of latrines in Guntarano Village, Tanantovea District, Donggala Regency obtained from observations and the results can be seen in table 5 below:

| No | Latrine Ownership | f  | %  |
|----|-------------------|----|----|
| 1. | Qualify           | 16 | 32.7|
| 2. | Not Eligible      | 30 | 61.2|
| Total |                  | 46 | 100|

Based on table 5, the distribution of latrine ownership frequency in Guntarao Village, Tanantovea District, Donggala Regency shows that of the 46 respondents who have latrines that do not meet the requirements, 30 (61.2%) respondents.

The habit of washing hands with soap in Guntarano Village, Tanantovea District, Donggala Regency obtained from observations and the results can be seen in table 6 below:

| No | Handwashing with soap habit | f  | %  |
|----|-----------------------------|----|----|
| 1. | Qualify                     | 11 | 23.9|
| 2. | Not Eligible                | 35 | 76.1|
| Total |                          | 46 | 100|

Based on table 6, the frequency distribution of the habit of washing hands with soap in Guntarano Village, Tanantovea District, Donggala Regency, shows that of the 46 respondents who regularly wash their hands with soap do not meet the requirements, 35 (76.1%) respondents.

b. Bivariate Analysis

Bivariate analysis was carried out with 2 variables which were thought to be interrelated using statistical tests (Chi-Square Test).

1. Nupabomba Village

   The relationship between clean water supply and stunting

| Clean water provision | Stunting incidence | Total | % | P Value | OR |
|-----------------------|--------------------|-------|---|---------|----|
|                       | cases | control |     |         |    |
|                       | F   | %      | F   | %      |    |
| Qualify               | 6   | 23.1   | 15  | 57.7   | 21 | 40.4 | 0.024 | 0.220 |
| Not Eligible          | 20  | 76.9   | 11  | 42.3   | 31 | 59.6 |       |       |
| Total                 | 26  | 100    | 26  | 100    | 52 | 100  |

Based on Table 7, it shows that respondents who have clean water supplies that meet the requirements which become cases of stunting are as many as 6 children under five with a percentage (23.1%) and respondents who have clean water supplies that meet the requirements but are not cases of stunting are as many as 15 children under five percent (57.7%). Meanwhile, respondents who have clean water supply that do not meet the requirements, which are cases of stunting, are as many as 20 children (76.9%) and those who have clean water supplies that do not meet the requirements and do not become stunting cases are as many as 11 children (42.3%).

The relationship between latrine ownership and the incidence of stunting
Table 8 The Relationship between Latrine Ownership and Stunting in Nupabomba Village, Tanantovea District, Donggala Regency, 2020

| Latrine Ownership | Stunting Incidence | Total | P Value | OR |
|-------------------|--------------------|-------|---------|----|
|                   | Cases F % | Control F % | % |
| Qualify           | 3        | 11.5     | 14 53.8 | 17 32.7 | 0.00 | 0.112 |
| Not Eligible      | 23       | 88.5     | 12 46.2 | 35 67.3 |
| Total             | 26       | 100      | 26 100  | 52 100 |

Based on Table 8, it shows that respondents whose latrine ownership that meets the requirements becomes a case of stunting as many as 3 children (11.5%) and respondents whose latrine ownership that meets the requirements but is not a stunting case is 14 children with a percentage (53.8%). Meanwhile, respondents whose latrine ownership that did not meet the requirements became stunting cases as many as 23 children (88.5%) and those whose latrine ownership did not meet the requirements and did not become a stunting case was 12 children (46.2%).

The relationship between the habit of washing hands with soap and the incidence of stunting.

Table 9 The Relationship between Handwashing with Soap and Stunting in Nupabomba Village, Tanantovea District, Donggala Regency in 2020

| Handwashing with soap habit | Stunting Incidence | Total | P Value | Odds Ratio |
|-----------------------------|--------------------|-------|---------|------------|
|                             | Cases F % | Control F % | % |
| Qualify                     | 1        | 3.8     | 15 57.7 | 16 30.8 | 0.00 | 0.029 |
| Not Eligible                | 25       | 96.2    | 11 42.3 | 36 69.2 |
| Total                       | 26       | 100     | 26 100  | 52 100 |

Based on Table 9, it shows that respondents who wash their hands with soap that meet the requirements which become cases of stunting are 1 toddler (3.8%) and respondents who wash their hands with soap that meet the requirements but are not cases of stunting are 15 toddlers (57.7%). Meanwhile, respondents who used to wash their hands with soap that did not meet the requirements became cases of stunting as many as 25 toddlers (96.2%) and those who used to wash their hands with soap that did not meet the requirements and did not become cases of stunting were 11 children (42.3%).

