Effect of structured patient education program on the knowledge level of mothers regarding childhood gastroenteritis and pneumonia at El-Raml Pediatric Hospital.

Nermine Abass, Manal Abd El Aziz, Noha Hal, Reem Tawfeek, Reem Gamal, Esraa Abd-el latif, Mai Koraiem, Heba barakat, Radwa Magdy, Hala Zahran, Radwa Hamza

Clinical Pharmacy Department, El-Raml Pediatric Hospital, Egypt.

Abstract

Diarrhea and pneumonia are leading childhood killers; together, they are responsible for almost one quarter of all deaths in children under 5. There is nothing new or exotic about these two diseases. Considering the influence of mass media education on the community, we recommend enforcement of mass media educational campaigns on pneumonia and the ways to avoid it.

Introduction

Diarrhea and pneumonia are leading childhood killers; together, they are responsible for almost one quarter of all deaths in children under 5. There is nothing new or exotic about these two diseases. In fact they are some of the oldest and most common in the world; most children contract pneumonia and diarrhea at some point during childhood. Globally more than 1.4 million children die every year, from diarrhea and pneumonia, particularly in settings with limited access to health services, nutritious foods, basic sanitation and hygiene [1].

Acute gastroenteritis is a common cause of morbidity and mortality worldwide accounting an estimated 2.4-2.8 million deaths each year in children under 5 years, despite the availability of simple effective treatment. In Egypt, the WHO death records reported that gastroenteritis killed around 3364 child per year in the last 5 years [2]. Most of these children die from extreme dehydration (abnormally low levels of body water) resulting from a combination of severe diarrhea, vomiting and not drinking enough fluids. Even in the well developed countries, millions of episodes of gastroenteritis occur each year, especially in young children. It is a common reason for hospital admission in previously healthy children during the first years of life [3].

Although gastroenteritis is considered one of the chief killers of children, it is self-limited. Treatment of acute episode is primarily directed toward preventing or treating dehydration. When possible, age-appropriate diet and fluids should be continued. ORS solution is used as supplemental fluid to those at increased risk of dehydration. Breastfeeding should not be discontinued, even during the rehydration phase. Giving fruit juices and carbonated drinks should be avoided until the diarrhea stops. Diet should be increased as soon as it is tolerated to compensate for lost caloric intake during acute illness. Lactose restriction is usually not necessary, although it might be helpful in cases of chronic malnutrition or in children with severe enteropathy; changes in formula are usually unnecessary. Full-strength formula is typically well tolerated and allows for a more rapid return to full energy intake. Anti-emetic and anti-diarrheal medications are generally not indicated and may contribute to complications. In addition, the use of antibiotics remains controversial [4-6].

In the past, a number of laboratory studies such as stool microbiology were used to evaluate children with acute vomiting and/or diarrhea. Since oral rehydration therapy has become the preferred method of treating dehydration, routine laboratory testing is no longer necessary. However, it may be beneficial for individual patients, when oral replacement therapy was unsuccessful or for patients who are receiving parenteral hydration [5].

Also Pneumonia remains the leading infectious cause of death among children under-five, killing 2,500 children a day. Pneumonia accounts for 15% of all under-five deaths and killed 920,000 children in 2015. Most of its victims were less than 2 years old. Around 8388 Egyptian child (2) passed away every year due to pneumonia in the past five years. Mortality due to childhood pneumonia is strongly

linked to poverty-related factors such as under nutrition, lack of safe water and sanitation, indoor air pollution and inadequate access to health care [7].

Despite this terrible reality, programs to fight childhood pneumonia remain critically underfunded. Estimates show that 1.3 million of childhood pneumonia deaths could be avoided if prevention and treatment efforts were implemented worldwide.

