


ICSM SPECIAL EDITION

RESEARCH ARTICLE

The relationship between parent's knowledge and attitudes regarding childhood diarrhoea treatment

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Keywords

Attitude
Knowledge
Paediatrics
Paediatric diarrhoea
Parent

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Abstract

Background: Diarrhoea remains a significant contributor to infant mortality rates in Indonesia. Implementing appropriate treatment strategies is essential to prevent complications such as dehydration in children. Parental involvement is crucial in the management and prevention of diarrhoea, as well as in providing timely care to affected children. **Objective:** To assess the relationship between parental knowledge and attitudes toward managing childhood diarrhoea. **Method:** Using an analytical observational cross-sectional design, the study was conducted in the Malang Raya region between December 2022 and May 2023. A total of 146 participants were selected through purposive sampling based on predefined inclusion and exclusion criteria. Data were collected via a knowledge questionnaire and an attitude questionnaire. The correlation between parental knowledge and attitudes was analysed using the Pearson Product-Moment correlation. **Result:** Respondents' knowledge levels were categorised as good (13.7%), moderate (52.7%), and poor (33.56%). Attitudes were categorised as positive (48.0%) and negative (52.1%). The Pearson Product-Moment test revealed a significant correlation, with a p -value of 0.000 and a correlation coefficient of 0.437. **Conclusion:** The findings indicate a statistically significant, positive correlation between parental knowledge and attitudes toward managing childhood diarrhoea.

Introduction

Diarrhoea is a medical condition characterised by the frequent passage of loose or watery stools, typically occurring three or more times per day (Florez *et al.*, 2020). Acute diarrhoea lasts less than 14 days, while persistent diarrhoea persists for 14 to 30 days. Most cases of acute diarrhoea are caused by viral, bacterial, or protozoal infections and often resolve without medical intervention (Dipiro *et al.*, 2017).

Despite advances in healthcare, diarrhoea remains a leading cause of infant mortality in Indonesia, as evidenced by the Basic Health Research conducted between 2007 and 2019 (Ministry of Health of the Republic of Indonesia, 2020). The high mortality rates can be attributed in part to inadequate management, both at the household and healthcare facility levels (Febriyuna, 2015). According to the 2021 Indonesian Health Profile, East Java Province ranked second in the

incidence of diarrhoea cases, following Central Java. East Java reported 470,968 cases of diarrhoea among toddlers, while Malang alone reported 44,236 cases in the same population (East Java Provincial Health Service, 2020). Given the high prevalence, effective management of pediatric diarrhoea is essential.

Diarrhoea can lead to severe complications, such as dehydration, hypovolemic shock, organ failure, and, in extreme cases, coma (Utami & Luthfiana, 2016). Both the World Health Organisation (WHO) and the Indonesian Ministry of Health have emphasised the importance of a five-pronged approach to diarrhoea management, including rehydration, zinc supplementation, nutritional support, the judicious use of antibiotics, and parental education (Hunter & Chan, 2017).

Oral rehydration solution (ORS) is the first intervention in the management of diarrhoea aimed at replenishing lost fluids and electrolytes. Zinc supplementation for

ten days has also been shown to enhance immune function and reduce the recurrence of diarrhoea for two to three months after recovery. Proper nutrition plays a critical role, with continued breastfeeding and the introduction of age-appropriate solid foods vital to prevent malnutrition, aid intestinal recovery, and reduce disease severity.

The use of antibiotics is reserved for specific cases such as the presence of bloody stools, abdominal pain, or oily diarrhoea (Brooks *et al.*, 2012). Probiotics may also help shorten the duration, severity, and frequency of diarrhoea episodes (Abedini *et al.*, 2015). Timely and effective treatment, combined with preventive strategies, can significantly reduce diarrhoea-related mortality and morbidity (Mokomane *et al.*, 2018). In addition to measles immunisation, another preventative intervention that has been identified is using rotavirus immunisation (Widiantari *et al.*, 2022).

