

## Effect of Educational Program for Mothers about Care of their Infants with Infantile Colic



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### ABSTRACT

**Background:** Infantile colic is a condition in which an infant shows signs of distress and parents especially mothers not know what the cause of the infant's crying and how to deal with it so it is very important to enhance mothers' knowledge and practices related to infantile colic to enhance quality of life of both family and their infants. **Aim of the Study:** This study aimed to evaluate effect of educational program for mothers about care of their infants with infantile colic. **Design:** A quasi-experimental research design was utilized in this study. **Setting:** the study was conducted at the Pediatric Emergency Department and Outpatient Clinics (Pediatric General Clinic) affiliated to Mansoura University Children's Hospital (MUCH). **Subjects:** A purposive sample of (246) mothers who attended the previously mentioned settings with their infants. **Tool:** one tool contains four parts used: - (I): Characteristics of the studied sample, (II): Medical and nutritional history, (III): Mothers' knowledge about care of infantile colic, and (VI): Mothers' reported practice about care of infantile colic. **Results:** revealed that a less than one quarter of the studied mothers had good knowledge at the pre-educational program and improved to be less than two thirds at post- educational program, Also, about three-quarters of them had unsatisfactory reported practices at the pre- educational program that decreased to be minority of them had unsatisfactory reported practices at the post- educational program. **Conclusion:** There was a highly statistically significant positive correlation between pre and post educational program on the studied mothers' total knowledge and total reported practices level. **Recommendations:** Encourage breastfeeding during infantile colic episodes and provide continuous educational programs to improve mothers' knowledge and practices regarding the care of their infants with infantile colic.

**Key words:** Care, Infantile Colic, Infants, Mothers

### Introduction:

Infantile colic (IC) is a prevalent condition that strikes many newborns globally during their initial six months of life. Infantile colic usually disappears during the initial six months of life, but persistent signs may trigger parental concern, resulting in recurrent visits to the doctor. The mechanism of disease is yet unknown, as are the consequences on foreseeable health. This is referred to as a multifaceted illness (Zeevenhoove et al., 2022).

Infantile colic characterized by the cry of an infant exceeding 3 h per day, greater than 3 days per week, and for minimally one long week, is the most common condition requiring exceptional medical help in the initial months of after infant's birth (Powell et al., 2020). It imposes a heavy burden on both parents and the health-care system (Desprie et al., 2022). Infantile colic is usually paroxysmal and inconsolable and may be manifested by grimacing, raising of the feet, and gas excretion. Infantile colic occurs in 20% of infants and disappears spontaneously in USA (Vandenplas, Hauser & Salvatore, 2020).

The exact etiology of infantile colic is still unknown. However, some theories attribute it to

factors such as excessive intestinal gas production, cow's milk allergy, lack of normal bacterial flora, gastrointestinal tract immaturity, intestinal spasms, air swallowing during feeding, improper feeding technique, ineffective mother–infant communication, maternal stress and anxiety, and mother's dietary regimen (Khajeh, Sadeghi, Ramezani & Derafshi, 2020).

The intricate relationships between behavioral variables (psychological and social), dietary habits (hypersensitivity or food allergies), an immature structure and function of the gastrointestinal tract, a large quantity of gas in the gut, irregularities of intestinal hormones, and gut dysmotility (Besirik, 2021) could have a pathophysiological impact on the onset of infantile colic. Among the most novel concepts attributes the onset of infantile colic to an imbalance in the composition of the gut flora. At birth, the microbiota, neurological, and immunological systems of the gastrointestinal tract are immature ((Côté, Hartvigsen, & Axén, 2021: Perry, Leach, Penfold & Davies, 2020).

Infantile colic, defined as inexplicable and uncontrollable excessive crying in an otherwise

healthy newborn, is a substantial and substantial warning sign for maternal postnatal depression (Gordon et al., 2020). Although infantile colic may be an early manifestation of some of the most prevalent children's illnesses, the prognosis is generally thought to be excellent (Wolke, Bilgin & Samara, 2021).