Practicing good hygiene and health habits as thorough and frequent hand cleaning, coughing or sneezing into an elbow or sleeve instead of hands and avoiding interaction with those who are sick, they are all things the mothers can teach their children to avoid as much as possible getting sick with the bacteria and viruses that can cause pneumonia. Breastfeeding during the first six months is critical in preventing pneumonia. Breast milk contains a nourishing supply of nutrients, antioxidants, hormones and antibodies a child needs for growth and development. Avoiding exposure to tobacco smoke and other pollutants, receiving proper nutrition, getting adequate rest, increasing access to immunization, and becoming knowledgeable about warning signs to identify infection, specifically a cough, fast breathing, and/or difficulty breathing will help to avoid the infection [8].

From the previous facts, it is obvious that both pneumonia and gastroenteritis are avertable. They are both preventable and treatable. Mother's education will have an impact in children management [9]. It will increase their understanding of the nature of both diseases, so they can avoid or minimize complications and reduce the number and duration of hospitalizations, which in turn can improve their children quality of life with substantial potential benefit on health care costs.

Literature Review

Inappropriate knowledge of pneumonia and gastroenteritis and wrong practices of caregivers are important causes of repeated admission of patients. Thus, it is essential to provide mothers as caregivers with the necessary knowledge to increase their understanding of both diseases and help them modify their practices and improve their attitude.

The idea of this study came first from our belief that health education is an effective tool in the implication of a significant change in mother's knowledge. Several studies testing the effectiveness of the patient education program have been reviewed; one of them was performed in Zagazig University in order to evaluate the effectiveness of educational program on type2 diabetic patients [10-13]. Its educational program succeeded to increase patient's knowledge and attitude toward the disease which helped them reaching their fasting blood sugar and hemoglobin A1C goals.

Evidence for the effect of mother's education regarding childhood gastroenteritis and pneumonia is rarely discussed in Egypt. Yet globally there is a lot of concern about the impact of mother's education on the child health since the child care is mostly the responsibility of mothers.

In a slum area of Karachi, Pakistan, a randomized controlled study was conducted. Its main objective was evaluating the impact of health education on the knowledge of mothers about the advantages of breast feeding, signs of dehydration, measures for prevention of measles and tuberculosis, sources of protein in diet, diseases that can be prevented by vaccination and the correct age of vaccination [12]. One hundred and fifty households were studied in the intervention and the same in the non-intervention group. Health education program covering the mentioned topics was continued for a minimum period of 6 months and the post-intervention survey was carried out after about 1 year of the pre-intervention survey there was a significant change in the knowledge level of the intervention group as compared to the control group.

In rural area in China, another study was conducted to investigate the knowledge, attitude and practice (KAP) of young children's mothers on infant feeding and evaluate the effects of nutritional education in the rural areas [13]. Five hundred and fifteen mothers, who had infants aged 4-6 months, were recruited for the questionnaire survey on the nutritional knowledge. After being educated with feeding guideline on infants and young children, the knowledge of infant's mothers was significantly improved and KAP scores of the mothers after intervention were higher than that of the baseline [14].

Aim of the Study

General Objective

To evaluate the effectiveness of structured education program on the knowledge level of mothers regarding childhood gastroenteritis and pneumonia which in turn can reduce the incidence of the diseases and the rate of hospitalization or even prevent them.

Specific Objectives

1. To identify weak points in mothers' knowledge through a pilot questionnaire.

2. To construct structured educational program as intervention based on the result of the pilot study done.

3. To evaluate the level of knowledge of mothers in both the intervention and the control groups through one at a time interviews using a pre-designed questionnaire.

4. To apply the pre-designed targeted educational program to the intervention group of mothers.

5. To re-evaluate the level of knowledge of mothers in both the intervention and the control groups using the same questionnaire.

Study Hypotheses

Mothers who will attend gastroenteritis and pneumonia educational intervention program will be more knowledgeable about the healthy practices, prevention and management of both diseases than those who will not attend.

Research Methodology

Research Setting

- Inpatient ward at Atfal El-Raml Hospital targeting mothers of Children aged up to 5 years admitted with gastroenteritis or pneumonia.

- Inclusion criteria: Mothers of children aged up to 5 years admitted to the hospital with pneumonia or gastroenteritis from 1/3//2016 to 31/7/2016.

- Exclusion criteria: Mothers of children aged older than 5 years or Children with auto immune or congenital diseases.

