Effect of Educational Guidelines about Preventive Measures of Acute Gastroenteritis on Mothers' Knowledge and Reported Practices

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Abstract

Background: Acute gastroenteritis is the fifth leading cause of death worldwide. Objective: current study *aimed* to evaluate the effect of application of educational guidelines about preventive measures of acute gastroenteritis on mothers' knowledge and reported practices. Methods: A quasi-experimental *design* was used in this study. The study was carried out in outpatient clinics affiliated to Mansoura University Children's Hospital, Egypt. Subjects of this study was a purposive sample of (100) mothers with their children attended outpatient clinics. A developed structured questionnaire sheet to assess mothers' knowledge and reported practice. Results: there was a statistically significant difference in mothers' knowledge and reported practice about preventive measures of acute gastroenteritis post implementation of educational guidelines. Conclusion: there was an enhancement in the mothers' knowledge and reported practice after application of educational guidelines about preventive measures of acute gastroenteritis. Recommendations: Continuous educational programs for health care providers and educators about gastroenteritis to be delivered at outpatient clinics.

Key words: Educational guidelines, preventive measures, acute gastroenteritis, mothers, knowledge and reported practices

Introduction:

Acute gastroenteritis (AGE) is the leading cause of morbidity and mortality in children under five years of age around the world, mostly in developing countries and it is one of the common presentations in the emergency department. Approximately 15% of children die of AGE before 3 years of age and one of every ten children born in developing countries dies of AGE before reaching the age of five (World Health Organization (WHO), 2013). The most commonly causes of AGE are bacterial, viral and fungal infection. The incidence of AGE may be high as 6-12 episodes per child annually and increase the rate of diarrheal morbidity for children in the first two years of life in the developing countries. The risk factors for AGE are lack of safe drinking-water, adequate sanitation and hygiene (United Nations International Children's Emergency Fund (UNICEF), 2020; WHO 2013).

The most frequent severe complications of AGE are dehydration resulted from fluid loss, which is associated with electrolyte disturbances and metabolic acidosis. It may be life-threatening, particularly in young children and who are already malnourished or have impaired immunity, in addition to, nutritional deficiencies, reduced resistance to infections and impaired growth and development (Sonny & Osborn, 2018; Vega and Avva 2019).

Prevention is the key to control AGE diseases and reduce this high mortality and morbidity associated with diarrheal diseases. UNICEF and WHO came up with preventive measures to avoid AGE. These are: access to safe drinking water (e.g. water safety planning (the management of water from the source to tap); household water treatment and safe storage), access to improved sanitation facilities, hand washing with soap at critical times (e.g. after toilet use and before the preparation of food). Hygiene promotion, along with access to safe drinking water and adequate sanitation should be accessible by all. Recently, the rotavirus vaccine became the predominant agent to prevent paediatrics viral AGE (UNICEF 2020; WHO 2013).

Although, AGE is a major killer disorder, it is preventable and treatable. Furthermore, the most of AGE in children under five years old

treated at home and the primary caregivers' role is very important in preventing and early management of disease (Sonny & Osborn, 2018; Vega and Avva 2019). So, the knowledge and practice of mothers as primary caregivers about AGE is very important in prevention and early management of this disorder. Moreover, recent studies recommended the importance of teaching and training AGE prevention measures interventions for the mothers. In addition, it is necessary to promote the continued routine feeding practices to decrease the morbidity and mortality caused by dehydration (Asiegbu, Asiegbu, Ezeonu, & Ezeanosike, 2017; Gul, Sadia, Sidra, & Muhammad, 2017; Merali, Morgan, and Boonshuyar 2018; Onwukwe, Van Deventer, and Omole 2016; Viateur 2018). Also, it is important to provide necessary training on these problems and increase the correct practices in preventing the prevalence of AGE (Durduran, Kandemir, Pekcan, & Evci, 2019).

Significance

Acute gastroenteritis is the fifth leading cause of death worldwide. It leads to more than three million deaths every year in developing countries especially in young children. In addition to it is a common reason for children hospitalization. Mothers as a primary caregiver, has an important role in the prevention and management of acute gastroenteritis. Still around the world there are a lot of concerns about the impact of educational programs for the mother on her child health. En Egypt, there is rarely evidences for research the effect of mother's education program regarding childhood gastroenteritis.

