

Effect of Simulation-Based Education about Colostomy on Mothers' Knowledge, and Practice among Their Children

Samar Sobhi Abd Elkhair 1 Gehan Mohammed Amin 2

1, 2 Lecturer of Pediatric Nursing, Faculty of Nursing, Cairo University

Abstract

The mothers of children undergoing colostomy usually do not receive sufficient information about colostomy care and prognosis; hence, they experience many problems. Simulation-based education not only increases mothers' knowledge but also improves their skills. **Aim:** to evaluate the effect of simulation-based education about colostomy on mothers' knowledge, and practice among their children. **Design:** quasi-experimental one group pretest-posttest research design was utilized to achieve the aim of the current study. **Setting:** The study was conducted at pediatric general surgical unit which located at the fourth floor in Cairo university specialized pediatric hospital (CUSPH). **Sample:** A convenient sample of 60 mothers of children with colostomy was participated in the study. **Data collection tools:** structured interview sheet and questionnaire of mothers' knowledge and checklist to evaluate mothers 'practices about colostomy. **Results:** After using simulation based education mothers had higher score of knowledge and there were highly statistically significant difference ($p < 0.001$). was detected between total mean score of mothers' knowledge in the pretest, immediate posttest and before discharge. Also there was higher score of practice, more competent and statistically significant improvement ($p < 0.001$) were detected mothers' practice regarding colostomy care in immediate, second, third and before discharge. **Conclusion:** Simulation based education is appropriate method in health education for mothers as it has a positive effect on improve the mothers' knowledge and practice regarding care of children with colostomy. **Recommendation:** Integration of the simulation based education for mothers of children with colostomy and incorporated into the discharge plan to get the best outcomes for mothers and their children.

Keywords: Simulation-based education, children with colostomy, mothers knowledge and practice.

Introduction

Worldwide, colostomies are frequently life-saving surgical procedures that are crucial in the treatment of both acquired and congenital gastrointestinal disorders, yet they are nevertheless linked to a high rate of morbidity. In contrast to adult stomas, pediatric stomas is done as a temporary surgery procedure as a means of treating congenital intestinal malformation (Maria & Lieske, 2021).

Twenty to seventy percent of children experience complications after the creation of a colostomy. These complications can be classified as early or late. Early complications include ischemia, hemorrhage, and infection. Late complications include stenosis, fistula formation, prolapse, hernia formation, colonic and small bowel obstruction, and denuded peristomal skin (Parini, et al, 2023).

A child's colostomy may be opened for a variety of causes, including

meconium ileus, intestinal tumors, hirschsprung disease, bladder exstrophy, necrotizing enterocolitis, meconium anus, and abdominal injuries. Colostomy is used to divert the fecal stream, to decompress obstructed bowel under emergency conditions, and to protect the lower colorectal after a reconstructive repair. A colostomy that functions well enhances child's quality of life. (Lee, et al, 2021).

Colostomy negatively impacts the child's and family's quality of life; it is a major cause of fear, anxiety, and stress. As a result, the child and the family may find it challenging to adjust to the colostomy. In general, parents view this as a failure, a deviation from normalcy, and a loss of hope. The idea of opening colostomy to the child causes him or her and the family to have difficulties with social and psychological concerns and worry from the first moment. Anxiety is typically brought on by factors such the size and care of colostomy, body image problems, disease process, complications, daily care needs, stigma, psychosocial barriers, and uncertainties (Abbasiasl, Hakim, & Zarea, 2021).

A pediatric health nurse's responsibilities include assisting families and children who require support in adjusting to a new life by evaluating them on a physical, psychological, and social level, identifying the areas in which their quality of life is compromised, and developing and implementing nursing interventions for those affected areas. Children with stomas and their families can benefit from the care and knowledge that pediatric nurses can offer, as well as from counseling, advocacy, and emotional support (Uzsen, Yaz, & Gumus, 2021)

Currently, technological advances offer many different educational tools which can facilitate the development of

parents' knowledge. They can inform mothers about the problems of their children and thereby, relieve their stress. Based on clinical experiences, mothers of children undergoing colostomy typically do not given enough information regarding the prognosis and care of their children, which causes them to face numerous challenges after their children are released from the hospital. Mothers may experience severe stress due to their lack of understanding. Stress can therefore impair their ability to appropriately care for their colostomy and children at home (Hernandez-de-Menendez, Escobar & Menendez, 2020).

Simulation-based education not only increases learners' knowledge but also improves their skills. With this training approach, learners can develop their problem-solving abilities in a virtual setting and effectively apply what they have learned in the actual world. (Tavan, Monemi, Keshavarz, Kazemi, & Nematollahi, 2022).

The simulation method provides the opportunity for patients to practice and gain confidence. Patients are given the chance to gradually increase their capacity to care for their ostomy through practice by using this strategy. Most protocols suggest the demonstration-return-demonstration strategy as the best one for ostomy training, per an ostomy guideline (Pouresmail, Nabavi, Abdollahi, Shakeri, & Saki, 2019).