Numerous therapeutic methods for infantile colic have been documented, including pharmaceutical therapies, probiotics, dietary changes, physiotherapy, and other complementary and alternative medicines (Hjern, Lindblom, Reuter & Silfverdal, 2020). The widely used complementary and alternative medicine approaches comprise structural osteopathy, cranial osteopathy, visceral osteopathy, and chiropractic therapies (Posadzki, Kyaw, Dziedzic & Ernst, 2022).

Increasing a mother's understanding of infantile colic and its typical course may lessen its negative effects and increase her confidence as a parent (Didişen et al., 2020). In order to treat infantile colic, parents may try a variety of non-medical approaches with varying degrees of success, which is quite stressful for both the infant and the parents (Gordon, Gohil & Banks, 2019).

Furthermore, nurses can provide parents with education and support thereby help them cope with their stressful conditions. Education and support for parents help them better control their conditions and become more actively involved in the care of their infant and also reduce stress significantly during infantile colic and crying of the infant. Such interventions could also improve infants' sleep and crying problems, and increase parental self-confidence and self-efficacy (Hjern et al., 2020).

#### **Significance of the study**

Infantile colic (IC) is a widespread childhood syndrome that impacts up to 20% of newborns internationally in India (Quist et al., 2019). Infantile colic impacts both newborns and their guardians, who grow fatigued and anxious while attempting to console their children (AL-Anazi, & Al-Mutiri, 2021).

The common approach aims to give parents with training, support, and psychological treatments. This method is referred to as a parent educational program. A teaching program may include calming methods and feeding guidance. Facetoface classes, online learning, printed materials, home visits, remote help, and counselling are all possible instructional formats (Bang et al., 2020). Therefore, it is essential to implement an educational schedule for mothers concerning care of their infants with infantile colic to enhance mothers' knowledge and reported practice.

#### **Aim of the study:**

This study aims to evaluate effect of educational program for mothers about care of their infants with infantile colic.

#### **1. Subjects & methods**

##### **1.1. Research design:**

A quasi-experimental research design was applied in this pre and post program investigation.

##### **Research setting:**

The research was conducted at Pediatric Emergency Department and Outpatient Clinics (Pediatric General Clinic) affiliated to Mansoura University Children's Hospital (MUCH), which provides health services to children from Dakahlia Governorate and neighboring locations. It consists of 1 room for examination and 2 rooms for children observation, with bed capacity 1 bed for examination room and 8 beds for observation rooms (4 beds for each room). The Pediatric General Clinic is located on the ground floor. It consists of 3 rooms, with bed capacity 6 beds (2 beds for each room).

##### **1.2. Research subjects:**

A purposive specimen of (246) mothers who got the previously mentioned settings and have infant with the following inclusion criteria:

- Age below 6 months.
- Diagnosed with Infantile Colic.
- Free from any organic disorders or problems such as Appendicitis and Abdominal aortic aneurysm
- **Sample Size Calculation:**

Based on data from literature (Al-Shehri et al., 2016), to calculate the sample size with precision/absolute error of 5% and type 1 error of 5%, Sample size =  $[(Z_{1-\alpha/2})^2 \cdot P(1-P)]/d^2$ , where,  $Z_{1-\alpha/2}$  at 5% type 1 error ( $p < 0.05$ ) is 1.96, P is the expected proportion in population based on previous studies and d is the absolute error or precision. Therefore, sample size =  $[(1.96)^2 \cdot (0.80)(1-0.80)]/(0.05)^2 = 245.9$ . Based on the formula, the sample size required for the study is 246.

##### **1.3. Tool for data gathering:-**

Data was collected through the following tool:

##### **Tool I: A Structured Questionnaire Sheet: (pre& post).**

It was developed via the researcher in a simple Arabic language following reviewing the related literature and employed to gather the needed data to evaluate mothers' knowledge and recorded practices about care of their infants with infantile colic. Questions included open and close ended questions. The Structured Questionnaire Sheet consists of the following four parts:-

##### **Part 1: Characteristics of the studied sample:**

- a. Socio-demographic data about the mother as; mothers' age, educational degree, marital status, occupation, family numbers, monthly income.
- b. Child's traits, comprising; age, sex, uterine age, delivery type, birth order, and whether the child spent outside house some of the daytime.
- c. Housing status as; residence, number of rooms, presence of insects in the house, and safe ways to get rid of these insects.