Aim of the study:

The aim of this study was to evaluate the effect of educational guidelines about preventive measures of acute gastroenteritis on mothers' knowledge and reported practices.

Research hypotheses:

- Mothers may have better knowledge regarding preventive measures of acute gastroenteritis after application of educational guidelines.

Mothers" practices regarding preventive measures of acute gastroenteritis may be improved after application of educational guidelines

Methods:

Research Design: A quasi-experimental research design was utilized to fit the aim of this study. An educational guidelines application was developed, constructed and applied with an approach of pre-test and post-test for the studied mothers.

Sample: A purposive sample of (100) mothers with their children attended outpatient clinics. Inclusion criteria included mothers able to read have and use a smart phone, having children aged less than 5years and willing to participate in the study. Sample size calculated using OpenEpi, Version 3, open source calculator. Sample size calculated using comparing two means according confidence interval (2-sided) = 95%, Power= 80%, Mean pre (= 0.78 and SD= .37 while, Mean post (= 0.95 and SD= .2) according pilot results.

Setting: This study was carried out at the general outpatient clinics number 4, 5 and 8 affiliated to Mansoura University Children's Hospital (MUCH), in Mansoura city, which provides health services to children from the surrounding areas at Dakhlia governorate. The general outpatient clinics are located at the ground floor. Each clinic has two beds for clinical assessment and a scale for weighing children. The general outpatient clinics receive children suffered from general health problems and make referral to other clinics according to the child's condition. Each clinic receives at least 100 pediatric patients per day from Saturday to Thursday, from 9.00 am to 3.00 pm. The prescribed medications are given free of charge through the outpatient pharmacy.

Instruments: The researchers developed two tools after reviewing the relevant literatures and recent studies (Desta, Assimamaw, and Ashenafi 2017; Viateur, 2018; Workie, Sharifabdilahi, and Addis 2018), to collect the study data as follow; Demographic Characteristics (age, education level, occupation, residence, family income). Tool I: Mothers' knowledge about AGE. This tool included close ended questions about

definition, causes and risk factors, role of breast feeding and bottle-feeding adverse effect in relation to acute gastroenteritis, signs and symptoms, complications and seriousness, measures of prevention of AGE. Tool II: Mothers' reported practice regarding preventive measures of AGE, included close end questions and covering five items: proper hand washing techniques, dealing with drinking water, keeping house cleanliness and sanitation, proper handling, preparation, and storage techniques of food, and weaning practice. The scoring of the mothers' answers structured questionnaire sheet to assess their level of knowledge was considered poor if the percent score was (< 50%), average if the percent score was (50 % - < 75%) and good if the percent score was (≥ 75%). As regards to their reported practice about preventive measures of AGE was unsatisfactory (<75%) if the percent score was (<75%) and satisfactory if (≥75%).

Content validity of the tools was tested by five panel experts in field of Pediatric Nursing. The modifications were done on the tool according to their opinions. Internal consistency reliability (Cronbach's α) for (Mothers' knowledge and reported practice about acute gastroenteritis emerged as (0.75). For and each part; knowledge part (Cronbach's α =0.54). Reported practice part (Cronbach's α =0.74).

Ethical Considerations

An approval of ethical considerations was obtained from the Research Ethical Committee of Nursing Faculty, Mansoura University (Ref. No. P.0213). Then an oral consent was obtained from the mothers after complete description of the purpose and process of the study by the researchers to obtain their acceptance for participation. Mothers will be informed that their participation in the study is voluntary; they have the right to withdraw from the study at any time without giving any reason. Confidentiality of the information collected and anonymity were assured for the mothers.

Statistical Analysis:

The collected data were coded and entered to the statistical package of social sciences (SPSS) version 20. After complete entry, data were explored for detecting any error, then, it was tested for normality by Kolmogorov-Smirnov test. The standard methods of descriptive statistics were used to describe the data (i.e. Frequencies and percentages for categorical variables and mean and standard deviation for continuous variables). Paired't' test was used to test for differences in pre-test to post-test mean of the participants' knowledge and reported practice scores. The Chi-Square ($\chi 2$) was used to check whether the variables are independent of each other or not. The level of significance (P-value) equal or less than 0.05 was considered to be statistically significant.