In addition to helping caregivers modify their attitude toward colostomy care, caregivers need to be knowledgeable about care, cure, and prevention. This knowledge must be founded on parental requirements to create a successful nurse-parent partnership. Nurses play a crucial role in the care of sick children. By building compassionate relationships,

providing knowledge and information, attending to the psychological and physical needs of parents, including parents in decision-making, and giving them authority over their child's care, nurses can reduce the stress that parents experience (Abdelmohsen, 2020).

Nurse plays an essential role in stoma care as pre-operative education and counseling, pre and postoperative teaching and emotional support. Furthermore empty and change pouching system, describe diet and fluid guidelines, recognize signs of

Significance of study

Colostomy is a common procedure performed in pediatric surgery. It may be associated with morbidity and mortality. Several studies have found that the incidence of problems linked to colostomies varies between 28–74% worldwide (Hamdi, Mohamed & Al-Ani, 2021).

According to reports, the overall morbidity from colostomies might range from 42 to 75% However, with appropriate surgical methods and nursing care, these complications can be avoided. Because colostomy causes a significant shift in elimination pattern and necessitates acclimating to a new way of life, high-quality care is necessary. The best outcomes are achieved with adequate parental consent prior to surgery, counseling, treatment and follow-up (Black, 2020) & (Chanchlani & Shrivastava, 2019).

Colostomy care can be a complex and challenging task, especially for mothers who are responsible for their child's daily

potential complications, as well monitor medications, manage gas and odor, teach patient to seek assistance if experiencing the changes in output, skin complications, and stoma complications. Moreover, discharge planning, follow-up care after discharge, and continuing rehabilitation care for children and their families are among the responsibilities of a pediatric nurse (Rashed, Khalifa, Zein El Dein, & Omar, 2020).

care. The nurse should improve mother's knowledge about measures like good hygiene practice, feeding, immunization and others may significantly reduce the mortalities and morbidities resulting from colostomy. The main reasons for development of complications of colostomy is a lack of knowledge and skills related to colostomy care so the criteria necessary for this are suitable stoma care. Therefore, assessment and provide knowledge for caregiver's regarding the stoma is important (Rashed, et al, 2020). Using simulation to teach ostomy self-care improves self-efficacy (Pouresmail, et al, 2019).

Hence the current study was undertaken to evaluate the effect of simulation-based education on mothers' knowledge and reported practice among their children with colostomy. Hopefully, the results will set a standard care that can be followed to improve the knowledge and practice of these mothers and providing guidance and recommendations that should be reflected in pediatric nursing education and providing evidence based data that can develop nursing practice and research in the field of pediatric surgery nursing.

The aim of the current study was to evaluate the effect of simulation-based

Methods

Aim of the study

education about colostomy on mothers' knowledge, and practice among their children.

Research Hypotheses

To fulfill the aim of this study, the following research hypotheses were formulated:-

- 1- Mothers had higher score of knowledge about colostomy after receiving simulation based education than before.
- 2- Mothers had higher score of practice about colostomy after receiving simulation based education than before.

Research Design

Quasi-experimental one group pretest-posttest research design was utilized to achieve the aim of the current study. Quasi-experimental design is very similar to the true experimental design except an absence of randomization or control. One group pretest-posttest research design is a type of quasi-experimental design in which the outcome of interest is measured two times: once before and once after exposing a non-random group of participants to a certain intervention (Reichardt, 2019).

Setting

The study was conducted at pediatric general surgical unit which located at the fourth floor in Cairo university specialized pediatric hospital (CUSPH), this unit received children affected with various gastrointestinal disorders either congenital or acquired from all over Egypt at a greater rate. Moreover, the unit provided preoperative care for children who are waiting for operation and also receiving children from operating theatre and provides complete care for them postoperatively until recovery and

discharge. Similarly, the study was conducted in the pediatric general surgical outpatient clinic, in second floor at CUSPH on Saturday, Monday, and Wednesday from 9 am to 2 pm. The clinic receives children from all over Egypt who have any gastrointestinal problem and refer them to the ward to wait for operation and also provide care and follow up for children postoperatively.

Subject

A convenient sample of 60 mothers of children with colostomy was participated in the study. The sample size was calculated based on the following formula (<http://www.ifad.org/gender/tools/hfs/anthropometry>).

$$n = \frac{T^2 \times p(1-p)}{m^2}$$

Description:

n = required sample size.

t = confidence level at 95% (standard value of 1.96).

p = estimated prevalence of children with colostomy in 2023 at CUPH (0.76).

m = margin of error at 5% (standard value of 0.05).

$$n = \frac{(1.96)^2 \times 0.76(1-0.76)}{(0.05)^2} = 60$$

Inclusion criteria

-Children diagnosed with GIT problems and had colostomy.

-Children aged from one month to three years.

-Both genders was included

Exclusion Criteria

Children with any other congenital anomalies such as (genitourinary, central nervous system and orthopedic anomalies

as well as congenital heart defects), will be excluded.

Data collection tools

The required data was collected by the following tools, which were developed by the researchers after extensive review of related literature.

