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Determinants of Childhood Diarrhea: The Roles of Maternal Employment, Dietary Patterns and Behaviors Supporting Hygiene and Health (PHBS) — A Cross-sectional Analysis

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Abstract

Diarrhea remains a leading cause of morbidity and mortality among children, particularly in low- and middle-income countries where nutritional status and hygiene practices are often suboptimal. This study aimed to examine the association between maternal occupation, children's dietary patterns and Behaviors Supporting Hygiene and Health (PHBS) with the incidence of childhood diarrhea at Simo Hospital, Boyolali Regency. An analytical cross-sectional design was employed involving 96 children aged 5–11 years selected through purposive sampling. Data were collected using structured questionnaires assessing maternal employment status, dietary patterns measured with the Child Feeding Questionnaire and PHBS indicators, complemented by a review of medical records to confirm diarrhea episodes. Bivariate analysis demonstrated significant associations between diarrhea incidence and maternal occupation ($p = 0.002$), dietary patterns ($p = 0.013$) and PHBS ($p = 0.001$). Multivariate logistic regression revealed that children of employed mothers had a higher likelihood of experiencing diarrhea (OR = 2.857). In addition, inappropriate dietary patterns (OR = 0.218) and poor PHBS (OR = 0.234) were significantly associated with increased diarrhea risk. These findings suggest that inadequate feeding practices and suboptimal hygiene behaviors contribute substantially to the occurrence of diarrhea among school-aged children. In conclusion, maternal employment status, child nutrition and hygiene-related behaviors are significantly associated with childhood diarrhea. The results highlight the importance of strengthening household-based health promotion programs focusing on appropriate feeding practices, improved hygiene behaviors and caregiver support strategies to reduce the burden of diarrhea in children.

Keywords: Diarrhea, Dietary Patterns, Maternal Employment, PHBS.

Introduction

Children aged 5 to 11 years represent a particularly vulnerable population to various diseases, primarily due to their frequent consumption of unregulated and contaminated food and the relative immaturity of their immune systems, which facilitates the entry and proliferation of pathogens (1). Diarrheal disease is among the most common health problems in this age group and remains a significant contributor to childhood morbidity and mortality worldwide. The World Health Organization reports that around 50,851 deaths each year are attributed to children's diarrhea aged 5–9 years (2).

In the Indonesian context, the incidence of diarrhea disease among children was reported at 37.88% in 2018, affecting approximately 1,516,438 children. This figure increased to 40% in 2019, with around 1,591,944 reported cases (3). At the provincial level, Central Java recorded a prevalence rate of 20.30% (4). Specifically, in Boyolali District, of a total of 29,085 diarrhea cases, 20,221 were reported among children (4).

Another study identified several risk factors contributing to childhood diarrhea, including low socioeconomic status, poor sanitation, limited maternal education, parental employment status, breastfeeding practices, inadequate housing conditions, recurrent diarrhea episodes, dietary habits and limited caregiver knowledge (5). Among these factors, parental employment status was found to significantly influence the frequency of diarrhea episodes in children.

Maternal employment status, in particular, has been identified as a key determinant of diarrhea incidence among children. In households where mothers work outside the home, limited availability for direct childcare and supervision often results in caregiving being delegated to

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grandmothers or domestic workers. However, the presence of substitute caregivers does not always ensure optimal hygiene practices, which may facilitate transmission of pathogenic microorganisms and increase the risk of diarrhea disease (6). Another study demonstrated a significant correlation between maternal employment and childhood diarrhea (7). Meanwhile, other study reported no such association, indicating inconsistencies in the current literature (8).

Another important risk factor influencing childhood diarrhea is diet, which includes the quantity, type and frequency of food consumption (9). Appropriate dietary practices are closely associated with adequate nutritional status, which is essential for maintaining a strong immune system capable of resisting infections. Children who follow balanced and nutritious diets generally exhibit better health outcomes and increased resistance to disease. Conversely, poor dietary habits—such as frequent consumption of unhealthy snacks—can compromise immune function and increase vulnerability to infections (10). Supporting this, another study reported that poor snacking behaviors contribute to nutritional problems in children (11). In addition, the consumption of unhealthy foods, such as instant products and those with artificial colorants and preservatives, has been associated with an increased likelihood of diarrheal illness. Another research demonstrated a strong relationship between dietary habits and diarrhea among children in Bangladesh (12).

