Impact of Pre-Operative Instructions Regarding Hypospadias Repair on Mothers' Knowledge, Practices and Selected Post-Operative Outcomes

Rania Atef Abd El-Salam[1]; Mohamed Fathy Mohamed [2]; Nagat Farouk Abolwafa [3]; Shaima Shaban Mohamed4

1. B.Sc. Nursing, Faculty of Nursing - Minia University.
2. Assistant professor of Pediatric surgery, Faculty of medicine , Minia University
3. Assistant Professor of Pediatrics Nursing, Faculty of Nursing, Minia University.
4. Lecturer of Pediatric Nursing, Faculty of Nursing, Minia University.

Abstract

Background: Hypospadias is one of the commonest conditions seen in pediatric urology practice, genetic and environmental factors play a significant role in its etiology. Post-operative nursing care of hypospadias repair is directed toward preventing infection and instructing parents in home care of the child .**Aim of the study:** The aim of the current study was to evaluate the impact of pre-operative instructions regarding hypospadias repair on mothers' knowledge, practices and selected post-operative outcomes. **Research design:** Quasi-experimental research design (pre-posttest) was used in the current study. **Setting:** The current study was conducted at in-patient surgery unit at Minia university hospital for obstetric and pediatric, which located in Minia city. **Subjects:** A purposeful sample of 100 mothers of children with hypospadias was participated in the study. 50 for (study group) and 50 for (control group). **Research tools:** Tool (I): A structured interview questionnaire: it covered sociodemographic data of mothers and data of child and mothers' knowledge about hypospadias repair; Tool (II): Observational checklist about diaper care; Tool (III): Post-operative outcomes assessment record. **Results:** It was illustrated that vast majority of mothers in the study group had satisfactory level of knowledge about hypospadias repair compared to minority in control group in post/test with highly statistically significant differences P-value at 0.001. As well as almost of the mothers in the post-test in the study group had appropriate level of practice in relation to diaper care. On the other hand, minority of children in the study group had less postoperative complication at the first postoperative day, 7th day after surgical repair and at 1st month of surgical repair compared to control group.**Conclusion:** The study concluded that the preoperative instructions for mothers of children with hypospadias were effective by means of marked improvement of knowledge, practices and selected post-operative .**Recommendation:** The study recommended that developing continuous training session to pediatric surgical nurses and educational sessions for mothers about preoperative instructions regarding hypospadias repair would improve mothers' knowledge, practices and selected postoperative outcomes.

Keywords: Hypospadias repair, Mothers, Knowledge, Practices, and Postoperative Outcomes.

Introduction

Hypospadias is a developmental anomaly characterized by a urethral meatus that opens onto the ventral surface of the penis proximal to the end of the glans, the meatus may be located anywhere along the shaft of the penis from the glans to the perineum **(Roychoudhury, 2019).**This leads to arrest in standard growth of the penile urethra, foreskin, and penile ventral aspect, and cause different abnormalities, the urethral opening can be presented anywhere along the penis ventral shaft, within the scrotum, or even in the perineum. And also, hypospadias is associated with a ventral curvature of the penis, or chordee **(Hassouna, et al., 2020).**

Hypospadias is one of the most common congenital anomalies with an incidence reported to be 1 in 300 males (0.3%), the recurrence rate is approximately 13 times greater in first degree relatives including brother, father, or son **.**Both genetic and environmental factors have been associated with hypospadias, the severity of hypospadias is based on the position of the urethral opening and the degree of ventral curvature of the penis (**Hockenberry & Wilson, 2018).**

Presentation of hypospadias is variable, ranging from mild forms with the meatus located at the corona (distal) to severe forms with the meatus in the perineum (proximal) **(Gong & Cheng, 2017)** . A more recent classification indicates the site of urethral meatus which divided into distal penile hypospadias 75%, proximal hypospadias 15%, and glanular 10%, and also the site of the urethral meatus may be before and after chordee correction, the prepuce (incomplete or complete), the glans (cleft, incomplete cleft or flat), the width of urethral plate, the degree of penile rotation if present and the presence of scrotal transposition **(Hadidi, 2017)**.

Causes of hypospadias remain unknown, several ways have been explored to explain this congenital defect of the genital organ, one of these factors include endocrine disorders such as insufficient secretion of androgens or insufficient response by the target tissues, and also there are several causes of hypospadias such as genetic disorders may be found in several members of the same family, young and old age of mothers, low-birth-weight babies and twins, placental insufficiency, environmental factors such as estrogen like molecules, pesticides, and fertilizers **(Renaux, et al ., 2019).**