1-Structured Interview Questionnaire Sheet:

- It was developed by researchers and included 4 items. It was divided into 3 parts:

Part I: included 5 questions concerned with data of the mothers' personal characteristics as age, education, occupation and residence.

Part II: involved 4 questions concerned with data of the child personal characteristics as age, gender, child rank in the family and number of siblings.

Part III: comprised of 5 questions about child medical history as the following: family history of colostomy, underlying cause of colostomy for the child, duration of disease, is the mothers took knowledge about colostomy, and who gave the mother knowledge about colostomy.

2- Questionnaire of mothers' knowledge and practices about colostomy:

The tool is developed by the researchers to assess mothers' knowledge and a practice regarding colostomy and it is comprised of 3 parts:

Part I: included 19 questions to assess mothers' knowledge including: definition, indication, sites, and types of colostomy, characteristics of normal colostomy, complication of colostomy, risk signs to seek help and child nutrition.

Scoring system:

Concerning mother knowledge regarding colostomy care, each complete response takes "2" scores, the incomplete one "1" score and the wrong response or not known takes zero. The total score is 19 which will be converted to 100%, and then categorized as: the total score of less than 60% (<11.4 scores) will be considered as unsatisfactory knowledge while score of 60% and more (≥ 11.4) will be considered as satisfactory knowledge.

Part II: Observation Checklists about Mothers' practices: It included 2 observation checklists to evaluate mothers' practices about colostomy as the following:

1. Checklists about colostomy care which involved 21 items and divided into 2 parts:
 - Part (1) about care of colostomy that covered with clean cloth, it includes 14 items
 - Part (2) about care of colostomy that connected with pouch, it contain 7 items

Scoring system:-

As regards mothers' practices about colostomy care: each correct practice in checklists will take (1) score, while each incorrect practice will take (0) score. The total score of all checklists will be calculated as 21 scores which will be converted to 100%, and then categorized as the following: the total score less than 70% (<14.7 scores) will be considered as competent practice while score of 70% and more (≥ 14.7) will be considered as incompetent practice.

Ethical Considerations:-

A primary approval was obtained from the research ethics committee in the Faculty of Nursing, Cairo University. A written informed consent was attained from children' mothers by the researchers after complete description of the purpose

and nature of the study in order to obtain their acceptance as well as to gain their cooperation. Children and their mothers were informed that participation in the study was voluntary; mothers had the right to withdraw from the study at any time without giving any reason and without any effect on the care of their children. Confidentiality was assured to children and their mothers.

Validity and Reliability

Data collection tools were developed after extensive reviewing of the literature. The tools were reviewed by experts in pediatric nursing to test the content validity of the tools. The tools were examined for content coverage, clarity, relevance, applicability, wording, length, format, and overall appearance. Based on experts' comments and recommendations; minor clarifications of some questions had been done such as rephrasing and rearrangements of some sentence. Reliability of tools were performed to confirm its consistency and was calculated statistically using Cronbach's alpha and the results was 0, 75.

Procedure

The study was carried out on three phases: preparatory or initial phase, implementation and evaluation phases.

1- Preparatory phase (initial)

Before conducting the study an official permissions was obtained from the director of CUSPH and from the heads of pediatric general surgical unit and pediatric general surgery out-patient clinic. The researchers introduced themselves to the mothers of children who fulfill the inclusion criteria. Oral acceptance and written consent was obtained from mothers after explanation of the aim and the nature of the study. During

the first session; the researchers filled the structured interview sheet on individual bases and questionnaire of mothers' knowledge and practices about colostomy. The interview was carried out on Saturday, Monday and Tuesday every week in waiting area of the pediatric general surgical outpatient clinic and in the pediatric general surgical unit. The time consumed to fill the structured interview questionnaire and questionnaire of mothers' knowledge and practice observation checklist about colostomy will be about 30- 40 minutes.

2- Implementation and evaluation phase

During the second session; the researchers was provided to the mothers' postoperative educational session about colostomy care which included theoretical part about colostomy that involves: definitions, sites, indications, types, characteristics of colostomy, nutrition and follow up. The researchers filled questionnaire of knowledge about colostomy immediately at the end of session. At the third session, the researchers was provided simulation based education about care of colostomy using of simulation device which was a doll with colostomy. The session included detailed care for stoma and peristomal skin, and dangerous signs which may be observed on stoma or surrounding skin. The educational session conducted at pediatric general surgical unit and pediatric general surgical outpatient clinic. The educational session provided for a group of two to three mothers per session. Immediately at the end that session; the researchers filled the observational checklist of mothers practice about colostomy. In the second and third day and the researchers evaluated mother practice for the second time and filled the observational checklist of mothers practice

about colostomy. Before discharge; the researchers evaluate mother knowledge and practice and filled mothers' knowledge questionnaire and observational checklist for mothers' practice about colostomy.

Statistical analysis

The collected data was coded, categorized, tabulated, and analyzed using the Statistical Package for Social Science (SPSS) program version 21. Descriptive data was expressed as mean and standard deviation. Qualitative data was expressed as frequency and percentage. Chi –square was used to detect the relation between parents' knowledge based on their selected personal variables. Comparison of means was performed using paired sample t-test. Correlation among variables was done using Pearson correlation coefficient. Level of significant at $p < 0.05$ was used.