The incidence of diarrhea among children can also be mitigated through the implementation of Behaviors Supporting Hygiene and Health (PHBS). PHBS refers to a series of health-promoting actions voluntarily undertaken by individuals and families based on awareness and commitment to maintaining health and preventing disease (13). Within the family setting, a central component of PHBS is proper handwashing, which involves using clean water, soap and a nail brush before food preparation, before eating, after using sanitation facilities and after defecation (14). Unwashed hands can serve as carriers of pathogenic microorganisms and failure to wash hands properly can lead to the transmission of these pathogens through food or beverages, thereby increasing the risk of diarrhea disease (15). Another empirical evidence supports a significant association between PHBS implementation—particularly handwashing with soap—and reduced diarrhea incidence among children (16). However, other findings indicate no significant relationship between handwashing habits and childhood diarrhea, suggesting inconsistency in the literature (17).

Building upon the findings of previous studies and considering the contextual relevance of the issue, the present research which investigate the effect of maternal employment status, food intake patterns and hygiene behaviors on the occurrence of childhood diarrhea. This study expands on prior research by incorporating a broader age range of respondents and examining a wider set of contributing factors.

Methodology

Study Design, Population and Sampling Technique

This study was conducted at Simo Hospital, Boyolali Regency which is located in Simo District, Boyolali Regency, Central Java, Indonesia (GPS coordinates: 7.5297° S, 110.6503° E). The research was conducted between October and November 2024. This study applied an observational analytic approach with a cross-sectional design. The study population included all pediatric patients at Simo Hospital who fulfilled the predetermined inclusion criteria.

Inclusion criteria were: (a) children aged 5–11 years who were registered as patients at Simo Hospital during the study period; (b) children accompanied by their biological mothers or primary caregivers who were responsible for daily feeding practices; (c) caregivers who were able to communicate effectively in Bahasa Indonesia; and (d) caregivers who provided written informed consent to participate in the study.

Exclusion criteria were: (a) children with congenital gastrointestinal anomalies, chronic diarrheal diseases, or other chronic medical conditions that could affect nutritional status or feeding patterns; (b) children who were critically ill at the time of data collection; (c) caregivers with cognitive impairment or severe illness that limited their ability to complete the questionnaire; and (d) incomplete questionnaire data.

The Child Feeding Questionnaire (CFQ) was used to assess maternal feeding practices. The internal

consistency of the CFQ domains in this study ranged from Cronbach's α = 0.72 to 0.86, indicating acceptable reliability. Each item was scored using a Likert scale and domain scores were calculated by averaging item responses, with higher scores reflecting greater use of the respective feeding practice. The Behaviours Supporting Hygiene and Health (PHBS) questionnaire was adapted from the Indonesian Ministry of Health standard household PHBS indicators with good internal consistency (Cronbach's α = 0.78). The PHBS score was computed by summing the dichotomous items (1 = healthy behaviour, 0 = unhealthy behaviour), with higher total scores indicating better hygiene and health practices. The total scores were subsequently categorised into "good" and "poor" PHBS based on the predetermined cut-off point.

A total of 96 subjects were recruited through purposive sampling. Data collection was conducted using medical record reviews alongside structured questionnaires. The obtained data were processed through univariate, bivariate analysis with the Chi-square method and multivariate testing used logistic regression. The study protocol has been approved by Dr. Moewardi General Hospital No. 2607/XI/HREC/2024.

Results

Univariate Analysis

Univariate analysis reveals the characteristics of the participants depicted in Table 1.

Table 1: Sociodemographic Characteristics of Parents

Characteristics of parents	Frequency (n)	Percentage (%)
Age categorization (in years)		
18–25	15	15.6
26–35	46	47.9
36–45	35	36.5
Educational Level		
Elementary School	8	8.3
Junior High School	30	31.3
Senior High School	54	56.3
College/University	4	4.2
Number of Children		
(a) children	26	27.1
(b) children	51	53.1
(c) children	19	19.8
Occupation		
Housewife	45	46.9
Self-employed	40	41.7
Private Sector Employee	5	5.2
Civil Servant	6	6.3

According to the data presented in the Table 1, the majority of respondents were between 26 and 35 years old, comprising 46 individuals [47.9%]. In terms of educational attainment, most participants had completed senior high school, accounting for 54 respondents [56.3%]. With regard to family size, the most common category was having two children, reported by 51 respondents [53.1%]. Additionally, employment status data showed that nearly half of the respondents, totalling 45 individuals [46.9%], were homemakers.

