

Mothers' Awareness regarding Care of their Children having Imperforate Anus

Aya Ibrahim Abd El-Fatah⁽¹⁾, Zeinab Fathy El-Sayed⁽²⁾, Mona Mohamed Hafez⁽³⁾

(1) B. Sc Pediatric Nursing, Faculty of Nursing, Ain Shams University, Egypt

(2) Professor of Pediatric Nursing, Faculty of Nursing, Ain Shams University, Egypt

(3) Lecturer of Pediatric Nursing, Faculty of Nursing, Ain Shams University, Egypt

Abstract

Background: Imperforate anus is a birth defect that usually occurs randomly for unknown reasons; it may cause by changes of one or more genes with environmental factors and associated with many problems, treatment includes diagnosis and surgical intervention. Awareness is the most important ingredient for attitude and skills. **Aim:** Study aimed to assess mothers' awareness regarding care of their children having imperforate anus **Design:** A descriptive research design was utilized. **Setting:** both pediatric surgery departments in children's hospital, Ain Shams University and Abo el-rish hospital Cairo University, Egypt. **Sample:** A convenient sample of 70 mothers having children with imperforated anus. **Tools I:** Structured Interviewing Questionnaire which consisted of four parts 1.Assess characteristics data; Assess medical and family history; 2.Assessing mothers' knowledge regards imperforate anus, temporary colostomy, nutrition and hygiene and 3. Observation checklist to assess mothers' reported practice **II:** Mindful Attention Awareness Scale to assess the mothers' awareness. **Results:** 78.6% of studied mothers had unsatisfactory knowledge, 51.4% of them had not done practices and 45% had poor awareness regarding care children with imperforate. Also, there was a highly statistically significant differences positive correlation between total mothers knowledge, practice and awareness at $P < 0.05$. **Conclusion:** total unsatisfactory mothers' knowledge about imperforated anus, total not done score practices and total poor awareness score of studied mothers, there was a positive correlation between total knowledge and practices and awareness. **Recommendation:** Raising awareness of mothers by open communication and an interaction between healthcare professionals and mothers.

Keywords: Imperforate Anus, Children, Mothers, Colostomy Care, Knowledge, Practice, and Awareness

Introduction

A child birth is one of the most important experiences in mothers' lives. It is normally associated with feelings of joy, but when the newborn child is ill and needs hospital care the presumed positive birth event is transformed into another dimension (hopia et al., 2021). Parents having children with imperforate anus were raises many questions and the care of the child is different in several methods from other children (Cengiz et al., 2018).

Imperforate anus is birth defect of the anorectum and caused several difficulties at birth. Nowadays surgical methods are advanced such as new anus is constructed and enhanced the treatment and follow up lead to fairly normal life children, the incidence of imperforate anus is one in every four to five thousand live births. The malformation more frequent among boys than girls, the most common defect among boys is recto-urethral

fistula (Al-Sharef et al., 2020). Anorectal malformations divided into two categories: high and low; in high the development of the rectum has closed above the levator muscle while low lesions the development of the rectum closed below the muscle (Muzira et al., 2018).

Male defects include: cutaneous fistula in lowest part of the rectum anteriorly and placed along the midline on the scrotum or at the base of the penis and fistula is often narrow. Retourethral is the most common defect among male; that the fistula is located in the lower part of urethra or rectoprostatic fistula is located in the posterior part of urethra then the rectum and urethra are common wall above the fistula that lead to sever distension of the rectum, the external sphincter muscle complex is located between the perennial skin and rectum (Mallik et al., 2019).

Children with higher urethral fistula have higher risk for poor muscles and flat perineum with absence of midline groove and dimple. Retovesical fistula: the rectum is open the bladder neck with fistula, the external sphincter muscle complex, the sacrum is deformed and poor muscle development. Furthermore, unusual male defects; is anorectal agenesis without fistula and rectal atresia but it unusual defects (Watson et al., 2018).

Symptoms may include the absence of an anal opening, or one in the wrong area, such as very close to the vaginal opening in females, and no stool within 24 to 48 hours after birth, or stool that comes out of the vagina, the base of the penis, urethra (where you urinate) or scrotum. Parents also may notice a swollen abdomen (Abbas et al., 2019).

Surgical treatment is colostomy generally performed for children with high imperforate anus during newborn period; the colostomy provides decompression of the bowel and protection in final correction of malformation then the rectum placed with precision in the external sphincter and closed the skin (WHO, 2019).

Colostomy closure; the colostomy is kept for two or three months, once the wound has completely healed and postoperative dilations have achieved their goal; the colostomy may be closed in traditional surgical fashion. Moreover, surgical method used as a treatment of fecal incontinence; the appendix or ilioconduit provide a continent catheterization stoma and channel to the colon caecum the child takes integrate enema through the stoma daily to keep clean (Abd- Elhay, et al., 2019)..

