

Efficacy of Predefined Discharge Instructions for Mothers on the Quality of Life and Post-Operative Recovery of their Children after Abdominal Surgery

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Abstract

Background: Pediatric health care has shifted toward family-centered care that is based on close involvement of the child's family members in pediatric care. Increased mothers' education and awareness about caring child undergoing surgery can prevent or minimize postoperative complications and improve a child's adoption. Hence we have conducted this study to evaluate the efficacy of predefined discharge instructions for mothers on the quality of life and post-operative recovery of their children after abdominal surgery. **Materials and methods:** Experimental design was used to conducted this study at the pediatric surgical unit at Benha Specialized Pediatric Hospital affiliated to Egyptian Ministry of Health and Population. Random sample of 80 mothers with their children were selected and divided equally into study and control group. Five tools were used for data collection; I: Interviewing questionnaire, II: Knowledge assessment sheet, III: Pediatric quality of life scale, IV: Abdominal surgery impact scale, and V: Post-operative complications assessment sheet. **Results:** There was a highly statistical significant difference between study and control groups regarding total level of mothers' knowledge after instructions intervention where $P < 0.001$. The total mean scores of pediatric quality of life scale and abdominal surgery impact scale showed no significance differences between the two groups pre-discharge instructions where p -value = 0.062 & 0.079 respectively, while, a significant difference was observed between the two groups after one month and three months post- discharge instructions intervention p value < 0.000 & $p < 0.05$ respectively. As well as, postoperative complications were significant lower score among children in the study group after one month and three months compared with the control group where $p < 0.05$. **Conclusion:** The predefined discharge instructions have an important role in the increasing mothers' knowledge regarding caring children post abdominal surgery, which enhancing recovery via decreasing post-operative complications and improving children's quality of life. **Recommendation:** Providing children and their parents who schedule for abdominal surgery with adequate care instructions before hospital discharge is necessary.

Key words: Abdominal surgery, discharge instructions, quality of life, post-operative recovery.

Introduction

Abdominal surgery poses a wide variety of surgical disorders occurring in pediatric patients requiring proper surgical intervention as the only option of management to salvage life, avoid or minimize disability. According to global disease burden, surgical conditions are responsible for approximately 6-12 % of all pediatric hospital admissions. The term of pediatric surgery is a sub-specialty involving the surgery of fetuses, infants, children and adolescents. In many developed nations pediatric surgery is very well developed and recognized as an important subspecialty

contributing to improve the child health delivery system and reducing the neonatal and infant mortality rates (Ismail et al., 2020 & Firomsa et al., 2018).

Appendectomy, cholecystectomy, herniorrhaphy, laparotomy, colostomy, gastrostomy and pyloromyotomy were the common abdominal surgeries performed in children (Zaghal & El Rifai, 2021). It ranges from the very simple to the most highly complex surgery, with life threatening conditions followed by extended recovery (Coventry, 2014; Etoneyaku et al., 2016). Abdominal surgery involves major and

minimally invasive techniques, which conceptually unique health intervention due to the significant risk of death, the likelihood of pain and other distressing symptoms, and the possibility of disability (*Istomina et al., 2014*).

Surgery is stressful experiences for children and their parents because its impact on the child's physical, environmental, social and psychological functioning. Therefore, the pre-operative preparation is important, not just by administering medications, but also facilitating postoperative recovery and home care. The initial weeks after hospital discharge following abdominal surgery represent a critical period of recovery and possibility of post-operative complications arises, resulting in increased morbidity, returned visits to the emergency department and unplanned hospital readmissions (**McGrath & Pomeantz, 2014; Rabbitts et al., 2015**). Commonly post-operative complications seen in children undergoing abdominal surgeries were nausea and vomiting followed by respiratory complications leading to hypoxia. Additionally, hemorrhage, wound infection, hematoma, dehiscence, constipation, urinary retention, urinary tract infection, hypotension and neurological complications such as, delirium, restlessness, sleep disturbance and seizure (**Pawar. 2012; Yagnik, 2018**).