Pilot Study

A pilot study was carried out on 10 mothers (10% of total sample) to test the clarity and applicability of the tools and the modifications were done accordingly. They were excluded from the study.

Data Collection Process

The data collected process was done over 3 months started from November 2019 to the end of January 2020. Permission obtained from the Dean of Faculty of Nursing and director of previously mentioned hospital before collection of data. Then, the researchers communicated with head nurse of outpatient clinics to explain the study aim and nature. The head nurse introduced the researchers to the outpatient clinics staff. After that the researchers were inviting the mothers for voluntary participation in the study. The study was conducted in three phases.

Assessment phase; educational sessions with mothers carried at clinic. The researchers introduced themselves and explain the study aim and process. Then each mother was subjected to the following: assess mothers' knowledge and reported practice about preventive measures of AGE. The times allowed for mothers were 20-30 minutes to fill the questionnaire. The researchers were available to answer questions and record the answers if needed to the mothers. Then the researchers revised all the parts in the sheets to be sure that it was filled completely. The researchers used direct structured interview for

each mother throughout their availability in the clinics.

Implementation phase; based on to the data obtained from the mothers, the educational guidelines were designed by the researchers and based on the literature review. The guidelines intervention prepared in Arabic brochure form was distributed to the mothers, which include: AGE definition, causes and risk factors, role of breast feeding and bottle feeding adverse effect in relation to AGE, signs and symptoms, complications, measures of prevention of AGE; and practical part which include: proper hand washing techniques, dealing with drinking water, keeping house cleanliness and sanitation, proper handling, preparation, and storage techniques of food as well as weaning practice.

The developed educational guidelines application was scheduled at a time that was not conflicted with the provided care. Face-to-face group session (45 to 60 minutes) was held in the waiting area in outpatient clinic. The researchers explained the study aim and nature to the mothers. Various teaching methods and media were used such as small group discussion, video and posters presentations as well as asking questions. The post test was collected after one month of educational guidelines application and it was collected via telephone call and Whats App. for mothers.

Evaluation phase; mothers' knowledge and reported practices were evaluated pre- and post-two months of educational guidelines application using (Tool 1 & Tool II).

Results

Table 1 showed that 49% of mothers, their age was ranged between 20-30 years with a mean 28.9 ± 2.4 years old. In relation to mothers' education, 35% of them were diploma education and 67 % had enough monthly family income. Regarding residence, 72 % of mothers were coming from urban area and 58% were house wife.

Table 2 revealed that, mothers' knowledge in relation to; definition, causes and risk factors, role of breast feeding and bottle feeding adverse effect in relation to AGE, signs and symptoms, complications and seriousness, measures of prevention of AGE; was significantly improved after participation in educational guidelines preventive measures regarding AGE application as evidenced by (11.27 ± 1.97; 13.80 ± 1.60 respectively). This improvement was statistically highly significant difference $P < 0.000$. Moreover, this table illustrated that the mothers knew the measures of prevention of AGE pre - implementation of educational guidelines but their knowledge improved post implementation as evidenced by (0.78 ± 0.37; 0.95 ± 0.20 respectively). This improvement was statistically significant difference $P < 0.001$.

Table 3 illustrated that, the mothers had satisfactory level of reported practice about proper hand washing techniques pre - implementation of educational guidelines which improved post implementation as evidenced by (10.13 ± 2.69; 12.84 ±1.40 respectively) and $P < 0.000$. Moreover, the mothers had satisfactory level of reported practice about dealing with drinking water pre - implementation of educational guidelines while improved post implementation evidenced by (2.68 ± 0.99; 3.26 ± 0.88 respectively) and $P < 0.000$.

Table 4 clarified that there is significant relationship between mothers' knowledge pre and post implementation of educational guidelines preventive measures regarding AGE and both residence and mothers' educational level as evidenced by ($P < 0.026$, 0.017 and $P < 0.034$, 0.026 respectively).

Table 5 indicated that there is significant relationship between mothers' reported practice pre and post implementation of educational guidelines preventive measures regarding AGE and mothers' age, their educational level and monthly income as evidenced by ($P < 0.022$, 0.017; $P < 0.034$, 0.004 and 0.022, 0.041 respectively).