Parents play a pivotal role in managing childhood diarrhoea due to their proximity and constant involvement in their children's care. Parental knowledge and attitudes toward diarrhoea management significantly impact family behaviour and health outcomes (Sari *et al.*, 2017). According to Sari and colleagues in 2017, parental interventions in response to childhood diarrhoea could influence the course of the illness. Knowledge forms the foundation for attitudes, which, in turn, shape behaviour and actions. Therefore, having accurate information is crucial for fostering positive health behaviours (Pramestutie *et al.*, 2021; Iriyanti *et al.*, 2022).

Previous studies conducted in India, Nepal, Saudi Arabia, and Malaysia revealed that while most mothers were aware of Oral Rehydration Solution (ORS), there remained substantial gaps in their knowledge and attitudes regarding diarrhoea and its management (Dawood *et al.*, 2010; Ansari *et al.*, 2011; Rani *et al.*, 2016, Alghadeer *et al.*, 2021).

Many mothers lacked sufficient understanding of the correct procedures for preparing and administering ORS, and none were able to describe all the steps involved accurately (Alghadeer *et al.*, 2021). Limited parental knowledge was often associated with lower educational attainment, which hindered access to appropriate health information (Alghadeer *et al.*, 2021).

Additionally, certain groups of parents demonstrated a lack of understanding regarding the proper management of pediatric diarrhoea (Nurhastuti, 2021).

Given the concerns discussed, this study aims to assess parents' knowledge and attitudes regarding managing childhood diarrhoea. This research is important as it highlights deficiencies in parental knowledge and

attitudes, thus identifying areas for improvement. The study was conducted in the Malang region due to its relatively high prevalence of childhood diarrhoea and the large number of pharmacies available for accessing treatment. Furthermore, limited prior research exists on managing childhood diarrhoea in this region.

Methods

Study participants and survey

This study employed an analytical observational approach with a cross-sectional research design. Data collection for both the independent and dependent variables was conducted simultaneously. In this context, parents' knowledge was designated as the independent variable, while parents' attitudes were considered the dependent variable. The study was carried out between December 2022 and May 2023, including Malang City, Batu City, and Malang District within the Malang region.

The sample size calculation in this research used the Lemeshow formula (Yu *et al.*, 2017), as seen below:

$$\begin{aligned} n &= \frac{Z^2 P(1-P)}{d^2} \\ &= \frac{1.96^2 \cdot 0.5(1-0.5)}{0.1^2} \\ &= \frac{3.8416 \times 0.25}{0.01} \\ &= 96.04 \rightarrow 100 \text{ respondent} \end{aligned}$$

n = Minimum sample size

Z^2 = Standard normal distribution values (Z table) at a certain $\alpha = 1.96$

N = Total Population

P = Population proportion 50% = 0.5

d = The (absolute) error that can be tolerated is 10%

Respondents for this study were selected through purposive sampling, a method that involves deliberately choosing participants based on specific inclusion and exclusion criteria. The inclusion criteria required respondents to be parents, relatives, or caregivers aged 18 to 60 years, who had children between one month and 12 years old, spent more than 12 hours per day with their children, had relevant experience in managing and preventing diarrhoea in children, and demonstrated a willingness to participate in the study. Individuals who could not communicate verbally or in writing were disqualified from participation based on the exclusion criteria applied.

The research methodology used in this study utilised a knowledge questionnaire and an attitude questionnaire as the primary research tools. The knowledge questionnaire had 12 questions, while the

attitude questionnaire comprised 16 statements. Based on the reliability test results, both questionnaires were reliable, as their Cronbach's alpha scores surpassed the threshold of 0.6, indicating sufficient internal consistency (Retnawati, 2017). Specifically, the knowledge questionnaire had a Cronbach's alpha score of 0.633, while the attitude questionnaire had a score of 0.654.

In addition to the reliability test, the instrument's validity was measured using the Pearson product-moment correlation. A statement or question was considered valid if its Pearson correlation coefficient was greater than the critical value of 0.194 ($r > 0.194$) or if its significance level was less than 0.05. The validity and reliability assessments indicate that the instruments used were appropriate for measuring parental knowledge and attitudes, each meeting the necessary criteria.

Ethical clearance

This research was approved by the Ethics Committee of the Faculty of Medicine, Brawijaya University, under reference number 25/EC/KEPK/10/2022.

