

Health Educational Program for Mothers regarding Prevention of Helicobacter Pylori Infection for their Children under Five Years

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Abstract

Background: The Helicobacter Pylori infection (HPI) has emerged as one of the most common chronic bacterial infections worldwide. The main ways to transmit HPI is direct contact from person-to-person by oral-to-oral or fecal-to oral and crowded living conditions. **Aim:** The present study aimed to evaluate health educational program for mothers regarding prevention of helicobacter pylori infection for their children under five years. **Design:** A quasi-experimental study design was used. **Setting:** The study was conducted in Pediatric Outpatient Clinic at Benha University Hospital and followed by home visit. **Sample:** A convenient sample of 97 mothers was included in the study within 6 months. **Tools:** Two tools were used to collect data; Tool (I): A structured interviewing questionnaire: Which divided into five parts; personal characteristics of the studied mothers regarding what their children, mothers family characteristics, mothers' knowledge and mothers' reported practices . Tool (II): An observational checklist: This consisted of two parts; mothers' observed practices and housing and living condition assessment. **Results:** There was a highly statistically significant improvement in mothers' knowledge and practices regarding prevention of HPI after educational program implementation. **Conclusion:** Utilization of health educational program achieving significant improvements in mothers' knowledge and practices. Also, there was a positive correlation between total score of knowledge and reported and observed practices. **Recommendations:** Healthy hygienic guidelines are needed to decrease the incidence of HPI and strengthen the knowledge and practices among high-risk populations and low socioeconomic families.

Keywords: Children under five years, Educational program, Helicobacter pylori, Mothers, Prevention

Introduction

Early childhood is the first years of life from birth to 5 years of age. It is a time of tremendous growth across all areas of development. Early childhood generally includes infancy, toddlerhood, kindergarten and first grade. Early childhood have three simultaneous development stages; Physical growth and development, cognitive growth and development and social-emotional growth and development. Early childhood is important, because what happens in early childhood can an issue for a lifetime. So, nurturing relationships, rich learning experiences and healthy practices in the earliest years provide

lifelong benefits for learning, behavior and both physical and mental health (Nelson et al., 2020).

Helicobacter Pylori (HP) is a gram negative bacterium that colonizes the stomach of approximately two thirds of the human population and it is involved in the pathogenesis of gastroduodenal diseases. H. pylori Infection (HPI) is generally acquired during childhood and persists life-long in the absence of treatment with antibiotics. HPI is a common cause of digestive illnesses, including gastritis (the irritation and inflammation of the stomach lining) and peptic ulcers (sores in the lining of the

stomach, small intestine, or esophagus) (**Mabeku et al., 2018**).

The Helicobacter Pylori is one of the most common chronic infections that infect approximately 4.4 billion individuals worldwide. The area with the highest reported prevalence was reported in Africa (70.1%) while the lowest prevalence was reported in Switzerland (18.9%). The prevalence of HP shows large geographical variation with infection rates much higher in developing countries (in some areas > 85 %) than in Europe and North America (approximately 30%-40%). In various developing countries, more than 80% of the population is HP positive, even at young ages (**De Brito et al., 2019**).

The HP is contagious, although the exact route of transmission is not known. Person-to-person transmission by either the oral-to-oral or fecal-to-oral route is most likely. HP may also be transmitted orally by means of fecal matter through the ingestion of waste-tainted water. Many of the reported factors for HPI included poor hygiene, deficient sanitation, crowded living conditions and environmental contamination (**Kayali et al., 2018**).

Many children with HPI will experience no symptoms, while others may develop serious complications including stomach ulcers and inflammation of the stomach lining. But the infection or the ulcer itself can lead to more serious complications such as internal bleeding, obstruction, perforation and peritonitis. Gastric cancer is the most fatal consequence of HPI. Gastric MALTL, a form of lymphoma, may be treated with HP eradication therapy and has a better prognosis than gastric cancer. HPI is also associated with esophageal cancer, and may play a role in a condition of low blood platelets (idiopathic thrombocytopenic purpura) (**Said, 2019**).