Table 10 The Relationship between clean water supplies and Stunting in Guntarano Village, Tanantovea District, Donggala District, 2020

| Clean water supply | Stunting Incidence | Total | P Value | Odds Ratio |
|--------------------|--------------------|-------|---------|------------|
|                   | Cases F % | Control F % | % |
| Qualify           | 4        | 17.4     | 19 82.6 | 23 50.0 | 0.000 | 0.029 |
| Not Eligible      | 19       | 82.6     | 4 17.4 | 23 50.0 |
| Total             | 26       | 100      | 26 100  | 46 100 |

Based on Table 10, it shows that respondents who have clean water supplies that meet the requirements are 4 under-five (17.4%) and respondents who have clean water supplies that meet the requirements but are not stunting cases are 19 (82.6%). Meanwhile, respondents who had clean water supply that did not meet the requirements were 19 children under five (82.6%) and those who did not meet the requirements and did not become stunting cases were 4 children (17.4%).

The relationship between latrine ownership and the incidence of stunting
Table 11 The Relationship between Latrine Ownership and Stunting in Guntarano Village, Tanantovea District, Donggala District, 2020

| Latrine ownership | Stunting Incidence | Total | % | P Value | OR |
|-------------------|--------------------|-------|---|---------|----|
|                   | Cases              | Control |    |         |    |
|                   | F %                | F %    |   |         |    |
| Qualify           | 2                  | 8,7    | 14| 60,9    | 16 |
|                   | 34,8               | 0,00   |    | 0,061   |    |
| Not Eligible      | 21                 | 91,3   | 9 | 39,1    | 30 |
|                   | 65,2               | 0,00   |    | 1       |    |

Based on Table 11, it shows that respondents whose latrine ownership that meets the requirements is a case of stunting as many as 2 toddlers (8.7%) and respondents whose latrine ownership that meets the requirements but is not a stunting case is 14 children (60.9%). Meanwhile, respondents whose latrine ownership that did not meet the requirements were 21 underfives (91.3%) and whose latrine ownership that did not meet the requirements and did not become a stunting case was 9 children (39.1%).

The relationship between the habit of washing hands with soap and the incidence of stunting

Table 12 The Relationship between Handwashing with Soap and Stunting in Guntarano Village, Tanantovea District, Donggala Regency in 2020

| Handwashing with soap habit | Stunting Incidence | Total | % | P Value | Odds Ratio |
|-----------------------------|--------------------|-------|---|---------|-----------|
|                             | Cases              | Control |    |         |           |
|                             | F %                | F %    |   |         |           |
| Qualify                     | 1                  | 4,3    | 10| 43,5    | 11        |
|                             | 23,9               | 0,006  |    | 0,059   |           |
| Not Eligible                | 22                 | 95,7   | 13| 56,5    | 35        |
|                             | 76,1               |        |    |         |           |

Based on Table 12, it shows that respondents who wash their hands with soap that meet the requirements which become cases of stunting are 1 toddler (4.3%) and respondents who wash their hands with soap that meet the requirements but are not cases of stunting are 10 toddlers (43, 5%). Meanwhile, respondents who used to wash their hands with soap that did not meet the requirements were 22 toddlers (95.7%) and those who did not meet the requirements and did not become stunting cases (56.5%).

4. Discussion

Nupabomba Village The Relationship between Clean Water Supply and Stunting Based on the results of the univariate analysis of the 52 respondents in the survey, it was found that 31 (59.6%) respondents who had clean water supply did not meet the requirements. The results of the bivariate analysis of 52 respondents showed that 31 (59.6%) respondents had clean water supplies that did not meet the requirements. The p value is 0.024 <0.05, which means that Ha is accepted and Ho is rejected, so it can be said that there is a significant relationship between the provision of clean water and the incidence of stunting in Nupabomba Village, Tanantovea District, Donggala Regency and an odds ratio value of 0.220 <1.00 means that the tendency respondents whose clean water supply does not meet the requirements increase the risk of children under five with stunting 0.220 times higher than the provision of clean water that meets the requirements. The results of this study are in line with Zairinayati and Purnama (2019) [6] regarding the Relationship between Hygiene and Environmental Sanitation with Stunting that there is a relationship with Water Supply Clean with the incidence of stunting p-value 0.001 <α = 0.05, Ho in this study was rejected, meaning that there is a relationship between the provision of clean water and the incidence of stunting.