Table (1): Distribution of Studied Subjects according to their Demographic Characteristics (N= 100)

Items	N= (100)	%
Mothers' Age		
<20 yrs.	20	20
20-<30 yrs.	49	49
≥30 yrs.	31	31
± SD	28.9 ± 2.4	
Mothers' Education		
Illiterate	10	10
Read and Write	18	18
Diploma	35	35
University	31	31
Higher studies	6	6
Mothers' Occupation		
Working	42	42
House wife	58	58
Monthly Family Income		
Enough	67	67
Not enough	33	33
Residence		
Rural	28	28
Urban	72	72

Table (2): Distribution of Studied Mothers' Knowledge pre and post Implementation of Educational Guidelines Preventive Measures regarding AGE.

Items	Pre - implementation	Post - implementation	t- test	
	Mean ± SD	Mean ± SD	t	P
Definition of AGE	0.64 ± 0.30	0.84 ± 0.36	3.15	0.002
Causes and risk factors of AGE	0.17 ± 0.37	0.69 ± 0.26	9.01	0.000
Role of breast feeding in relation to AGE	0.54 ± 0.34	0.86 ± 0.33	4.67	0.000
Bottle feeding adverse effect in relation in relation to AGE	0.58 ± 0.36	0.83 ± 0.32	5.13	0.000
Signs and symptoms of AGE	0.53 ± 0.32	0.64 ± 0.34	4.42	0.000
Complications and seriousness of AGE	0.68 ± 0.38	0.93 ± 0.22	5.57	0.000
Measures of prevention of AGE	0.78 ± 0.37	0.95 ± 0.20	3.79	0.001

(*) statistically significant at p ≤ 0.05

Table (3): Distribution of reported Practice of the Studied Mothers' pre and post Implementation of Educational Guidelines Preventive Measures regarding AGE

Items	Pre - implementation	Post - implementation	t- test	
	Mean ± SD	Mean ± SD	t	P
Proper hand washing techniques	10.13 ± 2.69	12.84 ±1.40	10.00	0.000
Dealing with drinking water	2.68 ± 0.99	3.26 ± 0.88	5.45	0.000
Keeping house cleanliness and sanitation	3.76 ± 1.09	4.55 ± 0.91	5.56	0.000
Proper handling, preparation, and storage techniques of food	5.34 ±1.28	6.30 ± 0.75	6.57	0.000
Weaning practice	7.44 ±1.65	9.98 ± 1.75	8.96	0.000

(*) statistically significant at p ≤0.05

Table (4): Relationship between Characteristics of Mothers and their Knowledge pre and post Implementation of Educational Guidelines Preventive Measures regarding AGE.

Items		Pre				post				Test of significance	
		Fair N=73		Good N=27		Fair N=23		Good N=77		Pre	Post
		No.	%	No.	%	No.	%	No.	%	χ^2 & p	χ^2 & p
Mothers' age	<20 yrs	16	16	4	4	7	7	13	13	1.599 & 0.450	2.99 & 0.224
	20-<30 yrs	33	33	16	16	8	8	41	41		
	≥30 yrs	24	24	7	7	8	8	23	23		
Residence	Urban	16	16	12	12	4	4	24	24	4.96 & 0.026	5.66 & 0.017
	Rural	57	57	15	15	19	19	53	53		
Mothers' Educational Level	Illiterate	9	9	1	1	2	2	8	8	4.52 & 0.034	4.43 & 0.026
	knows read and writing	6	6	3	3	2	2	7	7		
	Primary/Preparatory	9	9	--	--	4	4	5	5		
	Secondary	14	14	6	6	3	3	17	17		
	Institute	10	10	5	5	3	3	12	12		
	University	22	22	9	9	8	8	23	23		
	Higher studies	3	3	3	3	1	1	5	5		
Occupation	House wife	42	42	16	16	12	12	46	46	0.024 & 0.877	0.416 & 0.519
	Working	31	31	11	11	11	11	31	31		
Monthly Income	Enough	52	52	18	18	12	12	58	58	0.196 & 0.658	1.75 & 0.059
	Not enough	21	21	9	9	11	11	19	19		

(*) Statistically significant at $p \leq 0.05$

Table (5): Relationship between Characteristics of Mothers and their Reported Practice pre and post Implementation of Educational Guidelines Preventive Measures regarding AGE.