Mothers play a critical role in the family, which is a powerful force for social cohesion and integration. The mother-child relationship is vital for the healthy development of children. And mothers are not only caregivers; they are also breadwinners for their families. Yet women continue to face major and even life threatening challenges in motherhood. Mothers have the potential to play the most important role of educator in a child's early life and as children get older they are still at the heart of their children's education (**Cuartas, 2021**).

Community Health Nurse (CHN) plays an important role in preventing HPI and changing the behavior of mothers having children under 5 years by increasing their knowledge and related healthy practices regarding HPI. CHN provides mothers with the information about HPI definition, causes, risk factors, modes of transmission and preventive practices such as hand washing, hygienic food practices and maintaining healthy environmental condition (**Ibrahiem & Saad, 2021**).

Significance of the study:

The early childhood was identified as the critical time for acquisition of HPI. Also, mothers play an important role in the transmission of HPI to all family members. HP is a common chronic infection that can lead to destructive complications. It is revealed that half of the world's population is infected with HP. It is prevalent and endemic disease, especially in developing countries. In the Middle East, HP prevalence ranges from 60-90%. In Egypt, The prevalence of H. pylori in Egypt ranges from 13% to 72% in children (**Harrison and Vega, 2019**).

The HPI is usually acquired during early childhood. The overall H. pylori prevalence was 72.38%. Mothers of H. pylori-infected children

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showed higher sero-prevalence (39.5%) than their siblings and fathers (37.7% and 22.8% respectively). That sero-prevalence of H. pylori was significantly age-dependent: 60.6% of patients aged more than 5 years and 25.9% of children aged less than 5 years (Alboraie et al., 2018).

Aim of the study

The aim of this study was to evaluate educational program for mothers having children under five years regarding prevention of helicobacter pylori infection.

Research hypothesis:

Knowledge and practices of the mothers having children under five years regarding prevention of helicobacter pylori infection will be improved after the implementation of educational program.

Subject and Methods

Research design:

A quasi-experimental study design was utilized to conduct this study.

Setting:

The study was conducted at Pediatric Outpatient Clinic in Benha University Hospital because the availability of the studied sample and followed by home visit.

Subjects:

Convenience sample of 97 mothers having children under five years attending to the previous setting throughout 6 months.

Tools of data collection:

Two tools were used to collect data:

Tool (I): Structured interviewing questionnaire was developed by the researchers to collect data based on review of pertinent literature and it was consisted of four parts:

Part I: Included personal characteristics of the mothers having children under five years.

Part II: Included personal characteristics of the studied children under five years.

Part III: Included knowledge of mothers having children under 5 years about of HPI pre and post program implementation. Which included 9 questions.

Scoring system:

A scoring system for mothers' knowledge was calculated as follows 2 point for correct complete answer, while 1 point for correct incomplete answer, and 0 for don't know or incorrect answer. The score of the items was summed up and the total divided by the number of the items, giving a mean score for the part. The total score was converted into percentage and construed as follows:

- Poor < 50% (< 9 point).
- Average 50 - 75% (9-13).
- Good >75% (> 13 point).

Part IV: Included mothers' reported practice regarding prevention of HPI pre and post program implementation which included 7 items.

Scoring system:

The scoring system for mothers' reported practices was calculated as follows 1 point for done and 0 for not done practicing. The score of the items was summed- up and the total divided by the number of the items, giving a mean score. The total score was converted into percentage and construed as follows :

- Satisfactory practice $\geq 60\%$ (>30 point).
- Unsatisfactory practice < 60% (<30 point).

Tool (II): An observational checklist was developed by the researchers and was consisted of two parts:

Part I: Included general data to assess housing and living conditions of studied sample.

Scoring system:

Housing and living conditions scored according to availability of the sub-items one score for each item and the total score was calculated. The total score was converted into percentage and construed as follows:

- Safe = 1
- Unsafe = 0

Part II: Included data to assess mothers' observed practice regarding prevention of HPI pre and post program implementation.

Scoring system:

The scoring system for mothers' observed practices was calculated as follows 1 point for done and 0 for not done practicing. The score of the items was summed- up and the total divided by the number of the items, giving a mean score. The total score was converted into percentage and construed as follows :

- Satisfactory practice $\geq 60\%$ (≥ 35 points).
- Unsatisfactory practice $< 60\%$ (< 35 points).