Sample and Sample Procedure

Sample size: the minimum required sample size for this quasi experimental study was calculated to be 512 using an effect size=0.25 of the education program increasing the knowledge by 25% in a relevant study(10) with a statistical power of 95% and α=0.01.The sample size was calculated using G power 3.0.10 and will be rounded to be 600(300 to be enrolled in the intervention group and 300 in the control group).

Mothers of children aged up to 5 years with gastroenteritis and pneumonia in the specified period will be enrolled in the study till completing the minimum required sample size for this study and a systematic random sampling technique will be conducted to select cases and controls.

Study Design

- A Cross sectional pilot study.
- A quasi-experimental study.

Cross Sectional Pilot Study

The pilot study was conducted to figure out the following:

1. The missing points and misconceptions in mother's knowledge.

2. Decide if the selected tools are appropriate.

3. Testing the questionnaire to find out if the questions are appropriately understood and easily answered.

4. Assess if the sequence of the questions is logic, clear and translation is accurate.

Pilot Questions

1. What are the recurrent symptoms of your child?

2. Does your child suffer from any chronic diseases?

3. Do you know vaccinations other than those of the ministry of health?

4. Do you give your child antibiotics before consulting your doctor?

5. Did you give your child ORS at home before bringing him to the hospital?

6. How do you act if your child suffers from bronchospasm episode?

The type, sequence, rephrasing, addition and removal of questions were revised by all of the study conductors.

Pilot Study Results

A cohort of 30 patient's mothers was asked to participate in the pilot descriptive study in order to determine their main knowledge deficient points. Their descriptive statistics were as follow:

- 21 child out of 30 (70%) had a chest disease, 7 out of 30 (23.3%) had gastroenteritis disease and 2 out of 30 (6.7%) had both.

- 25 child (83.3%) had acute diseases while 5 (16.7%) had chronic diseases.

- 24 (80%) mothers did not know about private vaccinations not included in the ministry of health immunization schedule while 6 (20%) knew about it.

- 23 (76.7%) mothers used antibiotics properly while 7 (23.3%) did not.

- 22 (73.3%) mothers knew the right action to do when her child is respiratory distressed while 8 (26.7%) did not.

- 23 (76.7%) mothers had never given the oral rehydration solution ORS to their children while 7 (23.3%) had given it before.

Quasi-Experimental Study

1200 mothers agreed to participate in the study. Out of the 1200 patients, 600 conducted pre-test and post-test and attended educational intervention program (from 1/3/2016 till 30/5/2016). The rest 600 conducted pre-test and post-test only (control group) from 1/6/2016 till 31/7/2016 then they were given the educational program after conducting the post test.

Data Collection

Data Collection Tool

Data were collected by the clinical pharmacists over the period of 5 months between 1/3/2016 to 31/7/2016 using two pre-structured questionnaire. One for pneumonia and the other for gastroenteritis. Interviews to question mothers were done separately and NOT in groups.

Pneumonia Questionnaire

1. Are the positions during lactation related lead to pneumonia?

2. Do you stop the antibiotic course once your child improves?

3. How to avoid pneumonia?

4. When to suspect pneumonia? How do you act?

Gastroenteritis Questionnaire

1. Is gastroenteritis considered a contagious disease?

2. Mention the oral fluids that you provide to your child?

3. What are the medications you give to your child during gastroenteritis episode?

4. How to avoid gastroenteritis?

Intervention Program Components

Educational intervention sessions about pneumonia and gastroenteritis were conducted by the clinical pharmacists in the hospital. Sessions were arranged as a 30 min session for not more than 5 mothers per session. An extra time was given for discussion.

The educational materials were formulated, revised and developed by the clinical pharmacists' team and then approved by drug and therapeutic committee in the hospital. It included brochures that cover the main topics of the lecture.

The educational program topics included gastroenteritis and pneumonia definition, symptoms, risk factors, types, complications, management and preventive measures

At the beginning of the session the mothers answered the pre-test knowledge evaluation questionnaires verbally and the questionnaire were filled in by the clinical pharmacists.