Items		Pre				Post				Test of significance	
		unsatisfactory N=47		Satisfactory N=53		Satisfactory N=92		unsatisfactory N=8		Pre	Post
		No.	%	No.	%	No.	%	No.	%	χ^2 & p	χ^2 & p
Mothers' age	<20 yrs	12	12	8	8	20	20	--	--	5.95 & 0.022	4.23 & 0.017
	20-<30 yrs	19	19	30	30	47	47	2	2		
	≥30 yrs	16	16	15	15	25	25	6	6		
Residence	Urban	10	10	18	18	26	26	2	2	1.988 & 0.159	0.039 & 0.844
	Rural	37	37	35	35	66	66	6	6		
Educational Level	Illiterate	8	8	2	2	9	9	1	1	3.86 & 0.034	4.78 & 0.004
	knows read and writing	5	5	4	4	7	7	2	2		
	Primary/Preparatory	6	6	3	3	9	9	--	--		
	Secondary	9	9	11	11	18	18	2	2		
	Institute	9	9	6	6	14	14	1	1		
	University	9	9	22	22	29	29	2	2		
	Higher studies	1	1	5	5	6	6	--	--		
Occupation	House wife	30	30	28	28	52	52	6	6	2.90 & 0.088	1.37 & 0.096
	Working	17	17	25	25	40	40	2	2		
Monthly Income	Enough	29	29	41	41	67	67	3	3	3.23 & 0.022	4.64 & 0.041
	Not enough	18	18	12	12	25	25	5	5		

(*) Statistically significant at $p \leq 0.05$

Figure (1): The total score of studied mothers' knowledge level pre and post Implementation of Educational Guidelines Preventive Measures regarding AGE

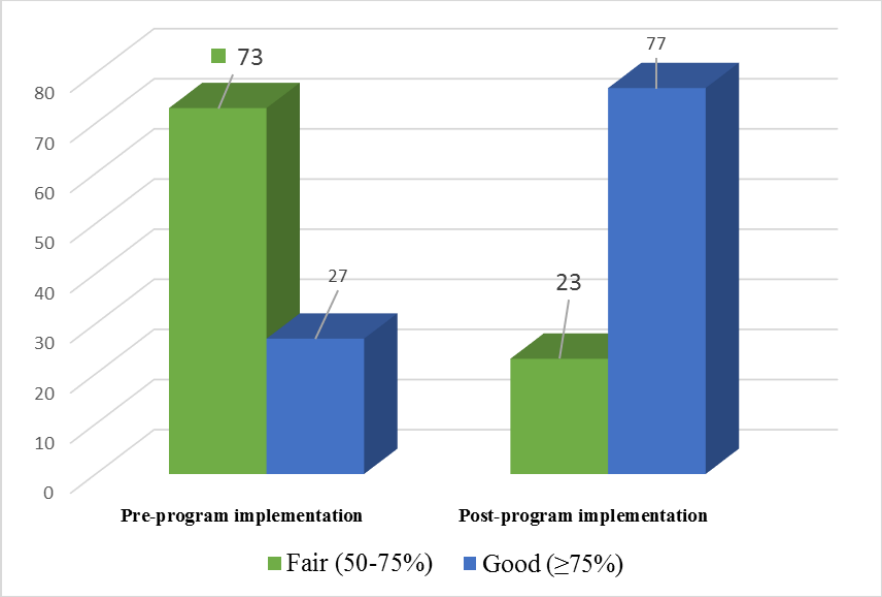
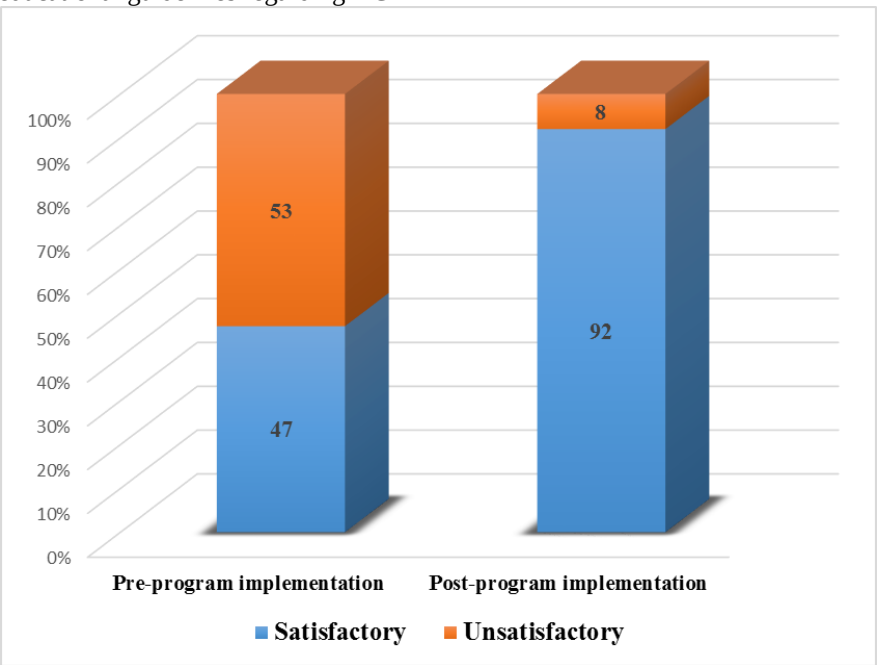