**Part 2: Medical and nutritional history:**

- a. Medical history of the infant as; previous hospital admission(s), previous history of infantile colic (the number of attacks), the age of the infant when had the attack, and duration of the current infantile colic.
- b. Nutritional history of the infant as; method of feeding (exclusive breastfeeding or bottle feeding), breast feeding period, and whether giving the infant other types of feeding or additionally feeding.

**Part 3: Mothers' knowledge about care of infantile colic**

It was designed by researcher based on reviewed related literature (Hjern., Lindblom., Reuter., & Silfverdal, 2020) & (Al Qahtani., & Ahmed, 2021) to assess mothers' knowledge concerning care of their infants having infantile coli. it included the following dimensions: definition of infantile colic, signs and symptoms, management, side effects of infantile colic, misbeliefs related to infantile colic and source of mother knowledge. It contains 27 items.

**Scoring system:**

Each item was scored as (correct, incorrect), scores range from 0-1. Score one written for the correct reply, score zero recorded for the incorrect reply. Overall scoring classified according to the answers of the surveyed mothers. The knowledge grade will be classified into (Al Qahtani., & Ahmed, 2021):

- Good > 75% (21-27 scores)
- Average 50:75% (14- 20 scores)
- Poor <50% (0-13 scores)

**Part 4: Mothers' recorded practice about care of infantile colic**

It was designed by researcher based on reviewed related literature as (Thomas., Gordon., Banks., & Wallace, 2016) & (Gordon., Gohil., & Banks, 2018) to assess mothers' reported practice concerning care of their infants having infantile colic by reported practices associated to mother's interventions for infantile colic. It included practices that mother must compliance with infantile colic (10 items), malpractices related to infantile colic (10 items), seeking help methods when facing infantile colic (6 items), mothers'

action when signs of infantile colic appear (6 items), mothers' comfortable practices to relieve infantile colic (7 items), It contains 40 items.

**Scoring system:**

Each item was scored as (correct, incorrect), scores runs from 0-1. Score one reported for the correct reported practices, score zero written for the incorrect reported practices. Total scoring classified according to the answers of the studied mothers. The practical level classified into (Gordon., Gohil., & Banks, 2018):

- Satisfactory  $\geq 50\%$  (20- 40 scores)
- Unsatisfactory <50% ( 0-19 scores)

**1.4. Methods**

**II - Operational design:**  
It includes the preparatory phase and the exploratory phase.

**1. The preparatory phase**

This phase includes a review of the past and current related literatures and studies, using available books, periodicals, magazines and articles to be acquainted with the various aspects of the study. The structured questionnaire sheet and the educational program was developed in an Arabic language by the researcher after reviewing the related literatures, then revised and adjusted by supervisors. **Validity:** Data collection tool was tested and juried for the content validity by five specialists in pediatric nursing field. The five experts were from Mansoura University, they reviewed and improved the study instruments' content for clarity and relevance in the realm of nursing care. The needed adjustments, according to their recommendation were done. Then the final form of questionnaire was used for data collection.

**Reliability:** The tool of data collection were tested for its reliability by using Cronbach's Alpha test in statistical package for social science (SPSS) version 20. The internal consistency of the study tool was  $r = 0.832$  for Mothers' knowledge about care of infantile colic questionnaire and  $r = 0.82$  for Mothers' reported practice about care of infantile colic questionnaire.

**1.5. Ethical considerations:**

Ethical consideration approval was obtained from the research Ethical Committee. The researcher followed ethical research principles as the following: Informed oral consent was obtained from each mother after explaining the aim of the study. Anonymity and confidentiality of collected data were assured and used only for research purposes. Participants were informed that participation in the study is voluntary, and they have the right to withdraw from the study at any time freely without any responsibilities

**2. The exploratory phase:**

It includes pilot study and fieldwork.