Based on the results of the univariate analysis of the 52 respondents who were surveyed, it was found that 35 respondents who had latrines did not meet the requirements. The results of the bivariate analysis of 52 respondents showed that 35 (67.3%) respondents had latrines that did not meet the requirements. Obtained p value 0.003 <0.05, which means that Ha is accepted and Ho is rejected, so it can be said that there is a significant relationship between latrine ownership and the incidence of stunting in Nupabomba Village, Tanantovea District, Donggala Regency.
Village, Tanantovea District, Donggala Regency and an odds ratio value of 0.112 <1.00 means that the respondent's tendency Those who have latrines that do not meet the requirements increase the risk of children under five being stunted 0.112 times higher than having a toilet that meets the requirements. The results of this study are in line with the research of Zairinayati and Purnama (2019) [6] on the Relationship of Environmental Hygiene and Sanitation with the Incidence of Stunting that there is a relationship between latrine ownership and incidence. Stunting p-value 0.000 <α = 0.05, so, Ho in this study was rejected, meaning that there is a relationship between latrine ownership and the incidence of stunting. The Relationship between Handwashing with Soap and Stunting Based on the results of the univariate analysis of the 52 respondents in the survey, it was found that 36 (69.2%) respondents who had the habit of washing their hands with soap did not meet the requirements. The results of the bivariate analysis of 52 respondents showed that 36 (69.2%) respondents had the habit wash your hands with soap that does not meet the requirements. The obtained p value is 0.000 <0.05, which means that Ha is accepted and Ho is rejected, so it can be said that there is a significant relationship between the habit of washing hands with soap and the incidence of stunting in Nupabomba Village, Tanantovea District, Donggala Regency and an odds ratio value of 0.029 <1.00 is obtained. that the tendency of respondents who wash their hands with soap does not meet the requirements increases the risk of stunting for toddlers by 0.029 times higher than the habit of washing hands with soap that meets the requirements. The results of this study are in line with the research of Sinatrya and Muniroh (2019) [8] concerning the Relationship between Sanitation and Hygiene Factors with The incidence of stunting that there is a relationship between the habit of washing hands with soap and the incidence of stunting p-value 0.000 <α = 0.05, so, Ho in this study was rejected, meaning that there is a relationship between the habit of washing hands with soap and the incidence of stunting in children under five.

Based on the results of the univariate analysis of the 46 respondents who were surveyed, it was found that respondents who had clean water supplies that did not meet the requirements were 23 (46.9%). Based on the results of the bivariate analysis of 46 respondents, 23 (46.9%) respondents had clean water supply that did not meet the requirements. The obtained p value is 0.000 <0.05, which means that Ha is accepted and Ho is rejected, so it can be said that there is a significant relationship between the supply of clean water and the incidence of stunting in Guntarano Village, Tanantovea District, Donggala Regency and an odds ratio value of 0.044 <1.00 means that the tendency respondents whose clean water supply did not meet the requirements increased the risk of children under five with stunting 0.044 times higher than that of providing clean water that met the requirements. b. The relationship between latrine ownership and stunting Based on the results of the univariate analysis of the 46 respondents who were surveyed, it was found that 30 (61.2%) respondents had unqualified toilets (61.2%). The results of the bivariate analysis of 46 respondents showed that 30 (61.2%) respondents had latrines that did not meet the requirements. The obtained p value is 0.001 <0.05, which means that Ha is accepted and Ho is rejected, so it can be said that there is a significant relationship between latrine ownership and the incidence of stunting in Guntarano Village, Tanantovea District, Donggala Regency and an odds ratio value of 0.061 <1.00 means that the respondent's tendency having a latrine that does not meet the requirements increases the risk of children under five being stunted 0.061 times higher than having a toilet that meets the requirements.

Based on the results of the univariate analysis of the 46 respondents who were surveyed, it was found that respondents who had the habit of washing their hands with soap that did not meet the requirements were 35 (76.1%). The results of the bivariate analysis of 46 respondents showed that 35 (76.1%) respondents had a habit of washing their hands with soap which did not meet the requirements. Obtained p value 0.006 <0.05, which means that Ha is accepted and Ho is rejected, so it can be said that there is a significant relationship between the habit of washing hands with soap and the incidence of stunting in Guntarano Village, Tanantovea District, Donggala Regency and the odds ratio value is 0.059 <1.00 water. that the tendency of respondents who wash their hands with soap does not meet the requirements increases the risk of children under five with stunting 0.059 times higher than the habit of washing hands with soap that meets the requirements.
5. Conclusion

The clean water supply factor has a significant relationship with direct incidence because the p value obtained is less than 0.05. The latrine ownership factor has a significant relationship with direct incidence because the p value obtained is less than 0.05. The habit of washing hands with soap has a significant relationship with the incident because the p value obtained is less than 0.05.

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