Content validity of the tools:

Content validity of the tools was done by five of Faculty's Staff Nursing experts from the Community Health Nursing Specialties who reviewed the tools for clarity, relevance, comprehensiveness and applicability and give their opinion.

Reliability of the tools:

Reliability of the study tools were tested for its internal consistency by Cronbach's Alpha. Reliability of the study tools was 0.826 for knowledge sheet, 0.791 for the observed practice and 0.738 for the reported practice.

Ethical considerations :

All ethical consideration was issued; oral consent was being obtained from each mother having children under 5 years before conducting the interview and given them a brief orientation to the purpose of the study. They were also reassured that all information gathered would be

in a confidential manner and used only for the purpose of the study. No names were required on the forms to ensure anonymity and confidentiality. They were also informed about their right to withdraw at any time from the study without giving any reasons.

Pilot study:

The pilot study was conducted on (10%) mothers who taken in 3 weeks. The pilot study was aimed to test the content, clarity, applicability and simplicity of the tools using the interviewing questionnaire and the observational checklist as a pre-test sheet. The estimation of the time needed to fill the questionnaire time needed to fill each sheet consumed about 30 minutes. No modifications were done, so the pilot study sample was included in the total sample.

Field work:

Data were collected over 6 months from the mid of December 2020 to the mid of June 2021. The study was carried out by the researchers for the studied sample in the selected setting of Pediatric Outpatient Clinic at Benha University Hospital and their homes through home visits. In the first week, the researcher visited the previous setting two days per week from 9:00 am to 12:00 mid- day, and other two days of the week to accomplish home visits to previously selected cases. The average time needed for the sheet was around 30-45 minutes, the average number interviewed at the pediatric outpatient clinic were 5-6 patients/day depending on the responses of the mothers and took their phone number to communicate them for home visit (preprogram). The second week, the researcher implemented the educational program using teaching methods and filled out the post program questionnaire by the previously selected cases in the first week. The third week, the researcher called the mothers to complete the post program observational checklist about the condition of the home and observed practices regarding prevention of HPI. These steps repeated in the rest weeks from 6

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months. The total sample included 97 of mothers having children under 5 years.

Educational Program construction included three phases:

Phase (I): Assessment phase:

In this phase of the educational program, the researchers assessed knowledge and practices of the studied mothers through collection and analysis of baseline data from the filled tools. In this phase the researcher did the pre- test.

Phase (II): Implementation phase:

Program implementation based on conducting session plans using different educational methods and media in addition to the use of guiding booklet. Time was opened for mothers to ask questions and to receive the corresponding answers as well as to express their feedback toward the teaching session. The general and specific objectives were explained to mothers. Educational media was used the poster, laptop, guidance booklet which includes instruction and information for mothers as a reference during and after program implementation. Teaching material was used Arabic booklet and audiovisual materials.

Phase III: Evaluation phase:

This phase aimed to evaluate the level of improvement in mothers' knowledge and practices through implementation of program. This was done through giving post-test similar to the pre-test, evaluation administered to study subjects after completion of the program in order to estimate the effect of program on mothers' knowledge and practices related to prevention of HPI.

Statistical analysis:

All data collected were organized, tabulated and analyzed using appropriate statistical test. The data were analyzed by using the Statistical Package for Social Science (SPSS) version 21 which was applied to calculate frequencies and percentage, mean and standard deviation, as well as test statistical significance and associations by using Chi- square test (χ^2) and

linear correlation coefficient (r) and matrix correlation to detect the relation between the variables (P value). Significance levels were considered as follows:

Highly statistically significant $P < 0.001^{**}$

Statistically significant $P < 0.05^*$

Not significant $P > 0.05$

Results

Table (1): Shows that; 60.8% of studied mothers aged 20 - < 30 years old, 93.8% of the them were married, and 50.5% of them were not working.

Table (2): Shows that; 63.9% of studied children were males, 40.2% of studied children ranked as the third member in birth order, 83.5% of them fed ordinary diet. While, 54.6% of them regarding education were before nursery.

Figure (1): Illustrates that 0% the studied mothers had good total knowledge score preprogram, but post program increased to 70.1%. While, 3.1% of them had average total knowledge score preprogram, but post program reached to 29.9%.