The choice of surgical procedure is affected primarily by the severity of the defect and the presence of associated anomalies .The preferred time for surgical repair is 6 to 12 months of age, before the child has developed body image. The principal objectives of surgical correction are, to enhance the child's ability to void in the standing position with a straight stream, improve the physical appearance of the

genitalia for psychological reasons, and to preserve asexually adequate organ **(Lisa, et al., 2019).** Repair is challenging owing to the variable anatomy and quality of the urethral plate. Those children with fibrotic and deficient urethral plates often require staged repair with urethral plate augmentation with preputial or buccal tissue **(Gong & Cheng, 2017).**

Complications occur in 10% of cases, include urethrocutaneous fistula which is the most common complication, the principles of its repair are to rule out distal obstruction and perform multi-layer repair with a fascial layer interposed to prevent overlapping suture lines. Another complication is excess penile skin which needs excision for adequate cosmesis, it is removed at least 6 months post-operatively to let the wounds fully recover, the stricture of the neo –urethra, urethral diverticulum, persistent chordee are considered rare complication, but if present repair may be delayed until after adolescence .Which is the time of the penis to stop growing **(John, etal., 2020)**.

Pediatric nurse has very important role in monitoring vital signs , encourage fluid intake to maintain adequate urine output, maintain patency of stent , monitor intake and output , observe the urine for cloudiness or a foul odor, and notify the pediatric surgeon if there is any abnormality , instruct the parents in the care of child who has stent or urinary diversion to avoid giving the child a tub bath until the stent is removed and the importance of follow up for dressing removal after surgery **(Linda& Angela , 2019)** .

Significance of the study

Hypospadias is one of the commonest conditions seen in pediatric urology practice, genetic and environmental factors play a significant role in its etiology. There is a wide variation in the prevalence reported from a variety of studies however most report between 5 and 50 per 10,000 live births , most are diagnosed at birth and some when circumcision is attempted**(Springer ,etal. ,2016).**

The incidence of meatal abnormalities associated with hypospadias varies from 9.6% to 31%.The meatal stenosis is the most common, affecting 9.1– 16.7% of children **(Pan, 2019).**Congenital anomalies are estimated to be the fifth leading cause of death in fewer than 5 year old globally**.** And also it can affect an estimated 1 in 33 infants, resulting in 3.2 million children with disabilities related to birth defects every year **(WHO, 2019)**.

Post-operative nursing care of hypospadias repair is directed toward preventing infection and instructing parents in home care of the child, including pain control, cleansing the operative site of stool and urine, observation of the wound for complications and activity restriction are discussed, the child should avoid vigorous sports activities and use of toys that are straddled for 2 weeks postoperatively **(Hockenberry & Wilson, 2018).**Parental especially mothers involvement in quality of care related to hypospadias repair is very important. It is proved that the child recover earlier when the parents involved in care. Mothers need information about the admission, the procedure itself, possible complications, and both the short and long-term surgical outcomes within individual units **(Mohamed, 2019).**

There are a few studies in urogenital system disorders especially hypospadias in Egypt, when reviewed the registration office in Minia university hospital for obstetric and pediatric I found that the number of children with hypospadias was 100 cases in- the last year 2019, this number is large among other types of congenital anomalies , as well as the mothers have lack of knowledge and practices about care of child with hypospadias repair which may lead to post-operative complications for a child , for these reasons, this study will be designed to improve mothers' knowledge and practices about care of child with hypospadias repair and prevent post- operative complications.

Aims of the Study

The aim of the current study was to evaluate the impact of pre-operative instructions regarding hypospadias repair on mothers' knowledge, practices and selected postoperative outcomes.

Research hypotheses

- Mothers of children with hypospadias who will receive pre-operative instructions about hypospadias repair will have better knowledge and practice than mothers in the control group.
- Children of mothers who will receive the pre-operative instructions will have less post-operative complications than children in the control group.

Subjects &Methods

Research Design:

Quasi-experimental research design (pre-posttest) was used in the current study. .Quasi-experimental research design examines whether there is a causal relationship between small independent and dependent variables. It involves the manipulation of an independent variable without the random assignment of participants to conditions or orders of conditions **(Grove & Gray, 2018).**

Setting:

The current study was conducted at in-patient surgery unit at Minia university hospital for obstetric and pediatrics, which located in Minia city. It serves Minia governorate and affiliated to Minia University, it received about 200 children annually. The in-patient surgery unit composed of one floor, and the floor consisted of two rooms, each room includes eight beds, In-patient surgery unit provide the children with many services like treatment, surgical operations, laboratory investigations, and outpatient follow-up.

Subjects:

A purposeful sample of 100 mothers of children with hypospadias was participated in the study. The sample divided into two equal groups: 50 for (study group) those mothers of children with hypospadias who were exposed to pre-operative instructions and 50 for (control group) those mothers of children with hypospadias who were exposed to routine hospital care.

Inclusion criteria:

- Children who have one stage surgical repair of hypospadias.
- Children aged from 6 months to 4 years.
- Mother should be the primary caregiver that accompanied with the child in the hospital.
- Pre & post-operative child.

Exclusion criteria:

- Children with recurrent hypospadias.