Table 2: Research Variables of the Study Participants

Variable	Frequency (n)	Percentage (%)
Employment Status		
Not Employed	40	41.7
Employed	56	58.3
Dietary Patterns		
Inappropriate	18	18.8
Appropriate	78	81.3
Behaviors Supporting Hygiene and Health (PHBS)		
Adequate	61	63.5
Inadequate	35	36.5
Occurrence of Childhood Diarrhea		
No Diarrhea	52	54.2
Diarrhea	44	45.8

As indicated in the Table 2, the majority of mothers participating in the study were employed, totaling 56 respondents [58.3%]. Regarding child feeding patterns, most respondents reported appropriate feeding practices, with 78 individuals representing 81.3% of the sample. In terms PHBS, the majority of respondents demonstrated moderate levels of adherence, accounting for 61 participants [63.5%]. Furthermore, the incidence of diarrhea among the children revealed that most had not experienced diarrhea in the preceding six months, with 52 cases [54.2%] reported.

Bivariate Analysis

Hypotheses testing of bivariate analysis in the study using Chi Square. Bivariate analysis employed the Chi Square test are as follows:

Correlation Between Employment Status and the Occurrence of Childhood Diarrhea

Bivariate analysis's results indicate the correlation between maternal employment and the occurrence of childhood diarrhea at Simo Hospital, Boyolali Regency, as detailed below:

Table 3: Association Between Employment Factor and the Occurrence of Childhood Diarrhea

Employment Factor	Diarrhea Incidence						P-value
	Not Diarrhea		Diarrhea		Total		
	n	%	n	%	n	%	
Not Working	29	30.2	11	11.5	40	41.7	
Employed	23	24.0	33	34.4	56	58.3	0.002*
Total	52	54.2	44	45.8	96	100.0	

*A P-value < 0.05 was considered statistically significant, indicating a meaningful association between the independent variable and the outcome variable.

The bivariate analysis in the Table 3 revealed that among the respondents, 29 mothers [30.2%] were not employed and had children who did not experience diarrhea. Conversely, 11 non-working mothers [11.5%] reported children who did suffer from diarrhea. Among working mothers, 23 individuals [24.0%] had children without diarrhea, while 33 mothers [34.4%] with employment had children who experienced diarrhea episodes. Furthermore, the Chi-square test indicated a P-value of 0.002 (P < 0.05), represent a statistically strong association between maternal employment status and the incidence of childhood diarrhea at Simo Hospital, Boyolali Regency.

Correlation Between Diet and the Occurrence of Childhood Diarrhea

Based on bivariate analysis, the association between diet and the incidence of childhood diarrhea in Simo Hospital, Boyolali Regency, as follows:

Table 4: Association Between Diet and the Incidence of Childhood Diarrhea

Diet	Diarrhea Incidence						P-value
	Not Diarrhea		Diarrhea		Total		
	n	%	n	%	n	%	
Incorrect	5	5.2	13	13.5	18	18.8	
Correct	47	49.0	31	32.3	78	81.3	0.013*
'otal	52	54.2	44	45.8	96	100.0	

*A P-value < 0.05 was considered statistically significant, indicating a meaningful association between the independent variable and the outcome variable.

The bivariate analysis in the Table 4 indicated that 5 children [5.2%] with an inappropriate diet did not experience diarrhea, whereas 13 children [13.5%] with an inappropriate diet did experience diarrhea. Among those with an appropriate diet, 47 children [49%] did not suffer from diarrhea, while 31 children [32.3%] with a proper diet were affected by diarrhea episodes. Moreover, the Chi-square test produced a P-value of 0.013 (P < 0.05), demonstrating a strong correlation between dietary patterns and the incidence of childhood diarrhea at Simo Hospital, Boyolali Regency.

Relationship Between PHBS and the Incidence of Childhood Diarrhea

Bivariate analysis indicates the correlation between PHBS with the incidence of childhood diarrhea in Simo Hospital, Boyolali Regency, as shown in Table 5.

