Effect of Educational Program on Mothers' Knowledge and Practices regarding Their Children with Splenomegaly

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Abstract

Background: The spleen, a multifunctional organ, plays a pivotal role in active hematopoiesis and immune monitoring. Splenomegaly, characterized by an increase in spleen size due to cellular or tissue components or vascular engorgement, necessitates careful evaluation. **Aim of the study:** evaluate the effect of educational program on mothers' knowledge and practices regarding their children with splenomegaly. **Research Design:** A quasi-experimental research design was used. **Sample**: A convenient sample of sixty mothers and their children with splenomegaly from the Pediatric Medical Department and Hematology Department of Tanta University Hospital. Two tools were utilized: Tool I: Mothers' knowledge regarding splenomegaly questionnaire. Tool II: questionnaire to collect Mothers' reported practice regarding care provided to their children with splenomegaly**.** **Results:** more than three-quarters of mothers had a low level of knowledge about splenomegaly preprogram implementation while immediately and after one month from the program implementation the total scores of mothers' knowledge were improved. Also, the majority of studied mothers had un satisfactory level of reported practice preprogram implementation while immediately and after one month from the program implementation there was a marked improvement in the total scores of mothers' practices. **Conclusion**: There was a significant effect of the educational program on improving the mothers' knowledge and practices regarding their Children with splenomegaly. **Recommendations**: educational programs should be organized for mothers to elevate their awareness and competence in providing care for children with splenomegaly.

Keywords: Children, Educational Program, Knowledge, Mothers, Practice, Splenomegaly

Introduction

Splenomegaly is an increase in the size or mass of the spleen. Moreover, it is considered a potential symptom associated with various conditions rather than a standalone disease. It has been established that a palpably enlarged spleen is not necessarily clinically significant. If the splenic edge is felt more than two centimeters below the margin of the left costum, which is occasionally suspected during adolescence. **(Shalagin, M. M. 2018).** Investigations are essential due to a pathogenic condition linked to an unusually enlarged spleen. Mechanisms underlying splenomegaly can be broadly categorized as infiltrative, congestive, or

reactive. (**Mcintyre, O. R. 2019)** According to Hackett's classification, splenomegaly is divided into six grades, as outlined below: Grade 0: The spleen is not palpable, even with deep inspiration. Grade I: Palpable spleen below the costal margin, typically after deep inspiration. Grade II: A line dropped vertically from the left nipple indicates the presence of the spleen but not beyond a horizontal line midway between the costal border and umbilicus. Grade III: The spleen can be felt more than halfway to the umbilicus but not any lower than the horizontal line passing through it. Grade IV: Palpable below the umbilicus but not beyond a line drawn horizontally midway between the pubic symphysis and the umbilicus. Grade V: Extending below Grade IV

It was stated that a palpably enlarged spleen is not necessarily indicative of a serious medical condition. During the physical examination of teenagers, if the splenic edge is felt more than 2 cm below the left costal margin**. (Eichner, E. R. 2018)**. Regardless of gender or gestational age, a palpable spleen tip is a common occurrence in up to 30% of newborns. However, in healthy school-age children, this percentage drops to 10% or less, and in adolescents or early adults, it drops below 3%. **(Arkles, L. B., Gill, G. D., & Molan, M. P. 2017).**

In addition to being firm and potentially displaying an aberrant surface, a pathologically enlarged spleen is often accompanied by signs and symptoms of the underlying disorders. **(Lewis, S. M., Williams, A., & Eisenbarth, S. C. 2019).** The differential diagnosis for splenomegaly includes infections, hematologic, metabolic, vascular, and neoplastic conditions affecting the spleens' reticulo-endothelial, lymphoid, or vascular components. While symptoms of an enlarged spleen are usually absent, they may occasionally include heaviness or pain in the left upper abdomen that can radiate to the left shoulder. Additionally, a feeling of fullness, even with minimal or no food, may occur due to the spleen pressing against the stomach. An enlarged spleen may lead to complications such as anemia, splenic rupture, increased susceptibility to infections, and easy bleeding. The risk of traumatic splenic rupture increases with splenic hypertrophy. **(Kamble, M. B., Meena, K. B., & Meena, V. K. 2019).**

The objectives of splenomegaly management include treating the underlying illness and safeguarding the child from complications associated with splenomegaly. While splenectomy may be necessary in some cases, its benefits must be carefully weighed against the potential for potentially lethal sepsis episodes. Children with any form of splenomegaly are more susceptible to splenic rupture, necessitating increased caution to prevent abdominal injuries **(Prasad, N., & Kumari, M. K. 2020).**

It is the role of the pediatric nurse to provide disease-specific education to the family of a child with pathological splenomegaly. In non-pathologic spleen enlargement cases, reassurance to the family is usually sufficient. Families should also be cautioned against splenic trauma. Additionally, children with a missing spleen or reduced splenic function should receive comprehensive explanations of the risks of infection and the necessity of vaccination. Moreover,

pediatric nurses should inform families of the serious signs and symptoms that may indicate a complication of splenomegaly and advise them to seek immediate medical attention. **(Konan TM, Kouame KJ, et al. 2019).** So, the primary objective of the present study was to assess the effect of educational program on mothers' knowledge and practices regarding their children with splenomegaly.