Statistical analysis

Statistical analyses were performed using IBM SPSS Version 25.0. Before the main data analysis, a preliminary evaluation was conducted using the Kolmogorov-Smirnov test to assess whether the data followed a normal distribution. The Guttman scale was employed for the knowledge analysis, where one score was assigned to correct answers, and a score of 0 was given to incorrect responses. In contrast, a Likert scale was utilised for attitude analysis. For positively worded statements, a score of four was assigned to the response "strongly agree", while a score of one corresponded to "strongly disagree". For negatively worded statements, the scoring was reversed.

The relationship between parental knowledge and attitudes was analysed using the Pearson Product-Moment correlation, with statistical significance assessed by the p -value.

Results

The study sample consisted of 146 participants, 45 from Malang, 84 from Malang District, and 17 from Batu. The sample size met the minimum requirement for the investigation.

The demographic data is shown in Table I. Most respondents were female (89.73%), with the largest age group being 26-35 (50.68%). Most respondents

were housewives (36.30%), followed by private employees (34.25%). Regarding educational background, most participants (65.75%) had completed higher education, while 23.29% had finished high school or its equivalent.

Table I: Sociodemographic data of respondent

Demographics	Total	%
Gender		
Male	15	10.27
Female	131	89.73
Age		
18-25	12	8.22
26-35	74	50.68
36-45	46	31.51
46-55	13	8.90
56-60	1	0.68
Occupation		
Housewife	53	36.3
Private employee	50	34.25
Self-employed	13	8.9
Civil servant	16	10.96
Student	2	1.37
Farmers	2	1.37
Nurse	2	1.37
Lecturer	5	3.42
Labourer	3	2.05
Education		
Elementary/MI or equivalent	4	2.74
Junior High School/SMP/MTs	12	8.22
Senior High School/SMA/MA	34	23.29
College (D1/D2/D3/D4/S1/S2/S3)	96	65.75
Monthly income		
≤ IDR 1,500,000	48	32.88
> IDR 1,500,000 - 2,500,000	32	21.91
> IDR 2,500,000 - 3,500,000	28	19.18
> IDR 3,500,000	38	26.03
Health facilities visited when sick		
Hospital	27	18.49
Clinic	25	17.12
Health center	23	15.75
Pharmacy	8	5.48
General practitioner	20	13.70
Specialist doctor practice	25	17.12
Independent midwife practice	15	10.28
Others		
Source of information		
Health workers	95	65.07
Mass media	36	24.66
Family/neighbour	15	10.27

The monthly income distribution indicates that 32.88% of respondents earned IDR 1,500,000 or less, while 26.03% reported an income of more than IDR 3,500,000. In terms of healthcare access, hospitals were the most frequently visited facility (18.49%), followed by clinics (17.12%) and specialist doctors (17.12%). A significant portion of respondents (65.07%) relied on healthcare workers for health-related information, 24.66% used mass media, and 10.27% consulted family or neighbours.

The sample was composed primarily of well-educated women in their prime working years, with diverse income levels and healthcare access. Healthcare professionals were the predominant source of health information for most respondents.

Based on Table II, probiotics are the most commonly used drug (60 users), followed by ORS (82 users) and Zinc (45 users). The most frequent dosage for most medications is either once or twice daily. Probiotics are taken once a day by 23 users twice a day by 20 users. ORS is most commonly used three times a day by 35 users, with 15 users taking it more than three times a day. Other medications, such as antibiotics, herbal drugs, and attapulgitite, have fewer users with limited daily dosage frequencies. Drugs like Loperamide and Kaolin Pectin are used by only one user each, while Activated Carbon is used by two users, both taking it more than three times a day. This suggests that probiotics, ORS, and zinc are the most frequently used medications, with varying daily dosages.

Based on the data provided in Table III, most respondents demonstrated a strong understanding of certain aspects of diarrhoea management. For instance, 93.83% correctly identified the definition of diarrhoea, and 98.63% knew that fluid deficiency (dehydration) can occur if a child does not receive proper treatment. Additionally, 97.95% of respondents recognised that handwashing before and after meals can prevent diarrhoea.