Caring of children with malformation or disability involves protecting the children from danger and making secure. Mothers and fathers participate in care and sometimes in treatment both at home and the hospital are substantial, when children needs to hospital care the parents naturally stay bedside their children to commitment the care and giving love and protection. Healthcare professionals engaged the parents in the care of children with malformation to performing complex clinical procedures on their children, they observe small changes in children condition, parents care of the affected children includes several

items of physical, emotional, social and developmental health (Alaswad et al., 2018).

Mothers' awareness will be improved by involve the mothers in child's care this lead to decrease the feeling of stress so open communication between mothers and health care providers is very important to cope with many situations, when communication limited mothers feel unsecure and uninformed (Roberts et al., 2020).

Lack of awareness among caregivers regarding proper imperforate anus and stoma care contributed to complications and infections in children with colostomy, leading to readmissions, particularly due to skin excoriation. Also, commonly overlooked complications, such as the inability to recognize signs of skin breakdown and the presence of ribbon-like stool; Numerous complications were observed, some of which resulted from errors in surgical techniques, while others were due to inadequate counseling of parents. The patients were categorized into two groups based on the reasons; the most frequent complications reported among these cases were skin excoriation, followed by wound infection (Mohamed et al., 2022).

Significance of the problem:

Imperforate anus is a congenital anomaly that is frequently observed in delivery room & pediatric surgical units. According to the American Association Statistics of Pediatrics in 2022, the incidence of imperforate anus is one per 4000-5000 live births reported globally and affect both girls and boys with a slightly more common in males (Ali et al ., 2022). In Egypt, Packing and Global Center for Packing and many researches in Universities conducted that an anorectal malformation was approximately 35.83% from December 2016 to January 2020 (Baha-aeldin et al., 2022).

Data generated from this study will seek in planning of care and increase the awareness of mothers' children having imperforate anus as well as training adequately for the mothers and family responsible for the provision of such caring to deal with the main problems that the affected child suffering from it, to improve knowledge and skills to this problems that influence care of children with imperforate

anus, from this point of view, the study will be conducted.

Aim of the study:

This study aimed to assess mothers' awareness regarding care of their children having imperforate anus.

Research questions:

- 1- What is the mothers' knowledge practice and awareness regarding care of their children with imperforate anus?
- 2- Is there a relation between total mothers' knowledge, practice & awareness and their characteristics?

Subjects and Methods:

Study design: A descriptive design was utilized to achieve the aim of this study.

Study Settings: This study was conducted at both pediatric surgery departments Ain Shams children hospital affiliated to Ain Shams University and Abo El-Resh hospital affiliated to Cairo University. As it locates in vital place and covering large area of country

Study Subjects: A convenient sample of this study was composed of 70 mothers having children with imperforated anus attending the previously mentioned study setting over a period of 6 months, 30 mothers from Ain Shams children hospital and 40 mothers from Abo El-Resh hospital with following inclusion criteria; all children having imperforated anus after birth, from both genders and accompanying with their mothers.

Tools for data collection:

Tool I: structured interview questionnaire:

It was used to assess mothers & children characteristics were designed by the researcher based on literature review and included the following parts:

- **Part I:** It was used to assess the characteristics of the studied subjects which included:
- a- Mothers' characteristics such as: age of mothers during this pregnancy, educational level; mothers' job, family income and residence.

- b- Children characteristics such as: age/months, gender, child ranking, anthropocentric measurement (weight, height and head circumferences), vital signs measurement (temperature, pulse and respiration).

- c- Medical history of children and family such as: type of birth, gestational age, surgeries required for child, relationship between father and mother, other children suffering, members of the family with anal obstruction, hereditary diseases of the parents, mothers' suffering from any chronic diseases, follow up during pregnancy, received medication during pregnancy period of this child, other birth defect of the family, smoking, exposure to radiation, health problem during pregnancy.

Part II: This part was designed to assess the mother's knowledge in the form of open and multiple choices questions which including their knowledge regarding the following:

- a) Assess the mother's knowledge regarding imperforated anus as: meaning, causes, signs and symptoms, complication, diagnosis, care necessary for child pre and post-operative surgery.
- b) Assess the mothers' knowledge regarding temporary colostomy as: meaning, site of opening, complication, care for the skin surrounding stoma" colon opening.
- c) Assess the mothers' knowledge regarding feeding for the child and fluid intake as: importance the wash hands before feeding, small frequent amounts, type and position of feeding.
- d) Assess the mothers' knowledge regarding personal hygiene and avoiding infection as: child bath, dipper care, care of stoma, keep child from infectious diseases and crowded places.

Scoring system: Each knowledge item with a correct response will scored one and zero for incorrect. The total score level for the questionnaire sheet was 100 marks, the maternal knowledge was checked with a model key answer and according to their knowledge, they were categorized into either:

Score < 50 % referred to unsatisfactory knowledge.