Data collection tools:

Three tools were used for both control and study group and included the following:

Tool (I):- A structured interview questionnaire, it was designed by the researcher after extensive review of related recent literature.It composed of these parts:

Part (I):(A)- **Sociodemographic** characteristics of mothers such as, age, level of education , place of residence , presence of consanguinity, degree of consanguinity.

Part (I):(B)- Bio-demographic data related to the child affected with hypospadias such as age, family history of hypospadias, history of circumcision.

Part (II): It included questions related to mothers' knowledge about hypospadias and consisted of 33 questions, adapted from **(Mohamed,2019**), and some modification is done by researcher , it includes (definition of hypospadias , signs &symptoms of hypospadias , signs and symptoms of wound infection , post-operative care (time of discharge from hospital , time of removing of surgical dressing , care of the urinary stent ,double diapering technique, diet , hygiene ,medications , activity of child ,when to call the doctor) .

Knowledge scoring system: - The score 1 was given for (correct answer), and zero for (incorrect answer) or (I don't know) and total knowledge score of less than 50% considered as unsatisfactory, while score of 50% and more considered as satisfactory.

Tool (II): Observational checklist about diaper care, it included (14 items) to evaluate mother's practice adopted from **(Mohamed, 2019**).

Practice scoring system: - Done practice scored as 1, and not done practice scored as zero. The level of practices is classified as total practice score of less than 50% considered as unsatisfactory, while score of 50% and more considered as satisfactory.

Tool (III):- Post-operative outcomes assessment record adopted from **(Soheir, etal., 2018)** for the purpose of follow-up of all children (study and control group) starting from the first day post-operative until one month post-operatively.

The recording sheet was divided into three sections:

- At the first postoperative day (immediate):to evaluate early complications such as bleeding and fever
- At the 7th day after surgical repair (at the time first dressing removal) to evaluate early complications such as wound infection, bruising, graft necrosis, wound dehiscence, urinary obstruction, burning on urination and falling of the urinary catheter .
- At 1st month of surgical repair, three items was evaluated;
    - The first is late complications such as fistula, meatal stenosis, and urethral obstruction.
    - The second one is the post-operative functional outcome through assessing the stream of urination (one direction or interrupted).
    - The third one is cosmetic appearance by assessing the children' penis postoperatively and comparing its appearance with normal appearance of penis made by assessing shape of glans, shape of meatus and shape of penile skin and straight penile axis.

Validity and Reliability of the Tools

The content validity of the tool was performed by a jury of 5 experts in the field of pediatric nursing and pediatric surgery. Tools were examined for content coverage, clarity, relevance, applicability, wording, length, format, and overall appearance. Based on experts` comments and recommendations modifications were made. The internal consistency was measured to detect the extent to which the items of the tools measure the same concept and correlate with each other. Cronbach's alpha coefficient was used to assess the internal consistency of the tools were .0.835 & 0.872, respectively.

Pilot study

The pilot study was conducted on 10% (10 mothers) who met the inclusion criteria, was done to ensure the feasibility, objectivity, applicability, clarity, adequacy, content validity, and internal consistency of the study tools and to determine possible problems in the methodological approach or the tools. The results of the pilot study were used to test the proposed statistical and data analysis methods. The tools were completed without difficulty, adding support to the validity of the tools, little modification was done, e.g., rephrasing and rearrangements of some sentences. The time required for completion of the interview questionnaire didn't exceed 30 minutes. Mothers involved in the pilot study were included in main study sample.

Data collection procedure

Administrative approval was obtained from the Dean of Faculty of Nursing, Minia University to the manager of hospital before implementation of the study. An objective of the study was explained to the manager to gain cooperation and to allow meeting with the mothers. The time of data collection is 6 months from beginning of October to the end of March 2020-2021 .The researcher was introduced herself to children' mothers at the day of surgical operations, was wearing protective mask and follow appropriate distance when interviewing mothers . All protective procedures were taken during interviewing mothers.

An oral consent was taken from each mother after complete description of the purpose and nature of the study then the researcher was filled the questionnaire sheet from mothers to collect the personal data about mothers and their children in both study and control groups, then all mothers were exposed to the pre-test sheet tool (1) ,tool (2) ,after that the prepared pre-operative instructions was explained to the mothers in the study group at the day of operation through four educational sessions each session took about 20-30 minutes on individual basis and sometimes for a group of mothers ranged from 2 to 4 mothers.

Arabic illustrated pre-operative instructions about appropriate post-operative care for the child after surgical repair of hypospadias was prepared by the researcher and it was given and explained to the mothers in the study group. It included simple instructions about (dressing, care of urinary stent, diaper care, prevention of urinary obstruction, medications, hygienic care, diet, fluid intake and activities, and when to call the doctor). To facilitate understanding, an

instructional illustrated Arabic booklet and re-demonstration of practice on a doll was done.