Table II: Respondent characteristics according to drug use

Drugs	n	Dosage use			
		Once daily	Twice daily	Thrice daily	More
Probiotics	60	23	20	15	2
Zinc	45	17	15	13	0
ORS	82	9	23	35	15
Antibiotics	3	0	0	3	0
Herbal drugs	13	2	3	6	2
Attapulgitite	4	1	0	0	3
Kaolin pectin	2	0	0	1	1
Loperamide	1	1	0	0	0
Activated carbon	2	0	0	0	2

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However, significant knowledge gaps exist in other areas. For example, 60.96% of respondents were unaware that diarrhoea with blood in the stool indicates a serious condition, and 63.70% did not correctly identify skin elasticity as a sign of dehydration. Furthermore, 71.92% did not know that kaolin-pectin should not be the first treatment for diarrhoea, and 45.21% incorrectly believed that antibiotics should be continued after diarrhoea has stopped, even when not needed. Those data highlighted that while general knowledge about diarrhoea prevention and treatment is relatively high, misconceptions persist, particularly regarding symptoms, appropriate medication, and antibiotics.

Table III: Parent knowledge regarding management of children's diarrhoea in Malang

Indicator	No.	Questions	Respondent's answer	
			Correct	Wrong
Definition	1	A child has diarrhoea if they have three or more bowel movements with mushy to liquid consistency	137 (93.83%)	9 (6.16%)
	2	Children had diarrhoea when the child's faeces is liquid in consistency and contains blood	57 (39.04%)	89 (60.96%)
Symptoms	3	Increased skin elasticity is one of the signs of dehydration in children who had diarrhoea	53 (36.30%)	93 (63.70%)
Medicine	4	Fluid deficiency (dehydration) can occur if a child with diarrhoea does not receive treatment right	144 (98.63%)	2 (1.37%)

Indicator	No.	Questions	Respondent's answer	
			Correct	Wrong
	5	The first action that parents can take if their child has diarrhoea is to give a medication containing kaolin pectin	41 (28.08%)	105 (71.92%)
	6	When a child between 0 and 2 years old has diarrhoea and increase the intensity of diarrhoea	125 (85.62%)	21 (14.38%)
	7	Probiotics containing Lactobacillus can reduce the intensity of diarrhoea	133 (91.10%)	13 (8.90%)
Frequency of medicine	8	The use of antibiotics to treat diarrhoea in children can be stopped when the diarrhoea has stopped, even though the drug has not been used up.	80 (54.79%)	66 (45.21%)
	9	ORS should be taken within the first 3 hours after the child has diarrhoea	130 (89.04%)	16 (10.96%)
Prevention	10	Washing hands with soap before and after meals can prevent diarrhoea in children	143 (97.95%)	3 (2.05%)
Storage	11	Leftover ORS solution can be stored in the refrigerator for up to 24 hours or more	88 (60.27%)	58 (39.73%)
Drug interaction	12	Antibiotic administration for diarrhoea may consumed together with milk	116 (79.45%)	30 (20.55%)

Based on the data provided in Table IV, A predominant number of respondents, specifically 76 individuals or 52.10%, displayed a negative attitude towards managing childhood diarrhoea. This aligns with the data, which shows that while most respondents exhibited positive behaviours, such as 98.60% agreeing to administer Oral Rehydration Solution (ORS) and 95.90% seeking medical attention if blood is present in the stool, misconceptions persist. For example, 50.30% still supported the unnecessary use of antibiotics, and 47.30% incorrectly believed that bowel movements occur only twice a day during diarrhoea. These findings

suggest that despite some positive practices, many respondents hold negative attitudes or misunderstandings regarding proper diarrhoea management, highlighting the need for targeted education to address these gaps.

The test results of the correlation between parents' knowledge levels and their attitudes toward managing childhood diarrhoea have revealed a statistically significant and positive relationship. The obtained significance value is 0.000, and the correlation coefficient stands at 0.437.