**a. Pilot Study:** The pilot study was conducted on 10% (25 studied mothers) from the same setting to evaluate the clarity, feasibility, and applicability of the study tool, and identify the possible obstacles that may hinder data collection. According to the findings of the pilot study and the mothers' needs assessment, the researcher prepared the educational program. There was no change in the study tool after pilot study.

**b. Field work**

**Data collection period**

Official permission to carry out the study was obtained from the director of Mansoura University Children's Hospital (MUCH). The study was carried out at the Pediatric Emergency Department and Outpatient Clinics (Pediatric General Clinic) at Mansoura University Children's Hospital (MUCH). In which the researcher introduced himself to the mothers who had infants diagnosed with infantile colic. Each studied mother was interviewed by the researcher to collect the necessary data. The time consumed to answer the questionnaire sheet ranged from 25-30 minutes. The researcher was available two days per week (Saturday and Monday) from 10 AM to 2 PM. Data collection was extended over a period of six months from the beginning of August 2022 to the end of January 2023.

**• The framework of the study was carried out in 4 phases as the following:**

1) **Assessment phase:** includes assessment of mothers' knowledge and reported practices for care of their infants with infantile colic through a structured questionnaire sheet. (pre education program format)

**2) Planning phase:**

- Based on the findings of the assessment phase, the researcher designed the educational program about care of infants with infantile colic based on review of related literature.
- In this phase, two educational sessions were planned by the researcher containing knowledge and practices regarding the care of infants with infantile colic.
- To aid comprehension of the information within, a brochure was prepared in plain Arabic and accompanied by photographs.

**3) Implementation phase**

Taking into account the moms' attention span, each didactic session lasts between 30-45 minutes to address its topics. Educational program contained theoretical and practical contents, the studied mothers divided into groups. Throughout the sessions, the researcher employed explanation, discussion, and questioning, along with additional teaching strategies such as brainstorming. Each mother received a guided coloured booklet on caring for newborns with infantile colic. Brief,

clear, and simple words used during the session, as well as at the end of each session, a summary was given.

**4) Evaluation phase:**

- Every mother was interviewed after the educational program was conducted to evaluate the level of knowledge and reported practices by using posttest-format tool.
- Comparison between mothers' pre and post evaluation finding done to determine the effect of the educational sessions on mothers' knowledge and reported practices about their care of infants with infantile colic.

**3.7. Administrative design**

Official permission: Official approval for conducting this study was obtained from the responsible authorities including dean of Faculty of Nursing, Mansoura University. Also Ethical consideration approval was obtained from the research Ethical Committee. An official letter to conduct the study was obtained from the hospital responsible authority after sending official letter from the faculty and giving an explanation to the aim and nature of the study.

**3.8. Statistical design:**

The gathered data were coded, computed and analyzed. Excel is a Windows-based spreadsheet application. Any errors were detected using frequency analysis and manual review. Data were entered into the Statistical Package for Social Sciences (SPSS) version 20.0, where they were analyzed using frequency tables and percentages. Qualitative data was presented as number and percent. Continuous variables were presented as mean  $\pm$  SD (standard deviation). The Chi-Square test was used to examine the relationship between categorical variables. Pearson correlation coefficient test was used for correlating different parameters. All tests were performed at a level of significance ( $P$  value  $< 0.05$ ) also it was considered high with ( $P$  value  $< 0.001$ ).

**2. Results:**

**Table (1-a)** illustrates that greater than two fifth of the surveyed mothers 41.5% had less than 25 years old age with mean  $\pm$ SD 27.8  $\pm$ 6.9 and more than two fifth of them 42.3% had university qualifications. Also, the majority of them 82.9% were married, more than half of them 56.1% had less than 4 family members and the majority of them 82.9% had enough monthly income.