Score $50 \leq 100$ % referred to satisfactory knowledge.

Part III: Observational Checklists. It was adopted from (Wilkinson & Van Leuven, 2007) and modified to suite to assess mothers' reported practice regarding: dealing with their children suffering from imperforate anus; to assess mothers' their reported practice regarding pre and post-operative care, care of children with stoma, nutritional status of children and infection control.

Scoring system: Regarding the scoring system for reported practicing of the studied mothers, a checklist was assigned to score according to its number of sub item. Each step done correctly was scored 1 while each step done answered incorrectly or not done was scored zero. The total mothers' responses are categorized into: Done $\geq 60\%$ and Not done <60%.

Tool II- Mindful Attention Awareness Scale (MAAS) (Appendix III): It was adopted by the researcher based on **Buchanan, C. Morgan, P. & Basil, M (2022)**; it revised by supervisors and was used to assess mothers' awareness regarding imperforate anus. Which included (15) items, it divided into Never=2, usually=1, and very much=0. Sum sores were calculated to obtain the total awareness score. Total mothers' awareness score was divided into: Good awareness: if the score more than 75%. Average awareness: if score from 50% to 75%. Poor awareness: if score less than 50%.

Validity:

It was ascertained by panel of experts include three expertise from pediatric nursing and pediatric surgical departments. Their opinions were elicited regarding the format, layout, consistency, accuracy and relevancy of the tools. The tool was tested to ensure that an assessment tool produces stable and consistent result overtimes reliability of the study tools used Alpha Cronbach's test.

Reliability:

It was done by using Cronbach's alpha test.

Items	Cronbach's alpha test
Mothers' knowledge	0.82
Mothers' practice	0.86
Mothers' awareness	0.79

II- Operational design:

Preparatory phase:

The researcher reviewed past, current, local and international related literature reviews and theoretical knowledge of aspects of the study using books, articles, internet journals, scientific periodicals and magazines was done to develop the study tools and to be acquainted with the various aspects of the research problem.

Ethical Considerations:

The protocol was reviewed and accepted by the Research Ethical Committee of Faculty of Nursing/Ain Shams University. Each study subject was informed that the study is harmless. Confidentiality and anonymity of the obtained data was guaranteed of data was kept and all the gathered data was used for research purpose only. Oral acceptance was taken from each mother.

Pilot Study:

A pilot study was carried out at January, 2023 including 10% of the expected sample ($n=7$). It was conducted to test the validity, feasibility and applicability of the study tools and also to estimate the time needed by the researcher to complete each one for each study subject. Results of data obtained from the pilot study helped to modify the tools where some items were corrected, omitted or added as needed. The final form of the tools was then obtained and the time needed, for completing each tool was determined. All mothers and children involved in the pilot study were included later from the study.

Fieldwork:

The actual field work was carried out over 6 months from the first week of February, 2023 to the end of July, 2023. The mothers having children with imperforated anus were clearly informed about the aim and nature of the study.

The researcher was available in the above mentioned setting 2 days/week alternatively between two hospitals from 9 am. : 1 pm. Each mother was interviewed individually to gather the necessary data of the study. The researcher started by introducing herself to the mothers and gave her a brief idea about the study and expected outcomes. Questionnaire were filled by the researcher, mothers were interviewed from 30 to 45 minutes depending upon their physical and mental readiness.

Administrative design:

An official permission to carry out the study was obtained from Dean of the Faculty of Nursing, Ain Shams University to administrators of both study settings to conduct the study at the previously mentioned setting. The aim of the study and its expected outcomes were explained

Statistical analysis:

Data were entry to statistical package for social science (SPSS version 26) was used for statistical analysis. The collected data were categorized, organized, tabulated in tables using numbers and percentage, mean percentage and standard deviation. Chi-square (χ^2) test used to test the relation among studied qualitative variables, Person correlation coefficient (r) was used for correlation analysis, compare quantitative variables in the same group and correlation coefficient test was used to rank different variables against each other either positively or inversely. Statistical insignificance was considered at $P > 0.05$ and significance at $P < 0.05$.

Results:

Table (1): shows distribution of the studied mothers by their demographic characteristic, as regards their age 45.7% of them their age was ranged between 30<40 years, with a mean age of them were 31.25 ± 2.14 . Concerning mothers' education 52.8% of the studied mothers have basic education. Furthermore, 52.9% & 54.3% of mothers respectively were house wife & lives in rural areas, and 84.3% of them had insufficient income.

Figure (1): regarding total knowledge about imperforated anus, 78.6% of studied mothers had unsatisfactory knowledge. While, 21.4% of studied mothers had satisfactory knowledge toward care their children having imperforated anus.