Results

Table (1) revealed that a relatively high percentage (65%, 50% respectively) of mothers of children with colostomy age ranged from 20 to less than 30 years. The mean age of mothers was 26.2 ± 5.65 . Half of mothers were secondary school graduates. The same table illustrated that less than two third of the mothers (60%) were housewives. More than three quarters (75%) of mothers came from rural areas. Three quarters (75%) of parents of children had negative consanguinity while 15 % of parents had positive consanguinity.

Table (2) indicated that three quarters (75%) of children were male. The half of children in study group of children aged from 1 month to less than 1 year. The mean age of children was 1.2 ± 2.48 years. Relatively one third (33.3%) of children were ranked as more than third child in their families. Regarding number of sibling

half of children had two siblings. More than one third of children (34%) diagnosed as imperforated anus. The vast majority of children (90%) didn't have family history of colostomy.

Regarding the mothers' knowledge related to colostomy care table (3) illustrated that more than two third of mothers (66.7%) had incomplete knowledge while after using simulation 53.3 % and 70% respectively had of mothers in immediate and before discharge posttest able to define colostomy completely. Before using the simulation 66.7% and of mothers disoriented about indication of colostomy. Nevertheless, in immediate and before discharge posttest more than 60% of mothers had incomplete knowledge about indication of colostomy. The same table proved that before using simulation no mother had complete knowledge about sites of colostomy. However, after using simulation a relatively high percentage of mothers had a complete knowledge about sites of colostomy.

The same table proved that, the majority of mothers (80%) had incomplete knowledge about normal appearance of colostomy in pretest while in immediate and before discharge posttest all of mothers had complete knowledge. Half of mothers disoriented about complication of colostomy in pretest, nonetheless after using simulation the vast majority (91.7%) and all mothers had complete knowledge. No mother had complete knowledge about nutrition of child with colostomy in pretest while all mothers had complete knowledge about nutrition after using simulation. More than two thirds (66.7%) disoriented about risk signs to seek help in pretest, however all of mothers had complete knowledge after using simulation in posttest before discharge.

Figure (1) demonstrated that, more than two third (70%) of mothers in the pretest had unsatisfactory level of knowledge about colostomy before using simulation while the vast majority of mothers had complete knowledge after simulation based education in immediate posttest after teaching session and posttest before discharge.

Table (4) concluded that the total mean score of mothers' knowledge in the post test group was 64.85 ± 5.91 compared with 28.33 ± 7.24 for mothers in pretest group. A highly statistically significant difference was detected between total mean score of mothers' knowledge in the pretest and immediate posttest ($t = 7.54$, $p < 0.001$). The total mean score of mothers' in immediate posttest was 93.20 ± 17.9 compared with 73.03 ± 9.5 in posttest before discharge with highly statistically significant ($t = 13.96$, $p < 0.001$).

Figure (2) revealed that the majority of mothers had incompetent level of practice regarding colostomy care in pretest. However the vast majority (90%, 97% and 100% respectively) of mothers had competent level of practice regarding

colostomy care after using simulation in the post test.

Table (5) highlighted that highly statistically significant ($f = 18.96$, $p < 0.001$) improvement were detected in total mean score of mothers' practice regarding colostomy care in immediate, second, third and before discharge after using simulation.

Table (6) showed that there were positive correlations between mothers' personal data (age, level of education and occupation) and mothers' knowledge and practice after using simulation based education with $p < 0.05$. On contrary, there were negative correlations between mother place of residence and improve mothers' knowledge and practice ($p > 0.05$).

Table (1) Percentage Distribution Mothers of Children with colostomy Personal Data (n=60).

Mothers' personal data	Study group (n=60)	
	No.	%
Age / years:-		
<20	2	3.3
20-<30	40	66.7
30-<40	14	23.3
40 and more	4	6.7
X ± SD	26.2±5.65	
Level of Education:-		
Can't read and write	2	3.3
Just read and write	8	13.3
Preparatory education	10	16.7
Secondary or technical	30	50
University education	10	16.7
Occupation:-		
Housewives	36	60
Working mothers	24	40
Place of residence:-		
Rural	40	66.7
Urban	20	33.3
Presence of consanguinity:-		
Yes	45	75
No	25	15

Table (2) Percentage Distribution of Children with Colostomy according to their Characteristics (n=60).

