



Maternal Knowledge and Practice Regarding Childhood Diarrhea and Diet in Zahedan, Iran

Manijeh Khalili^{1*}, Maryam Mirshahi², Amin Zarghami³, Mohsen Rajabnia⁴, Fatemeh Farahmand⁵

¹ Children and Adolescent Health Research Center, Zahedan University of Medical Sciences, Zahedan, IR Iran

² Sport Medicine Research Center, Tehran University of Medical Sciences, Tehran, IR Iran

³ Student Research Committee, Babol University of Medical Sciences, Babol, IR Iran

⁵ Children's Medical Center, Pediatrics Center of Excellence, Tehran University of Medical Sciences, Tehran, IR Iran

*Corresponding author Manijeh Khalili, Children and Adolescent Health Research Center, Zahedan University of Medical Sciences, Zahedan, IR Iran. Tel: +98-9112120205, Fax: +98-5413411252, E-mail: dr_khalili2000@yahoo.com.

ABSTRACT

Background: Diarrhea infection has been established as one of the major etiologies and risk factors of malnutrition in children.

Objectives: The aim of this study was to assess the maternal knowledge, attitude and practices when treating diarrhea in their children less than 5 years old in the Zahedan, south-east province of Iran.

Materials and Methods: This cross-sectional study was conducted in urban health centers in Zahedan. Three hundred mothers who had less than five years old children and had been referred to the health centers for six months duration had been included. The questions were about demographic characteristics, knowledge and practice regarding childhood diarrhea, and had been designed to obtain information through an interview.

Results: The findings indicated that knowledge of the majority of mothers (64.3%) regarding diarrhea and diet was moderate and only 3.7% had good knowledge. The majority of mothers (56%) had a moderate practicing knowledge of diarrhea and diet and only 2.3% had a good practice.

Conclusions: Based on the low level of knowledge and practice among the study population, the usual practice of focusing on a target group would be necessary. Our findings indicated a serious lack of competence in dealing with this problem.

Keywords: Diarrhea; Maternal Knowledge; Practice; Diet

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►Implication for health policy/practice/research/medical education:

Health professional's role for proper implementation of interventions in management of knowledge, attitude and practice of mothers regarding childhood diarrhea, requires effective and beneficial methods of education.

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1. Background

Diarrhea affects 1 to 2.5 billion individuals annually and causes 1.5 to 2.5 deaths of children under the five years old (1). It is associated with the lack of safe drinking water, inadequate sanitation and poor hygiene. Acute diarrheal disease is responsible for the majority of diarrheal illnesses (less than 14 days). However, chronic or persistent diarrhea is defined as an episode that lasts longer than two weeks. Diarrheal infections are the fifth leading cause of mortality worldwide (2, 3).

Various preventive techniques were reported in the literatures including hygiene, diet, medications, and supplements; although according to a general classification, health care, breastfeeding, immunization, supplemental zinc, and probiotics could be used. Simple remedies could be taken to reduce the number of mortality. Fluid therapy with Oral Rehydration Solution (ORS) and other standard home solutions, non-stop feeding during diarrhea, and continued breastfeeding are the typical treatments. Since 1970s, ORS has been the cornerstone of management in order to prevent life-threatening dehydration associated with diarrhea. Nevertheless, only less than 40% of children with diarrhea in developing countries received the recommended treatment and there has been a little progress toward the trend in the last decades (4, 5). Global reports indicated that in 2008, despite the recommendations about the success of ORS, only 38% of children less than five years old received ORT (Oral Rehydration Therapy) and continued food intake during diarrheal episode. According to an analysis based on data from 34 countries in 2007, 68% of surveyed countries have reduced the use of ORT in diarrheal children less than 3 years of age (6). Numerous studies about the maternal awareness of proper diet of children with diarrhea suggested that knowledge of the etiologic factors, symptoms, treatment, and caring methods in diarrheal children among mothers is inadequate (7). Data from Qazvin and Gonabad revealed the low and moderate knowledge of mothers about ORS indications respectively (8). Unfortunately medical staff has been less than successful knowledge as well. Despite of the publication about ORS in medical literature, as an example, Thai's physicians administrated ORS only in 43% of the cases with medical indications (9).