Significance of the Study

The incidence of splenomegaly is strongly dependent on the geographical location reflecting the etiology as causes may vary with diseases prevalent in a given area In Asia and Africa. Splenic sequestration crisis in pediatric sickle cell disease and compound HemoglobinS-beta-thalassemia plays a special role as up to 30% of these children may develop this life-threatening illness with a mortality rate of up to 15%. It is encouraged by venous splenic vaso-occlusion, a condition where a significant amount of blood is trapped inside the spleen.

In addition, (55%) of Arab children with idiopathic thrombocytopenic purpura had splenomegaly. Furthermore, splenomegaly has a serious complication in these pathological cases such as Iron deficiency anemia in 84% of these children. In addition to bleeding which may cause hypovolemic shock and even death. Splenomegaly is defined as an increase in the size or mass of the spleen. Moreover, it is considered a potential symptom associated with various conditions rather than a standalone disease. However, It has been established that a palpably enlarged spleen is not necessarily clinically significant. An enlarged spleen may lead to complications such as anemia, splenic rupture, increased susceptibility to infections, and easy bleeding. So, the mothers of these children need to be educated about how to care for their children in order to comprehend the complexities of splenomegaly. Improved knowledge can empower them to make informed decisions about their children's health. In addition, understanding symptoms, preventive measures, and potential complications can contribute to early intervention and improved overall health outcomes. Moreover, educating mothers about potential risks, such as splenic trauma or infections, enables them to take preventive measures. This knowledge is crucial for creating a safe environment and reducing the likelihood of complications. Furthermore, The study contributes to the empowerment of mothers as primary caregivers. A well-designed educational program can boost confidence, reduce anxiety, and foster a proactive approach to managing a child's health condition. **(J. Swarrop & R. A. O'Reilly, 2017)**.

Aim of the Study:

The study aimed to evaluate the effect of educational program on mothers' knowledge and practices regarding their children with splenomegaly.

Subjects & Methods

Study design: The present study employed a quasi-experimental research design during the period spanning April 2022 to September 2022. The research was executed at the Pediatric Medical Department of Tanta University and the Hematology Department at Tanta University Hospital.

Subjects:

A convenient sample comprising sixty mothers and their children with splenomegaly was included in the study. The study sample was randomly selected from the aforementioned settings.

The tool of the study: Two tools were used in the study.

Tool 1. Mothers' knowledge regarding splenomegaly questionnaire :

The tool utilized in this study was developed by the researcher after a thorough review of the relevant literature, guided by **(Shereen M et. al,2016).** It was employed to evaluate the knowledge of mothers concerning their children with splenomegaly, comprising three distinct parts:

Part one: Socio-demographic characteristics such as:

Part 1: Data related to mothers such as level of education, age, residence, occupation, and number of children in the family.

Part 2: Data related to children such as sex, age, birth order, and number of siblings.

Part two: Past and present medical history

a. **Children:** Such as previous hospitalization, medical and family history child's diagnosis, and length of hospital stay.
b. **Associated health problems of children with splenomegaly**.

It was formulated by the researcher after an extensive literature review, this tool aimed to evaluate health issues encountered by children with splenomegaly, including bleeding tendency, anemia, fatigue, and increased susceptibility to infections.

Part three: Mothers' knowledge regarding splenomegaly

It included the meaning of splenomegaly, its causes, signs and symptoms, management, and complications that may occur.

Scoring system:

Each question was scored as follows (2, 1, 0 grades).

Correct and complete answers received a score of (2), correct but incomplete answers were scored (1), and incorrect or unknown responses were scored (zero). The total knowledge score for mothers was then calculated and categorized as follows, **Shereen M et al. (2016): A high level of knowledge** was determined when the mother's score ranged from 70% to 100% of the total score, **a moderate level of knowledge** was identified when the mother's score was between 50% and 70% of the total score, and **a low level of knowledge** was assigned when the mother's score was less than 50% of the total score.