Figure (2): illustrates that, as regards to total practices of studied mothers it was found that 51.4% were not done practices toward care their children having imperforated anus

Figure (3): highlights that, as regards to total attitude of studied mothers it was found that 20% were good awareness toward care their children having imperforated anus, 34.3% were average awareness. While, 45.7% of studied mothers were poor awareness

Table (2): clarifies that, there were statistical significant differences between total knowledge of the studied mothers and their characteristics namely; age, mothers' education, job, residence and family income.

Table (3): showed that, there were statistical significant differences between total practices of the studied mothers and their characteristics namely; age, education job and pregnancy monitored.

Table (4): indicates that 65.6% of studied mothers were age ranged between $30 \leq 40$ had poor awareness; there were statistical significant differences between total mothers awareness and their age and residence at <0.05 , while there were highly statistical significant differences between total mothers' awareness and their education, job and family income, at <0.001 .

Table (5): reveals that, there was a positive correlation between total mothers' knowledge, practices and awareness scores ($P \leq 0.05$) regarding to imperforate anus

Table (1): Distribution of studied mothers according to their characteristics (n=70).

characteristics	No.	%
Mothers age:		
-< 20	16	22.9
20 <30	22	31.4
30 ≥ 40	32	45.7
Mean ± SD	31.25 ± 2.14	
Mother education:		
Reading and writing	9	12.9
Basic education	37	52.8
Secondary school	21	30
University education	3	4.3
Mothers Job		
House wife	37	52.9
Worker	33	47.1
Residence		
Rural	38	54.3
Urban	32	45.7
Family income		
Sufficient	11	15.7
Insufficient	59	84.3

Figure (1): Percentage distribution of the studied mothers according to their total knowledge regarding care for their children has imperforated anus.

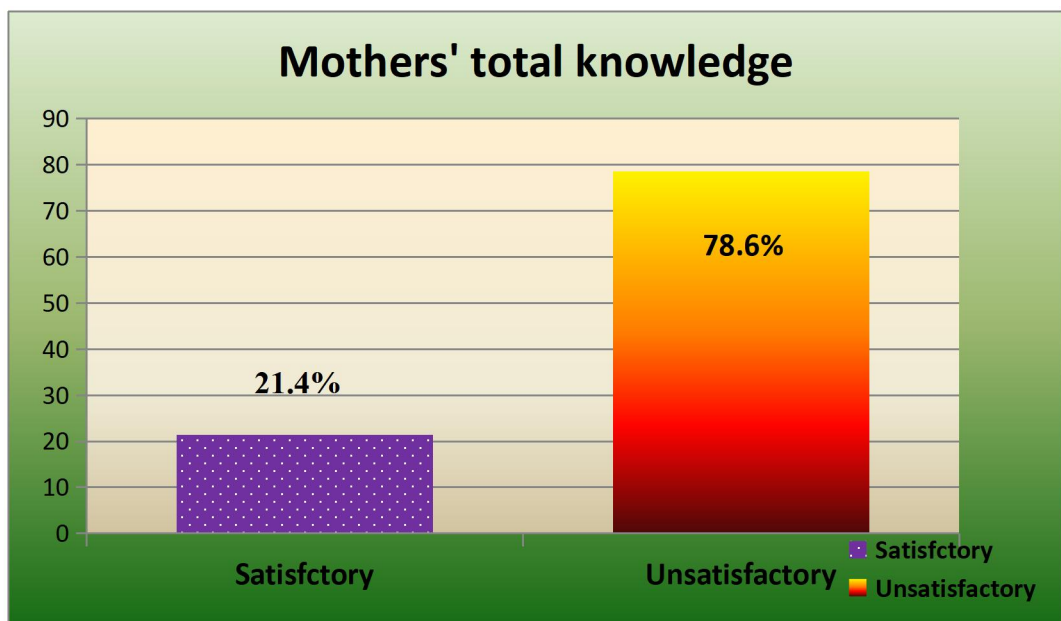


Figure (2): Percentage distribution of the studied mothers according to their total reported practices regarding care for their children has imperforated anus