Postoperative discharge education is an essential component of nursing care directed toward preparing the child and the family to take responsibilities about the core activities which are necessary at home after left the hospitals (**Dolgun et al., 2019**). It involves the development of a personalized plan for the child who is leaving the hospital, that aims to enhance mothers' discharge readiness, increase mothers' knowledge and skills in relation to child care (**Gonçalves-Bradley et al., 2016**). Discharge guidelines of pediatric care is complex and involve several domains of care including; medications, diet, activity restrictions, incision care, prevention of infection, bowel habits, and follow up appointment (**Kang et al., 2020**). It provides children and family with the required information to make informed decisions of the treatment plan and gives the needed knowledge to adhere to self-care instructions and regain

independence after surgery (**Glick et al., 2017**). Insufficient discharge education can compromise patients' recovery process causing postoperative complications and unplanned hospital readmission. Additionally, gaps and frustration with post-discharge care after child surgery could negatively impact on recovery outcomes and quality of life. Ineffective discharge teaching may lead to lack of knowledge about home care and ignorance signs and symptoms of impending complications which can affect the child quality of life (**Adugbire & Aziato, 2018**).

Significance of the study:

Currently, pediatric health care has shifted toward family-centered care that is based on close and continuous involvement of the child's caregivers. To shape and improve how pediatric care is delivered, pediatric nurses need to know what children and parents need, expect, and experience. Such knowledge would enable the development of appropriate, systematic, and effective routines to optimize care for all children. Parental participation is beneficial to children, parents, and health care facilities, but it is dependent on the existence of effective routines to facilitate adequate communication among all parties. The role of family-centered care in pediatric nursing, common understanding between the nursing staff and the child's parents can lead to providing higher-quality of medical care (**Commodari, 2010; Kristensson, 2000; Garro et al., 2017**). Therefore, the researchers conduct this study to examine the effectiveness of the discharge guidelines for mothers and their participation in caring their child post abdominal surgery on the child's recovery, quality of life and post-operative complication occurrence.

Aim of the study:

To evaluate efficacy of predefined discharge instructions for mothers on the quality of life and post-operative recovery of their children after abdominal surgery.

Research hypotheses:

- Mothers of children in the study group will have a satisfactory level of knowledge

regarding discharge instructions than the mothers in the control group.

- Children in study group will have higher quality of life scores than those in the control group.
- Children included in the study group will have lower postoperative complications compared to those in the control group.

Subject and Methods

Study design: An -experimental design (Study and control group), with pre-post assessment was used in this study. Experimental methods that involve the creation of a comparison group are most often used when it is possible to randomize individuals or groups to treatment and control groups. This is always the case for ex-post impact evaluation designs (White & Sabarwal ,2014).

Study setting: This study was conducted at the Pediatric Surgical Unit at Benha Specialized Pediatric Hospital affiliated to Egyptian Ministry of Health and Population. The unit consisted of intermediate ICU which includes 5 beds and other 2 rooms for stable cases each room consists of 8 beds.

Sample size: 80 mothers with their children.

Sample size calculation: According to the statistics of pediatric department at Benha Specialized Pediatric Hospital, the incidence of children undergoing abdominal surgery was 400 cases annually, we assumed that the confidence interval of 10% and confidence level of 95%. The sample size actually obtained for this study was 80 patients, the study subjects were divided randomly and alternatively into two equal groups, 40 mothers with their children in each group. The study group received routine care and the discharge instructions. While, control group received only the routine care administered by the nurses at the pediatric surgical units.

Study subject selection: Random simple sample were selected in this study after

fulfilling the following. **Inclusion criteria:**

1. Mothers who recently admitted to surgical unit with their children.
2. Mothers who accepted to participate in the study.
3. Mothers were the primary caregiver that accompanied with the child in the hospital
4. Children aging from $6 \leq 12$ years.
5. Children with abdominal surgery
6. Both gender included.

Exclusion criteria:

1. Children suffering from chronic illness were excluded.

Tools of data Collection:

After written informed consent was obtained, a well-designed questionnaire was used to collect the data of the recruited sample retrospectively. The questionnaires included the following:

Tool I: An interviewing sheet: It was developed by the researchers, it included three parts: **Part (1)** personal data of children as age, gender, level of education and place of residence. **Part (2)** personal data of mothers such as age, level of education and occupation. **Part (3)** covers the medical data such as previous hospitalization and type of abdominal surgery.

Tool II: Knowledge assessment questionnaire: It was constructed by the researchers based on the relevant review of literature (Dewit et al., 2017; Sharma et al., 2018 and Rush University Medical Center, 2013) to assess mothers' knowledge about various aspects of discharge guidelines, it consisted of 10 questions about incision care, wound infection preventive measures, medications, pain management, nutrition, activities and periods of rest needed after surgery, bowel habits, child care such as bathing,

danger signs for calling doctor and follow up appointments.