Table IV: Parental Attitude Regarding the Management of Children's Diarrhea in Malang

Indicator	No.	Question	Respondent's answer (*)			
			SA	A	D	SD
Acceptance	1	I think that diarrhoea can cause death in children (+)	57 (39.04%)	75 (51.37%)	12 (8.22%)	2 (1.37%)
	2	I am of the opinion that the stool consistency is always liquid in diarrhoea (-)	41 (28.08%)	88 (60.27%)	16 (10.96%)	1 (0.68%)
	3	I think that a child's bowel movements occur at least 2 times a day during diarrhoea (-)	17 (11.64%)	53 (36.06%)	70 (47.95%)	6 (4.11%)
Responsiveness	4	I will give ORS when my child has diarrhoea (+)	62 (42.47%)	82 (56.16%)	2 (1.37%)	0 (0%)
	5	I will give antibiotics when my child has diarrhoea (-)	23 (15.75%)	50 (34.25%)	65 (44.52%)	8 (5.84%)
	6	I will give probiotics when my child has diarrhoea (+)	46 (31.51%)	88 (60.72%)	11 (7.53%)	1 (0.68%)
Evaluation	7	I prefer to use kaolin-pectin over probiotics if my child has diarrhoea (-)	13 (8.90%)	57 (39.04%)	72 (49.32%)	4 (2.74%)
	8	I will stop giving zinc after 7 days if my child has diarrhoea (-)	17 (11.64%)	97 (66.44%)	29 (19.86%)	3 (2.05%)
Organisation	9	I will give breast milk to my baby who has diarrhoea (+)	78 (53.42%)	54 (36.99%)	13 (8.90%)	1 (0.68%)
	10	I will change formula milk to low lactose when my child has diarrhoea (+)	40 (27.40%)	78 (53.42%)	26 (17.81%)	2 (1.37%)

Indicator	No.	Question	Respondent's answer (*)			
			SA	A	D	SD
Assessment	11	I will go to the doctor if I find blood in my child's stool who has diarrhoea (+)	107 (73.29%)	33 (22.60%)	4 (2.74%)	2 (1.37%)
	12	I will go to the doctor if my child has diarrhoea for more than 3 days (+)	96 (65.75%)	43 (29.45%)	3 (2.05%)	4 (2.74%)
	13	I let my child eat straight away without washing his hands (-)	4 (2.74%)	3 (2.05%)	72 (49.32%)	67 (45.89%)
	14	I will let my child defecate in the river (-)	1 (0.68%)	6 (4.11%)	69 (47.26%)	70 (47.95%)
	15	I rarely clean the latrine/WC (-)	4 (2.74%)	4 (2.74%)	67 (45.89%)	71 (48.63%)
	16	I will give the rotavirus vaccine when my child is a baby to prevent diarrhoea (+)	43 (29.45%)	76 (52.05%)	23 (15.75%)	4 (2.74%)

The knowledge score for each respondent was calculated by dividing the number of correct answers by the total number of statements and converting this to a percentage by multiplying by 100%. A score between 76.00% and 100.00% indicated good knowledge, while scores between 56.00% and 75.00% reflected a moderate level of knowledge. Scores below 56.00% were categorised as "poor knowledge". Most respondents (52.70%) demonstrated a moderate level of knowledge, while 33.56% exhibited good knowledge. The remaining respondents were classified as having poor knowledge.

Discussion

The majority of respondents were women, who are more active on social media and demonstrate greater engagement than men (Woran *et al.*, 2021). Women tend to be more attentive to children's health and healthcare services, including immunisations (Hossain & Hoque, 2015). A significant portion of the participants were between the ages of 26 and 35, reflecting early adulthood—a life stage that impacts their ability to adapt to parenting roles. Age influences individuals' understanding, knowledge, and cognitive processes (Silaen *et al.*, 2022).

Education plays a crucial role in shaping and acquiring knowledge, with 65.80% of respondents holding tertiary degrees, indicating a broader knowledge base. A notable proportion of the respondents were housewives (36.30%), who often have a stronger familial connection, enabling them to address health-related issues, such as managing childhood diarrhoea, more effectively (Meilita & Dissyifa, 2019). Prior research suggests that heightened maternal involvement among housewives may reduce the risk of severe childhood diarrhoea (Andreas *et al.*, 2013).