The sessions for pneumonia and gastroenteritis were conducted on separate days. Maternal education in this pattern continued for a minimum period of 3 months for the intervention group.

The gastroenteritis session began with an explanation of the disease and how it can be contagious followed by clarification of its symptoms and description of signs of dehydration as a main complication of gastroenteritis and the ways by which mothers can avoid it and the proper management of the disease.

The pneumonia session included the definition of pneumonia and the signs of pneumonia recognition. The pharmacists interpreted the impact of the improper positions of breast and bottle feeding and how it can cause pneumonia, followed by explanation of prevention and management facts of pneumonia.

The clinical pharmacists ran a discussion after the educational session. The mothers were given clear and simple answers for their questions about the presented topics by them before starting the post-test.

- In the same manner as the pre-test, the post evaluation questionnaires were filled in literally.

Study Instrument

Questionnaires formulated to evaluate the maternal knowledge degree regarding different aspects of the diseases under study. Related biographic data were taken from mothers including the child age and medical history.

Mothers gave their verbal consent before taking part in the study

The questionnaire consists of 4 questions (4 for gastroenteritis and 4 for pneumonia) covering several subjects including gastroenteritis and pneumonia definition, symptoms, risk factors, types, complications, management and different aspects of prevention.

Data Analysis

The data obtained from the knowledge evaluation questionnaire were entered into the Statistical Package for Social Sciences, (SPSS) Windows version 16 program using a 95% level of confidence

Data analysis tests were done to compare between knowledge scores before and after conducting the educational intervention program in both the control and the intervention groups using paired t-test.

Independent t-test was used to compare the mean score change (post-test score – pre-test score) for every question of the four questions included in the test questionnaire and for the total score between the intervention and the control group as well.

Results

For Pneumonia Educational Program Intervention

In Table 1, mean and standard deviation of each question and total test score for control and intervention groups for pneumonia educational program are mentioned.

As shown in Table 2 by using paired t-test, the post-test mean score (1.86 ± 1.209) of the control group had not been significantly (p=0.528) changed from the pre-test mean score (1.86 ± 1.211) while in case of the intervention group, the post-test mean score (3.89 ± 0.323) was significantly changed (p=0.0001) from the pre-test mean score (2.26 ± 0.966) after implementation of the educational program.

Independent t test showed significant difference (p ≤ 0.0001) between the intervention and the control group in every question score difference as clarified in Table 3 which lead in turn to significant difference (p ≤ 0.0001) in the total score change between the intervention group (1.6082 ± 0.97124) with 70% increase and the control group (0.0067 ± 0.1827) with less than 0.38% increase.

For Gastroenteritis Educational Program Intervention

In Table 4 mean and standard deviation of each question and total test score for control and intervention groups for gastroenteritis educational program are mentioned.

Table 1. Means and standards deviation of each question and total test score for control and intervention groups for pneumonia educational program

Scores	Control group		Intervention group	
	Pre Score Mean ± Std. Deviation	Post Score Mean ± Std. Deviation	Pre score Mean ± Std. Deviation	Post score Mean ± Std. Deviation
Question 1	0.39 ± 0.488	0.38 ± 0.486	0.49 ± 0.501	0.99 ± 0.086
Question 2	0.6 ± 0.49	0.6 ± 0.49	0.71 ± 0.456	0.99 ± 0.105
Question 3	0.27 ± 0.446	0.28 ± 0.45	0.25 ± 0.435	0.93 ± 0.257
Question 4	0.59 ± 0.493	0.59 ± 0.492	0.82 ± 0.381	0.98 ± 0.135
Total test	1.85 ± 1.211	1.86 ± 1.209	2.26 ± 0.966	3.89 ± 0.323

Table 2. Pneumonia knowledge score difference between pre and post test scores in both control and intervention group

Groups	Pre-test score mean ± Std. Deviation	Post test score mean ± Std. Deviation	Difference mean ± Std. Deviation	Paired t-value	P-value
Control	1.85 ± 1.211	1.86 ± 1.209	0.007 ± 0.183	0.632	0.528
Intervention	2.26 ± 0.966	3.89 ± 0.323	1.608 ± 0.971	27.107	0.0001