Figure (2): The total studied mothers' reported practice level pre and post implementation of educational guidelines regarding AGE



Discussion

Although the accessibility of simple effective treatment for AGE, it is a common cause of morbidity and mortality worldwide. The estimated numbers were 2.4-2.8 million deaths reported annually among under 5-year age children. WHO death records reported in Egypt that, AGE killed around 3364 child per year in the last five years (Abass, et al. 2017).

But it is preventable and treatable condition. Mother's education is an important useful effect in their children care. Through their understanding of the nature of AGE. Accordingly, they can avoid the complications, reduce hospitalization period, decrease health care costs and improve children quality of life. Therefore, this study is an interventional study, aimed to evaluate the effect of an interventional educational guidelines to improve mothers' knowledge and reported practice about preventive measures against AGE in children.

The results of the study showed that significant improvement in the studied mothers' knowledge and reported practice post implementation of educational guidelines than before. It might be explained by the mothers' interest with the teaching methods and the audio- visual materials utilized during implementation. In addition to active involvement of mothers during discussion and motivated them to have an interest to take a full of life role in their children caring.

The present study was carried out among one hundred mothers with their children who attend outpatient clinics of whom near from half of them their age was ranged between 20-30 years with the mean 28.9 ± 2.4 years old. The majority of them had secondary and university education and two thirds of them had enough monthly family income. Regarding residence, the majority of mothers were coming from urban area and more than half of them were house wife. This was similar with Padhy, Sethi, and Behera (2017) findings showed that, the majority of mothers were in the age group of 21-30 years, but near from one third of them had higher secondary education.

Another study conducted by Workie et al. (2018) found that more than half of studied mothers were in the age of 25–34 years, more than one third of them were housewives and near from half of them were unable to read and write. In addition, Chauhan, Chauhan, and Shukla (2015), found the mean age of the mothers was 24.9 + 3.25 years, two third of them were illiterate and the majority were housewives. While this was different with Rosales (2016) found the majority of the mothers were aged between 38-45 years old, 38 % of them were not able to reach high school level and half of them had not enough monthly income.

It is cleared from this study results that mothers' knowledge in relation to; definition, causes and risk factors, role of breast feeding and bottle feeding adverse effect in relation to AGE, signs and symptoms, complications and seriousness, measures of prevention of AGE; was significantly improved after participation in educational guidelines preventive measures application regarding children with AGE. This is similar to the previous study conducted by Abass et al. (2017) who found that there was a significant improvement in the mothers' knowledge about gastroenteritis preventive measures.

Also, this was in line with the study carried out by Padhy et al. (2017) they found that, about half of mothers had good knowledge about definition of diarrhea and answered correctly the cause of diarrhea. While majority of mothers were aware of the diarrheal risk factors and also found about half of them had good knowledge regarding role of breastfeeding and bottle-feeding adverse effects and proper feeding in relation to diarrhea. Moreover, the result of the present study is consistent with the findings of Hackett et al. (2015) revealed that near of the half of the mothers did not know the causes of diarrhea. This results may be due to the mothers aware of the important of breastfeeding to the infant and mothers because it's religious and cultural issues.

