

Analysis of community perspectives regarding the hygiene-sanitation and socio-economic factors influencing the occurrence of diarrhea in toddlers: A literature review

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Abstract

Diarrhea is a disease that causes the second highest morbidity and mortality rate in toddlers after pneumonia. Poor and developing countries generally exhibit high incidence rates of diarrhea, thus diarrhea is often associated with poor socio-economic conditions and inadequate sanitation. Understanding the caregivers' perspectives on the factors contributing to diarrhea is crucial for the prevention and management of diarrhea, aiming to reduce the morbidity and mortality rates among toddlers. The aim of this research is to analyze the community perspectives on the factors of hygiene-sanitation and socio-economic factors influencing the occurrence of diarrhea in toddlers. The research methodology employed is a literature review, which assesses the occurrence of diarrhea in toddlers based on both hygiene-sanitation factors and socio-economic factors from the community's perspective. The data used consists of a minimum of 10 scientific journals obtained from Google Scholar and ResearchGate databases. The research findings indicate that, in terms of hygiene-sanitation, the factors contributing to diarrhea include the lack of cleanliness and hygiene practices implemented by caregivers of toddlers, untreated or unprotected water sources, inadequate availability of water, low utilization of sanitation facilities, unhygienic living conditions, and water contamination during the rainy season. Meanwhile, in terms of socio-economic factors, it is influenced by the knowledge and education of caregivers, financial status, resource limitations, and community acceptance of interventions for improving water, sanitation, and hygiene. From these results, it can be concluded that there is a correlation between the risk factors of diarrhea and the occurrence of diarrhea in toddlers, as observed from both hygiene-sanitation and socio-economic perspectives.

Keywords: Diarrhea; Hygiene; Sanitation; Toddler

1. Introduction

Diarrhea is a disease burden that causes mortality and morbidity in children. According to UNICEF and WHO, diarrhea is the second leading cause of death and illness in children under five years of age (toddlers), following pneumonia [1]. Research by G. Njeri and M. Moses stated that 18% (1.5 million out of 9 million) of deaths in toddlers worldwide occur due to diarrhea each year [1]. High mortality due to diarrhea also occurred in the previous decade, specifically in 2003, when diarrhea accounted for approximately 22% of the 10.8 million global deaths in toddlers. Additionally, in 2012, it was estimated that 15% of the 8.79 million toddler deaths worldwide were caused by diarrhea [2,3]. In addition to being a cause of child mortality, diarrhea is also often associated with hospitalization [2]. The data indicates that diarrhea in children should not be taken lightly by anyone, especially caregivers who are directly involved with toddlers.

The role of caregivers or family members is crucial, particularly when it comes to making decisions related to the health condition and future of toddlers. The toddler phase is often referred to as the "golden age" because it is a determining factor for the success of a child's growth and development in subsequent periods. Parenting styles, habits, and

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inappropriate decision-making during this precious period can have fatal consequences for the health of toddlers. Poor parenting characterized by a lack of attention to environmental cleanliness and hygiene behavior makes toddlers more susceptible to infections or diseases such as diarrhea. Furthermore, inappropriate decision-making in the management of diarrhea can lead to mortality in toddlers [4].

The high rates of mortality and morbidity caused by diarrhea predominantly occur in poor and developing countries. This is evidenced by the findings of several studies that demonstrate the link between socio-economic factors, such as poverty and limited resources, and the occurrence of diarrhea. Research by Maccado et al. [2] mentioned that cases of diarrhea in Ceara, Brazil are associated with socio-economic conditions, including poor basic sanitation. This statement aligns with previous research Srivastava et al. [5] has stated that poverty, malnutrition, poor hygiene, and limited resources are risk factors for diarrhea.

Various efforts have been made by the government to reduce the morbidity and mortality rates caused by diarrhea. One of these efforts is the improvement of water, sanitation, and hygiene. However, in reality, these programs do not always yield the expected results. Community-based interventions often encounter obstacles during implementation in the field. These obstacles can include community resistance due to differing perspectives and the influence of local culture, leading to suboptimal outcomes of the interventions. Therefore, this research aims to analyze the community perspectives on hygiene-sanitation factors and socio-economic factors influencing the occurrence of diarrhea in toddlers, in order to ensure that interventions conducted within the community can be maximally effective.