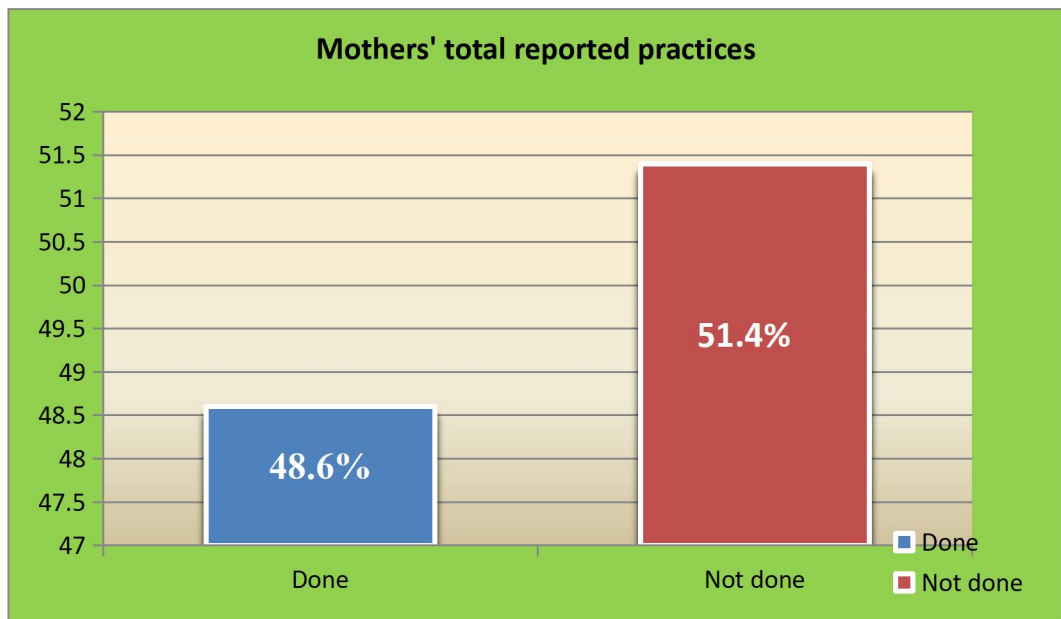


Figure (3): Percentage distribution of the studied mothers according to their total awareness regarding care for their children has imperforated anus.

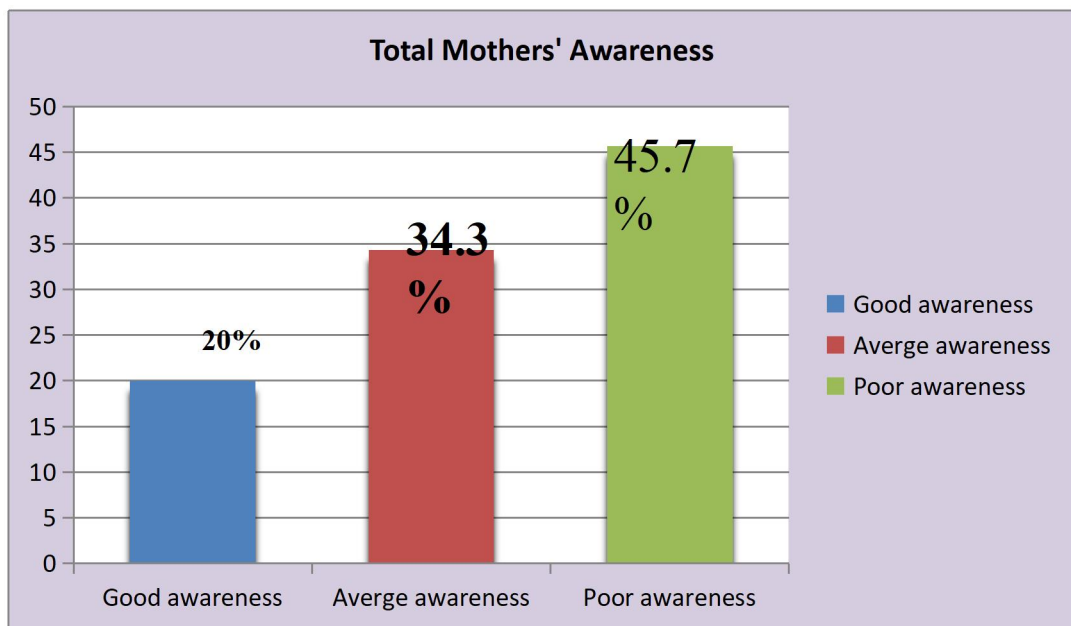


Table (2): Relation between studied mothers' characteristics and their total knowledge regarding to care of children with imperforated anus (n= 70).

Characteristics	Mother's knowledge				Chi-square P-value
	Satisfied n=15		Unsatisfied n =55		
	N	%	N	%	
Mother's age					
< 20	0	0.0	16	29.1	20.99 0.041*
20 <30	7	46.7	15	27.3	
30 ≤ 40	8	53.3	24	43.6	
Mother education:					
Reading and writing	0	0.0	9	16.3	28.61 0.001*
Basic education	7	46.7	30	54.5	
Secondary school	5	33.3	16	29.2	
University education	3	20.0	0	0.0	
Mother's Job					
House wife	3	20.0	34	61.8	29.37 .000*
Worker	12	80.0	21	38.2	
Residence					
Rural	13	86.7	25	45.5	27.52 0.001*
Urban	2	13.3	30	54.5	
Family income					
Sufficient	10	66.7	1	1.8	34.41 .000*
Insufficient	5	33.3	54	98.2	

Figure (3): Relation between studied mothers' characteristics and their total practices regarding care of children with imperforated anus (N=70).