Table 3. Difference between control and intervention groups in every question score change and total test score change

Score Differences	Control Group	Intervention Group	t-value	P-value
Q1_score_change	0.00± 0.082	0.49± 0.501	16.069	0.0001
Q2_ score_change	0.00± 0.116	0.29± 0.456	10.265	0.0001
Q3_score_change	0.01± 0.082	0.67± 0.473	22.557	0.0001
Q4_ score_change	0.0067± 0.0815	0.1561± 0.37378	6.423	0.0001
Total_score_change	0.0067± 0.18276	1.6082± 0.97124	26.578	0.0001

Table 4. Means and standards deviation of each question and total test score for control and intervention groups for gastroenteritis educational program

Scores	Control Group		Intervention Group	
	Pre score Mean ± Std. Deviation	Post score mean ± Std. Deviation	Pre score Mean ± Std. Deviation	Post score mean ± Std. Deviation
Question 1	0.56 ± 0.497	0.59 ± 0.493	0.83 ± 0.374	0.99 ± 0.103
Question 2	0.45 ± 0.499	0.48 ± 0.5	0.52 ± 0.5	0.95 ± 0.211
Question 3	0.62 ± 0.486	0.67 ± 0.473	0.5 ± 0.501	0.94 ± 0.246
Question 4	0.63 ± 0.485	0.64 ± 0.481	0.62 ± 0.487	0.97 ± 0.177
Total test	2.26 ± 1.108	2.37 ± 1.085	2.47 ± 1.112	3.85 ± 0.516

As shown in Table 5 by using paired t-test, the pre-test mean score (2.26 ± 1.108) for the control group had been significantly (p=0.002) changed into (2.37 ± 1.085) at the post-test while the mean scores of the intervention group showed a marked significant change (p ≤ 0.0001) between the pre-test (2.481 ± 0.113) and the post-test (3.85 ± 0.516).

Independent t test showed significant difference (p ≤ 0.0001) between the intervention and the control group in every question score difference as clarified in Table 6 which lead in turn to significant difference (p ≤ 0.0001) in the total score change between the intervention group (1.364 ± 1.175) with 55% increase and the control group (0.1139 ± 0.5987) with 5% increase.

Discussion

Our study revealed that the mothers' knowledge level concerning childhood pneumonia and gastroenteritis was quite limited and inexact specially pneumonia. This study provides evidence and proof that health education program for the mothers' patients can be effectively implemented and can be an effective tool to generate knowledge, promote practice and adjust attitude towards management and prevention of both diseases

Concerning Pneumonia

As clarified in Table 2, the mean scores before and after educational program were measured in the intervention group. Results revealed a significant (p ≤ 0.0001) increase in the mean score after conducting the educational program.

The current study reflected that:

1. The intervention group knowledge towards the relation between the proper lactation instructions and pneumonia showed a significant increase in knowledge by 111% increase with a mean difference score of (0.49 ± 0.501).

Table 5. *Gastroenteritis knowledge score difference between pre and post test scores in both control and intervention group*

Groups	Pre Test Score Mean ± Std. Deviation	Post Test Score Mean ± Std. Deviation	Difference mean ± Std. Deviation	Paired t-value	P-value
Control	2.26 ± 1.108	2.37 ± 1.085	0.114 ± 0.599	3.189	0.002
Intervention	2.48 ± 1.113	3.85 ± 0.516	1.364 ± 1.174	19.438	0.000

Table 6. *Gastroenteritis knowledge score difference between control and intervention groups in every question score change and total test score change*

Score Differences	Control Group	Intervention Group	t-value	P-value
Q1_score_change	0.0285 ± 0.1666	0.1571 ± 0.3743	5.257	0.0001
Q2_ score_change	0.0249 ± 0.2593	0.4357 ± 0.5179	11.872	0.0001
Q3_score_change	0.0463 ± 0.3071	0.4286 ± 0.5239	10.540	0.0001
Q4_ score_change	0.0142 ± 0.1187	0.3429 ± 0.4904	10.901	0.0001
Total_score_change	0.1139 ± 0.5987	1.364 ± 1.175	15.878	0.0001

2. The intervention group knowledge about the use of antibiotics had significantly (p ≤ 0.0001) increased by 70%.

3. The intervention group had low levels of knowledge regarding the ways to avoid the disease. This lake of knowledge was obviously altered after receiving the educational sessions as the mean difference score between pre and post-tests (0.67 ± 0.473) was strongly significant by an increase of 257%.