Tool 2: Mothers' reported practice regarding care provided to their children with splenomegaly

The tool was developed by the researcher, guided by (Shereen M et al., 2016), to assess the actual reported practices of mothers concerning handwashing, temperature measurement, tepid compresses, breathing exercises, upper limb exercises, lower limb exercises, relaxation techniques for sleep and rest, compliance with medication, and a healthy balanced diet. The scoring system for mothers' reported practices assigns one grade for each step done correctly and a zero grade for each step not done. Consequently, mothers' total actual

practices were categorized as either unsatisfactory, considered to be < 60% of the total score, or satisfactory, considered to be > 60% of the total score.

Method:

1- Administrative Process:

Official approval was obtained from the administrative authorities of the hospital setting mentioned above, following an explanation of the study's aim, to secure their cooperation and acceptance.

2-Ethical Consideration

The study was carried out after obtaining ethical approval from the Research Ethics Council of Tanta University's Nursing Faculty. (16/12/2021). consent was obtained from each participating mother, with the researcher providing detailed explanations of the study's procedures, benefits, and potential risks. Participants were informed of the voluntary nature of their participation, emphasizing their right to withdraw at any point without facing consequences.

Mothers participating in this study were assured that their participation was completely voluntary and they had the right to withdraw at any time without any consequences.

Data confidentiality and anonymity were protected, with information used exclusively for research purposes. The study's nature did not pose any harm or pain to the entire sample.

3- Tools development:

The structured questionnaire sheet consisted of two tools collection, **Tool (1)** was developed by the researcher after reviewing relevant literature and used to collect biosocial data of mothers and children as well as to assess mother's knowledge about the care of their children with splenomegaly.

Tool (II) was modified by the researcher to assess the mothers' reported practices regarding their children with splenomegaly. It was used three times before, immediately, and after one month of data collection.

4-**Content validity:** The tools were presented to a jury of five experts in the field of Pediatric Nursing to check content validity clarity, relevance, comprehensiveness, understanding, applicability, and ease of implementation. The content validity index is 98.0%.

5-Realiability of the tools was tested through internal consistency. The value of Cronbach's alpha coefficient was 0.990.

6-Statistical Design

The collected data underwent thorough organization, tabulation, and statistical analysis using the SPSS software statistical computer package, version 28. Quantitative data were assessed through the calculation of range, mean, and standard deviation. In contrast, qualitative data underwent comparison utilizing the Chi-square test ($\chi 2$). For the comparison of means between two variables within a group, the paired samples t-test was applied. In scenarios involving the comparison of means across three intervention periods in a group or for more than two variables, the F-value of analysis of variance (ANOVA) was computed. Correlation between variables was assessed using Pearson and Spearman's correlation coefficient (r). A significance level of $P < 0.05$ was adopted for the interpretation of results in significance tests (*), while a highly significant

threshold of P < 0.01 was set for tests of significance (**).

7- A pilot study was carried out before starting the data collection. It was done on a sample of 10% to evaluate the clarity and applicability of the research tools and the necessary modifications were done. A pilot study was included in the study.

8-Data collection was conducted in four phases as follows:

1. Assessment phase:

-Before conducting the educational program, every mother was interviewed separately to document the characteristics of them and their children using part I of Tool 1.

-Assessment of past, and present medical history and associated health problems of children with splenomegaly using part II of Tool 1.

-Assessment of mothers' knowledge regarding splenomegaly was done by part III of the study tool.

-Assessment of mothers' reported practice regarding care provided to their children with splenomegaly was done by Tool II of the study.

2. planning phase:

- Objectives, priorities, and expected outcomes of the educational program were established according to the results of the assessment phase, to meet the needs of mothers to care for their children with splenomegaly.

The teaching program was applied to all mothers through six sessions, mothers were divided into six groups (each group consisted of ten mothers).

-The time for each session was ranged from 30-45 minutes.

-Teaching methods which were used included group discussions, demonstration, and re-demonstration, and the booklet was also used to facilitate their learning.

3. Implementation phase:

First session: during this session, the researcher introduced herself providing a brief idea about the study as well as, the sessions' objectives. The aim of this session was to orient the mothers about the importance of the program and increase mothers' knowledge about the definition and causes of splenomegaly. The session duration was 45 minutes in order to discuss the session's topics, considering mothers' attention span.

Second session: the researcher discussed the manifestations of splenomegaly, complications, and management of splenomegaly throughout the session. It took 30-45 minutes in order to discuss the session's topics, considering mothers' attention span.

Third session: during this session, the researcher gave training to mothers about practical skills such as hand washing and measurement of temperature. It took 30-45 minutes to discuss the session's topics, considering mothers' attention span.

Fourth session: the researcher had a discussion with mothers about how to apply breathing exercises, the method of doing tepid compresses, and compliance with medication. It took 30-45 minutes in order to discuss the session's topics, considering mothers' attention span.