Children' Characteristics	Study group (n=60)	
	No.	%
Children gender:		
Male	45	75
Female	15	25
Age :-		
1 month <1 year	30	50
1 year <3 years	30	50
X ± SD	1.2 ±2.48	
Child rank:-		
First	5	8.3
Second	16	26.7
Third	19	31.7
More than third	20	33.3
Number of siblings:-		
One	6	10.0
Two	30	50.0
Three or more	24	40.0
Childs' diagnosis:-		
Imperforated anus	34	56.7
Hirschsprung disease	26	43.3
Family history of had colostomy:-		
Yes	6	10
No	54	90

Table (3) Percentage Distribution of Mothers' Knowledge related to colostomy care in Study (n=60)

Mothers' Knowledge	Study group (n=60)					
	Pretest		Immediate posttest		Posttest before discharge	
	No.	%	No.	%	No.	%
Definition of colostomy						
Complete	5	8.3	32	53.3	42	70
Incomplete	40	66.7	26	43.4	18	30
Unknown	15	25	2	3.3	0	0
Indication of colostomy						
Complete	0	0	13	21.7	20	33.3
Incomplete	20	33.3	40	66.7	37	61.7
Unknown	40	66.7	7	11.6	3	5
Sites of colostomy						
Complete	0	0	50	83.3	45	75
Incomplete	10	16.7	10	16.7	15	25
Unknown	50	83.3	0	0	0	0
Normal Appearance of colostomy						
Complete	4	6.7	60	100	60	100
Incomplete	48	80	0	0	0	0
Unknown	8	13.3	0	0	0	0
Complication of colostomy						
Complete	0	0	55	91.7	60	100
Incomplete	30	50	5	8.3	0	0
Unknown	30	50	0	0	0	0
Nutrition of the child						
Complete	0	0	30	100	30	100
Incomplete	17	28.3	0	0	0	0
Unknown	43	71.7	0	0	0	0
Risk signs to seek help						
Complete	0	0	52	86.7	60	100
Incomplete	20	33.3	8	13.3	0	0
Unknown	40	66.7	0	0	0	0

Figure (1) Percentage Distribution of Mothers' Total knowledge regarding colostomy (n=60)

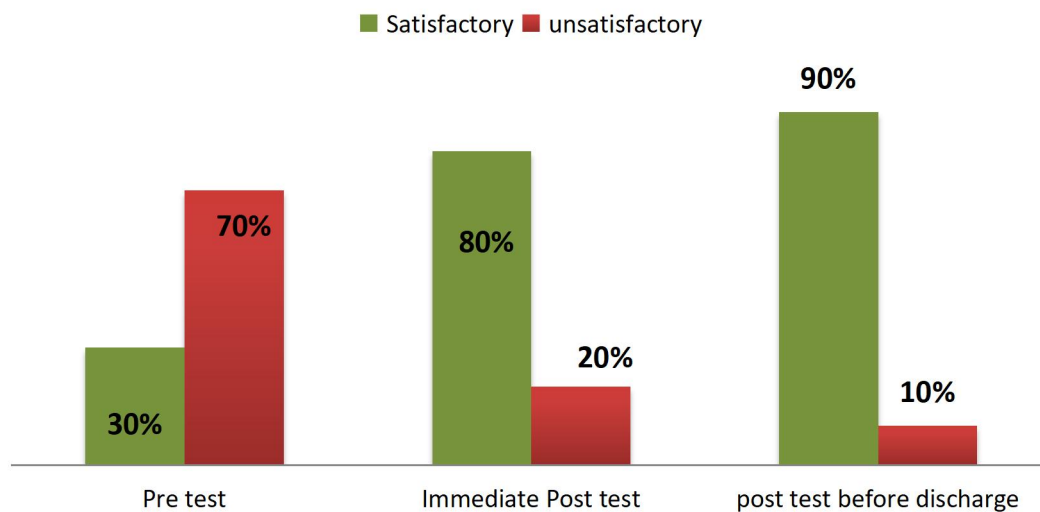


Table (4) Comparison between Total Mean Score of Mothers' Knowledge in the pretest and posttest regarding colostomy and its care (n=60).

Total mean score of mothers' knowledge	X± SD	t.test	P
Pretest	2.33±7.24	7.54	.001
Immediate posttest	6.85±5.91		
Immediate post test	9.20±17.9	13.96	.000
Posttest before discharge	3.03±9.5		

Significant at $p < 0.05$

Figure (4) Percentage Distribution of Mothers' practice Regarding Colostomy Care in Pre Immediate, second day, Third day Posttest & Before discharge Direct Observation posttest (N=60)

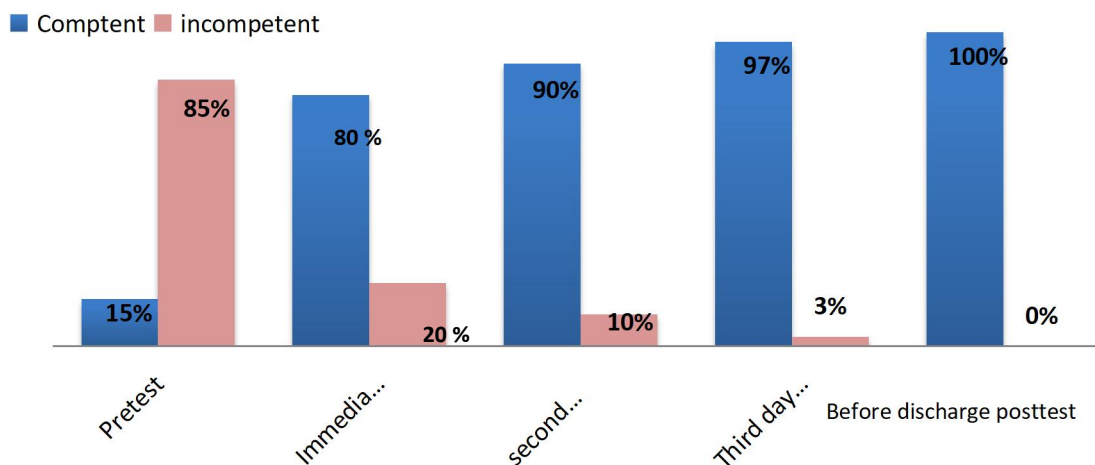


Table (5) Comparison between Total Mean Score of Mothers' practice regarding colostomy care (n=60).