Figure (2): Demonstrates that only 12.4% of the studied mothers had satisfactory total reported practices score regarding prevention of HPI preprogram, but post program this percentage increased to 95.9%.

Figure (3): Demonstrate that 93% of the studied mothers had safe total housing and living conditions score, while only 7% of them had unsafe total housing and living conditions score.

Figure (4): Illustrates that only 6.2% of the studied mothers had satisfactory total observed practices toward prevention of HPI preprogram which increased to 88.7% post program.

Table (3): Shows that; there was highly significant positive correlation between the

studied mothers' total knowledge score and their total reported practices score. And there was highly significant positive correlation

between the studied mothers' total reported score and their total observed practices score.

Table (1): Distribution of the studied mothers having children under five years according to their personal characteristics (n=97).

Personal characteristics	No.	%
Age:		
20:<30 years old	59	60.8
30:<40 years old	38	39.2
Marital status:		
Married	91	93.8
Divorced	6	6.2
Educational level		
Read and write	3	3.1
Basic education	40	41.2
Secondary education	54	55.7
Occupation:		
Working	48	49.5
Housewife	49	50.5

Table (2): Distribution of the studied children under five years according to their personal characteristics (n=97).

Personal characteristics	No.	%
Sex:		
Male	62	63.9
Female	35	36.1
Age:		
One month :< 1 years old	9	9.3
1-<2 years old	23	23.7
2-<3 years old	21	21.6
3-<4 years old	17	17.5
4-<5 years old	27	27.8
Birth order:		
First	29	29.9
Second	18	18.6
Third	39	40.2
Fourth and more	11	11.3
Children's nutrition type:		
Breast feeding	6	6.2
Artificial feeding	6	6.2
Breast and artificial feeding	4	4.1
Ordinary diet	81	83.5
Child stage:		
Before nursery	53	54.6
Nursery	44	45.4

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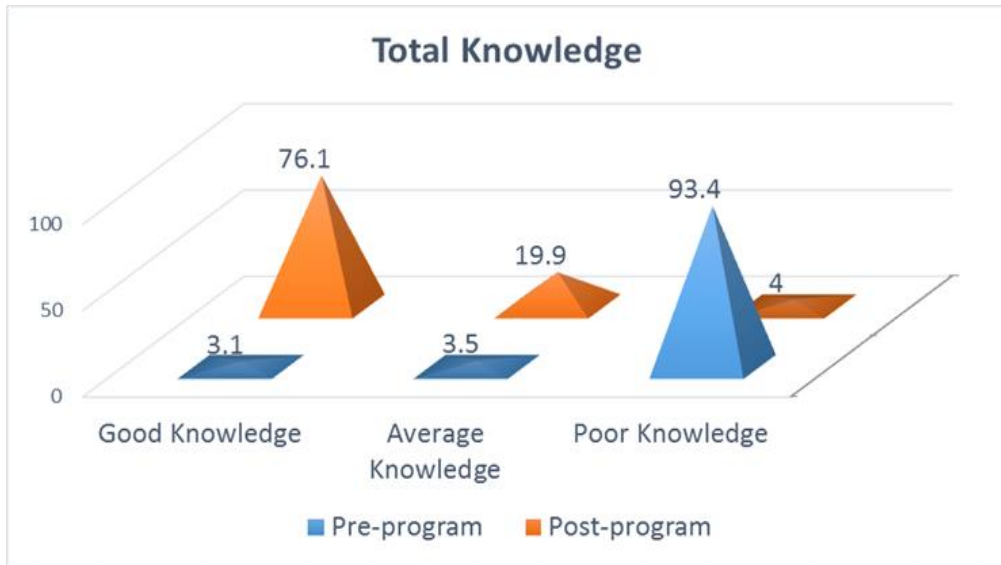


Figure (1): Percentage distribution of the studied mothers' total knowledge score regarding HPI pre and post program implementation (n = 97).