Characteristics	Mother's reported practices				Chi-square P-value
	Done n=34		Not done n=36		
	N	%	N	%	
Mother's age					
< 20	2	5.9	14	38.9	28.09 .000*
20 <30	17	50.0	5	13.9	
30 ≤ 40	15	44.1	17	47.2	
Mother education:					
Reading and write	0	0.0	9	25.0	30.14 .000*
Basic education	21	61.8	16	44.4	
Secondary school	10	29.4	11	30.6	
University educ.	3	8.8	0	0.0	
Mother's Job					
House wife	23	67.6	10	27.8	28.5 0.001*
Worker	11	32.4	26	72.2	
Residence					
Rural	16	47.1	22	61.1	19.7
Urban	18	52.9	14	38.9	.001*
Family income					
Sufficient	8	23.5	3	8.3	21.43
Insufficient	26	76.5	33	91.7	.001*

* Statistical significant differences

Table (4): Relation between the mothers' characteristics and their total awareness regarding related to imperforate anus (n=70)

Characteristics	Mothers' Total Awareness						Chi-square	
	Good (n=14)		Average (n=24)		Poor (n=32)			
	No.	%	No.	%	No.	%	X ²	P value
Age/ years								
-< 20	2	14.3	7	29.2	7	21.9	11.20	0.05*
20< 30	9	64.3	9	37.5	4	12.5		
30≤ 40	3	21.4	8	33.3	21	65.6		
Mothers' education:								
Read & write			5	20.8	4		177.9 2	.001**
Basic education	0	0.0	13	54.2	19	12.5		
Secondary educ.	5	35.7	6	25.0	9	59.4		
University educ.	6	42.9	0	0.0	0	28.1		
	3	21.4				0.0		
Women's job:								
Worker	9	64.3	17	70.8	7	21.9	96.08 8	.001**
House wife	5	35.7	7	29.2	25	78.1		
Residence								
Rural	5	35.7	15	62.5	18	56.3	14.46	.05*
Urban	9	64.3	9	37.5	14	43.7		
Family income								
Sufficient	0	0.0	7	29.2	4	12.5	30.55	.001**
Insufficient	14	100	17	70.8	28	87.5		

Table (5): Correlation coefficient between total level of knowledge score, total practices score and total awareness of the studied mothers regarding to imperforate anus (n=70).

Items		Total score of knowledge	Total score of reported practices	Total score of awareness
Total score of knowledge	r		.643**	.586**
	P-value		0.000	0.000
Total score of reported practices	r	.559**		.447**
	P-value	0.000		0.000
Total score of awareness	R	.637**	.578**	
	P-value	0.000	0.000	

Discussion:

Mothers of infants and children with imperforate anus are generally very upset by the idea that their child needs to surgery and may be a stoma and frightened at the thought of ostomy care. With appropriate teaching and emotional support, mothers generally adapt well. Ensure that mothers know how to obtain supplies and seek help when they have questions or concerns. Support and teaching by skilled qualified nurses

at hospital have a significant impact on the child's and family's adaptation to the anomaly and stoma care if found (Coyne, 2020)

Regarding mothers' personal data the result of the current study showed that in mothers' age in the study obvious was ranged from thirty and forty years with mean 31.25 ± 2.14 . This result in the same line with Kadam, & Shinde (2018) who studied entitled "Effectiveness of structured education on caregiver's knowledge and attitude regarding imperforate anus care" and found that

the majority of respondents belonged to the age group of 31-40 years; on other hand the results of **Naser, (2019)** entitled "Assess the indications & complications of colostomy in children with imperforate anus who found that, most of mothers ranged from 20-35 years old.

As regards the educational level of the studied mothers, the current study illustrated that more than half of the studied mothers had basic education. This finding agreed with the result of the study done by **Mokhtar et al., (2017)** in a study entitled "Bowel function, mental health and psychosocial function in children: a review of etiological features, natural history, and management" who found that, more than half of the studied mothers had middle education. This result was in accordance with **Adams et al., (2020)** in a study entitled "Living with a chronic illness: measure of social functioning for children" who found that the majority of the studied participant were working. From the researcher's point of view, free mothers are usually assumed to be the caregiver in our culture. In addition, this finding was supported with **Kim et al., (2019)** who conducted a study to assess "Effects of social support and self-efficacy on the psychosocial adjustment of Korean imperforate anus children" in Korea; who found that the majority of the studied subjects had insufficient income in family and living in wing district.