Total mean score of mothers' practice	X± SD	f	P
Before using simulation	3.64 + 1.59		
Immediate using simulation	10.78±0.39		
Second day after using simulation	13.54±0.42	18.97	.001
Third day after using simulation	16.32±0.22		
Before discharge after using simulation	18.55±0.34		

Significant at $p < 0.05$

Table (6) Correlation matrix between the studied mothers' knowledge, practice and their characteristics after using simulation based learning

Mothers' characteristics	Mothers' knowledge		Mothers' practice	
	R	p-value	R	p-value
Age	.463	.001	.215	.049
Level of education	.337	.001	.513	.001
Occupation	.438	.001	.305	.002
Place of residence	.190	.059	.126	.213

Significant at $p < 0.05$

Discussion

As regard to children mothers' personal characteristics the current study revealed that the highest percentage of mothers of children with colostomy age ranged from 20 to less than 30 years. Half of mothers were secondary school graduates and the majority of the mothers were housewives. More than three quarters of mothers came from rural areas. These results are in the same line, Kasem (2020) who studied effect of nursing instructions on mothers' knowledge and practice of colostomy care and found that mothers' age in the study and control groups ranged from 20-35years old and , the majority of mothers 86.7 % were secondary school graduates. As for occupation most of mothers (80%) were housewives. Concerning residence, more than half of mothers were from rural areas. These results also agree with Maheswari, Poonguzhali, and vairamuthuraju (2016) who established that, maximum of mothers ranged from 20-35 years old, and majority of them were secondary school graduates and about two thirds of them were housewives.

Concerning consanguinity, it was found that three quarters of parents of children had negative consanguinity. Agreement with these findings did by Zeng, et al 2023 who studied Gastrointestinal congenital malformations and found that parental consanguinity is not rare, as shown in the study by its finding in 11.73% of cases. Since some digestive malformations have a genetic component, consanguinity would logically increase their occurrence.

Based on the result of the current study, the three quarters of children were male. On the same line with these findings of studies done by Rashed, et al, (2020)

and Kasam, et al (2020) who concluded that more than half of studied children with colostomy were males. Half of children in study group of children aged from 1 month to less than 1 year and other half aged from 1 year to 3 years. This finding is merely in agreement with a study carried out by Halemani, Shashidhara, & D'Souza (2021) who investigated the effectiveness of a video-assisted teaching module on knowledge and practice regarding home-based colostomy care of children and found that more than seventy percent (73.3%) of children are aged from 1 month to 3 years.

Regarding children diagnosis the current study revealed that more than one third of children diagnosed as imperforated anus. This result is matched with Mohmed, Mohmed, Abouelfadl, & Kamel (2022) who found that, more than half of infants diagnosed as imperforated anus. In the same context Shalaby (2021) who found that, over three years in Egypt, high anorectal malformation (90%) were the most common causes of creation of children colostomy.

More than two third of mothers in the pretest had unsatisfactory level of knowledge about colostomy before using simulation. From the researchers experience most of mothers admitted performing colostomy for their children had poor knowledge and practice which lead to lots of problems whether they faced or their children which affect the outcome and may increase the hospital stay and elongate the period of recovery of their children. This finding is consistent with that of the 2019 article (Early postoperative complications following ostomy surgery) by Butler, 2019 who concluded with family members have

become an integral part of care which put family members under significant emotional, financial, and physical stress and burden as the information of family is poor and recommended that The family member or caregiver's quality of life may be improved if he/she is educated about care of their children.

Also the study finding showed that, the vast majority of mothers had complete knowledge after simulation based education in immediate posttest after teaching session and posttest before discharge. These finding are backed up by Ahmed, Mohamed and Ali (2024) who stated that simulation-based intervention should be integrated as an effective method in training about colostomy. In the same line the study done by Chernikova, et al, (2020) who concluded that simulation-based education increased knowledge and motivation for parents for care of their children. So, this result agrees with the first hypothesis of the current study.

Regarding mother practice about colostomy care the current study indicated that, the majority of mothers had incompetent level of practice regarding colostomy care in pretest. However a relatively high percentage of mothers had a complete had competent level of practice regarding colostomy care after using simulation based education with highly statistically significant ($f = 18.96$, $p < 0.001$) improvement were detected in total mean score of mothers' in immediate, second, third and before discharge after using simulation.