The bivariate analysis in the Table 5 revealed that among respondents with adequate PHBS, 25 [26%] had children who did not experience diarrhea, while 36 [37.5%] had children who did experience diarrhea. Among those with poor PHBS, 27 respondents [28.1%] had children without diarrhea, whereas 8 respondents [8.3%] had children who suffered from diarrhea episodes. Furthermore, the Chi-square test indicated a P-value of 0.001 (P < 0.05), contributing a strong correlation between PHBS and the incidence of childhood diarrhea at Simo Hospital, Boyolali Regency.

Table 5: Association Between PHBS and the Occurrence of Childhood Diarrhea

PHBS	Diarrhea Incidence						P-value
	Not Diarrhea		Diarrhea		Total		
	n	%	n	%	n	%	
Sufficient	25	26.0	36	37.5	61	63.5	
Less	27	28.1	8	8.3	35	36.5	0.001*
Total	52	54.2	44	45.8	96	100.0	

*A P-value < 0.05 was considered statistically significant, indicating a meaningful association between the independent variable and the outcome variable. PHBS: Behaviors Supporting Hygiene and Health

Table 6: The Results of Multivariate Test

Variables	P-value	(Exp B)	95% C.I.for EXP(B)	
			Lower	Upper
Employment Status	0.031	2.857	1.103	7.398
Eating Patterns	0.020	0.218	0.061	0.786
PHBS	0.005	0.234	0.084	0.651

Note: PHBS: Behaviors Supporting Hygiene and Health. CI: Confidence Intervals (95% CI).

Multivariate Test

Multivariate test in this research investigates the correlation between maternal employment, diet and PHBS with the occurrence of diarrhea in toddlers at Simo Boyolali Hospital. Multivariate analysis's results are as shown in Table 6.

Variables that demonstrated a P-value < 0.25 in the bivariate analysis were included in the multivariate logistic regression model to control for potential confounding factors. The results are reported as Adjusted Odds Ratios (AOR) with 95% Confidence Intervals (95% CI). Statistical significance was defined as a P-value < 0.05, indicating that the variable remained an independent predictor of diarrhea after adjustment for other covariates.

Findings from the multivariate analysis in the Table 6 revealed that maternal employment status had a P-value of 0.031 (<0.05) with an odds ratio (Exp B) of 2.857. This indicates a strong association between a mother's employment and the occurrence of diarrhea among children at Simo Boyolali Hospital, where children of employed mothers faced a 2.857-fold higher likelihood of developing diarrhea compared to those with non-working mothers. Furthermore, dietary patterns showed a P-value of 0.020 (<0.05) with an odds ratio of 0.218, signifying a meaningful link between diet and diarrheal incidence. Children with poor dietary practices were found to be at a 0.218 times greater risk of diarrhea than those with adequate diets. As for Clean and Healthy Living Behavior (PHBS), the analysis produced a P-value of 0.005 (<0.05) and an odds ratio of 0.234, underscoring a strong relationship between PHBS practices and the occurrence of diarrhea in children. Respondents exhibiting poor PHBS were found to have a 0.234 times higher likelihood of having children affected by diarrhea compared to those with adequate PHBS.

Discussion

Association Between Maternal Employment Factor and the Occurrence of Childhood Diarrhea

The results of this research demonstrate a strong relationship between maternal employment and the occurrence of diarrhea in children, supported by a P-value of 0.002 (P < 0.05). This suggests that a mother's employment status has a substantial impact on the likelihood of diarrheal illness among pediatric patients at Simo Hospital, Boyolali Regency. Diarrhea itself is a widespread environmentally related disease that disproportionately affects children in low- and middle-income communities and continues to be a major contributor to morbidity and mortality in this age group (18). Clinically, it is defined by changes in stool consistency—from soft to watery—along with an increased bowel movement frequency of more than three times daily and it may also present with symptoms such as vomiting or blood in the stool (19).

Maternal employment is identified as an indirect risk factor contributing to the incidence of diarrhea in children (20). Employment outside the home limits the time mothers can dedicate to nurturing and caring for their young children. Consequently, children of working mothers who develop diarrhea may experience delayed treatment due to the mother's occupational commitments. The limited availability to seek timely medical consultation, often conflicting with work schedules, may exacerbate the severity of the illness. Conversely, non-working mothers tend to respond more promptly to their children's health needs, allowing for earlier management of diarrhea episodes (21). Supporting these findings, another study reported a strong correlation between maternal employment status and childhood diarrhea incidence (6).