Fifth session: during this session, the researcher made training to mothers about upper and lower limb exercises. It took 30-45 minutes in order to discuss the session's topics, considering mothers' attention span.

Six session: the researcher had a discussion with mothers about a healthy balanced diet, relaxation techniques for rest and sleep, and how to avoid sharing sports that can cause a rupture of the spleen. It took 30-45 minutes in order to discuss the session's topics, considering mothers' attention span.

4-Evaluation phase:

- The researcher interviewed every mother separately next educational program application for making immediate and follow-up after 1 month post-test to make an evaluation of mothers' knowledge and practice` by (**part III of tool I, and tool 2)** of the study tool.

Results

Table 1: Displays the percentage distribution of the mothers under study with respect to their sociodemographic attributes. It was found that thirty to less than forty years old made up one-third of the mothers in the study (33,33%). Regarding the educational level of the mothers, more than one-third (36,67%) of them had secondary or diploma educational school. Concerning their occupation and residence, more than two-thirds of the mothers (66,67% &61.67%) were not working and living in rural areas respectively.

Table(2): Shows the percent distribution of the children regarding their sociodemographic characteristics. It is observed from the table that, one-third of the studied children (30.00%) were aged between six to less than eight years, with a mean& SD of 7.08±2.219. Concerning the gender of the studied children and birth order, more than two-thirds of them (66,67%) & (60,00%) were male and the first children in their families respectively. It was also observed that more than two-thirds of them (66,67%) & (60,00%) were male and the first children in their families respectively.

Figure (1): Illustrates the percent distribution of the studied mothers regarding their total knowledge level about the enlargement of their children's spleen. It was observed that there was a high statistically significant difference between the total knowledge level of studied mothers about splenomegaly before, instantly, and one month after implementing the program, where more than three-quarters of mothers (78,33%) had a low level of knowledge about splenomegaly before program implementation. While 96.67% &76.67% had a high level of knowledge regarding splenomegaly immediately and one month after the implementation of the program respectively.

Figure (2): This figure illuminates that there were statistically significant differences in mothers' total reported practice level about the care of their children with splenomegaly before, immediately, and one month after the program implementation, where P=0.000. It was observed that 83.33% of studied mothers had un satisfactory level of reported practice preprogram. In addition, 96.67% &70.00% had a satisfactory level of practice regarding the care of their children with splenomegaly immediately and one month after program implementation respectively, where p=0.000.

Table 3: shows the percentage correlation between mothers' knowledge and self-reported practices regarding splenomegaly management at three time points: before,

one week after, and one month after program implementation. Notably, a significant positive correlation (p= 0.006) existed between total knowledge scores and total practice scores at all three-time points, highlighting the program's effectiveness in translating knowledge into improved care practices.

Table (4): shows the relation between of socio-demographic characteristics of the studied mothers and their knowledge score about splenomegaly of their children's spleen**.** A high statistically significant difference was observed between the knowledge of the studied mothers and their ages, with a p-value of (0.001). Similarly, a high statistical significance was found between mothers' knowledge and their educational level, where the p-value was (0.000). Additionally, there was a statistically significant difference between mothers' knowledge and their occupation (p-value = 0.018) as well as residence (p-value = 0.002).

Table (5) presents the relationship between the sociodemographic characteristics of the studied mothers and their reported practice scores. The table indicates that a high statistically significant difference was found between the mothers' practices and their ages, level of education, occupation, and residence, with p-values of (0.000).

Table (1): Percent Distribution of the Studied Mothers regarding their Sociodemographic Characteristics.

Characteristics	The studied mothers (n=60)	
	N	%
Age (in years)		
(<20)	4	6.67
(20-<30)	19	31.67
(30-<40)	20	33.33
(≥40)	17	28.33
Range	**(19-46)**	
Mean ± SD	**32.78±7.740**	
Educational level		
Illiterate	3	5.00
Primary	6	10.00
Preparatory	10	16.67
Secondary/Diploma	22	36,67
University	13	21,67
Post studies	6	10.00
Occupation		
Work	20	33.33
Not work	40	66.67
Residence		
Rural	37	61.67
Urban	23	38.33
Number of children in family		
A child	14	23.33
Two children	19	31.67
Three children	18	30.00
Four or more	9	15.00

Table (2): Percent Distribution of the Studied Children regarding their sociodemographic Characteristics.