At the first day after surgical correction and at the 7th day which is the first time of dressing removal, the researcher observed and recorded the early post-operative complication as mentioned in tool (III). The late post-operative complication, the functional and cosmetic outcomes was observed and recorded through post-operative outcome assessment record (by 1stmonth after surgical operation). Mothers' knowledge and their practices were evaluated at 1st week after surgical operation, post/test was done at 1st week after surgical repair for the mothers'to evaluate the effect of preoperative instructions.

Ethical Consideration

A written initial approval was obtained from the research ethical committee of the faculty of nursing, Minia University. Oral informed consent was obtained from the mothers who participated in this study. Each assessment sheet was coded and mother's name was not appear on the sheets for the purpose of anonymity and confidentiality, The researcher explained the purpose and nature of the study through direct personal communication before starting their participation in the study. These data were confidential and were used for the research only. The study followed the common ethical consideration to participate in clinical research, and privacy was assured during data collection. Anonymity and privacy were assured through coding the data, and mother has the right to refuse participation in the study without any rationale. The researcher also informed the mothers about their rights to withdraw from the study at any time without giving any reason and without any effect on the care of their children.

Results

Table (1): Comparison between the Study and Control Group of Mothers regarding their Socio -Demographic Characteristics (n= 100).

Socio Demographic Characteristics of mothers	Groups				Test of significance	
	Study (n=50)		Control (n=50)		X^2/ fisher	P. value
	N	%	N	%		
Age / years						
Less than 20 yrs.	1	2.0	0	0.0	5.698	0.18 NS
20-30yrs.	41	82.0	39	78.0		
31-40yrs.	8	16.0	11	22.0		
More than 40 yrs.	0	0.0	0	0.0		
Mean ± SD	27.9± 5.1		28.3 ± 9.2			
Level of education						
Not read and write	13	26.0	21	42.0	5.154	0.16 NS
Read and write	9	18.0	11	22.0		
Secondary	18	36.0	14	28.0		
University	10	20.0	4	8.0		
Residence						
Rural	8	16.0	1	2.0	5.983	0.10 NS
Urban	42	84.0	49	98.0		
No of children						
1-3 children	40	80.0	32	64.0	3.704	0.15 NS
4-6 children	10	20.0	17	34.0		
More than 6 children	0	0.0	1	2.0		

NS= Not statistically significant differences

Table (1) : It was found that 82% of mothers'age in the study group ranged between 20-30 years old and while the age of 78% of the mothers in the control group ranged between 20-30 years old and the mean of their ages was 28.3 ± 9.2 and 27.9± 5.1, respectively . Regarding to mothers level of education it was found that 36% of the mothers in the study group have secondary school otherwise 42% of mothers in the control group did not read or write. The same table revealed that the majority of mothers in study group and control group (84 % , 98%); respectively came from urban area. In addition, 80% of mothers in the study group and 64% in control group had 1-3 children.

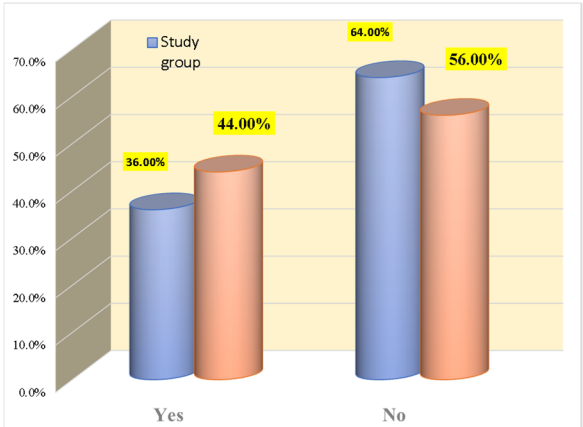

Figure (1) Percentage Distribution of Consanguineous Marriage among Parents

Figure (1) Illustrated that more than one third and more than two fifths of the study and control groups (36% and 44%); respectively have consanguineous marriage, however a relatively high percentage of non- consanguineous marriage in study and control groups (64% and 56%); respectively.

Table (2): Comparison between Study and Control Groups of Children regarding their demographic Characteristics *(n= 100).*

Child's demographic characteristics	Groups				Test of significance	
	Study(n=50)		Control (n=50)		X^2/ fisher	P. value
	N	%	N	%		
Age / years						
6 months -<1year	13	26.0	12	24.0	18.63	0.22
1year- < 2yrs	16	32.0	14	28.0		NS
2yrs-<3yrs	8	16.0	10	20.0		
More than 3 years	13	26.0	14	28.0		
Mean ± SD	4.5± 10.1		3.5 ± 16.3			
Family History of Hypospadias						
Yes	6	12.0	9	18.0	0.706	0.28
No	44	88.0	41	82.0		NS
If Yes, whom had the history of Hypospadias						
Father	2	4.0	2	4.0	3.120	0.39
Brother	0	0.0	3	6.0		NS
Uncle	4	8.0	4	8.0		
History of circumcision						
Done	3	6.0	4	8.0	.154	0.50
Not done	47	94.0	46	92.0		NS

NS= Not statistically significant differences

Table (2): Showed that 32% of children in the study group their ages ranged between **1-< 2yrs** while 28% of children in the control group their ages ranged **1year- < 2yrs** with mean age ±SD, 4.5± 10.1and 3.5 ± 16.3 respectively. In addition, 88% of children in the study group and 82% in the control group had no family history of hypospadias. Meanwhile, 94% of children in the study group and 92% in control group didn't have been circumcised before hypospadias repair, with no statistically significance differences between the study and control groups.