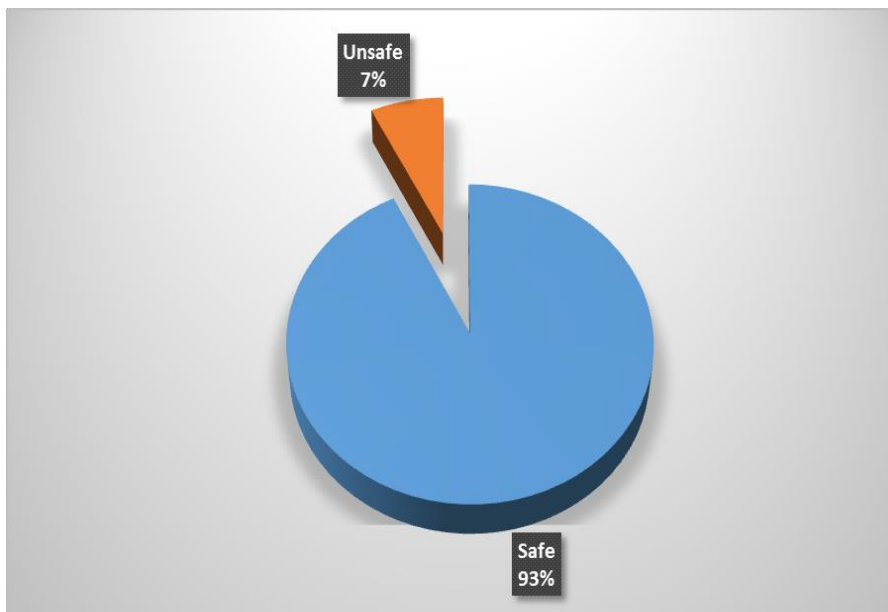


Figure (2): Percentage distribution of the studied mothers regarding to total scores of housing and living conditions (n = 97).

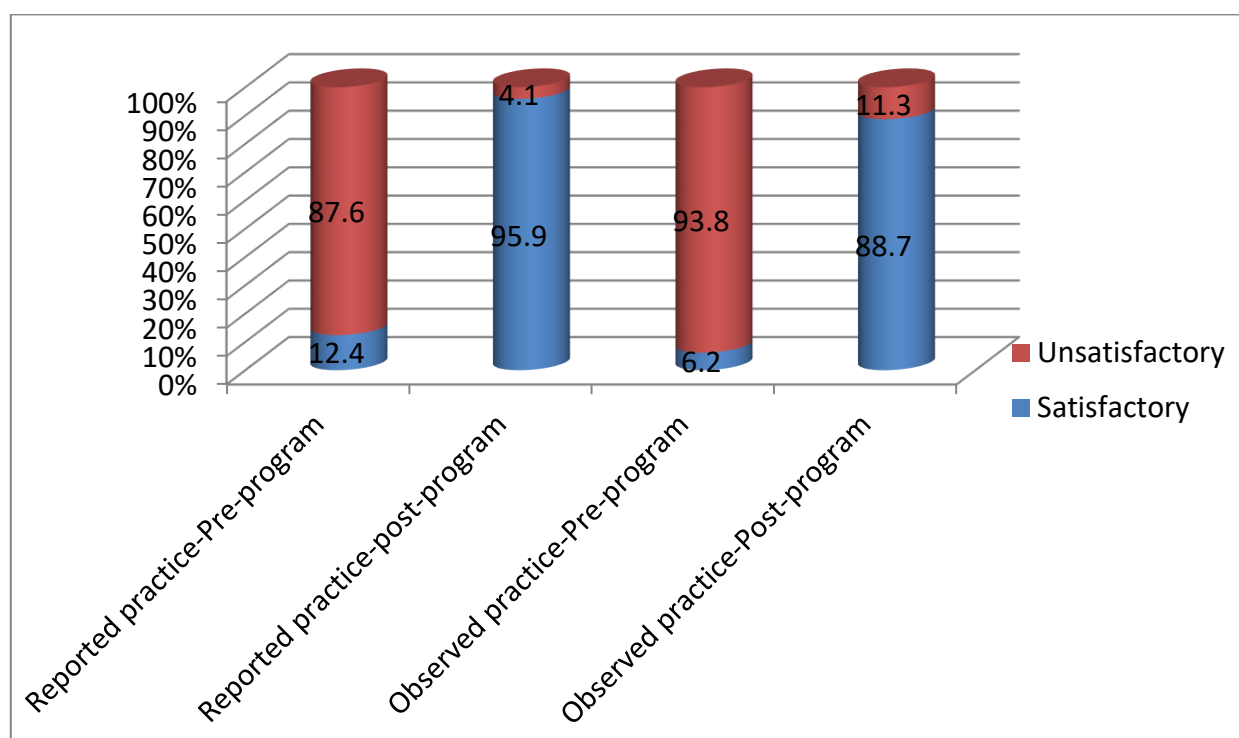


Figure (3): Percentage distribution of the studied mothers' total reported and observed practices toward prevention of HPI pre and post program implementation (n = 97).