Characteristics	The studied children (n=60)	
	N	%
Age (in years)		
▪ (4-<6)	17	28.33
▪ (6-<8)	18	30.00
▪ (8-<10)	13	21.67
▪ (10-<12)	12	20.00
Range	**(4-11)**	
Mean ± SD	**7.08±2.219**	
Gender		
▪ Male	40	66.67
▪ Female	20	33.33
Order of child in family		
▪ First	36	60.00
▪ Second	18	30.00
▪ Third	6	10.00

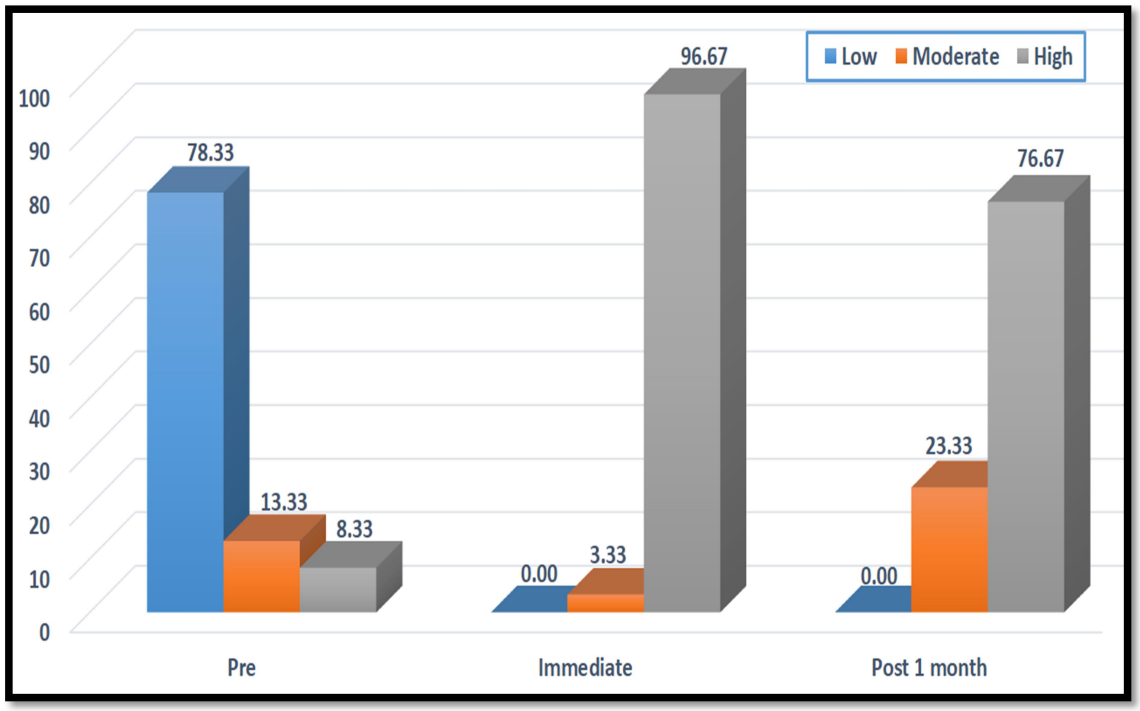

Figure (1): Total level of Knowledge about Splenomegaly in Children Among Studied Mothers Before and After Program Implementation (n= 60)