Scoring system for mothers' knowledge: Each complete correct answer scored (2), the incomplete answer scored (1) and incorrect or don't know answer scored (0). The total scores were ranged from (0 – 20). Those who had a scores less than 65 % was considered an unsatisfactory level of knowledge while those who had a scores more than or equal to 65% was considered a satisfactory level of knowledge.

Tool (III): Pediatric quality of life scale, (version 4.0): It was adopted from *Varni et al., (2007)* to assess quality of life (QOL) in children which completed by mothers from children perspective view. This scale was composed from 23 items grouped under four subscales namely; physical functioning (8 items), emotional functioning (5 items), social functioning (5 items), and school functioning (5 items).

Scoring system: A 5-point Likert response scale from 0= never a problem, 1= almost never a problem, 2= sometimes a problem, 3= often a problem to 4= almost always a problem was employed for scoring responses from subjects. Items are reverse-scored and linearly transformed to a 0–100 scale, being (0=100, 1=75, 2=50, 3=25, 4=0). The score is calculated by counting the points given to the items for each dimension. The total score was obtained by calculated the sum of the scores and dividing by 23, (100-75 indicated high score) (50- ≤25 indicated low QOL). A higher score represents higher quality of life.

Tool (IV): Abdominal surgery impact scale (ASIS): It was adopted from *Urbach et al., (2006)* this scale designed to measure health-related quality of life after abdominal surgery. It has six domains including; physical limitations (3 item), functional impairment (3 item), pain (3 item), visceral function (3 item), sleep and psychological function (3

item). Each domain has three items, the total items counted 18.

Scoring system: A 7-point Likert response scale, ranging from 1 to 7 (1= strongly agree, 2= agree, 3= somewhat agree, 4= neither agree nor disagree, 5= somewhat disagree, 6=disagree to 7= strongly disagree). The summative scores for the scale ranged from 18-126, with higher scores indicating improved quality of life.

Tool (V): Post-operative complications assessment sheet: It was developed by the researchers based on the relevant literature Pawar, (2016) to assess post-operative complications in children after discharge. It included eight complications related to wound complications (such as redness, swelling, hemorrhage, hematoma, infection, dehiscence & incisional hernia), gastrointestinal complications (such as loss of appetite, nausea, vomiting, post-operative ileus, constipation & bowel obstruction), renal complications (hematuria, urinary retention & urinary tract infection), respiratory complications (such as sputum retention, shortness of breath, atelectasis & pneumonia), cardiac complications (such as hypotension & dysrhythmia), neurological complications (coma, delirium & seizure), sleep problems (insomnia & restlessness) .

Tools content validity and reliability:

The tools of the study were tested by five jury experts in the field of pediatric nursing from the Faculty of Nursing/ Benha & Beni-Suef University, to test the content validity of the instruments and judge its clarity, comprehensiveness, relevance, simplicity, and accuracy. **Reliability:** The internal consistency of the instruments has been tested using Cronbach's alpha coefficient. Cronbach's alpha for the knowledge assessment questionnaire was 0.75, pediatric quality of life scale was 0.91, abdominal surgery impact scale 0.94 and post- operative complication sheet was 0.89.

Methods:**Ethical considerations:**

To conduct this study, the researchers obtained an official approval from the scientific research ethics committee of the Faculty of Nursing / Benha University. Before starting the practical work, an official letter explaining the purpose of the study was sent to the hospital director to carry out the study and collect the necessary data. The consent was taken from the participants; they were informed that the data collected will be used only for this study purpose.

Pilot Study:

A pilot study was carried out with 10% of the sample size to evaluate the feasibility, applicability of the tools and time needed to gather data. The tools were applicable, and the pilot study subjects were excluded from the actual study.

Field work

Data collection was carried out over a period of 24 weeks (March 2019 up to August 2019), the researchers started by explaining the purpose of the study briefly to the mothers with their children to collect baseline data. Then, the researchers start to classify participants who met the inclusion criteria into study and control group through serial numbers of cases by using simple random sample technique. The researcher was available two days/ week in the surgical unit.

Data were collected post-operatively immediately after the surgery performed. Pre-test sheets were distributed to collect baseline data. Average of 8-10 mothers with their children were interviewed per/week.

Based on baseline data obtained from participants, the researchers prepared the discharge guidelines booklet which was designed using a simple Arabic language. The booklet was distributed to each mother accompany her child in the study group to be considered as a reference after discharge.