**Table (1-b)** demonstrates that more than three quarters of the surveyed mothers 75.6% were lived at rural region, vast majority of them 90.2% had 2 to 3 rooms and about one quarters of them 24.4% had flying or crawling insects. As well as, more than half of them 60% had cockroaches and more than two thirds of them 66.7% used chemical insecticides as safe ways to get rid of these insects.

**Table (2)** illustrates that more than half of the surveyed infants 61% had 1 to less than 3 months, more than half of them 56.1% were male, more than two fifth of them 43.9% were preterm as uterine age and majority of them 85.4% were delivered through cesarean section. In addition, more than two fifth of them 43.9% were the first in infant birth order, nearly one quarters of them 24.4% spend time outside the home and more than two thirds of them 70% spent time outside with relatives.

**Table (3)** Shows that regarding infant previous hospitalization more than one-third of the studied infants 36.6% had previous hospitalization, the majority of them 86.7% had less than 3 times of infant previous hospitalizations, more than one-quarter of them 25.6% their reason for previous hospitalization was related to the digestive system, more than two-thirds of them 69.6% had nutritional problems. In addition, minority of the studied infants 14.6% had history of previous infantile colic, all of them 100% had once previous infantile colic. As well as, less than half of the studied infants 48.4% had infantile colic from one month to less than 3 month of age and less than one third of

them 29.3% had from 1 week to less than 3 weeks suffering from the current infantile colic.

**Figure (1)** reveals that less than one quarter of them 17.1% had good knowledge at the pre-educational program and improved to be less than two-thirds 62.6% at post-intervention. While, more than half of them 52.4 had poor knowledge at pre-educational program and decreased to be a minority of them 13.8% had poor knowledge at post educational program

**Figure (2)** demonstrates that more than three quarters of the studied mothers 75.6% had unsatisfactory practices at the pre- educational program that decreased to be less than one quarters of them 18.3% had unsatisfactory practices at the post- educational program.

**Table (4)** Shows that there was a highly statistically significant positive correlation between the studied mothers' total knowledge and total reported practices level post educational program. While, there was no statistically significant correlation between the studied mothers' total knowledge and total reported practices level pre educational program.

**Table (1-a): Number and percentage distribution of studied mothers' socio-demographic characteristics**

Socio-demographic characteristics	N=246	%
<b>Age (Years)</b>		
< 25	102	41.5
25 – 35	96	39.0
> 35	48	19.5
<b>Mean ±SD</b>	<b>27.8 ±6.9</b>	
<b>Educational Level</b>		
Preparatory	3	1.2
Medium Qualification	85	34.6
Qualification above average	24	9.8
University qualification	104	42.3
Postgraduate qualification	30	12.2
<b>Marital Status</b>		
Married	204	82.9
Divorced	24	9.8
Widowed	18	7.3
<b>Occupation</b>		
Working	66	26.8
Not working	180	73.2
<b>Family Members</b>		
< 4	108	43.9
4 or More	138	56.1
<b>Monthly Income</b>		
Enough	204	82.9
Not enough	42	17.1

Table (1-b). Number and percentage distribution of studied mothers' housing status

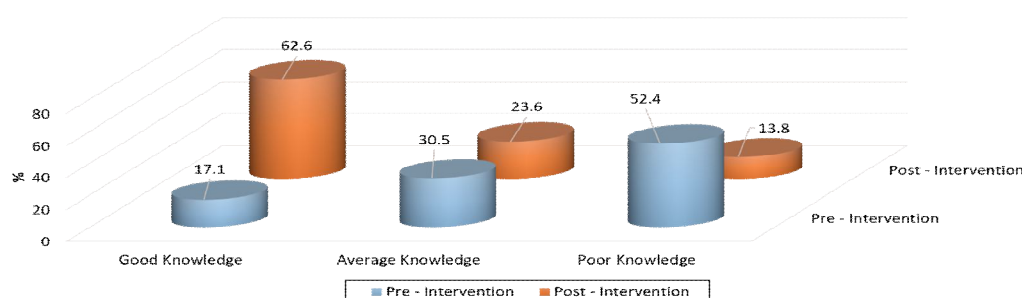
The residential data	N=246	%
<b>Residence</b>		
Rural	186	75.6
Urban	60	24.4
<b>Number of rooms</b>		
2 – 3	222	90.2
4 or More	24	9.8
<b>Presence of flying or crawling insects</b>		
No	186	75.6
Yes	60	24.4
<b>Kind of these insects (n=60)</b>		
Flies	24	40.0
Cockroaches	36	60.0
<b>Safe ways to get rid of these insects (n=60)</b>		
Chemical insecticides	40	66.7
Natural ways	12	20.0
Manual ways	8	13.3