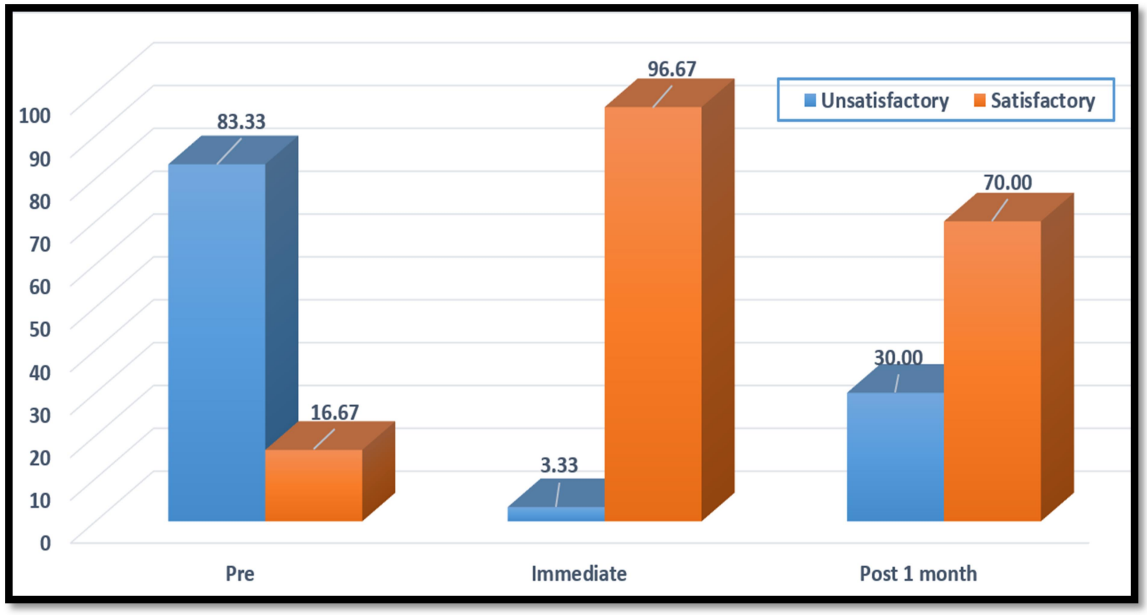

Figure (2): Total level of Reported practice level about Splenomegaly in Children Among Studied Mothers Before and After Program Implementation (n= 60)

Table (3): Correlation Between Total Knowledge level of The Studied Mothers and their Total reported Practice level about Splenomegaly in children Before, Immediate and 1 Month After Program

Total practice level	The studied mothers (n=60) Total knowledge level													
	Pre						Immediate				Post 1 month			
	Low		Moderate		High		Moderate		High		Moderate		High	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Unsatisfactory	40	66.67	6	10.00	4	6.67	0	0.00	2	3.33	6	10.00	12	20.00
Satisfactory	7	11.67	2	3.33	1	1.67	2	3.33	56	93.33	8	13.33	34	56.67
χ^2 , P	**10.546 , 0.041***						FE , 1.00				**FE , 0.019***			
r , P	0.185 , 0.180						**0.315 , 0.013***				**0.961 , 0.006****			

Table (4): Relation between Socio-Demographic Characteristics of the Studied Mothers and Their Total Knowledge Score about Splenomegaly in Children

Characteristics	The studied mothers (n=60) Total knowledge score Mean ± SD		
	Pre	Immediate	Post 1 month
Age (in years)			
<20	4.50±1.00	32.00±2.00	31.95±2.84
20-<30	5.45±2.89	33.05±2.28	28.30±3.34
30-<40	**7.21±3.63**	**33.53±1.71**	**32.00±2.00**
≥40	**7.29±2.78**	31.88±2.62	29.65±1.69
F , P	2.082 , 0.113	1.922 , 0.137	**6.636 , 0.001***
Educational level			
Illiterate	3.33±2.06	31.00±3.09	25.00±3.22
Primary/Preparatory	5.50±2.96	32.75±1.94	29.50±2.19
Secondary/Diploma	6.23±2.67	32.45±2.34	30.68±1.86
University/Post studies	**8.94±2.64**	**34.00±1.54**	**31.75±3.19**
F , P	**7.903 , 0.000***	**3.286 , 0.027***	**11.357 , 0.000***
Occupation			
Work	**8.75±3.14**	**32.85±2.21**	**31.40±2.91**
Not work	5.33±2.46	32.70±2.41	29.43±3.00
t , P	**21.369 , 0.000***	0.058 , 0.811	**5.908 , 0.018***
Residence			
Rural	5.54±2.66	32.04±2.25	29.14±2.99
Urban	**7.96±3,32**	**33.27±2.17**	**31.61±2.64**
t , P	**9.639 , 0.003***	**4.418 , 0.040***	**10.579 , 0.002***

Table (5): Relation between Socio-Demographic Characteristics of the Studied Mothers and their Total Score of Reported Practice about Splenomegaly in Children

Characteristics	The studied mothers (n=60) Total practice score Mean ± SD		
	Pre	**Immediate**	**Post 1 month**
Age (in years)			
<20	15.75±8.88	114.75±10.53	80.79±21.20
20-<30	22.16±15.88	114.75±11.21	77.50±22.85
30-<40	**25.55±23.71**	**114.76±10.05**	**90.50±8.10**
≥40	20.06±11.87	111.95±14.01	80.82±15.84
F , P	**8.494 , 0.000***	0.243 , 0.866	**7.489 , 0.000***
Educational level			
Illiterate	22.17±14.49	112.50±14.22	80.50±19.56
Primary/Preparatory	18.88±14.84	114.81±12.68	74.06±25.04
Secondary/Diploma	19.36±11.35	113.64±10.72	81.05±13.89
University/Post studies	**29.69±25.64**	**115.83±3.65**	**85.63±20.55**
F , P	**11.379 , 0.000***	**10.162 , 0.000***	**10.936 , 0.000***
Occupation			
Work	**28.85±23.60**	**114.13±11.12**	**83.20±16.42**
Not work	18.98±12.70	113.35±12.85	74.65±24.40
t , P	**4.469 , 0.039***	**8.058 , 0.000***	**22.589 , 0.000***
Residence			
Rural	20.11±13.71	113.70±11.49	78.04±21.80
Urban	**25.74±22.32**	**114.13±12.09**	**81.78±18.38**
t , P	**11.472 , 0.000***	**10.019 , 0.000***	**10.509 , 0.000***