Program intervention was achieved through five sessions which conducted by the researchers within three days before discharge from hospital, the content of sessions covered

the following: Session I: Incision care and measures to prevent wound infection. Session II: Medication used after surgery and pain management strategies. Session III: Nutrition, activities can be performed after surgery, periods of rest needed after surgery. Session IV: Bowel habits, personal care such as bathing. Session V: Danger signs for calling doctor and follow up appointments. The participants were subdivided according to type of surgery into 8 subgroups, 5 mothers accompanying their children in each subgroup. The duration of time in each session was about 45 minutes, the sessions were repeated for different groups.

For study and control groups, the evaluation of mothers' knowledge was done immediately post implementation of discharge instructions, while pediatric quality of life scale and abdominal surgery impact scale were evaluated after one month and after three months of discharge guidelines. Moreover, post-operative complications were evaluated two times post one month and three months after discharge. The evaluation was carried out during each follow-up visit at outpatient clinics or by telephonic follow up.

Statistical analysis

The collected data were organized, tabulated and statistically analyzed using Statistical Package of Social Studies (SPSS) version 20. Variables were categorical and were presented as number and percentages. The differences between variables was done using Chi-square test, using independent t-test. The observed differences were considered as follows: Non- significant at $P > 0.05$, significant at $P < 0.05$ and highly significant at $P < 0.001$.

Result

Table 1: reflects that, children's mean age were 7.95 ± 1.28 and 8.02 ± 1.64 years in study and control group respectively. Regarding children's gender, this table shows that 65.0% of children in the study group was males compared to 57.5% in the control group. Also this table shows that 37.5% of children in the study group study at 6th grade of primary level compared to 30.0% in the control. Concerning to residence, it is notice that 62.5 % & 52.5%

of children were from rural area in both study and control groups respectively.

Table 2: Reveals that, the mean age of the mothers was 26.925 ± 6.342 and 26.675 ± 6.619 years in both study and control groups respectively. Regarding the mothers' educational level, it is found that 62.5% in study and 52.5% of control groups had secondary education level. Additionally, this table shows that 72.5% of mothers in the study group were not working compared to 75.0% in the control group.

Figure 1: Clarifies that, 50.0 % & 52.0% of the studied children were undergoing appendectomy in both study and control groups respectively.

Figure 2: Illustrates that, the majority of the studied children (87.5% & 82.5%) had no history of previous hospitalization in both study and control groups respectively.

Table 3 shows that, 72.5% and 82.5% of the studied mothers in both study and control groups had unsatisfactory level of knowledge pre-discharge instructions implementation with no significant differences where $p = 0.284$. In contrast, post implementation of discharge instructions, there was a highly statistical significant difference between study and control groups regarding total level scores of mothers' knowledge, where 80.0% of the study

group had satisfactory level of knowledge compared to 22.5% of the controls ($p < 0.001$).

Table 4 Shows that, children in both study and control groups had lower total mean scores for all quality of life domains pre-discharge guidelines implementation. While, the total mean scores for all quality of life domains were higher in the study group at one month and three months after discharge than in the controls, with statistical significant differences (77.8 ± 16.8 & 87.53 ± 13.5 versus 62.5 ± 6.97 & 71.98 ± 21.39) respectively, where $P < 0.001$

Table 5: Reveals that, children in study and control groups had lower scores in all domains of abdominal surgery impact scale particularly physical limitations, functional impairment, pain, visceral function, sleep and psychological function pre-discharge guidelines implementation. Meanwhile, after discharge guidelines implementation, children in the study group demonstrated higher significant difference concerning all domains of abdominal surgery impact scale at one month and three months compared to controls groups where $P < 0.000$ & $P < 0.05$.

Table 6 illustrates that, children in the study group demonstrated lower post-operative complications than children in the control group at one month and three months after discharge instructions implementation with a significant difference where $p < 0.05$.

Table (1): Distribution of the studied children according to their personal data (n=80)

Personal data	Study Group (n=40)		Control Group (n=40)	
	No.	%	No.	%
Age/ years				
6 < 9	22	55.0	24	60.0
9 ≤ 12	18	45.0	16	40.0
mean ± SD	7.95±1.28		8.02±1.64	
Gender				
Male	26	65.0	23	57.5
Female	14	35.0	17	42.5
Level of education				
Not enrolled in the school	5	12.5	3	7.5
First grade	2	5.0	3	7.5
Second grade	3	7.5	5	12.5
Third grade	6	15.0	4	10.0
Fourth grade	5	12.5	8	20.0
Fifth grade	4	10.0	5	12.5
Sixth grade	15	37.5	12	30.0
Residence				
Urban	15	37.5	19	47.5
Rural	25	62.5	21	52.5