Table (2): Number and percentage distribution socio-demographic characteristics of studied infants

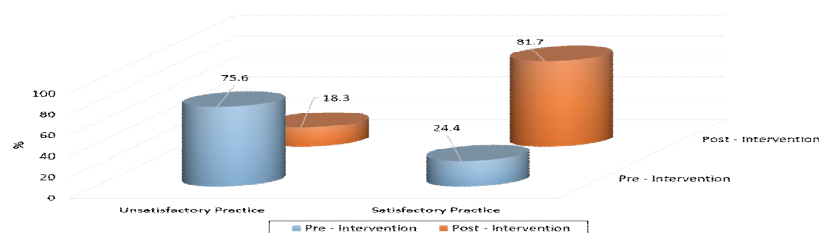
Socio-demographic characteristics	N=246	%
<b>Age (Months)</b>		
Less than 1 month	24	9.8
1 – < 3 month	150	61.0
3 – 6 months	72	29.3
<b>Gender</b>		
Male	138	56.1
Female	108	43.9
<b>Uterine Age</b>		
Pre-term	108	43.9
Full-term	102	41.5
Post-term	36	14.6
<b>Delivery Type</b>		
Vaginal	36	14.6
Cesarean section	210	85.4
<b>Infants birth order</b>		
First	108	43.9
Second	66	26.8
Third	42	17.1
Fourth	18	7.3
Fifth or more	12	4.9
<b>The Infant spends time outside the home</b>		
No	186	75.6
Yes	60	24.4
<b>The Infant spends time outdoors with (n=60)</b>		
Nanny at home	6	10.0
Relative	42	70.0
Day Care Homes	12	20.0

Table (3) Number and percentage distribution of the studied infant's medical history

Infant's medical data	N=246	%
<b>Infant previous hospitalization</b>		
No	156	63.4
Yes	90	36.6
<b>Frequency of infant previous hospitalization (n=90)</b>		
< 3 times	78	86.7
3 times or More	12	13.3
<b>The reason for previous hospitalization is related to digestive system (n=90)</b>		
No	67	74.4
Yes	23	25.6
<b>Problems related to the digestive system caused a previous hospitalization (n=23)</b>		
Nutritional problems	16	69.6
Gastrointestinal bleeding	5	21.7
Intestinal obstruction	2	8.7
<b>History of previous infantile colic</b>		
No	210	85.4
Yes	36	14.6
<b>Frequency of previous infantile colic (n=36)</b>		
Once	36	100.0
Twice or more	0	0.0
<b>Age of the Infant at onset of the current infantile colic</b>		
Less than a month	98	39.8
From one month to less than 3 months	119	48.4
From 3 months to less than 6 months	29	11.8
<b>Duration of suffering from the current infantile colic</b>		
Less than a week	24	9.8
From 1 week to less than 3 weeks	72	29.3
3 weeks or more	150	61.0



**Figure (1): Percentage distribution of studied mothers' total knowledge level pre and post- educational program**



**Figure (2): Percentage distribution of total mother-reported practice level pre and post- educational program**

**Table (4): Correlation between the studied mothers' total knowledge level and total reported practice level pre & post educational program**

Item	Mothers' Knowledge	
	Pre – educational program	Post – educational program
<b>Mothers' reported practices</b>		
R	0.030*	0.159
P value	0.636	0.013*

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

### 3. Discussion

Infantile colic is a prevalent syndrome in the initial months after birth, affecting many infants worldwide. Infantile colic can cause parental exhaustion and discomfort, as well as stressed parental connections and inadequate parental engagement with their infant. In addition, despite the introduction of multiple therapy procedures for infantile colic, no clear cure has been presented so far for this condition (Hjern et al., 2020).