Table (3): Comparison between the Total Level of Mothers' Knowledge at Pre and Post- Test Program in Study and Control Group (n=100)

Total mothers' knowledge in pre and post - test program	Groups				X2	X2
	Study (n=50)		Control (n=50)			
	N	%	N	%	P.value	P. value
Total knowledge in pre program						
Un satisfactory (Less than 50%)	49	98.0	50	100.0	1.010	0.315
Satisfactory (50% and more)	1	2.0	0	0.0		
Total knowledge in post program						
Un satisfactory (Less than 50%)	3	6.0	47	94.0	77.44	0.001**
Satisfactory (50% and more)	47	94.0	3	6.0		

NS= Not statistically significant differences ** statistically significant difference at < 0.01

It was clear from **(table 3)** that ,98% of mothers in the study group, compared to 100% in the control group have un satisfactory level of knowledge in pretest, while in posttest 94% of mothers in the study group compared to 6% in control group have satisfactory level of knowledge with statistically significance difference P-value at 0.001.

Table (4): Comparison between the Total Score of Mothers' Practice at Pre and Post- Test Program in Study and Control Group (n=100)

Total score of mothers practice in pre and post program	Groups				X2 P. Value	X2 P. Value
	Study (n=50)		Control (n=50)			
	N	%	N	%		
Total practice in preprogram						
Un satisfactory (Less than 50%)	11	78.0	9	82.0	0.250	0.617
Satisfactory (50% and more)	39	22.0	41	18.0		
Total practice in post program						
Un satisfactory Less than 50%	0	0.0	0	0.0	…….	1.000
Satisfactory 50% and more	50	100.	50	100		

NS= Not statistically significant differences

Table (4): cleared that 78% of mothers in the study group compared to 82% in the control group have un satisfactory level of practice in pretest. On the other hand 100% of mothers in the study and control group have satisfactory level of practice in post /test.

Table (5): Comparison between Study and Control Group regarding Post- Operative Outcomes at First day and 1st week (*n= 100).*

Outcomes at 1st day post- operative	Groups				Fisher P. value
	Study (n=50)		Control (n=50)		
	N	%	N	%	
Bleeding					
YES	4	8.0	5	10.0	0.122
No	46	92.0	45	90.0	0.726
If yes, severity of bleeding (no= 2)					
Mild (red coloring of the dressing)	4	8.0	5	10.0	…….
Sever (blood oozing& drippling on child thighs clothes)	0	0.0	0	0.0	…….
Fever					
Not present	46	92.0	40	80.0	2.99
Above normal	4	8.0	10	20.0	0.07
Outcomes at first week postoperative					
Wound infection					
Present	3	6.0	6	12.0	0.487
Not present	47	94.0	44	88.0	0.295
Bruising					
Present	0	0.0	1	2.0	1.10
Not present	50	100.0	49	98.0	0.50
Wound dehiscence					
Present	2	4.0	3	6.0	0.20
Not present	48	96.0	47	94.0	0.50
Urinary obstruction					
Present	5	10.0	10	20.0	1.96
Not present	45	90.0	40	80.0	0.13
Flap necrosis					
Present	2	4.0	2	4.0	……
Not present	48	96.0	48	96.0	……..
Other complication					
None	37	74.0	24	48.0	8.34
Burning	10	20.0	15	30.0	0.02*
Urinary stent fall	3	6.0	11	22.0	

NS= Not statistically significant differences ** statistically significant difference at < 0.01

Table (5):- The above table reveals that 92%and 90% of children in the study and control group respectively have no bleeding in first day post-operative. As well as 92% of children in the study group, compared to 80% in the control group have no fever in the first day post -operative. While in the 1st week post-operative 94% of children in the study group, compared to 88% in the control group haven't expose expose to wound infection. Furthermore 100% of children in the study group and 98% in the control group did not expose to post -operative wound bruising, while (96% and 94%); respectively did not expose to wound dehiscence. On addition, the vast majority of children in the study group and control group (90%, 80% respectively) did not expose to urinary obstruction. Wherever 96% of children in both groups did not expose to graft necrosis with no statistically significance differences. On the other hand, the minority of children in the study group and control group (6%, 22% respectively) did not have been exposed to burning sensation during urination or urinary catheter fall with statistically significance difference P. value at 0.02.