Table (2): Distribution of the studied mothers according to their personal data (n=80)

Personal data	Study group (n=40)		Control group (n=40)	
Age/ years				
< 20	8	20.0	11	27.5
20 < 30	22	55.0	17	42.5
30 ≤ 40	10	25.0	12	30.0
mean ± SD	26.925±6.342		26.675±6.619	
Educational level:				
Illiterate/Read and write	3	7.5	2	5.0
Primary	4	10.0	5	12.5
Preparatory	1	2.5	7	17.5
Secondary	25	62.5	21	52.5
University or higher	7	17.5	5	12.5
Occupation:				
Working	11	27.5	10	25.0
Not working	29	72.5	30	75.0

Figure (1): Distribution of the studied children according to the type of surgery (n=80)

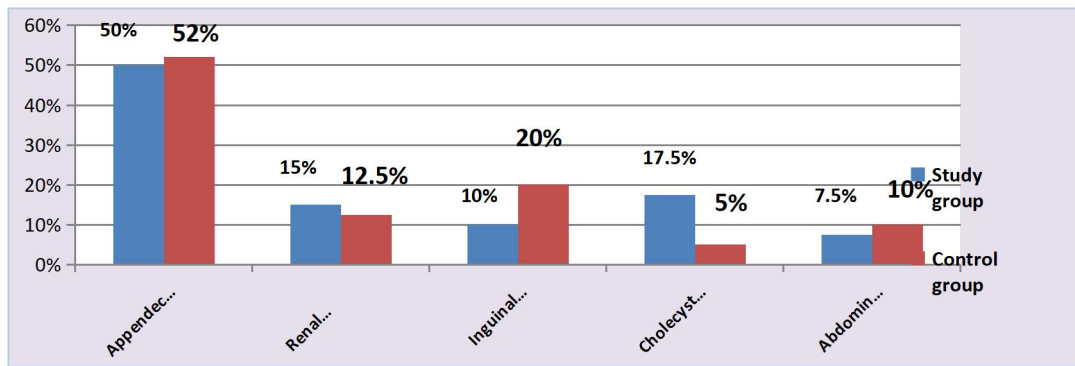


Figure (2): Distribution of the studied children according to previous hospitalization (n=80).

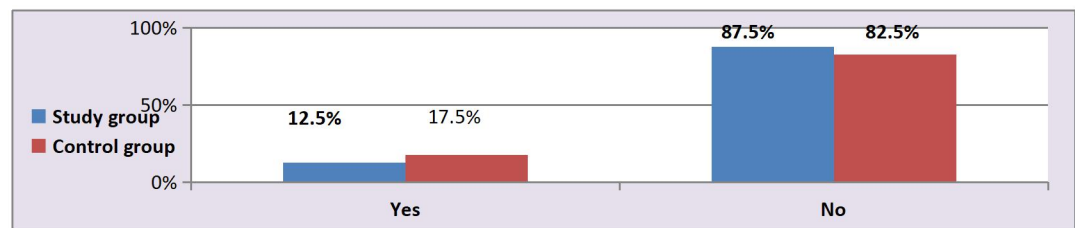


Table (3): Comparison between study and control groups mothers' total level scores of knowledge throughout the study periods (n=80).

Mothers' level of Knowledge	Pre -instruction				X2 (P - value)	Post - instruction				X2 (P -value)
	Study group (n=40)		Control group (n=40)			Study group (n=40)		Control group (n=40)		
	No.	%	No.	%	No.	%	No.	%		
Satisfactory	11	27.5	7	17.5	1.147 0.284 NS	32	80.0	9	22.5	26.467 < 0.001**
Unsatisfactory	29	72.5	33	82.5		8	20.0	31	77.5	

**High statistical significant differences P-value <0.001

*Not Significant (NS) P>0.05

Table (4): QOL Mean scores among children in the study and control groups throughout the study periods (n=80).