Therefore, the present investigation seeks to evaluate effect of educational program for mothers about care of their infants with infantile colic.

Regarding percentage distribution of the socio-demographic traits of the surveyed mothers, our experiment revealed that more than two fifth of them had less than 25 years old age and more than two fifth of them had university qualifications. Also, the majority of them were married, more than half of them had less than 4 family persons and most of them had enough monthly income. From author opinion, this might be because females are married in young age and prefer completing their university education to get suitable work. Our findings were in accordance with Jasim & Hasan, (2023), who applied a study entitled "Knowledge and Practice of Mothers about Infantile Colic Attending Central Pediatric Teaching Hospital in Baghdad" which discovered that almost all of mothers' ages between 20-24 years old and about

two fifth of them had university education. Additionally, this outcome was agreed with Al-Shehri et al., (2016), who carried out study which entitled "Assessment of maternal knowledge about infantile colic in Saudi Arabia", and reported that more than half of mothers had university level of education.

As regard to percentage distribution of the socio-demographic characters of the surveyed mothers, the current investigation demonstrated that greater than three quarters of the surveyed mothers were lived in rural areas, vast majority of them had 2 to 3 rooms and about one quarter of them had flying or crawling insects. As well as, more than half of them had cockroaches and more than two thirds of them used chemical insecticides as safe procedures to eliminate these insects. From author point view, this could be because the rural environment depends mainly on agriculture and raising animals and birds inside their homes which make them susceptible for flying or crawling insects.

This outcome was in accordance with Khalaf et al., (2023), who published an experiment entitled "Educational Health Program for Mothers Regarding Infantile Colic Syndrome at Assiut City", and found that more than two thirds of mothers were from rural areas. This finding was in harmony with Bagherian et al., (2021) who



performed an investigation entitled "How Do Mothers Take Care of Their Infants with Infantile Colic Pain" and noticed that the highest mean score regarding residence of the mothers associated with living in village.

Concerning percentage distribution of the socio-demographic characteristics of the studied infants the current study illustrated that more than half of the studied infants had 1 to less than 3 months, more than half of them were male, more than two fifth of them were born preterm and majority of them were delivered through cesarean section. In addition, more than two fifth of them were the first in infant birth order, nearly one quarters of them spend time outside the home and more than two thirds of them spent time outside with relatives. From scientist opinion, this might be because infantile colic is more common in this age due to intestinal immaturity (Skonieczna-Zydecka et al., 2022).

This result was similar with **Jasim & Hasan, (2023)**, who found that more than half of surveyed infants were male and slightly more than two fifth of them were the first in infant birth order. Also this result was supported by **Yen & Lee, (2021)**, who evaluated the effects of a health education intervention program on infantile colic and recorded that more than half of surveyed infants were male and their ranking was the first infant.

Regarding percentage distribution of the studied infant's medical history the current study showed that regarding infant previous hospitalization more than one-third of the studied infants had previous hospitalization, the majority of them was hospitalized for less than 3 times, more than one-quarter of them their reason for previous hospitalization was related to the digestive system disorders, more than two-thirds of them had nutritional problems. In addition, minority of the surveyed infants had history of previous infantile colic, all of them had for once previous infantile colic occurred. From researcher thought this may be attributed by the fact that infants in this age are susceptible for bacteria and viruses which causes digestive problems as diarrhea and vomiting due to milk or bottle feeding.

This result was in harmony with **AL-Anazi & Al-Mutiri, (2021)**, who conducted study entitled "Prevalence, perception, and habits of mothers to use of anise tea for infantile colic in Riyadh city, Saudi Arabia" and revealed that more than one third of the infants were not healthy with previous hospital admission, and less than half of them suffered from cramps and abdominal pain repeatedly and frequently woke up from infantile colic pain. Also this result was in accordance with **Didişen et al., (2020)**, who conducted study about "Infantile Colic in Infants Aged One-Six Months and the Practices of Mothers for Colic", and observed that more than two thirds of infants with infantile colic had previous hospital admission.

