Determinants of Diarrhoea Incidence in Toddlers: Epidemiological Studies

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Abstract

This study was to determine the influence of environmental factors and social-cultural toward the incidence of diarrhoea. The methodology used in this study is a quantitative method by applying an analytical survey with a cross-sectional approach. The population of this research was all mothers who have babies in the Lueng Keube Jagat Health Center in Working Area Tripa Makmur Subdistrict, Nagan Raya Regency, as many as 1,792 mothers. Further, the sample is taken by implementing a simple random sampling technique, as many as 95 mothers. Data analysis used in this study is univariate, bivariate and multivariate analysis. The results showed that there was a significant influence between the environmental factors (p value <0.05, RP = 15.9) and socio-culture factors (p value <0.05, RP. 14.0) with the incidence of diarrhoea in infants.

Keywords: Environmental factor, Social Culture, Diarrhea, and Toddlers.

Introduction

Diarrhoea is a condition in which the faeces excreted abnormally. The abnormality occurs increasing of volume of faeces a liquid and the frequency of the excretion either with or without bloody mucus, which is three times or more a day1. A person is said to suffer diarrhoea when he/she excretes more mucous faeces, or defecates three times or more, or excretes mucus faeces without blood within 24 hours.1

There are some right and practical actions that can prevent diarrheal disease, generally by living a healthy life. Some practices can do the prevention of diarrhoea in children. There are a fully breastfeeding the baby for six months, providing complementary feeding to get used to adult food gradually, disposing baby’s faeces correctly, and giving measles immunization immediately after they are nine months old. Another activity that can prevent the occurrence of diarrhoea is by creating a healthy environment, consisting of providing clean water, waste management, and wastewater disposal2. Clinically, the causes of diarrhoea grouped into six factors, which are infection (bacteria, viruses, parasites), allergies to foods such as spicy food, etc., poisoning, immunodeficiency, and other causes.2

Human behaviours or activities are someone’s responses to stimuli associated with illness and disease. These behaviours include improving and maintaining health, preventing illness, seeking treatment, and caring for health care, food, and environment systems. Also, it contains behaviours towards the environment. Moreover, health behaviour is also necessary since it relates to someone’s actions in maintaining and improving health, including efforts to prevent disease, maintain personal hygiene, choose food, and take care of sanitation. According to WHO and UNICEF, there are around 2 billion cases of diarrhoea occurring every year worldwide. Of all deaths of children under five due to diarrheal disease, 78% occur in the African and Southeast Asia.3
The number of diarrhoea cases in Indonesia in 2012 was 1,654 cases and resulted in the death of 34 people. Whereas in 2013, the number of diarrhoea cases was as many as 646 cases with seven fatalities. The number of evidence in Indonesia in 2014 was estimated at 8,713,537 cases, while the cases handled were 8,490,976 cases. In 2015, the number of cases estimated at 5,405,235 cases and the cases handled were only 4,017,851 cases.

In Aceh Province, the number of diarrhoea cases in 2013 was estimated at 196,948 cases, of which 98,525 (50.03%) were experienced by men and 98,423 (49.97%) experienced by women. The number of cases handled was limited to 107,582, of which 51,343 cases (52.1%) in men and 56,239 cases (57.1%) in women. In 2015, the cases estimated at 101,368 cases and the number of diarrhoea cases handled was only 64,589 cases.

Specifically, in Nagan Raya Regency, the number of diarrhoea cases in 2014 was estimated at 2,521 cases (2.10%), and the number of cases handled was 2,438 cases (93.13%). Meanwhile, in 2015, the cases were estimated at 3,517 cases (3.20%), and the cases handled were 3,286 cases (93.4%). In 2016, the cases estimated at 3,496 cases (2.25%) and those handled were 3,329 cases.

Based on observations in the field, it is seen that many infants experience diarrhoea in the work area of the Health Center of Lueng Keubeu Jagat because of the less clean environment and unhealthy behaviours of the family. This statement based on the results of the interviews with twelve mothers who have 0-1-year-old babies. From the interview, there were nine mothers whose babies had experienced diarrhoea and some even vomiting with diarrhoea. Three mothers stated that this happened because their children had been fed with stale milk, while the other two claimed their carelessness caused the diarrhoea for good supplementary food given to the children. The mothers followed their parents’ advice to abstain from certain foods during childbirth which had been a tradition or culture for generations, but they do not know that these are the cause of diarrhoea in infants. The other four mothers said that their children had diarrhoea because their children were eating not suitable food, e.g. not proper porridge.