The previous results is in the same context with Attia, et al. (2024) who indicated that colostomy-affected children require long-term care, mothers are the primary careers. The majority of mothers who admitted performing colostomies on their children had inadequate knowledge

and practice. These issues could have an impact on the outcome, or prolong their recuperation period. The study also concluded that the value of empowering mothers as careers by concentrating on their knowledge and practices. Better results and overall care can be achieved by giving mothers with thorough nursing instructions and guidelines the confidence and skills to manage their child's colostomy.

These finding also was in accordance with Mohamed, et al, (2022) who denoted that, after Colostomy empowerment program, there was a significant improvement in the level of knowledge and reported-practices among mothers in the study group. Halemani, et al, (2021) similarly recommended that, audio-Visual aids were more effective among mothers of colostomy children. These results matched also with Kasem (2020) who established that mothers who receive nursing instruction related colostomy care have higher mean score of knowledge and practice than mothers who receive hospital routine care. Consequently this result agrees with the second hypothesis of the present study. The researchers could attribute these results to the educational intervention, which resulted in mothers acquiring more knowledge about colostomy care, and their actual practices in managing their children were enhanced accordingly.

In relation to correlation between the studied mothers' knowledge, practice and their characteristics the present study proved that showed that there were positive correlations between mothers' personal data (age, level of education and occupation) and mothers' knowledge and practice after using simulation based education with $p < 0.05$.

These previous findings are supported by Sobhi Abd Elkhair, & Mohammed Amin (2023) who found that there was correlation between the mothers' level of education, occupation and mothers' knowledge outcomes there were statistically significant correlations before and after receiving telenursing program.

This result also was in agreement with Ibrahim & Abd Elkhair, (2023) who found that there was a highly statistically significant positive correlation between mothers' knowledge and practices and their educational level. There was a statistically significant positive correlation between mothers' knowledge and practices before receiving empowerment guidelines and working status. From the researchers' perspective, this may be because educated mothers are more likely to be aware of colostomy care and to apply it to their children than uneducated mothers.

Conclusion

The result of the current study concluded that simulation based education is appropriate methods in health education for mothers as it has a positive effect on improve the mothers' knowledge and practice regarding care of children with colostomy. Mothers who received simulation based education had higher mean score of knowledge and practice regarding care of their children with colostomy than before.

Reference

Abbasiasl, H., Hakim, A., & Zarea, K. (2021). Explaining the care experiences of mothers of children with hirschsprung's disease: A Qualitative Study. *Global pediatric health*, 8, 2333794X211015520.

Recommendations

Based on the results of the current study the following recommendations are suggests;

- Integration of the simulation based education for mothers of children with colostomy in the pediatric surgery ward and incorporated into the discharge plan to get the best outcomes for mothers and their children.

- Implementing colostomy simulation based education and utilizes interactive teaching methods such as training videos hands-on demonstrations, roleplaying, and brochures to enhance mothers' understanding and retention of colostomy care information from admission to being adopted by mothers after discharge. This can help ensure that the instructions are practical, engaging, and applicable to real-life situations.

- Further comparative research studies to compare the effect of a simulation-based education and other methods of teaching such as video-base methods, mobile application-base methods on mothers' knowledge and practice regarding care of their children with colostomy.

Abdelmohsen, S. A. (2020). Effectiveness of Structured Education on Patient's Knowledge and Practice Regarding Colostomy Care. *Asia-Pacific journal of oncology nursing*, 7(4), 370 available at <https://www.researchgate.net/publica>

- [tion/328430088_Colostomy_Care_in_Paediatic_Patients.](#)
- Ahmed, E. A., Mohamed, I.N.H., & Ali. E, M, A. (2024). The Effect of Simulation-Based Intervention on Nurses' Performance and Satisfaction regarding Colostomy Care at Pediatric Surgical Unit. *Egyptian Journal of Health Care*, 15(1), 1450-1463.
- Attia Mohammed, B., Abd Elkreem, M., Mona Abd Elnaser Ahmed Elnabawey, G., Mohammed Ahmed, S., & Ismail Ismail Elsayed, A. (2024). Educational Guidelines on Stress and Coping Strategies among Mothers Having Children with Colostomy. *Egyptian Journal of Health Care*, 15(1), 1136-1152.
- Black, P. (2020). Living with and beyond colorectal cancer with a permanent colostomy: metaphor, survivorship and long-term care. *Gastrointestinal Nursing*, 18(6), 24-32.
- Butler, D. L. (2019). Early postoperative complications following ostomy surgery: a review. *Journal of Wound Ostomy & Continence Nursing*, 36(5), 513-519.
- Chanchlani, R., & Shrivastava, D. (2019). Indications and complications of colostomy in newborn: our experience. *International Surgery Journal*, 7(1), 194-196.
- Chernikova, O., Heitzmann, N., Stadler, M., Holzberger, D., Seidel, T., & Fischer, F. (2020). Simulation-based learning in higher education: A meta-analysis. *Review of Educational Research*, 90(4), 499-541.
- Halemani, K., Shashidhara, Y. N., & D'Souza, S. R. (2021). An evaluative study to assess the effectiveness of a video-assisted teaching module on knowledge and practice regarding home-based colostomy care of children among primary caregivers in selected hospital Lucknow, Uttar Pradesh. *Indian Journal of Surgical Oncology*, 12, 146-151.
- Hamdi, M. A., Mohamed, W. M., & Al-Ani, U. F. T. (2021). The colostomy complications in anorectal malformation: a retrospective study. *Journal of Coloproctology (Rio de Janeiro)*, 41, 286-288.
- Hernandez-de-Menendez, M., Escobar Díaz, C., & Morales-Menendez, R. (2020). Technologies for the future of learning: state of the art (Stoma care for children) *International Journal on Interactive Design and Manufacturing (IJIDeM)*, 14(2), 683-695. Available at <https://www.researchgate.net/sjms/article/view/116419>. Accessed at: June 2023.
- Ibrahim, M. A. E., & Abd Elkhair, S. S. (2023). Effect of mothers' empowerment guidelines about caring for children with cast on their knowledge and children selected outcomes. *Tanta Scientific Nursing Journal*, 30(3), 238-256.
- Kasem Alaswad, N. (2020). Effect of Nursing Instructions on Mothers' Knowledge and Practice of Colostomy Care. *Egyptian Journal of Health Care*, 11(4), 1392-1406.
- Lee, H., MacKenzie, T., Nijagal,A., Ozgediz,D.,& Vu, L.(2021).