Domains of QOL	Pre -instruction			One month post- instruction			Three months post-instructions		
	Study group (n=40)	Control group (n=40)	t-test / P- value	Study group (n=40)	Control group (n=40)	t-test / P- value	Study group (n=40)	Control group (n=40)	t-test / P- value
	Mean (SD)	Mean (SD)		Mean (SD)	Mean (SD)		Mean (SD)	Mean (SD)	
Physical Health	59.3±14.4	58.3±13.6	1.37 (0.19)	84.4±8.82	61.72±14.8	16.62 0.000**	86.0±11.4	64.85±18.56	12.94 0.000**
Emotional Functioning	61.7±12.1	61.0±11.6	0.632 (0.987)	87.8±6.14	64.4±7.08	10.211 0.000**	88.4±10.8	70.66±20.05	9.106 0.000**
Social Functioning	58.2±6.30	57.8±7.42	0.441 (0.675)	81.87±14.09	71.00±16.32	13.19 0.000**	83.84±12.6	71.90±16.14	17.62 0.000**
School Functioning	56.5±11.30	54.8±5.11	1.62 (0.589)	79.9±11.4	62.9±7.17	9.157 0.000**	85.15±16.7	75.38±21.11	10.90 0.000**
Total QOL	59.4±13.2	58.8±5.11	2.163 (0.062)	77.8±16.8	62.5±6.97	11.214 0.000**	87.53±13.5	71.98±21.39	10.910 0.000**

**High statistical significant differences P-value <0.001

Not Significant (NS) P>0.05

Table (5): Mean of abdominal surgery impact scale scores in both study and control groups throughout the study periods (n=80)

Domains of abdominal surgery impact scale	Pre discharge guidelines			One month after discharge guidelines			3months after discharge guidelines		
	Study group (n=40)	Control group (n=40)	t-test / P- value	Study group (n=40)	Control group (n=40)	t-test / P- value	Study group (n=40)	Control group (n=40)	t-test / P- value
	Mean (SD)	Mean (SD)		Mean (SD)	Mean (SD)		Mean (SD)	Mean (SD)	
Physical limitations	4.72±2.13	4.42±1.66	.701 (.485)	12.07±2.3	10.27±1.5	4.141 .000**	19.80±1.48	16.5 ±1.9	8.58 .000**
Functional impairment	4.80±2.01	4.50±1.92	.681 (.498)	12.97±1.9	11.55±1.7	3.43 .001*	18.90±2.06	13.80±2.1	10.89 .000**
Pain	4.125±1.4	3.90±1.69	.635 (.527)	13.20±1.6	10.87±2.0	5.68 .000**	18.97±2.18	14.62±3.0	7.32 .000**
Visceral function	4.65±1.79	3.97±1.57	1.78 (.077)	13.12±1.7	11.47±2.1	3.77 .000**	19.20±1.77	13.87±2.5	10.95 .000**
Sleep	5.17±1.92	4.57±1.79	1.44 (.153)	13.20±1.8	11.77±2.2	3.02 .003*	19.35±1.79	13.35±3.4	9.73 .000**
Psychological function	5.25±1.89	4.72±1.78	1.27 (.205)	13.50±1.5	11.77±2.3	3.85 .000**	19.42±1.92	14.55±3.6	7.40 .000**
Total QOL	28.20±4.8	26.10±5.6	1.77 (.079)	78.07±5.7	67.72±5.5	8.25 .000**	115.65±4.7	86.70±6.6	22.47 .000**

**High statistical significant differences at P < 0.001 * A statistical significant difference (P < 0.05).

Table (6): Children's postoperative complications after program implementation in both study and control groups throughout the study periods (n=80).

Postoperative Complications	One month post-instruction				X2 (P value)	Three months post instruction				X2 (P value)
	Study Group (n=40)		Control Group (n=40)			Study Group (n=40)		Control Group (n=40)		
	No.	%	No.	%		No.	%	No.	%	
Wound complications	33	82.5	21	52.5	8.43	39	97.5	32	80.0	6.19
- No	7	17.5	19	47.5	.015*	1	2.5	8	20.0	0.045*
- Yes										
Gastrointestinal complications	25	62.5	10	25.0	11.42	36	90.0	22	55.0	12.64
- No	15	37.5	30	75.0	.001**	4	10.0	18	45.0	0.013*
- Yes										
Renal complications										
-No	35	87.5	28	70.0	3.66	39	97.5	34	85.0	3.91
-Yes	5	12.5	12	30.0	.056*	1	2.5	6	15.0	.048*
Respiratory complications	37	92.5	30	75.0	4.50	40	100.0	32	80.0	8.88
- No	3	7.5	10	25.0	.034*	0	0.0	8	20.0	.003*
- Yes										
Cardiac complications	39	97.5	34	85.0	3.91	40	100.0	34	85.0	6.48
- No	1	2.5	6	15.0	.048*	0	0.0	6	15.0	.011*
- Yes										
Neurological complications	39	97.5	36	90.0	4.21	40	100.0	35	87.5	5.33
- No	1	2.5	4	10.0	.040*	0	0.0	5	12.5	.021*
- Yes										
Sleep problems										
- No	32	80.0	23	57.5	4.71	38	95.0	30	75.0	6.27
- Yes	8	20.0	17	42.5	.030*	2	5.0	10	25.0	0.012*
Hospital readmission	34	85.0	30	75.0	5.23	38	95.0	33	82.5	7.44
- No	6	15.0	10	25.0	0.022*	2	5.0	7	17.5	0.006*
- Yes										

* A statistical significant difference (P < 0.05).