Discussion

Splenomegaly is the enlargement of the spleen, either in terms of size or mass. Historically, splenomegaly was diagnosed through clinical examination, but in recent years, imaging studies have also become instrumental in assessing or confirming mild splenomegaly. The spleen is a multifunctional organ actively involved in immune surveillance and hematopoiesis. An increase in spleen size can be identified through clinical examination (a palpable spleen exceeding the left costal margin by more than 2 cm) and/or imaging procedures. Its median size is approximately that of an individual's fist, particularly in children. **(Blennerhassett, R.et al., 2019)**. Regarding the sociodemographic characteristics of the mothers, more than two-thirds of the studied mothers aged between, 30 years and less than 40 years old **(Table 1)**, From the researcher's point of view, this may be due to the majority of mothers were married early due to their residence in rural areas so, the most common children in the study were in the school age and this age appropriate for their mothers' age who married early. These results align with the findings of the study conducted by **Amoran et al., (2017),** who reported that the majority of mothers in their study were between ages 30-40 years.

Regarding the educational level of the studied mothers, It was observed that more than one-third of them had secondary or diploma educational school **(Table 1)**, this may be due to the most of the studied mothers were from rural areas and the countryside is satisfied with educating girls until they have a diploma or secondary school and then marriage. These results were in the same line with **Elsayed, H. M. (2019)** who reported that the majority of the mothers had secondary education in their study about the effect of sickle cell crisis prevention guide for children on parents' knowledge and reported practices. In addition, the current study was contrary to a study done by **Abd El-Gawad, (2017)**, who reported that 42% of the mothers were illiterate, 15% of them had a secondary level of education and 10% of them had a university education.

In relation to the occupational state and residence of studied mothers, It was observed that two-thirds of the studied mothers in this study were not working and living in rural areas **(Table 1)**, From the researcher's point of view, It may be due to the most proportion of studied mothers **(Table 1)** were illiterate, had primary, preparatory or secondary education which makes them not able to find suitable job. In addition, Tanta University hospitals provide medical services for the governorate and all surrounding rural areas. This result was in the same line with **Fowora (2016)** who reported that the majority of mothers were housewives and two-thirds of them were living in rural areas. Also, these findings were supported by the study done by **Mahmoud et al**., **(2017),** who reported that 84 % of studied mothers were not working, and 70% were living in rural areas.

The present study revealed that one-third of the studied children were in the age between six years and 8years. **(Table 2)**, this could be attributed to the fact that this age group is in school, exposing them to higher risks of

infection through increased social contact which is the most common cause of splenomegaly in small age. The current finding was in the same line with **Pore SN (2017)** who reported that the age of children ranged from 0 months to 12 years, 57.2% of children were below the age of 6 years and 42.7% of cases were between the ages of 6 to 12 years, these results were also supported by **Mahmoud et al., (2017)** who stated that the average age of children was 7.3 in his study about mother's knowledge and practice regarding care of their children with sickle cell anemia.

In this study, it was observed that two-thirds of the studied children were male **(Table 2).** From the researcher's point of view, this may be explained by the fact that the male sex is more predisposed to splenomegaly than the female sex, similar to **Kamble1 MP, Meena1 KB*, Meena VK (2019),** who reported that male predominance was observed in the study with a male: female ratio of 1.3:1. Moreover, this study was supported with **Mahmoud et al., (2017)**, who reported that more than two-thirds were males. In addition, this study revealed that nearly two-thirds of studied children ranked as the first child in birth order**, (Table 2)**. From the researcher's point of view, this may be due to the inadequate level of knowledge and experience of mothers in the first time of birth related to caring for and protecting their children from infection, this result was in the same line with the study done by **Mahmoud et al., (2017)**, indicated that approximately two-thirds of the participants held the position of the first child in the birth order.

Regarding the total level of knowledge of the participating mothers regarding the care of their children with splenomegaly, the findings of this study revealed that three-quarters of them possessed a low level of total knowledge about splenomegaly before the program implementation. However, the majority of them demonstrated improvement, reaching a high level of total knowledge immediately and one month after the program implementation. **(Figure 1),** this result may be due to the unavailability of educational programs about splenomegaly in rural communities and the improvement that occurred after the educational program of the current study. The results of the current study were in the same line with **Shahzad, (2017)** who reported that two-thirds of mothers had a low level of total knowledge in pre-/test and also had a high total score level of knowledge post/ test, while p= 0,000.