Furthermore, the present study results presented near from two third of mothers were aware of dangerous and complications of AGE. This was in line with the study conducted by Chaudhary et al. (2014). But different with Sutariya, Talsania, and Shah (2011) showed that most of the studied sample did not consider the diarrhea to be dangerous. In addition, the result of the present study is compiling with the finding of Chauhan et al. (2015) who found that, there was a significant enhancement in mothers' knowledge after educating them how to prevent the diarrhea by simple household practices. This result may be due to simple handout used to explain the guidelines to the mothers.

The present study findings revealed that near from half of mothers were reported proper practice regarding proper hand washing techniques, dealing with drinking water, proper handling, preparation, and storage techniques of food, and weaning practice, was significantly improved most of them after the implementation of educational guidelines preventive measures regarding childhood gastroenteritis. This finding is in harmony with Merali et al. (2018) conducted the study in Cambodia. They found that most of mothers of under-five year's age children had good knowledge of diarrhea, but poor knowledge about preventative behaviours of diarrhea.

Moreover, it is also in the same line with Padhy et al. (2017) who found that one third of mothers had good knowledge about the proper drinking water source and sanitary latrine uses to prevent diarrhea. In addition, the study of Workie et al. (2018) showed that more than one third of mothers had good practice in prevention and home-based management of diarrhea. The opposite was observed in studies conducted by Desta et al. (2017) and Amare et al. (2014). These might be due to using of posters and group discussion as teaching methods which helped the mothers to acquire knowledge and to recall information after intervention.

The result of this study shed light on there is a significant relationship between mothers' knowledge pre and post implementation of educational guidelines preventive measures regarding AGE and both residence and mothers' educational level. This may be due to using different methods of mass media and health facilities, which may broadcast the proper information to the mothers. This result was supported by the study of Padhy et al. (2017) found that mothers having higher socioeconomic status and higher education and above were better knowledge about the diarrheal disease and the preventive practices. A similar finding was observed in Abass et al. (2017) they found that there was a significant relationship between education level and knowledge of the mothers.

Knowledge and practice of mothers as primary care givers about diarrhea in children are very important in prevention and early management of these illnesses. This study results indicated that there is a significant relationship between mothers' reported practice pre and post implementation of educational guidelines preventive measures regarding AGE and mothers' age, their educational level and monthly income. The present study was carried out among about half of mothers' age was ranged between 20-30 years with the mean 28.9 ± 2.4 years old, the majority of them had secondary and university education and two thirds of them had enough monthly family income all of these characteristics facilitate gaining the instruction provided. In addition to, the simplicity and attractiveness of the educational guidelines, which made in a simple Arabic language and contained a coloured pictures and simple illustrated videos.

This findings is consistent with Viateur (2018) who found that, there was positive significant relationship of mothers' knowledge; attitude and belief with their preventive practices against children with AGE. In addition, Merali et al. (2018) found that, the oldest mothers and higher educated had good prevention measures against AGE total scores. Moreover, Abass et al. (2017) and Abdinia (2014) found that, there was also a direct significant relationship between mothers' educational level and their performance, when dealing with acute pediatric diarrheal diseases. The same result was observed in a study by Khalili et al. (2013) in Iran, who found that, mothers' knowledge and practice was also medium level. But these results are in contrast with Chauhan et al. (2015) who found that almost similar in both literate and illiterate mothers in their performance level, so they concluded that there is no role of educational level in the development of mother's skill.

Conclusion:

The current study results concluded that there was an enhancement in the mothers' knowledge and reported practice after application of educational guidelines about preventive measures of acute gastroenteritis.

Recommendations:

Based on the results of this study, the researchers recommended that:

- Continuous educational programs for health care providers and educators about gastroenteritis to be delivered at outpatient clinics.
- Raise health care providers' knowledge and attitude regarding prevention of gastroenteritis is highly recommended through on job training sessions.
- Application of mass media educational health promotion programs on gastroenteritis.
- Reapplication of this study on large sample of the population.

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