Relationship between Diet and the Occurrence of Childhood Diarrhea

This study's results reveal a significant correlation between dietary habits and the incidence of

diarrhea in children, with a P-value of 0.013 (P < 0.05). Thus, it can be inferred that diet has an important influence on the occurrence of childhood diarrhea at Simo Hospital, Boyolali Regency. In this context, diet refers to the approach and effort to manage both the type and portion of food consumed, with the purpose of sustaining health, fulfilling nutritional needs and preventing or reducing the risk of disease (22). A proper diet involves the consumption of foods that provide balanced nutrition, meeting the body's daily requirements for protein, carbohydrates, fats, vitamins, minerals and water, preferably derived from natural sources. Such balanced nutrition enhances nutritional status and strengthens the body's resistance to illnesses, including diarrhea diseases (23).

This study further revealed that the majority of respondents practiced appropriate dietary habits for their children. Adequate nutrition is crucial for supporting the immune system, thereby enabling children to resist infectious diseases effectively. In contrast, inadequate nutrition weakens immune responses, increasing vulnerability to infections such as diarrhea (10). These findings corroborate another study who identified a significant association between diet and the occurrence of diarrhea among toddlers in the Kalijudan Surabaya Public Health Centre area (12).

Relationship Between PHBS and the Occurrence of Diarrhea

The findings of this study reveal a strong association between Behaviors Supporting Hygiene and Health (PHBS) and the occurrence of childhood diarrhea, as demonstrated by a P-value of 0.013 (p < 0.05). Thus, PHBS significantly influences the occurrence of diarrhea diseases among children at Simo Hospital, Boyolali Regency. The prevention of diarrhea in children can be effectively achieved through the practice of PHBS. PHBS is defined as a series of health-related behaviors carried out consciously and learned over time, enabling individuals, families, groups, or communities to independently manage health and actively contribute to public health improvement (24). The major goal of PHBS implementation is to improve overall health quality through increased awareness, beginning in early childhood.

Within the family context, one key manifestation of PHBS is the practice of proper handwashing using sufficient clean water, soap and a nail brush prior to food handling, eating and after using sanitation facilities or defecation (14). Hands frequently harbor dirt and pathogens, which can transfer bacteria and viruses from fecal matter or other sources to food. Therefore, consistent handwashing with soap and running water is essential to remove dirt and microbes, interrupting the fecal-oral transmission route that is common for diarrhea pathogens (25). Supporting these findings, another study identified a significant correlation between PHBS, specifically handwashing treatment with soap and the occurrence of diarrhea in children (16).

Relationship Between Maternal Employment Status, Diet and Behaviors Supporting Hygiene and Health (PHBS) with the Occurrence of Childhood Diarrhea

Multivariate analysis revealed a strong relationship between maternal employment factor and the occurrence of diarrhea in children at Simo Boyolali Hospital, with a P-value of 0.031 (<0.05) and an odds ratio (Exp B) of 2.857. This indicates that toddlers of working mothers have a 2.857-fold higher risk for contributing diarrhea than children of non-working mothers. Additionally, the result indicated a strong relationship between diet and diarrhea occurrence, evidenced by a P-value of 0.020 (<0.05) and an odds ratio of 0.218. This suggests that children with inappropriate dietary habits have a 0.218 times greater likelihood of experiencing diarrhea than those with appropriate diets. Regarding Behaviors Supporting Hygiene and Health (PHBS), the analysis indicated a significant correlation of diarrhea occurrence, showed a P-value of 0.005 (<0.05) and an odds ratio of 0.234. Children of respondents exhibiting poor PHBS practices were found to have a 0.234 times greater risk of contracting diarrhea than those whose caregivers practiced adequate PHBS.

Diarrheal disease is an illness caused by viral, parasitic and bacterial infections of the digestive tract. It is characterized by abnormal bowel movements that are more frequent and liquid than usual, occurring three or more times within a 24-hour period (26). Diarrheal diseases can affect individuals across all age groups, from infants to adults, with children being among the most susceptible populations. Consequently, addressing diarrhea in children requires focused attention,

concerted effort and commitment from all sectors of society, including the community, government and nation (27). The incidence of diarrhea in children is influenced by a variety of factors, encompassing both direct and indirect causes. This study identified significant associations between maternal employment status, diet and Behaviors Supporting Hygiene and Health (PHBS) with the occurrence of children's diarrhea.