Table (4): Correlation between the studied mothers' total knowledge score, total reported practices score and total observed practices score at post implementation (n = 97).

Items		Total knowledge	Total reported practices	Total observed practices
Total knowledge score	R	1	.534	.422
	p-value	-	.000**	.038*
Total reported practices score	R	.534	1	.671
	p-value	.000**	-	.000**
Total observed practices score	R	.422	.671	1
	p-value	.038*	.000**	-

(**) Highly statistically significant $p < 0.001$ (*) Statistically significant $p < 0.05$

Discussion

Helicobacter pylori is a motile and gram-negative bacterial pathogen that infects one-third of all children worldwide. H. pylori is mainly acquired during childhood and transmission of the bacterium commonly proceeds from person to person, especially among family members. The most frequent transmission route is from the mother to children. Various gastrointestinal and extra-gastrointestinal diseases are reported to be

associated with H. pylori in children. The early childhood was identified as the critical time for acquisition of HPI and able to establish lifelong chronic infection. Also, mothers play a key role in the transmission of HPI to all family members as mothers are the corner stone of each family and the close contact of mothers to her children in this age and her family as all (Reshetnyak et al., 2021).

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So, the current study aimed to evaluate educational program for mothers having children under five years regarding prevention of helicobacter pylori infection through: assessing mothers having children under five years' knowledge regarding prevention of helicobacter pylori infection, assessing mothers having children under five years' practices regarding prevention of HPI, designing and implementing educational program on prevention of mothers having children under five years regarding HPI, evaluating the effect of educational program on improving mothers having children under 5 years' knowledge and practices regarding prevention of helicobacter pylori infection.

According to personal characteristic of the studied mothers, the current study demonstrated that three fifths of the studied mothers aged 20:< 30 years old. Most of them were married. These findings were in accordance with **Abongwa et al., (2018)** who conducted entitled " Knowledge, Practice and Prevalence of Helicobacter Pylori Infection in the North West Region of Cameroon" showed that two third of their participants aged < 29 years old .

According to personal characteristics of the studied children, the current study revealed that less than two thirds of the studied children were males. These findings were in accordance with **Palanduz et al., (2018)** who conducted entitled "Helicobacter Pylori Infection in Family Members of Patients with Gastro Duodenal Symptoms. A cross-sectional Analytical Study" in Istanbul, Turkey and showed that more than half of participants children were boys. This is may be due to most of mothers attended the pediatric outpatient clinics within period of study had children aged from 4-5 years ago.

Regarding to the studied children's birth order, two fifths of them ranking was the third member and majority of children's nutrition

type was ordinary diet and more than half of children education was before nursery. These might be due to a high percentage of children were from 4 - 5 years and this is age of before nursery (pre-school). In addition to, their food becomes the same food we eat.

Regarding distribution of the studied mothers' total knowledge score regarding HPI pre and post program implementation, the current study showed that, no one of the studied mothers had good total knowledge score about HPI preprogram and this percentage improved to less than three quarters post program. This result was supported with **Ibrahiem & Saad, (2021)** who found that three-quarters of their participants had good total knowledge scores in the post-test rather than of the pre-test after the health awareness package and that there was a radical improvement in the mean scores of participants' knowledge items in the post-test rather than pre-test with highly statistically. This may be the lack of public awareness of HPI and might be due to failure to hold relevant meetings by health officials and the importance not related to prevention issues and focus on treatment related. But, after educational improved because mothers were keen to attend educational program that help them to protect their children from acquiring HPI and effectiveness of educational program.

Regarding total scores of housing and living conditions, the current study proved that most of the studied mothers had safe total housing and living conditions score. This finding agreed with **Wang, (2019)** who found that more than two thirds of their participants had good household surrounding environment. Also, the study was in the same line with **Schacher et al., (2020)** and found that majority of their participants had a good housing condition. This may be mother's education is generally higher and this makes better awareness and a good

response from them regarding healthy housing and living conditions.