2. Material and methods

This study is a qualitative research employing the literature review method and adopting a descriptive analysis approach. Literature review is an activity that involves re-examining various publications previously published by academics or other researchers related to the topic under investigation [6]. The data used in this study were sourced from scientific articles in national and international journals, obtained from databases such as Google Scholar and ResearchGate, using keywords such as "diarrhea", "sanitation and hygiene", "toddler", and "qualitative study". The inclusion criteria for this research were scientific articles published within the last 10 years (2013-2023). The collected data were then analyzed by organizing the data through data reduction, which involved focusing, simplifying, sorting, and thematically categorizing the data to clarify and eliminate unnecessary information, facilitating the drawing of conclusions. Subsequently, the data were presented in tables for both the results and the discussion sections, and finally, conclusions were drawn.

3. Results

3.1. Causes of Diarrhea Examined from the Perspective of Hygiene and Sanitation

Table 1 Factors of Hygiene and Sanitation Related to the Occurrence of Diarrhea in Toddlers

| | Primary Empirical Sources | Factors of Hygiene and Sanitation |
|---|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| 1 | Yanti et al [1]; Yalew [3]; Srivastava et al. [5]; Mosisa et al. [7]; and Godana & Mengistie [8]. | Lack of cleanliness and hygiene practices implemented by caregivers of toddlers |
| 2 | Yanti et al [1]; Srivastava et al. [5]; Godana & Mengistie [8]; and Tamene [9]. | Untreated water, unprotected drinking water sources |
| 3 | Godana & Mengistie [8]; Ray & Smith [10]; | Inadequate availability of water hindering hygiene practices |
| 4 | Yanti et al [1]; Godana & Mengistie [8]; | Low utilization of sanitation facilities |

| | | |
|---|---------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| | Lawrence et al. [10]; and Kuhl et al. [12]. | |
| 5 | Yanti et al [1]; Srivastava et al. [5]; and Kuhl et al. [12]. | Uncovered drainage channels, living near drainage channels, and living in proximity to pets |
| 6 | Yalew [3] and Srivastava et al. [5]. | Water contamination due to rainy seasons |

Based on the analysis of the collected articles, the following findings were found:

3.1.1. Insufficient Hygiene Practices by Toddler Caregivers

The research findings conducted by Mosisa et al. [7] explain that children with parents or caregivers who do not wash their hands at critical times are 10.6 times more likely to experience diarrhea compared to children whose parents or caregivers wash their hands at critical times. This finding is consistent with the research conducted by Yalew [3] in the rural districts of West Ethiopia, which explains that diarrhea in children is caused by inadequate hygiene practices. Research by Yanti et al [1] in Pagar Alam City, Indonesia, also provides similar evidence that the community exhibits attitudes that reflect an unhealthy lifestyle, which contributes to the occurrence of diarrhea. In Pagar Alam City, the number of diarrhea cases exceeds 1000 and exhibits fluctuating patterns.

Research Results Srivastava et al. [5] further reinforce the previous statement that minimal hygiene practices affect children's health. The participants in the study expressed the opinion that toddlers require closer supervision as they often come into contact with dirt or mud while playing. Additionally, another research finding successfully identified that the implementation of hygiene practices is also influenced by the presence of a reinforcing factor, namely health educators. This occurrence was observed in the Dirashe District, South Ethiopia [8]. All of the above research findings serve as evidence that public awareness of hygiene practices is still very low. The community has not fully realized the importance of hygiene practices and the consequences of not adhering to them.

3.1.2. Untreated Drinking Water and Unprotected Water Sources

In research Yanti et al [1] the occurrence of diarrhea is linked to drinking water sources. The research findings established that the majority of drinking water sources come from tap water and groundwater obtained from drilling or wells. Only about 37% of the population has access to quality drinking water. Children who consume water from open wells have a 34% higher risk of experiencing diarrhea compared to those using protected water sources.

Godana & Mengistie [8] Conducting research in the Kebeles Village, South Ethiopia, it was found that all residents did not use piped water but relied on river water and unprotected water sources. The study also explained that unsafe drinking water contributed to 88% of diarrhea cases. This statement aligns with previous research Srivastava et al. [5] stated that the lack of safe and clean drinking water, wastewater contamination in water sources, and the tendency to use untreated water are risk factors for illness and death in children. In rural areas of Ethiopia, only 21.8% of households have access to protected drinking water, while the rest rely on boreholes and rainwater as their drinking water sources. As a result, several disease outbreaks in Ethiopia are caused by biological contamination in water [9].