Hospitals, frequently used for treating childhood diarrhoea (18.49%), are highly regarded for their specialised care, advanced equipment, and skilled healthcare professionals, making them a preferred choice for parents seeking effective medical treatment (Damayanti *et al.*, 2017). Healthcare personnel serve as the primary source of information, accounting for 65.75% of instances. Healthcare professionals play a vital role in providing clear, concise, and easily understood information regarding medication use (Muharni *et al.*, 2015).

Oral Rehydration Solution (ORS) is commonly administered as the first-line treatment for diarrhoea to replenish fluids lost due to dehydration. ORS contains salt and glucose and has an osmolarity of 245 mOsm/L. Upon ingestion, the osmotic pressure in the intestine decreases compared to plasma osmolarity, which is approximately 300 mmol/L, thereby reducing fluid loss in the gastrointestinal tract (Nammalwar & Sudha, 2018). ORS should be administered promptly after diarrhoea ceases, with dosage adjusted based on the degree of dehydration (Haris *et al.*, 2021).

Knowledge is derived from comprehension and is shaped by individual experiences (Sahafia, 2021). This study found that 52.70% of parents had a moderate level of knowledge, consistent with previous research in East Jakarta, where 41.00% of parents displayed moderate knowledge (Tampubolon *et al.*, 2022). Factors such as education, personal experiences, information sources, and access to healthcare facilities may impact knowledge acquisition and attitudes.

Attitudes encompass parents' responses to managing and preventing childhood diarrhoea, reflecting positive or negative actions (Azwar, 2013). Positive attitudes are expected to result in appropriate interventions, while negative attitudes may lead to ineffective or delayed actions. Various factors, including personal experiences, the influence of others, mass media,

education, and cultural contexts, shape attitudes (Budiman & Riyanto, 2013).

This finding aligns with previous research by (2022), which noted a moderate level of knowledge but negative attitudes. In this study, a Pearson correlation of 0.437 was found, indicating a moderate positive relationship between knowledge and attitudes, with a significance value of 0.000 confirming the statistical significance of this relationship. Education, information sources, socio-cultural factors, economic status, environmental conditions, and personal experiences likely influenced the study's outcomes (Budiman & Riyanto, 2013).

Parental experience also plays a crucial role in managing and preventing diarrhoea. Although parents with lower educational levels may have limited knowledge, their practical experience in managing diarrhoea can improve their ability to administer appropriate treatments. Regular interactions with healthcare professionals and visits to healthcare facilities, such as hospitals, contribute to enhanced knowledge and attitudes (Manetu *et al.*, 2021). These encounters provide valuable information and counselling that can positively influence parents' understanding and treatment approaches (Budiman and Riyanto, 2013).

Beliefs also affect knowledge acquisition. Some parents associate diarrhoea with developmental milestones like teething, crawling, and walking. Many still view diarrhoea as a common occurrence linked to growth, as observed by Radjabaycolle *and colleagues* (2019). Furthermore, the use of traditional treatments, which have been transmitted throughout generations, continues to be a widely favoured option for managing diarrhoea. The therapies in question may include the use of herbal remedies, supernatural interventions, or a mix thereof (Syahrani *et al.*, 2020).

A limitation of this study was the reliance on online data collection, which reduced interaction between researchers and respondents. As a result, respondents had fewer opportunities to ask questions, provide feedback, or engage in discussions during and after the research process.

Conclusion

Based on the research, a significant proportion of parents in Malang (52.70%) possess a moderate level of knowledge. Furthermore, a majority of parents in the same region exhibit a negative attitude towards managing children's diarrhoea, with a percentage of 52.10%. Notably, a positive and statistically significant correlation has been observed between parents'

knowledge and their attitudes in addressing this health issue in Malang, which means parents with a higher level of knowledge will have an improved outlook when it comes to managing their children's diarrhoea therapeutically.

Acknowledgement

Acknowledgements are extended to the Faculty of Medicine at Universitas Brawijaya for providing financial support for this research project in 2023.

Source of Funding

This study was funded by the Faculty of Medicine Universitas Brawijaya in 2023.

Conflict of Interests

The authors declare that there are no conflicts of interest in this study.

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