Regarding total reported practices score toward prevention of HPI pre and post program implementation, the current study evident that minority of the studied mothers had satisfactory total practices score regarding prevention of HPI preprogram, and this percentage improved to the most post program. This result agreed with **Ibrahiem & Saad (2021)** who revealed that there was a radical satisfactory improvement in participants' total score of reported practices after the health awareness package as the vast majority in the post-test rather than of minority in the pre-test.

Also, this study was in accordance with **Malek et al., (2021)** who demonstrated that more than three fifths of respondents stated they would be willing to improve their self-hygienic practices to avoid being infected with *H. pylori*. This may be the success of the health educational program on the improvement of mothers' healthy reported practices about HPI as well as healthy practices were important for mothers to help them how to avoid and reduce risk of incidence of HPI in future.

Regarding total observed practices score toward prevention of HPI pre and post program implementation, the current study illustrated that minority of studied mothers had satisfactory observed practices score toward prevention of HPI pre-program, and this percentage improved to the most post program. This study was supported with **Alidosti et al. (2012)** who conducted entitled " Impact of Education Based on Health Belief Model in Isfahani Housewives in Preventing Helicobacter Pylori Infection" in Iran and proved that less than one quarter of their participants had satisfactory observed health practices score toward prevention of HPI pre-program, and this percentage improved to the majority post program. This may be all aspects

of observed practices provide positive effect for participated mothers to avoid HPI and active participation of mothers in educational sessions through demonstration.

The current study revealed that there was highly significant positive correlation between the studied mothers' total knowledge score and their total reported practices score and there was highly significant positive correlation between the studied mothers' total reported score and their total observed practices score. This might due to the link between knowledge score change and practice change is logic as the studied mothers who gained more knowledge change are more likely to improve their practice regarding HPI.

Conclusion

Highly significant positive correlation was found between the studied mothers' total knowledge score and their total reported and observed practices score. Highly significant positive correlation was found between the studied mothers' total reported practices score and their total observed practices score.

Recommendations

- 1- Raise the mothers' awareness regarding HPI through:
 - Healthy hygienic guidelines are needed to decrease the incidence of HPI and strengthen the knowledge and practices among high risk populations and low socioeconomic families.
 - Healthy dietary practices training program should be conducted for all family members in the different community setting as MCH centers, schools and outpatient clinics.
- 2- Application patterns of health education in the field of activities of health care providers and managers of health care centers and educational institutions for health promotion of all population.

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For further research studies:

3- More comprehensive study based on methods of HPI prevention of different and large sample size, to determine the generalizability of the results.

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برنامج تعليمي للأمهات الذين لديهم أطفال أقل من خمس سنوات فيما يتعلق بالوقاية من جرثومة المعدة

ابتسام على محمد احمد - محبوبة صبحي عبد العزيز- منى عبدالله عبدالمرضى

ظهرت عدوى جرثومة المعدة كواحدة من أكثر أنواع العدوى البكتيرية المزمنة شيوعاً في جميع أنحاء العالم. الطرق الرئيسية لنقل جرثومة المعدة هي الاتصال المباشر من شخص لآخر عن طريق الفم إلى الفم أو البراز إلى ظروف المعيشة الفموية والمزدحمة. لذا هدفت الدراسة الحالية إلى تقييم برنامج التنقيف الصحي للأمهات فيما يتعلق بالوقاية من عدوى الملوية البوابية لأطفالهن دون سن الخامسة. وتم استخدام تصميم دراسة شبه تجريبي. وقد أجريت الدراسة في العيادة الخارجية للأطفال بمستشفى جامعة بنها وتبعها زيارة منزلية. على عينة ملائمة من 97 أم في الدراسة في غضون 6 أشهر. و كشفت الدراسة عن تحسن ذو دلالة إحصائية عالية في معرفة وممارسات الأمهات فيما يتعلق بالوقاية من جرثومة المعدة بعد تنفيذ البرنامج التعليمي. كما اوصت الدراسة بضرورة الاستمرار في تنفيذ برنامج تعليمي للأمهات فيما يتعلق بالوقاية من جرثومة المعدة.