Discussion

Children with abdominal surgery frequently develop postoperative complications that result in hospital a readmission and diminished their quality of life. Discharge education provides children and their families with the essential information about the child's condition, prevention and management the post-operative problems, to minimize morbidity and mortality rates¹¹. Therefore, this study done to evaluate the efficacy of predefined discharge instructions for mothers on the quality of life and post-operative recovery of children after abdominal surgery.

The results of the current study clarified that more than half of the child's age ranged from 6- 9 years in both study and control groups. This result goes in line with *Esmail et*

al., (2020) who evaluate the effect of implementing educational guidelines on mothers' performance regarding postoperative gastrointestinal mobility for children with abdominal surgery" and found that more than half of the studied children aged 6 to less than 9 years. Contrarily, the results of this study disagreed with *Firomsa et al., (2018)* who studied "trends and outcomes of emergency pediatric surgical admissions from a tertiary hospital in Ethiopia" and reported that the majority of the studied children were in the age group from 3-5 years.

Concerning gender of the children in this study, these results indicated that most of the children in this study were males. This finding is in the same context with *Mahna et al., (2020)* who carried out a study entitled "assessment of post-operative pain in children

undergoing abdominal surgery" and revealed that more than half of the studied children were males. Similarly, this finding is in harmony with *Firomsa et al., (2018)* who showed that 66.5% of the children were males. In addition, this result showed that, most of the children were from rural area in both study and control groups. This finding may be interpreted as unavailability of pediatric specialized hospitals performing abdominal surgery in rural areas. This finding is in harmony with *El-Moazen et al., (2018)* who evaluated the effect of selected play activities for preoperative anxiety level and fear among children undergoing abdominal surgeries and found that the highest percentage of children came from urban areas.

As regards child's educational level, the study findings declared that, nearly one third of children in this study was in the sixth grade at primary level. This finding agreed with *Sabaq et al., (2020)* who evaluated the effect of implementing continuous care model on psychological outcomes in children undergoing abdominal surgery and mothers' anxiety level and pointed that nearly one third of children in the study p was in the sixth grade primary education.

Concerning the child's type of surgery, the current study reported that most of the children in this study undergoing appendectomy in both study and control groups. This finding is compatible with *Sumathi and Sreedevi, (2017)* who studied "effectiveness of a pre-educational program on pain and respiratory status of children undergoing elective abdominal surgery" and stated that, both control and study groups were homogenous in terms of type of surgery and most of the studied children were undergoing appendectomy. Likewise, this finding is on the same wavelength with *Esmail et al., (2020)* who showed that more than half of the studied children were undergoing appendectomy. This may be due to the international peak incidence age for such surgical problem among pediatric patients. Additionally, the current findings stated that the majority of the studied children had no history of previous hospitalization in both study and control groups. This result agreed with *El-Moazen et al., (2018)* who showed that, the highest percentage of children

had no history of previous hospitalization. Also, this is compatible with *Sabaq et al., (2020)* who pointed to that, the majority of children in their study had no history of previous hospitalization.

Concerning age of the studied mothers, the results of this study reflected that nearly half of the studied mothers' age ranged from 20 < 30 years. This finding was consistent with *El-Wasfy et al., (2015)* who carried out a study to evaluate the "effect of an educational program for mothers regarding care of their children having gastrointestinal tract stomas" and found that more than half of studied children mothers' aged between 20 to less than 30 years.

In relation to mothers' level of education, it is found that more than half of the studied mothers in both study and control groups had secondary education. This result agrees with *Esmail et al., (2020)* who demonstrated that half of the studied mothers had secondary education. In contrast, this finding disagrees with *Ahmed et al., (2020)* who studied "self-management program for mothers of children with stoma" and found that less than two thirds of mothers were illiterate. As well as, this study results clarified that most of mothers in this were housewife. This result is consistent with *Sabaq et al., (2020)* who found that nearly three quarters of mothers in the study group not worked. Also, this finding is in harmony with the study done by *Poonguzhali et al.,(2016)* who studied the "effectiveness of instructional package on knowledge regarding colostomy care among care givers in pediatric postoperative ward" and found that more than half of the studied mothers hadn't worked.