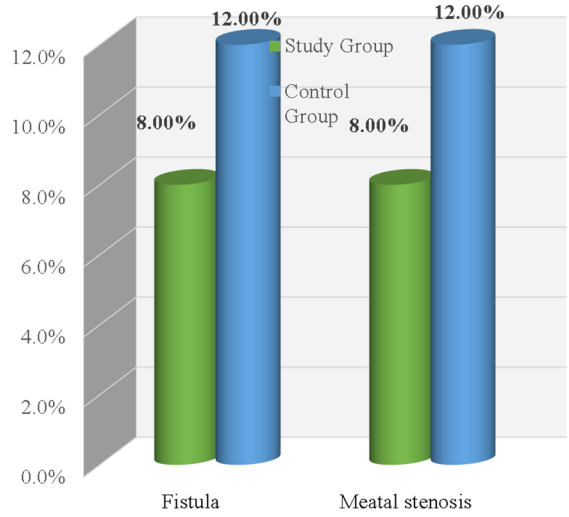

Figure (2): Post- Operative Complications at 1st month

Figure (2): It was clear from figure 2 that the minority of children in the study and control group (8% versus 12% respectively) suffer from fistula at 1st month post-operative with no statistically significant differences. While, 8% versus 12% respectively, suffer from meatal stenosis with no statistically significant differences.

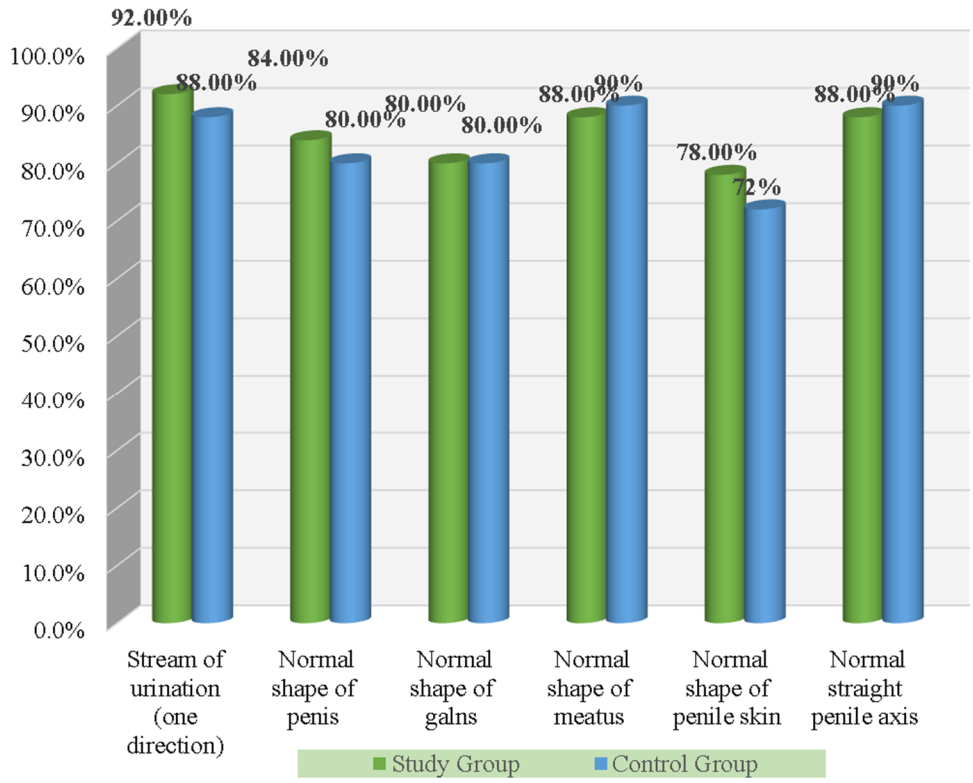

Figure (3): Post- Operative Functional and cosmetic outcomes.

Figure (3): Cleared that, 92% compared to 88% of children in the study and control group respectively had one direction of urine stream, while 84% and 80% respectively had normal cosmetic appearance and 80% of children in both groups had normal shape of glans. Furthermore, 90% of children in the both groups had normal shape of meatus. In addition, 78% of children in the study group had normal shape of penile skin, versus 72% in the control group with no statistically significant differences.

Discussion

Hypospadias surgery remains very challenging, with a significant rate of complications even in the best hands. The incidence of complications can be reduced by particular preoperative instructions; actually, mothers of children with hypospadias need to improve their knowledge and practices to reduce postoperative complications **Mohamed, (2019).**

The results of the current study assured that the majority of mothers in the study and control group their age ranged from 20-30 years old, this result was congruent with the study of **Mohamed, et al., (2018)** about effect of preoperative instructions for mothers on selected postoperative outcomes among their children with hypospadias, and indicated that, the highest percentage of mothers in the study and control groups their age ranged from 25 to less than 30 years.