2. Objectives

Regarding to the relationship between nutritional disorders and appropriate nutrition in preventing complications of diarrhea and the leading role of mothers in first line management of diarrheal children, our objective was to assess the maternal knowledge and practices about diarrhea and appropriate nutrition in children with diarrhea in Zahedan.

3. Materials and Methods

This cross-sectional study was carried out in primary health care centers which were selected by cluster sampling among four districts of Zahedan, Iran. However, most of the patients who referred in these centers were mainly from the city that came on their own to receive medical attention. The study carried on the mothers who brought their less than five years old children for consultation or treatment at the health centers. The ethical considerations were obtained from the research ethics committee of Zahedan University of Medical Sciences, Zahedan, Iran.

To determine the sample size, 30 questionnaires were filled by mothers as a pilot study. To find out the validity of the questionnaire, we solicited expert opinions. Thirty interview sessions were conducted twice in an interval of 10 days by 30 mothers. The validity of the questionnaire was approved by pediatricians in department of pediatrics of faculty of medicine in Zahedan University of Medical Sciences and the reliability of 85% was calculated by Cronbach's alpha. Eventually 300 individuals were used as a sample size.

3.1. Available Sampling Method

The questionnaires were administered by the author to whoever had given verbal consent to participate in the study. The questionnaire was researcher made and consisted of two parts including demographic characteristics and the section designed for assessing the knowledge and practice. There were 10 questions for assessment of the knowledge and 10 questions for practice. Questions were designed based on knowledge about incidence of diarrhea, diarrheal etiologies, risk associated diarrhea, associated symptoms, treatment, and maternal behavior associated with nutritional factors during diarrhea (7). Subsequently, if the mother was uneducated, the questionnaire was completed by the researchers. Eventually, following completing the questionnaires, the scoring of the responses was performed. The total score was 30 (16 for knowledge plus 14 for practice). The result divided in three categories including good knowledge (more than 12 scores)/practice (more than 11 scores), moderate knowledge (8-12)/practice (7-11) and poor knowledge (lower than 8 scores)/practice (lower than 7 scores). Subsequently, the data were analyzed by SPSS version 18 using descriptive and analytic statistics and chi-square. P value less than 0.05 was considered statistically significant.

4. Results

The mean age of participants was 23.76 ± 4.25 (with the minimum age of 15 and maximum of 40 years old). Twenty six percent were uneducated, 29% had low levels

of education, and 45% had a diploma or higher degree. Forty eight point six percent of the mothers only had one child and less than 4% of them had five or more children. In terms of employment, 80.4% of the subjects were housewives and 14.6% were employed.

Among the 300 mothers interviewed, 196 participants (65.8%) attested that the onset of diarrhea is in crawling babies and the others mentioned that it was after two years of age. In this survey, 155 (52%) mothers declared that diarrhea may occurred due to the digestion of contaminated food and water, 142 subjects (47.7%) reported that the teething may cause diarrhea, and the few remaining mentioned the common cold as an etiology. On the other hand, in a question about the effective factors in developing diarrhea approximately 36.5% of participants considered unsafe water and unclean hands as one of the factors in developing diarrhea. Only 20 of them mentioned all of the three factors of cooked and cold food, unsafe water, and not washing hands as being the cause for diarrhea (Table 1). About the clinical symptoms, one hundred and seventy nine mothers (59.7%) stated that dehydration as a major complication of diarrhea. Vomiting (23.7%) and loss of appetite (16.3%) were mentioned respectively. Furthermore, 12.7% of subjects considered child's lethargy and 6.3% mentioned dry mouth and eyes as alarming symptoms of diarrhea. Among the study population, 240 individuals positively responded to the question about the importance of vaccination in preventing of diarrhea. Only 137 participants were aware of the importance of measles vaccination in order to prevent severe diarrhea. Tuberculosis vaccine (27.1%) and pertussis vaccine (15.8%) were mentioned in the following categories. With regards to the source of their information, subjects claimed physician consultation (51%), health center staff (44.6%), as well as relatives and television programs as a major source of information (Table 2).