Concerning the mothers' total level of reported practices about splenomegaly, this study clarified that more than two-thirds of studied mothers had an unsatisfactory level of practice pre-program, while the majority of them had a satisfactory level of practice regarding care of splenomegaly immediately after program implementation **(Figure 2)**. According to the researcher's perspective, this outcome could be attributed to the fact that the mothers under study did not receive the necessary knowledge on how to care for their children with splenomegaly before the program implementation, which consequently impacted their practices. This result was aligned with **Abo Seif M et al, (2021),** who reported that practices towards

splenomegaly were unsatisfactory before the educational program, which improved to a satisfactory level of practice immediately and one month after the implementation of the educational program, where statistically significant at the level P<0.05.

The results of the present study revealed a highly statistically significant positive correlation between the total knowledge and total practices of the studied mothers throughout the phases of the educational program (**Table 3**). This suggests that knowledge plays a crucial role in influencing behavior, leading to changes in practices so that the rise in overall knowledge was linked to a proportional increase in the overall practice score. This finding aligns with **Abd El-Gawad's (2017)** study, which also identified significant positive correlations between mothers' total knowledge and their total practice.

The current study's findings indicate a highly statistically significant difference concerning the studied mothers' knowledge about splenomegaly and their age (**Table 4**). This difference may be attributed to the positive correlation between age and knowledge, suggesting that as age increases, so does experience. This result aligns with **Maheen et al. (2018)**, who observed a positive relationship between mothers' knowledge about splenomegaly and their age. Additionally, **Hassan (2017)** highlighted an exceedingly statistically significant difference in mothers' knowledge relative to their age. The present findings align with **Kumar and Pujari (2020)**, who similarly identified a highly statistically significant difference concerning the knowledge of the studied mothers and their ages.

In relation to the correlation between mothers' educational attainment and their knowledge, the current study uncovered a highly statistically significant difference in the knowledge levels of the studied mothers based on their educational background (refer to **Table 4**). The researcher posits that the educational level of mothers may play a crucial role in shaping their knowledge, consequently influencing the care they extend to their children with splenomegaly. This suggests that mothers with a higher level of education are more capable of acquiring knowledge to enhance their awareness and improve their healthcare practices. This result aligns with **Kumar and Pujari (2020),** who noted a positive relationship between mothers' knowledge about splenomegaly and their education level.

Regarding the mother's residence, occupation, and knowledge **(Table 4),** the present study reported a highly statistically significant difference between mothers' knowledge and their residence and occupation. From the researcher's point of view, this result may be attributed to mothers who live in urban areas having more education opportunities compared to those in rural areas, and mothers who work may have more social relationships within the community, leading to increased knowledge and personal experiences. The findings of the current study align with those of **Shahzad (2017)**, who identified a connection between mothers' knowledge and various characteristics. Additionally,

Hassan E (2019) reported an extremely statistically significant difference in parents' knowledge related to their characteristics, with mothers of younger age, lower education level, housewives, and residing in rural areas exhibiting less satisfactory knowledge.

The results of the present study reveal a statistically significant difference in mothers' practices based on their age and education level (refer to **Table 4**). From the researcher's point of view, this can be explained by the notion that an increase in the mother's age will lead to an increase in knowledge, consequently improving the practice provided to children. Additionally, the increase in the level of education is likely to result in an increase in knowledge, thus improving practice. The outcomes of the present study are consistent with the findings of **Kumar and Pujari (2020)**, who identified a statistically significant difference in the practices of the studied mothers concerning their age and education. Similarly, the results align with those reported by **Shahzad (2017)**, indicating a correlation between mothers' practices and their characteristics.

Moreover, this study disclosed a statistically significant difference between mothers' practice and their occupation and place of residence **(Table 4).** This may be attributed to mothers who work having more knowledge than those who don't work, thus exhibiting better practice in providing appropriate care to their children with splenomegaly. Additionally, mothers who live in urban areas have more opportunities to provide appropriate care due to the accessibility of healthcare facilities, programs, and workshops that increase awareness. This result is in line with **Kalra et al. (2019),** who found a relationship between parents' practice about splenomegaly and their occupation and residence.

Conclusion

Based on the findings of the current study, it is concluded that there was a significant positive effect of the educational program implemented for mothers regarding the care of their children with splenomegaly. Additionally, there was a significant improvement in mothers' levels of knowledge and practices regarding their children with splenomegaly, with a calculated p-value was less than 0.000

Recommendations

Based on the study findings, the following recommendations are suggested:

1. Implement regular educational programs for mothers to enhance their caregiving skills for children with splenomegaly.
2. An educational booklet should be available in pediatric units containing updated information about the care of splenomegaly.
3. In-service training programs should be done for mothers periodically to raise their awareness about the care of splenomegaly.

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