The current study results assured that, one third of mothers in the study group had secondary school education ,otherwise two fifth of mothers in the control group didn't read or write these results were incongruent with the study by **Mohamed, (2019)** about effect of pre-designed instructions for mothers of children with hypospadias on reducing postoperative complications, who showed that, 30% in the control group were illiterate, and only 3,3% were university educated in both groups.

The results of the current study illustrated that there was a relatively high percentage of non- consanguineous marriage in the study and control group , it was less than two thirds in study and more than half in control groups, also the majority in the study group and almost of mothers in control group came from urban area .This result was consistent with the study of **Al-Tamimi Al-Quraishi and Naji, (2019)**about maternal and fetal risk factors associated with hypospadias in a sample of Iraqi boys, who indicated that, 33.33% of women among cases have consanguineous marriage compared to 14.29% among controls . And also inconsistent about the residence in cases and controls was (45.24%) and (23.81%) came from rural area respectively, indicating that the rural dwelling of boys' mother significantly increased the risk of hypospadias.

The results of the current study assured that less than one third of children in the study group their ages ranged between1-2 years and the mean of their age was 4.5± 10.1, while more than one quarter of children in the control group their ages between (1y-2y and 3y-4y) and the mean of their age was 3.5 ± 16.3. These results were supported with a study done by **Roychoudhury, (2019)** about clinical study of complications of Snodgrass urethroplasty for hypospadias, and proved that, the highest number of children their ages ranged between 1-4 year of age.

The study results were contradicted with **Rasool, (2019)** about Outcome of hypospadias surgery in children stated that, the majority of children presented after 5 years of age perhaps due to unawareness about the problem among parents or due to the cosmetic nature of problem with anterior hypospadias. Most surgeons recommend doing surgery between 6-18 months, because between 18 months to 2.5 years of age child is hyperactive and it's very difficult to retain urethral stent for about a week.

The current study clarified that the highest percentage of children had distal penile hypospadias in the study and control group (more than half & less than two thirds); respectively. These results were supported with a study done by **Sheikh, Latif and Ahmed, (2019)** about hypospadias repair on 134 child stated that, sixty three (70 %) had distal hypospadias (glanular, coronal, subcoronal, distal penile) without chordee.

As regard to family history of hypospadias, the results of the current study assured that, the majority of children in the study and control group had no family history of hypospadias. These results were supported with a study done by **Yadigar, Abbas and Aljomaily, (2019)**, who studied tubularized incised plate (Snodgrass) urethroplasty as the surgical technique of choice for repair of distal and midshaft hypospadias in Tikrit Teaching Hospital, who indicated that, a positive family history was found in 9 cases (15%) from these first degree relative in 6 cases (10%) and second degree relative in 2 cases (3%).

The current study results revealed that almost of mothers in the study and control group had unsatisfactory level of knowledge before receiving the preoperative instructions, but in post/test the vast majority of mothers in the study group had satisfactory level of knowledge versus vast majority in the control group had un satisfactory level of knowledge .

The current study results indicated that the mothers who received preoperative instructions show improvement in their knowledge in post/test, this is due to the effectiveness of these instructions for the mothers compared to mothers in the control group

The study results were consistent with the study of **Mohamed,etal.,(2018)** ,who found in their study that 100% of mothers in the control group still have unsatisfactory level of knowledge, but after implementation of the preoperative instructions, it was evident that 100% of mothers in the study group had satisfactory level of knowledge. And also, the study by **Mohamed, (2019)** cleared that, the majority of mothers in control group and all in the study group had inadequate level of knowledge about hypospadias in pre-test. As regards post-test; almost all mothers (86.7%) in the control group had inadequate level of knowledge, although the same percentage (43.3%) in the study group had high and adequate level of knowledge about hypospadias.

In addition, the current study results were supported with a study done by **Mohamed, (2019)**, who indicated that, 90% of mothers in the control group and 100% of mothers in the study group had inadequate level of knowledge about hypospadias in the pre-test, and in post-test 86,7% mothers in the control group had inadequate level of knowledge, but the same percentage 43,3% in the study group had high and adequate level of knowledge about hypospadias.

The results of the current study show that the majority of mothers in the study and control group had unsatisfactory level of practice in pretest regarding performing diaper care correctly, compared to all of mothers in both groups had satisfactory level of practice in post/test and almost of those mothers were performed the procedure correctly, so there were highly statistical significant difference between pre and post-test regarding mother's practices. The current study result was agreed with **Marrocco, et al., (2014)** about Hypospadias Surgery: a 10-year Review, they stated that, 95% of mothers receiving pre designed instructions reported a significant improvement in the daily care at 4th and 5th day after surgical repair.