Table 1. Frequency of Identified Causes of Diarrhea According to Mothers' Viewpoints

	Frequency, No. (%)
Unclean Hands and Un-healthy Water	109 (36.33)
Unhealthy Water	74 (24.66)
Unclean Hands	37 (12.33)
Unclean hands and Cold Cooked Food	32 (10.66)
Unhealthy Water and Cold Cooked Food	21 (7.0)
Combination of Three Causes	20 (6.66)
Cold Cooked Food	6 (2.0)
No Response	1 (0.33)
Total	300 (100)

Table 2. Method for Treatment of Vomiting in the Home

Cause	Frequency, No. (%)
Watery food and then refer to physician	139 (46.3)
Refer to physician	85 (28.3)
Watery food and liquid	50 (16.7)
Other Methods	20 (6.7)
Antiemetic	6 (2.0)
Total	300 (100)

Sixty four percent of mothers continued breastfeeding more extensively during diarrhea. Only 2.3% of the mothers stopped breast-feeding and 33.7% diluted their milk during diarrhea. On the other hand, our findings revealed that 31.3% of subjects used dough, 30.3% of them fed their child with enameled rice, and 22.3% preferred fruit juice as a major supplementation. Mothers were also asked about their approach to vomiting which is presented in Table 2. Two hundred and sixty four mothers (88%) gave ORS solution to their children and 12% of them used apple juice. According to the evaluation on the completed questionnaires, the majority of mothers (64.3%) were evaluated in the moderate range of awareness. Thirty two percent of subjects had poor knowledge and only 11 participants (3.7%) had a good awareness. According to their practice evaluation, 56% of maternal practice was moderate and 41.7% had a weak performance and others practiced appropriately. Chi-square test was applied to compare the level of education and employment status of mothers in this study and a significant difference was found. The higher level educated and employed mothers had better knowledge ($P < 0.001$). In Table 3 the results were presented in separated groups. The role of these variables in the situation of maternal practice toward their children's diarrhea and diet were analyzed. The statistical evaluation revealed the significant difference between education level and employment statuses and maternal practice ($P < 0.001$). Educated and employed women revealed better competence in dealing with diarrhea and the diet of child with diarrhea (Table 4).

5. Discussion

Considering our findings, most of the mothers (64.3%) had moderate knowledge about diarrhea and proper diet in diarrheal children and only 3.7% of the subjects had good attitude. Hence, the awareness and practice of mothers and their approach to diarrhea was not acceptable. In a study carried out in north of Iran, the results indicated that most of the knowledge of mothers had been located in the range of moderate awareness and well awareness only evaluated in 6% of them (10). Our results revealed that there was a significant difference between level of education and maternal attitude regarding diarrhea and nutritional condition of their children dur

Table 3. Distribution of Level of Knowledge regarding Diarrhea Among Mothers

	Good, No (%)	Moderate, No (%)	Low, No (%)	Total, No (%)	P value
Level of Education					
Uneducated	-	39 (50.0)	39 (50.0)	78 (100)	< 0.001
Lower diploma	-	45 (51.7)	42 (48.3)	87 (100)	
Higher diploma	11 (8.2)	108 (80.6)	15 (11.2)	134 (100)	
Total	11 (3.7)	192 (64.2)	96 (32.1)	299 (100)	
Engagement Position					
Practitioner	6 (13.6)	34 (77.3)	4 (9.1)	44 (100)	< 0.001
Housewife	5 (2)	159 (62.1)	92 (35.9)	256 (100)	
Total	11 (3.7)	193 (64.3)	96 (32)	300 (100)	