Regarding total score of the studied mothers' knowledge, the current study represented that, more than three quarter of the studied mothers had unsatisfactory level of knowledge regarding imperforated anus while less than one quarter of them had satisfactory level of knowledge. This result agreed with **Young et al., (2018)** who conducted a study entitled "Childhood functional status, family stressors, and psychosocial adjustment among children with disabilities in United States", who concluded that, parents of children with imperforate anus had experienced suffering and many difficulties and psychological impairment associated with the malformation also, less satisfaction with medical care and support received had been insufficient. From the researcher point of view, poor knowledge level of the studied mothers might be due to lack of opportunity for attending programs, training courses and guideline booklet availability regarding imperforate anus.

Regarding total score of the studied mothers' knowledge, the current study represented that, more than three quarter of the studied mothers had unsatisfactory level of knowledge regarding imperforated anus while less than one quarter of them had satisfactory level of knowledge. This result parallel with a study conducted at Egypt in Menoufia University Hospital to assess mothers' knowledge and practice regarding colostomy care also similar with a study conducted by **Alpert, & Glatter, (2017)** they reported that mothers included in the study had unsatisfied level of knowledge regarding colostomy. From the investigator view; may be inadequate women knowledge can directly impact the care practices for children with imperforate anus. For instance, mothers with insufficient understanding may struggle with tasks such as post-operative care, managing complications, or recognizing warning signs.

Furthermore, this result agreed with **Young et al., (2018)** who conducted a study entitled "Parent advisory group in pediatric practice: parents' and professionals' perception", and concluded that, parents of children with imperforate anus had experienced suffering and many difficulties and psychological impairment associated with the malformation also, less satisfaction with medical care and support received had been insufficient. From the researcher point of view, poor knowledge level of the studied mothers might be due to lack of opportunity for attending programs, training courses and guideline booklet availability regarding imperforate anus.

From the researcher point of view; low scores of mothers needs to interventions to improve mothers' education and support regarding post-operative care for children with imperforate anus. Healthcare team play a critical role in providing clear instructions, addressing concerns, and monitoring children progress to ensure optimal recovery and long-term outcomes; Also, collaborative efforts between health care team & parents may be necessary to address the underlying factors contributing to suboptimal post-operative care practices and enhance the quality of care for affected children.

As regards total score of the mothers' practices regarding care for their children has imperforated anus, the current study reflected that half of studied mothers had not low level of

practice toward care their children having imperforate anus. This finding was in accordance to some extent with **Waheed et al., (2019)**, who found that, half of studied participant was average practice and its importance to address the barriers of proper care and could implementing interventions to improve participants' education and support in managing this condition.

From the researcher point of view, incompetent total level of practices regarding imperforate anus may be attributed to decline of mothers' knowledge, limited resources & training related to care the children with anomalies so they needs to educational sessions and the frequent demonstration of the related procedures during the period of the study

As regards to total awareness of studied mothers it was found that only 20% had good awareness toward care their children having imperforate anus, more than one third had average awareness. While, less than half of studied mothers were poor awareness. The researcher believes that; it is encouraging to note that 20% good awareness of the studied mothers towards caring for their children with imperforate anus. These mothers likely exhibit a strong understanding of the condition and its management, which may positively influence their care giving and outcomes for their children. Average awareness indicates a moderate level of understanding, there is still room for improvement in terms of knowledge and readiness to provide optimal care for their children with imperforate anus. Finally, poor awareness may lead to suboptimal caregiving practices, increased stress, and potentially negative outcomes for children with imperforate anus.

Concerning mothers' age, the association between age and mothers' knowledge; From the researcher point of view; younger mothers may have access to more recent information and resources, while older mothers may have accumulated experiences that influence their knowledge base so understand the age related difference can help to tailor an educational intervention to better meet the needs of different age groups.

Regarding mothers' education, the significant differences in knowledge based on mothers'

education levels highlight the importance of educational attainment in shaping maternal understanding. Mothers with higher levels of education may have better access to health information, critical thinking skills, and resources to comprehend complex medical conditions like imperforate anus. These results were in the same line with **Al Fasil, (2019)**, who studied "Knowledge, attitudes and practices regarding imperforate anus management of children admitted to surgery units in Khartoum State. And reported that, there was significant association of the studied participant with pre post intervention knowledge score regarding imperforate anus, the highly educated participant have more knowledge score. From the researcher point of view; efforts to improve maternal knowledge should consider educational disparities and prioritize targeted interventions for mothers with lower levels of education.

Regarding mothers' residence, the differences in knowledge based on residence urban vs. rural may reflect disparities in access to healthcare services, information, and resources. From the researcher point of view; urban mothers may have greater access to healthcare facilities, educational opportunities, and support networks compared to their rural counterparts so address the rural urban disparities in healthcare access and knowledge can help ensure equitable care for all mothers and their children with imperforate anus.