- Colostomy. Available at: <https://surgery.ucsf.edu>. Accessed at: June 2023..
- Maheswari, N., Poonguzhali S., and vairamuthuraju M., (2016). Effectiveness of instructional package on knowledge regarding colostomy care among care givers in pediatric post-operative ward at institute of child health and RESEARCH. Madurai Medical College, Madurai-6.
- Maria, A., & Lieske, B. (2021). Colostomy Care. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK553156>.
- Mohamed Elzeky, A. M., Khalil, A., & Farrag, J. M. (2022). Effect of health care program for mothers having children with stoma. Port Said Scientific Journal of Nursing, 9(1), 77-99.
- Mohmed,A.R., Mohmed, S. A. Abouelfadl, M.H.& Kamel,W.M.(2022). Effect of colostomy empowerment program for mothers on occurrence of peristomal skin complications among their infants. International Journal of Health Sciences. DOI:10.53730/ijhs.v6nS6.11022.
- Parini, D., Bondurri, A., Ferrara, F., Rizzo, G., Pata, F., Veltri, M., & Multidisciplinary Italian Study group for STOMas (MISSTO). (2023). Surgical management of ostomy complications: a MISSTO–WSES mapping review. World Journal of Emergency Surgery, 18(1), 48.
- Pearson, R. Knight, S. Ng, J., Robertson, I. McKenzie, C. Angus, M. (2020). Stoma-related complication following ostomy surgery in 3 acute care hospitals: A cohort study. Journal of Wound, Ostomy and Continence nursing. 47:1. Pp 32-38.
- Pouresmail, Z., Nabavi, F. H., Abdollahi, A., Shakeri, M. T., & Saki, A. (2019). Effect of using a simulation device for ostomy self-care teaching in Iran: A pilot, randomized clinical trial. Wound management & prevention, 65(6), 30-39.
- Rashed, N. I., Khalifa, M. I., Zein El Dein, N. A., & Omar, T. K. (2020). Stoma Care for Children having Colostomy in Menoufia University Hospital. Menoufia Nursing Journal, 5(1), 47-53.
- Reichardt, C., S. (2019). Quasi-Experimentation: A Guide to Design and Analysis. Available at <https://psycnet.apa.org/record/2019-44408-000>.
- Shalaby, M.M. (2021). Indications, creation, and complications of colostomy in neonates: single tertiary center experience over three years. The Egyptian Journal of Hospital Medicine, 85 (2), 4179-4181.
- Sobhi Abd Elkhair, S., & Mohammed Amin, G. (2023). Impact of Telenursing Program about Ventriculoperitoneal Shunt Care on Mothers' Knowledge and Complications Occurred among Children. Egyptian Journal of Health Care, 14(4), 826-842.
- Tavan, A., Monemi, E., Keshavarz, F., Kazemi, B., & Nematollahi, M. (2022). The effect of simulation-based education on parental management of fever in children: a quasi-experimental study. BMC nursing, 21(1), 1-7.

Uzsen, H., Yaz, S. B., & Gumus, M. (2021). The effect of ostomy on pediatric patient and family in nursing: A systematic review. *Journal of Pediatric Surgical Nursing*, 10(4), 153-158.

Zamil, A. L., Radhi, O. A. K., & Hasan, H. S. (2018). Colostomy in Anorectal Malformation and Hirschsprung's Disease in Infants and Children. *European Scientific Journal*.

Zeng, F. T. A., Mbaye, P. A., Gueye, D., Niang, R., Wellé, I. B., Seck, N. F., ..& Ngom, G. (2023). Gastrointestinal congenital malformations: a review of 230 cases at Albert Royer National Children's Hospital Center in Senegal. *Egyptian Pediatric Association Gazette*, 71(1), 9.