Table 4. Distribution of Level of Practice Against Diarrhea Among Mothers

	Good, No (%)	Moderate, No (%)	Low, No (%)	Total, No (%)	P value
Level of Education					
Uneducated	-	23 (29.5)	55 (70.5)	78 (100)	< 0.001
Lower diploma	-	39 (44.8)	42 (55.2)	87 (100)	
Higher diploma	7 (5.2)	105 (78.4)	22 (16.4)	134 (100)	
Total	7 (2.3)	167 (55.9)	125 (41.8)	299 (100)	
Engagement Position					
Practitioner	2 (4.5)	34 (77.3)	8 (18.2)	44 (100)	< 0.001
Housewife	5 (2.0)	134 (52.3)	117 (45.7)	256 (100)	
Total	7 (2.3)	168 (56)	125 (41.7)	300 (100)	

ing diarrhea. None of the uneducated participants had good knowledge whereas 50% of them had a poor level of knowledge. According to a study conducted in Ethiopia, of the 750 mothers or baby nurses, 79.3% were uneducated. Solely, 7.5% of the studied subjects had adequate information about diet and treatment of diarrhea. In their study, it was demonstrated that maternal education and literacy levels were directly proportional to the level of their awareness (7). In another study in Tanzania, similar results were achieved (11). Several studies in developing countries have shown that children of uneducated mothers are at higher risk of diarrhea incidence. Moore et al demonstrated that low education and early cessation of breastfeeding were significant risk factors in childhood diarrhea (12). Furthermore, the attitude toward hygiene was significantly associated with higher levels of education (13, 14). In this study there was significant difference between education level and their knowledge as well as practice ($P < 0.0001$). On the other hand the mother's employees included moderate and good knowledge almost 77.3% and 13.6% respectively. Moreover, only 8.2% of mothers with a good education had good knowledge ($P = 0.0001$).

In our study the number of children in participant' mothers were 1-7 in ranges. In contrast to Salmalian et al. study, we did not observe any significant difference between number of children and maternal attitude status regarding diarrhea and diet of children with diarrhea. In our findings no differences were found between the number of children and the mothers' practice ($P > 0.05$). Of the mothers who only had one child, 41.8% were poor in practice. Of note only 2.7% of the mothers with single baby associated with good practice. Former studies demonstrated that children living in the lower socio-economic areas are experiencing more episodes of diarrhea with greater severity of dehydration and further mortality rate (15).

In a study in Tehran, 90% of mothers knew about the ORS and 72% of them used it for their children; however, only 43% of diarrheal children received ORS, in practice (8). In a similar study in India, 18% of subjects had adequate awareness of ORS and 17% knew the ingredients of the solution therefore following the training programs, 80% of individuals reached adequate knowledge and their awareness significantly increased (16). In another study,

it has been emphasized that educational intervention has had a positive impact on maternal attitude and practice (17). Considering government health interventions in Bangladesh, rural attitude increased dramatically although, minimal improvement was seen in urban areas (18). Kudlova et al. in Czech indicated that awareness of ORS had been 27% and approximately 2% of participants applied it during the recent diarrhea. However, no difference was found regarding their source of information. The knowledge source of most mothers in the study were relatives and friends which was 76%, and almost 58% of them were informed by pediatric specialists (19). A comprehensive study conducted in India demonstrated that 63% of Indian mothers were aware of ORS whereas only 27% of them took advantage of it for their children (20). These studies suggest a profound lack between the cognition of ORS and its utilization. Thus, a superficial understanding of ORS is not enough and it requires consistent efforts to emphasize on importance of ORS in resolving dehydration during diarrhea, particularly in children; since this group of age is more likely to be dehydrated quickly (4).