Based on Tamene's research [9] the average level of knowledge among the community regarding water treatment is considered high. Only 2.58% of the participants had no knowledge of the water treatment process at all. On average, the participants in the study were able to mention 1 to 4 water treatment methods. However, there are factors that influence water treatment, such as the varying definitions of clean and safe drinking water quality among the participants. These differences in perception can be classified based on different levels, including the individual level, household level, community level, and related factors within the environment.

3.1.3. Inadequate Availability of Water

Research Godana & Mengistie [8] In the Kebeles Village, Dirashe District, South Ethiopia, the study found that water scarcity is a major issue for the local community. The lack of water availability is the biggest barrier to practicing personal hygiene, such as handwashing. This statement is supported by previous research Ray & Smith [11] that highlights how individuals living in poverty are concerned about access to water and sanitation. The inequality between high-income and low-income countries has led to increased mortality and morbidity due to poverty, including water scarcity, which hinders the practice of handwashing.

3.1.4. Low Utilization of Sanitation Facilities

The occurrence of diarrhea is associated with inadequate fecal disposal. In 2014, in Pagar Alam City, Indonesia, only about 37% of the total population had access to proper sanitation facilities (healthy toilets), while the rest had inadequate sanitation. Inadequate sanitation can increase the risk of diarrhea in children by 2.55 times [1]. In line with the aforementioned statement, research conducted by Godana & Mengistie [8] also indicates that unhealthy human waste disposal contributes to 88% of diarrhea cases. The utilization of toilets in that village is extremely minimal, as evidenced by 38.1 million residents practicing open defecation. Sadly, waste disposal is done near houses where children play, in open fields, and outside of toilet facilities. As a result of these practices, approximately 23% of total toddler deaths are caused by diarrhea.

Data from the Joint Monitoring Programme by WHO/United Nations Children's Fund (UNICEF) also indicates that approximately 5.6 million people in Zambia lack access to improved sanitation, and only 36% of the rural population has access to improved sanitation. This high burden contributes to the elevated mortality and morbidity rates of diarrhea in Zambia [10].

Research by Kuhl et al. [12] reveals that there is a variety of behaviors related to the disposal of children's feces. Some participants dispose of feces in diapers while their children are playing in the yard, some dig holes to dispose of their children's feces, and others create small holes next to the toilet for their children to use. Additionally, there are cases where feces disposal is delayed due to parents being occupied with work. The research also mentions that the fecal pathogen exposure pathway is a major contributor to childhood morbidity in the South Kivu region of the Democratic Republic of Congo. In the past 10 years, annual deaths in the Democratic Republic of Congo have been caused by diarrheal diseases [12].

3.1.5. Residential Location

From the research findings, Yanti et al [1] stated that residents living near rivers have a low awareness of clean and healthy living, as evidenced by their practice of defecating in rivers or drains. The residential location in geographically inaccessible areas and poor housing conditions are also risk factors for childhood diseases, including diarrhea [5]. The residential location of communities in close proximity to domestic animals such as cows, pigs, goats, chickens, and others can also be a risk factor for the occurrence of diarrhea, considering that the fecal pathogen exposure pathway, including animal waste, is a contributor to childhood morbidity [12].

3.1.6. Water Contamination due to Rainy Seasons

Based on research, Yalew [3] the participants involved in the research revealed that the high incidence of diarrhea is associated with the rainy season and its impact on water sources. In line with this, the study Srivastava et al. [5] demonstrates results that stagnant floodwater, which creates an unhygienic environment, increases the risk of health issues.