### Method

This study is a survey with a cross-sectional approach, where the free and bound variables studied at the same time. This study aims to find out the effect of environmental and social culture on the occurrence of diarrhoea in infants the Health Center of Lueng Keubeu Jagat, Nagan Raya Regency, Indonesia. The study carried out from November 16, 2017, to February 8, 2018. The population of this study was 1,792 mothers who had babies 0-59 months in the Lueng Keube Jagat. The sample used in this study was 95 mothers who had babies from 0 to 59 months, who were selected by simple random sampling.

**Results**

**Respondents’ Characteristics:** Concerning the Distribution of Respondents about Environmental Factor on Diarrhea Occurrence, the following information obtained through univariate analysis. It obtained from the questionnaire that mothers who used clean water every day are only 34 mothers out of 95 (32%). Then, those who use the health-standard toilet, whose house has a good garbage dump, who always cover their babies’ food and equipment, and who use boiled water for baby’s milk are only 37 out of 95 respondents (37%), equally. While the other 58 mothers do not conduct all these practices. Concerning environmental and socio-cultural factors, it obtained that mothers coming from a good environment are 41 mothers (43.2%) while those coming from the poor environment are 54 mothers (56.8%). Then, those coming from the supportive social culture are 38 mothers and who do not are 57 mothers.

Regarding the socio-culture factor, the information is as in the following. In regards to socio-cultural support, there are only 31 mothers who give ORS when their babies are experiencing diarrhoea. The rest do not. And 29 of them carry the baby herbs to cure his/her diarrhoea instead of taking him/her to the health centre. However, 66 mothers do not do this. Next, 37 mothers believe that they should avoid particular food after giving birth. Later, 31 of them stated that newborns should only be breastfed, while only 37 agreed that they should be fed on bananas or other complementary food. However, 66 mothers believe that diarrhea in babies is not common, while the rest think it is common because they still eat a little amount of food. Furthermore, there are only 41 mothers who informed that their babies have three bowels movement a day, while the rest do not. And on average, there are 44 mothers whose children have experience diarrhoea as infants.
**Bivariate and Multivariate Analysis:** Later, concerning the results of the bivariate analysis, the information is as shown in the tables below.

### Table 1. The Influence of Environmental Factors on the Diarrhoea Occurrence

<table>
<thead>
<tr>
<th>Environment</th>
<th>The Occurrence of Diarrhea</th>
<th>Total</th>
<th>p-Value</th>
<th>RP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Good</td>
<td>2</td>
<td>4.9</td>
<td>39</td>
<td>95.1</td>
</tr>
<tr>
<td>Poor</td>
<td>42</td>
<td>77.8</td>
<td>12</td>
<td>22.2</td>
</tr>
</tbody>
</table>

Based on the result of the chi-square test, it obtained the value is 0,000 < α = 0.05 so that there is an influence of environmental factor on the occurrence of diarrhoea in the area where this research conducted. Further, the results of RP = 15.944 shows that the poor environment has a risk of 15,944 times for the occurrence of diarrhoea in infants in the area.

### Table 2. The Influence of Social and Cultural Factor on Diarrhoea Occurrence

<table>
<thead>
<tr>
<th>Socio-culture</th>
<th>The Occurrence of Diarrhoea</th>
<th>Total</th>
<th>p-Value</th>
<th>RP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Supportive</td>
<td>2</td>
<td>5.3</td>
<td>36</td>
<td>94.7</td>
</tr>
<tr>
<td>Unsupportive</td>
<td>42</td>
<td>73.7</td>
<td>15</td>
<td>26.3</td>
</tr>
</tbody>
</table>

The p-value = 0,002 < α = 0.05 proves that there is an influence of social and cultural factor on the occurrence of diarrhoea and the results of RP = 14.000 shows that the unsupportive social and cultural environment has a risk of 14,000 times for the occurrence of diarrhoea.

### Table 3. The correlation between Environmental and socio-cultural variable on infant diarrhoea occurrence

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>p-value</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>Good</td>
<td>0,000</td>
<td>4,634 - 341,243</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social and Culture</td>
<td>Supportive</td>
<td>0,002</td>
<td>2,445 – 232,325</td>
</tr>
<tr>
<td></td>
<td>Unsupportive</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The logistic regression test results with p < 0.05 (95% CI: 4,634 - 341,243), this shows that there is a powerful influence between the environment on the incidence of diarrhoea in infants. Likewise, socio-cultural variables show that the value of p < 0.05 (2,445 – 232,325), proves that there is a strong influence between social culture on the incidence of diarrhoea in infants.