As regards mothers' family income: The association between family income and mothers' total knowledge underscores the role of socioeconomic status in shaping healthcare knowledge and access From the researcher point of view; higher family income may afford mothers greater resources, including access to healthcare, educational materials, and support services.

Regarding to age the association between age and mothers' practices suggests that different age groups of mothers may engage in varying levels of caregiving behaviors for children with imperforate anus. The result of the current study agrees with the result of a study conducted by **Poonguzhali et al., (2018)** aimed to assess the level of efficiency of instructional package on colostomy care among mothers in which most of mothers ranged from 20-35 years old, Younger mothers may exhibit different practices compared

to older mothers, influenced by factors such as access to information, personal experiences, or cultural beliefs. Understanding these age-related differences can help tailor support and educational interventions to better meet the needs of different age groups.

Regarding the mothers' education the significant differences in practices based on mothers' education levels that reflected that the role of educational attainment in shaping mothers, higher levels of mothers' education may have better access to healthcare information, critical thinking skills, and resources to implement recommended practices for caring for children with imperforate anus. (Marquis, & Huston, 2019) stated that, efforts to improve mothers' practices should consider educational disparities and prioritize targeted interventions for mothers with lower levels of education.

Regarding the relation between the mothers' characteristics and their total awareness among imperforate anus, the current study pointed that, 65.6% of studied mothers were age ranged between $30 \leq 40$ had poor awareness; there were statistical significant differences between total mothers awareness and their age and residence at <0.05 , while there were highly statistical significant differences between total women awareness and their education, job and family income, at <0.001 . As regards mothers' age and residence; Understanding these age and location-related differences can help to tailor educational interventions to better meet the needs of different characteristics.

Concerning correlation between mothers' total level of knowledge, reported practice and their awareness scores regarding to care of children with imperforate anus, the current study revealed that, there was a positive correlation between total mothers' knowledge, practices and awareness scores ($P \leq 0.05$). This result agreed with study done by Callery et al., (2018), who studied "Commentary of children undergoing surgery, preoperative information needs" and reported that, there was a positive correlation between total participant's knowledge, practices, and awareness score and the mothers who have a better understanding about imperforate anus are more likely to implement appropriate practices and demonstrate higher levels of awareness. From the researcher point of view; the importance of

comprehensive education, training and awareness of the mothers on the practice technique are a fundamental tools in preventing and minimizing the complication for their children with imperforate anus.

Finally, mothers need to comprehensive support, the nurses, doctors and health fields could give comprehensive support by programs that address knowledge gaps, promote appropriate caregiving practices, and awareness and understanding among mothers of children with imperforate anus. By addressing all components simultaneously, these programs can maximize their impact and empower mothers to provide the best possible care for their children.

As regards correlation between the studied mothers' knowledge and their reported practices regarding to care for their children have imperforated anus (table 24), the current study illustrated that, there was statistically significant positive correlation between studied mothers' total knowledge and their total reported practices regarding to mothers' care of their children with imperforated anus; This finding was the same line with (Bray, & Sanders, 2019), who studied "Preparing children with imperforate anus for stoma surgery" and reported that, the positive correlation suggests that mothers who possess a greater understanding of imperforated anus and its management are more likely to engage in appropriate caregiving practices for their children. This highlights the critical role of education in empowering mothers to effectively care for their children with this condition.

Promoting adherence to best practices: Healthcare providers can leverage this correlation to emphasize the importance of adhering to recommended care practices for children with imperforated anus. By reinforcing the link between knowledge and action, providers can encourage mothers to prioritize their child's care and follow evidence-based guidelines to optimize outcomes.

Continued support and education: The positive correlation underscores the need for ongoing support and education for mothers of children with imperforated anus. As new research emerges and treatment protocols evolve, it is essential to provide mothers with updated information and resources to ensure that they are

equipped to meet the changing needs of their children.

Statistically significant positive correlation between mothers' total knowledge and their reported practices regarding the care of children with imperforated anus highlights the critical importance of education in empowering mothers to effectively manage this condition. By leveraging this correlation, healthcare providers can develop tailored interventions to improve knowledge, promote adherence to best practices, and ultimately enhance the outcomes for children and families affected by imperforated anus.

Conclusion:

In the light of the study findings, it can be concluded that, total unsatisfactory mothers' knowledge about imperforated anus, total not done score practices and total poor awareness score of studied mothers, there was a positive correlation between total knowledge and practices and awareness. These study findings were supported the study research questions.

Recommendations:

- Raising awareness of mothers by open communication and an interaction between healthcare professionals and mothers
- In-service training program to enhance mothers' skills among caring for children with imperforate anus, including tips for managing bowel movements, preventing infections, and ensuring proper hygiene.
- Encourage mothers to open communication to seek the guidance from healthcare professionals experienced in managing imperforate anus.
- Offer counseling services or connect them with support groups where they can share experiences and receive emotional support from others in similar situation.

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