Children of employed mothers have 2.857 times more susceptible of developing diarrhea than children of unemployed mothers. This heightened risk is attributed to the limited time working mothers have for childcare, prevention and timely health examinations, which may increase the likelihood of diarrhea episodes. Conversely, unemployed mothers tend to have more available time to care for and manage their children's health, especially during illness (21). These findings corroborate the results of Ariesta who reported a strong correlation between maternal employment factor and childhood diarrhea occurrence (6).

Furthermore, this study indicated a strong association between diet and the incidence of diarrhea in children. An appropriate diet, which ensures sufficient nutrition and essential nutrients, supports a stronger immune system that can better resist infections. In contrast, malnutrition weakens the immune response, thereby increasing vulnerability to infections such as diarrhea (10). These results align with another research which demonstrated a connection between dietary patterns and diarrhea incidence among toddlers in Bangladesh (12).

Additionally, Behaviors Supporting Hygiene and Health (PHBS) constitute a significant factor correlated with the occurrence of children's diarrhea. Within the family setting, a key manifestation of PHBS is the practice of handwashing using adequate clean water, soap and a nail brush prior to handling food, use clean eating utensils, before meals, after using the toilet and following defecation (14). The consistent practice of hand hygiene using clean water is critical in preventing disease transmission by effectively removing dirt particles harboring pathogenic microorganisms. This is particularly important as the majority of pathogens responsible for diarrhea infections are transmitted via the fecal-oral route. Consequently, handwashing with soap and water serves as a crucial intervention to interrupt the transmission cycle of diarrhea pathogens (28). Supporting this, another study demonstrated a strong correlation between PHBS, specifically handwashing with soap and the occurrence of diarrhea in children (16). Moreover, such preventive behaviors promote a healthier lifestyle, thereby enhancing overall quality of life (29-33).

Conclusion

This study demonstrates that maternal employment status, dietary patterns and Behaviors Supporting Hygiene and Health (PHBS) are significantly associated with the occurrence of diarrhea among children attending Simo Regional Hospital, Boyolali Regency. Multivariate analysis further confirmed that these variables act as independent predictors, indicating that both socio-behavioral and household environmental factors contribute to the risk of childhood diarrhea. These findings underscore the multifactorial nature of diarrheal disease, in which caregiving arrangements related to maternal employment, suboptimal dietary practices and inadequate hygiene behaviors collectively influence children's vulnerability to enteric infections.

Strengths of the Study

The study contributes to the growing body of evidence highlighting the importance of integrating maternal socioeconomic characteristics with child feeding and hygiene practices in diarrheal disease prevention strategies, particularly in hospital-based pediatric populations in low- and middle-income settings. From a public health perspective, the results support the need for targeted health education programs focusing on safe food preparation, appropriate child feeding practices and consistent implementation of PHBS, alongside supportive policies for working mothers to ensure adequate childcare and hygiene supervision.

Limitations

However, this study has several limitations. The cross-sectional design precludes causal inference, the use of purposive sampling may limit generalizability beyond the study setting and reliance on self-reported behavioral data introduces the possibility of recall and social desirability bias. Additionally, environmental and microbiological factors were not assessed, which may also play a role in diarrheal transmission.

Future Recommendations

Future research should employ longitudinal or cohort designs to clarify causal pathways, include objective environmental and microbiological measurements and explore the role of childcare arrangements among working mothers.

Intervention studies evaluating community-based PHBS promotion and nutrition education are also warranted to determine effective strategies for reducing the burden of childhood diarrhea.

Abbreviations

PHBS: Behaviors Supporting Hygiene and Health

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Author Contributions

N Juni Triastuti, Sultan Bayu Fahmi: conceptualization, study design, data collection, data analysis, interpretation, writing- first draft, revision for important intellectual content. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this study.

Data Availability

The datasets are available from the corresponding author on reasonable request

Declaration of Generative AI And AI Assisted Technologies in the Writing Process

Generative AI or AI Assisted Technologies was not used in the Writing Process

Ethics Approval

This study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval was obtained from the Health Research Ethics Committee of Dr. Moewardi General Hospital with approval number No. 2607/XI/HREC/2024. Written informed consent was obtained from the parents or legal guardians of all participating children prior to data collection.

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