4. Concerning the detection of the disease and the proper action taken in case of its existence, our study revealed that nearly most of them have some knowledge about the symptoms of the disease and the action taken towards it as the mean score increased by 22% only although there was a significant change (0.1561 ± 0.37378) (p ≤ 0.0001).

Concerning Gastroenteritis

As shown in Table 5, there was a significant change in the level of knowledge of the control group (0.114 ± 0.599) (p=0.002) this significant increase although un expected but caught the attention to the observer effect, observer effect or hawthorn effect was defined as "a type of reactivity in which individuals modify an aspect of their behavior in response to their awareness of being observed" the mothers responses were reactivated due to the pre-intervention test which stimulated the interesting mothers to search about answers in order to perform better in the post-intervention test ,this effect happened as access to gastroenteritis information was easy, majority of mothers had a baseline knowledge about this disease and that was confirmed as the mean score of pre test concerning the gastroenteritis group(2.26 ± 1.108) was higher than that of the pneumonia group(1.85 ± 1.211), the presence of control group counteracted this effect and guarded against the rowing of the results, the ease of access to the gastroenteritis information may be explained by the effect of media which focuses on the management of childhood dehydration as a major complication of gastroenteritis. This effect was studied in 1991 in Egypt (14), in which

they observed the effect of the health education messages in mass media on the knowledge and practice of mothers.

Still the difference in the mean score was greater in the intervention group (1.364 ± 1.174) which provides evidence and proof that knowledge of the mothers had been significantly (p ≤ 0.0001) improved after implementation of the educational program. This confirms the profound effect of active learning rather than passive learning.

The current study demonstrated that:

1. Nearly most of the mothers knew that gastroenteritis is a contagious disease as the mean score difference was (0.1571 ± 0.3743) by an increase of 23% only although it had been significantly changed (p ≤ 0.0001).

2. This study showed a significant (p ≤ 0.0001) increase in the knowledge level concerning the management of gastroenteritis by (0.4357 ± 0.5179) and (0.4286 ± 0.5239)

3. There was a significant (p ≤ 0.0001) increase in the mothers' knowledge about the preventive measures of gastroenteritis by (0.3429 ± 0.4904).

Conclusion and Recommendations

Health education programs that target knowledge, attitude and practice bridge the gap between health information and health practice.

Health education is not an addition to treatment. It is one of the treatment tools that have a great effect on enhancing the children's quality of life with substantial potential benefit on health care costs. In addition, Caregivers' education is an essential strategy to avoid spreading of infectious diseases as pneumonia and gastroenteritis.

The results of this study send a strong message to health care providers and educators for the intense need for developing education and prevention programs about gastroenteritis and pneumonia to be delivered at outpatient clinics.

Training providers working in outpatient clinics with skills for delivering adequate health education message targeted to raise knowledge of both diseases' management and prevention is highly recommended.

Considering the influence of mass media education on the community, we recommend enforcement of mass media educational campaigns on pneumonia and the ways to avoid it.

Ethical Considerations

1. The researcher took an official permission from the General Director of El-Raml Pediatric Hospital.

2. Before conducting the interview, the researcher informed the patients' mothers about the purpose of the study and that participation is voluntary and they were consented to enroll in the study.

3. The researcher was in a continuous direct contact with the mothers to answer any question before starting the post-test.

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Correspondence to:

Reem Tawfeek,
Clinical Pharmacist,
El-Raml Children Hospital,
Clinical Pharmacy,
Egypt.
Tel: 00201223684793
E-mail: reemtawfeek@hotmail.com