**Discussions**

**Environmental Impacts:** First, below is described the results concerning the environment impact on diarrhoea occurrence in infants. Despite the fact of living in a clean environment, the mothers whose children encountering diarrhoea caused by the mothers’ negligent behaviour of not minding the cleanliness of their babies. Contrarily, the mothers who lived in a clean environment and did not have infants encountering diarrhoea was because the children’s hands regularly washed, and their food was always covered. Hence, it can be claimed that flies are one of the factors causing diarrhoea in infants.

Besides uncovered food, those living in an unclean domain and had their children encountering diarrhoea was because there was a lot of food waste smelling extremely horrible and, again, invites flies. This condition is exceptionally perilous for children’s health. Likewise, the kitchen utensils were also not covered. This finding is following the consequences of different studies expressing that mothers’ behaviour affects diarrhoea occurrence in infants.
As indicated by Mwambete and Joseph, there are a few factors that extend the danger of babies encountering diarrhoea, for example, ecological elements that incorporate waste arrangement, sewage and water sources. Inappropriate handling of waste and sewage can also cause diarrhoea. This condition caused because the flies that have landed on garbage will later land on food. Moreover, diarrhoea can happen through polluted water, either from its source or from the storing place at home.

Another factor is housing and settlements. Settlements are a piece of the environment that may be out of individual control both in urban and remote areas. It works as neighbourhoods/individual situations and where the activities to help the livelihoods done. Housing and settlements are two things that cannot be isolated and firmly identified with monetary action issues, industrialization and local development. This result is in line with Marlina’s study (2015) expressing that there was a massive impact of environmental cleanliness on the diarrhoea occurrence in the family unit setting in Kedaung Wetan Tangerang region and the relationship between the incidence of health behavior based on environmental sanitation aspects.

Muliati (2017) found that the level of children under five years old who suffered from diarrhoea in the last 3 months was 89.1%, while those who lived in a clean environment was only 4.2%. The p-values of was precisely 0.000> α 0.05, so it deciphered that there was a connection between environment and diarrhoea occurrences in the Mangkang Health Center. Moreover, Megasari (2015) further obtained that those living in poor environmental sanitation was 0.265 occasions higher to experience diarrhoea compared to those living in great natural sanitation in Barito Kuala. Godana and Mengiste (2013) suggest that the absence of ecological sanitation will expand the occurrence of diarrhoea.

Socio-cultural Impacts: Second, the description of the results concerning the social and cultural impact is as follows. The researchers found that those living in a steady and social condition and having diarrhoea children, was because they lived in their relatives’ homes. For example, the baby was allowed to play in muddy puddles. Besides, the mothers choose to give breast milk directly, not using bottles. This practice can minimize the risk of diarrhoea. Respondents who lived in an unsupportive social and cultural condition and had a child encountering diarrhoea spurred by the behaviour of the moms who did not exactly think about one another, and there was no frequent collaboration. The infants were permitted to play uninhibitedly as long as it was not risky. However, this circumstance made the infant experience diarrhoea.

Culture is a way or frame of the human mind in managing nature and environment which incorporates the results of imagination, taste, goal, and work either physically, mentally, colloquially, or spiritually. Culture regards all parts of human life, both material and non-material. Most specialists see that culture will create from a straightforward stage to an increasingly perplexing stage. The study uncovered the impact of waste arrangement on the diarrhoea occurrence in children in Pallangga Public Health Center, Gowa (p-value 0.02820). The study additionally found the effects of social and culture on the diarrhoea occurrence in children under five years old in Aceh Baroh Pasie Town, which situated in Meureubo, West Aceh.

This examination is in accordance with Ogbo, Aina, and Aderemi (2014), in regards to the connection between ecological sanitation and social variables and diarrhoea occurrence. Children and environmental cleanliness impact both on children’s physical and psychological entity. Children living in poor conditions maintain intestinal worms and diarrhoea. Thus, sufficient educational supervision to generate a clean environment for children’s growth and development is profoundly necessary.

Conclusions

There is an influence of environmental and social and cultural factors on the occurrence of diarrhoea in infants (p-value <0.05), but the environmental factor has a more significant impact on the appearance of diarrhoea in infants. Further research is needed to see the possibility of other factors that influence the occurrence of diarrhoea in infants.

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