In an attempt to assess knowledge of the mothers about discharge instructions for caring and complications of children with abdominal surgery; the findings of this study reflected that, the majority of the studied mothers in both study and control groups had an unsatisfactory level of knowledge pre-discharge instructions implementation. This result could be due to lack of enthusiasm from hospital administration to apply guidelines implementation for children and their families before discharge. While, post-discharge program implementation the majority of mothers in the study group had a satisfactory level of knowledge compared to

less than one quarter in the control group. This could be due to that, the discharge instructions given to mothers in clear and simple language according to their level of understanding.

These findings were coincided with *Ahmed et al., (2020)* who reported that there is a high statistical significance difference between mothers' knowledge as pre and post program implementation. Additionally, this finding is compatible with *Schweitzer et al., (2014)*¹ who conducted a study on "evaluation of a discharge education protocol for pediatric patients with gastrostomy tubes" and concluded that the use of education protocol resulted in improved pediatric patients' outcomes and increased knowledge of the caregivers. On the same scope, this result of goes in line with *Pars & Soyer, (2020)* who carried out a study to evaluate "home gastrostomy feeding education program: effects on the caregiving burden, knowledge and anxiety level of mothers" and observed that the knowledge level of mothers increased and there was a significant difference between pre-discharge education program scores and the scores after the first week and the third month after the program.

The findings of the current study declared that, children in both study and control groups had lower total mean scores for all quality of life domains pre-instructions implementation. While, the total mean scores for all quality of life domains were higher in the study group at one month and three months after instructions implementation than in the controls. This could be due to that, increasing the mother's knowledge about caring for their children with surgery lead to improving children's recovery and their quality of life. This result matches with *Danielsen and Rosenberg (2014)* who conducted a study entitled "Health related quality of life may increase when patients with a stoma attend patient education" and found that there was a significant rise in health related quality of life in the intervention group and there was no significant change in the control group. Conversely, this finding is contradicting with *Abdelmowla et al., (2017)* who carried out study to evaluate the impact of nursing interventions and patients' education on quality of life regarding renal stones treated by

percutaneous nephrolithotomy and concluded that there were no statistical significant differences on quality of life for patients in both groups.

As regards abdominal surgery impact scale assessment, the current study reveals that the studied children in study and control groups had lower quality of life in all domains of abdominal surgery impact scale particularly physical limitations, functional impairment, pain, visceral function, sleep and psychological function pre-discharge guidelines implementation. Meanwhile, after instructions implementation, children in the study group demonstrated higher significant difference concerning all domains of abdominal surgery impact scale post one month and three months compared to control group. This finding is in agreement with *Datta et al., (2009)* who conducted a study entitled "abdominal surgery impact scale is responsive in assessing outcomes following ileal pouch anal anastomosis" and found that, patients had a significant lower mean score at discharge secondary to lower scores on the physical limitations, functional impairment and visceral function domains. The overall mean ASIS score significantly increased over time. Moreover, this result agrees with *Rabbitts et al., (2015)* who studied "pain and health-related quality of life after pediatric inpatient surgery" and reported that more than three quarters of children demonstrated improvement in health-related quality of life scores above baseline levels post one month of surgery.

Additionally, children in the study group had lower post-operative complications than children in the control group at one month and three months after discharge with a significant difference. This could be due to that instructions given before the discharge had an effect on increasing awareness of mothers and their children, improving quality of life of children and thus minimize post-operative complications. This finding is compatible with *Kang et al., (2020)* who studied "nurses' role in delivering discharge education to general surgical patients" and mentioned that 50% of hospital readmission and postoperative complications can be prevented when patients are given effective discharge education. Also,

this result is in the same context with *Abdelmowla et al., (2017)* who found that, there were statistical significant differences between the two groups of patients as regarding their postoperative complications.

Conclusion

Based on the findings of the current study, it can be concluded that, the discharge instructions have an important role in increasing mothers' knowledge in relation to caring their child post-surgery, which lead to improving the children's quality of life and decreasing their children post-operative complications which enhancing their recovery.

Recommendation

Providing children scheduled for abdominal surgery and their families with adequate knowledge at discharge is necessary, provision of seminars to raise nurses' awareness about the benefits of children's discharge education, and replication of the study on a larger sample to validate and generalize its findings.

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