In the present study, 52% of mothers stated their children's diarrhea incidence was due to contaminated food and water. Approximately, 48% of respondents considered teething as a cause of diarrhea and approved consensus. However, similar study in Nigeria revealed that 35% of mothers were aware of contaminated food and water as an etiologic agent of diarrhea and only 3.9% believed in teething (20). In comparison, our finding was substantially higher which could be due to the credibility of these issues in the region. There are beliefs which can be the basis of incorrect interventions or even absence of intervention by mothers that may ultimately lead to harm.

Dehydration is one of the important complications of diarrhea. In this study, 59.7% of individuals considered dehydration as the most important risk threatening factor following the diarrhea. However, in a study conducted in India, only 5.3% of mothers were aware of dehydration caused by diarrhea (21). In another study in Iran, the same finding was estimated in 32% of subjects (10), indicating a higher level of awareness than in our study population.

In our study, 63.2% of mothers maintained consistent breastfeeding during diarrhea. Despite its lack of veracity, it is still believed that the diluted milk or food is better tolerated by the gastrointestinal system of children during diarrhea. Hence, 33.3% of mothers diluted their children's milk. Obtained findings from a study in India demonstrated that 88% of mothers were restricted their children's diet during diarrhea (22). Kolahi et al. found that only 11% of mothers had increased amount of breast milk or food in their children's diet and 60% had discontinued both (8). Results of a study in Norway emphasized on the role of breastfeeding as the most important factor affecting the duration of diarrhea (23).

Our findings revealed that 31.3% of mothers used dough, 30.3% of them fed their children with enameled rice, and 22.3% preferred fruit juice. In a similar study conducted on 300 rural mothers in India, 39% of them used rice and milk, and 34% used diluted cow's milk (24). Some studies suggested that yogurt and an amino acid-based diet could reduce the duration of treatment in children with persistent diarrhea. Nowadays, supplemental zinc is recommended in developing countries in favor of childhood diarrhea treatment. It was demonstrated that oral supplemental zinc treatment decreases either the course of treatment or risk of the disease and consequently reduces morbidity and mortality rates (12). A recently published systematic review has approved the role of supplemental zinc in reducing the duration of diarrhea in children older than 6 months with acute diarrhea. In addition, it also reduces the numbers of children suffering from prolonged diarrhea (25).

6. Conclusions

The findings indicated the low proportion of maternal knowledge and practice about etiologies and interventions in children with diarrhea which makes it clear that education in this population needs to be intensified. There is a need to modify policies in this area. This could be achieved in a number of different approaches including physicians' instructions to mothers about the disease and proper diet of children. Furthermore, participation in retraining programs could be very useful in improvement of awareness of mothers. Another way to educate the mothers is training all health care employees to promote the transmission of awareness to the patients refers to these centers. Providing information through mass media and clarifying public opinion about the importance of nutrition in physical and intellectual growth and development of children may also be beneficial. Consequently, enhanced maternal knowledge would have a positive effect on their treatment of diarrhea in children. It bears repeating that we need to further education efforts in order to improve the health of children and reduce medical expenses related to diarrhea which are imposed on health system. This education should be focused on matter as followed: symptoms of dehydration in children, knowledge about ORS and how to prepare ORS solution, proper and systematic diet of diarrheal children, and disease prevention.

There were several limitations in our study. We could not obtain a homogenous population because of the diversity of population from different levels of social and cultural categories in Zahedan. Another limitation was that we had to interview the uneducated people versus others who simply filling in the questionnaire. This might cause some level of bias in the responses between the two groups.

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Authors' Contribution

Study concept and design: Manijeh Khalili, Maryam Mirshahi. Analysis and interpretation of data: Amin Zarghami, Fatemeh Farahmand. Drafting the manuscript: Amin Zarghami, Fatemeh Farahmand, Mohsen Rajabnia Chenari. Critical revision of the manuscript for important intellectual content: Manijeh Khalili, Mohsen Rajabnia Chenari.

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