3.2. Causes of Diarrhea Examined from the Perspective of Socio-economic Factors

Table 2 Socio-economic Factors Influencing the Occurrence of Diarrhea

| | Primary Empirical Sources | Socio-economic Factors |
|---|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 1 | Srivastava et al. [5]; Tamene [9] Lawrence et al. [10]; and Kuhl et al. [12]. | Knowledge and Education |
| 2 | Srivastava et al. [5] Tamene [9] Ray & Smith (11); and Kuhl et al. [12]. | Financial Status and Resource Limitations |
| 3 | Lawrence et al. [10] | Acceptance of Interventions (Improvement of Water and Sanitation in Diarrhea Prevention) |

Based on the analysis of the collected articles, the following findings were found:

3.2.1. Knowledge and Education

Research Srivastava et al. [5] presents risk factors for disease occurrence in children, one of which is literacy. In that study, it is explained that low-quality household resources due to low education levels affect the quality of seeking care and acceptance of health practices. Other research findings also mention the perception of the community that feces from toddlers who exclusively breastfeed are not very harmful. They also coexist with pets and do not consider them as a source of disease. In fact, they consider certain animal feces, such as from cows, to be relatively clean [12]. Inaccurate perspectives also originate from the opinions of participants in Tamene's research [9] who consider diarrhea in toddlers as a sign of survival. The above opinions indicate that participants' knowledge regarding the dangers of diarrhea and risk factors for diarrhea is still low.

Contrary to those opinions, the study by Lawrence et al [10] stated that the majority of participants in their study had a high level of knowledge regarding community-led total sanitation. They were also able to associate health issues with poor hygiene and sanitation practices. However, high knowledge does not necessarily indicate high implementation of hygiene and sanitation practices. Some participants expressed that behavior change was influenced by emotional factors that are driven and shaped by social values within the community. On the other hand, there are also inhibiting factors that hinder the achievement of hygiene and sanitation, such as traditional practices within the community.

3.2.2. Financial Status and Resource Limitations

Lack of financial resources poses a barrier to accessing healthcare, which can result in the severity of diseases and even death [5]. Not only that, the opinions of participants in the study Kuhl et al. [12] further strengthen this opinion by expressing that financial limitations restrict the ability to purchase or build a clean and attractive house for children to play in.

Regarding water treatment practices, the sustainability of household water treatment technologies is determined by the availability of funds. In addition, barriers to water treatment are caused by the accessibility of water treatment technology equipment and transportation costs for purchasing water sterilization materials. Untreated water leads to the emergence of microbiological contamination, which subsequently becomes a source of disease [9]. Considering the aforementioned statement, various strategies are implemented by the government to achieve access to clean and safe water, including the development of cost-effective water treatment technologies. However, in reality, technologies labeled as low-cost fail to achieve sustainability due to other expenses such as operational and maintenance costs, including the costs of education and family labor, which are rarely taken into account. As a result, households still cannot afford these expenses [11].

3.2.3. Public Acceptance of Interventions to Improve Hygiene and Sanitation

There are factors that influence the public acceptance of interventions provided to improve hygiene and sanitation, as explained in the study by Lawrence et al. [10] some factors that encourage the use of toilets include feelings of shame, disgust, hierarchical power pressure, community group influence, and competition between villages to achieve open defecation-free status. On the other hand, there are also several factors that hinder sanitation improvement:

- The feeling of shame when using a shared toilet due to the possibility of others seeing and knowing that one is defecating.
- Traditional practices of using the same toilet as in-laws or different generations within a family, which are considered taboo.
- Inadequate access to toilet construction, causing children to fear falling while using the toilet and dislike the odors emanating from it.
- The belief that children's feces are not harmful, leading to their disposal in bushes, on the ground, or in open waste disposal areas.

4. Conclusion

Based on the findings of this study, it can be concluded that the analysis from the perspective of the community shows a relationship between risk factors for diarrhea and the occurrence of diarrhea in toddlers, both in terms of hygiene and sanitation, as well as socio-economic factors. In terms of hygiene and sanitation, several factors are identified, including the lack of cleanliness and hygiene practices implemented by caregivers, untreated water and unprotected water sources, inadequate availability of water as a barrier to hygiene practices, low utilization of toilets, unhygienic living conditions, and water contamination during rainy seasons. Meanwhile, in terms of socio-economic factors, the morbidity and mortality caused by diarrhea in toddlers are influenced by the knowledge and education of caregivers,

financial status and resource constraints, as well as the acceptance of the community towards interventions for improving water, sanitation, and hygiene provided by healthcare workers and social workers.

Compliance with ethical standards

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There are no differences of opinion among the authors in the publication of this article.

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