As regard to percentage distribution of total mother knowledge score at pre and post-

educational program the present study revealed that less than one quarter of them had good knowledge at the pre- educational program and improved to be less than two-thirds at post-intervention. Yet, more than half of them had poor knowledge at pre-educational program and reduced to be a minority of them had poor knowledge at post educational program. Authors claim that this may be due to the importance of this subject to all mothers as it is common among infants and sometimes causes mothers distress and depression.

This outcome was in the same line with **Al Saadoon et al., (2018)**, who performed an investigation concerning "Prevalence and Associated Factors of Infantile Colic among Omani Babies", and concluded that around two thirds of the mothers had lack of data about infantile colic. This result was incongruent with **Jasim & Hasan, (2023)**, who clarified that more than half of mothers had a fair level score of knowledge concerning infantile colic.

As regard to percentage distribution of total mother-reported practice score pre and post-educational program, the present research illustrated that more than three quarters of the surveyed mothers had unsatisfactory practices at the pre- educational program that decreased to be less than one quarters of them at the post-educational program. This might be because of the limited knowledge regarding of mothers about managing infantile colic at pre educational program that appeared in their poor practices.

Our findings disagreed with **Waziry, (2018)**, who performed a research entitled "Mothers' Practices Regarding Management of Common Gastrointestinal Problems Affecting Their Young Children", and revealed that almost half of the mothers got good total scores of practices regarding management of common gastrointestinal problems. Also this result was in agreement with **Azeez et al., (2023)**, who carried out a research about "The Effectiveness of Massaging, Swaddling, and Reflexology Intervention in Mothers' Practices Regarding Infantile Colic", and confirmed that there was a statistically substantial median rise in practice scores when mothers involved in the course program. In addition, this outcome was similar with **Al Qahtani & Ahmed, (2021)**, who affirmed that most of novel mother after program had reliable practice and there were high statistically remarkable variation.

Regarding correlation between mothers' total knowledge scores and total reported practice scores the present research described that there was highly statistically substantial positive correlation among the surveyed mothers' total knowledge and total reported practices level post educational program. While, there was no statistically remarkable correlation among the surveyed mothers' total knowledge and total reported practices level pre educational program. This could be due to increases knowledge and information



about infantile colic after program implementation which is reflected positively on mother practices.

These results were in congruence with Ouda et al., (2022), who showed that there was a greatly statistically substantial positive correlation among the surveyed mothers' total knowledge and their total recorded practice. Also, our results were in agreement with Azeez et al., (2023), who assessed effectiveness of massaging, swaddling, and reflexology intervention in mothers' practices regarding infantile colic, and discovered a positive correlation among practice and knowledge of mothers.

#### 4. Conclusion

**In conclusion,** Findings confirmed that, there were greater progress in the mothers' practices and knowledge regarding caring of infants with infantile colic after implementation of educational program

#### 5. Recommendations

##### Recommendations for mothers:

- ✓ Provide breastfeeding during infantile colic episodes
- ✓ Avoid to give infants any medications to treat infantile colic without physician prescription
- ✓ Drink herbal and enough amount of water during the day
- ✓ Sterilize the feeding bottle before each feeding
- ✓ Avoid giving sugars and foods to the infant to overcome infantile colic
- ✓ Leave the infant with others when necessary to avoid exhausting yourself

##### Recommendations for nurse:

- ✓ Provide continuous educational programs to improve mothers' knowledge and practices regarding the care of their infants with infantile colic.
- ✓ Developing support groups for mothers of infants suffering from infantile colic is mandatory to enhance quality of life of both family and their infants.
- ✓ Establish posters in the outpatient clinic and pediatric department about mothers' practices regarding infantile colic.
- ✓ Organize the campaigns for mothers of infants suffering from infantile colic to offer sufficient knowledge and skills concerning management of infantile colic.

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