As regard to first post-operative day complication among children in the study and control group, the study results showed that the minority of children in both groups exposed to mild bleeding. The study result was consistent with the study done by **Makki, et al., (2020)** on 187 children to assess the outcome of limited urethral mobilization urethroplasty for anterior hypospadias; they proved that immediate post-operative bleeding occurred in one patient which has to be secured under general anesthesia.

The result of the current study revealed that the minority of children in the study and control group exposed to fever with slight increase in children in the control group. This result was supported with **Weed and Baddour (2015)** about Postoperative fever who indicated that, fever above 38ºC is common in the first few days after major surgery. Most early postoperative mild fever is caused by the inflammatory stimulus of surgery and resolves spontaneously.

As regard to complications by 1st week, the current study results revealed that, wound infection occurred among children of the study group less than those in the control group. These results were contradicted with a study done by **Nyongole and Mgaya (2020)** about single center experience of hypospadias repair and found that, wound infection in the surgical site was the commonest complication.

The current study results revealed that, the minority of children in study & control group exposed to wound dehiscence with slight increase in children of the control group. These results was incongruent with the results of **Chou, et al., (2019)**, who studied one-stage urethroplasty for hypospadias in pediatrics–single surgeon's experience and indicated that, the incidence rates of dehiscence and fistula were only half in group I and 19.5% in group II.

In addition, the study results were supported by **Asgari, et al., (2015)** about the effects of parenteral testosterone administration on the results of hypospadias repair in 182 children, and indicated that, no child in the study group exposed to post-operative wound dehiscence, compared to small number in control group.

It was evident from the current study results that, the urinary obstruction occurred among children in the study group less than those in the control group. These results contradicted with the result of **Hassouna, etal., (2020)** ,who studied Mathieu repair compared to Snodgrass repair and their effect on distal hypospadias, and found that urinary obstruction was noticed in two patients ,one of each group.

The current study result show that, the flap necrosis occurred among small number of children in both groups. These results were inconsistent with the result of **Jawale,(2017**),who studied ten commandments of hypospadias surgery, and indicated that, flap necrosis was developed in half of cases.

It was evident from the current study results that urinary stent fall occurred among small number in the study and control group with slight increase in children of the control group, these results were consistent with a study done by **Maher, Chasapi and Dalal, (2017)** about hypospadias: an algorithm for repair with the aid of the microscope in 102 patients, their study result proved that, two cases only experienced dislodged/snapped catheters.

Regarding late post-operative outcomes at 1st month , the current study results showed that, the minority of children in the study and control group exposed to urethrocutaneous

fistula with slight increase in children of the control group , these results were supported with a study done by **Sheikh, Latif and Ahmad, (2019)** they indicated that, small number patients with distal hypospadias experienced urethrocutaneous fistula .In addition , the study by **Elbakry, et al .,(2016)** about Tubularized incised-plate versus tubularization of an intact and laterally augmented plate for hypospadias repair in Egypt, who proved that, both groups of TIP repair and laterally augmented plate repair had fistula(9.8% & 2.8%);respectively.

And also, the finding of the current study was incongruent with the study done by **Mohammed, et al., (2020)** about Long-term complications of hypospadias repair: a ten-year experience from northern zone of Tanzania, who proved that, urinary catheter fall was the most common complication encountered two fifth of the cases. In addition the study results were incongruent with the study done by **Tessier,etal.,(2021)** about a cover flap reduces the rate of fistula after urethroplasty whatever the severity of hypospadias, and supposed that, the overall rate of fistula appeared on 44 cases.

The current study represented that the minority of children in the study and control group exposed to meatal stenosis with slight increase of children in the control group. These results were supported with a study done by **Yadigar, Abbas and Aljomaily, (2019)**, who supposed that meatal stenosis occur in 6.2 - 12% and most cases responded good to regular urethral dilatation, these results stated that postoperative regular calibration of urethra should be considered as an obvious part of urethroplasty of TIP form in prevention stenosis of meatus.

Regarding stream of urination the results of the current study assured that the majority of children in the study and control group had one direction of urine stream. These results were supported with a study done by **Haider, et al., (2019)** about outcomes of urethral mobilization and advancement after anterior hypospadias surgery, they indicated that 90% of children had slit-like meatus and good urinary stream.

As regard to postoperative functional outcome, the current study results revealed that, the majority of children in the study and control group had normal cosmetic appearance. These results were incongruent with a study done by **Hamid, Baba and Shera, (2014)**, who studied comparative study of snodgrass and mathieu's procedure for primary hypospadias repair, and indicated that, the cosmetic appearance of the penis was excellent in 100% of patients in group-A and in 44,66% of patients in group B and 16,7% in group-B of patients had mild torsion of the shaft.

It was evident that, the majority of children in both groups had normal shape of meatus. These results were supported with a study done by **Hassouna, etal.,(2020)**,who indicated that, there is highly significant difference between the two studied groups as regard the shape of meatus, 100% in Snodgrass group showed slit like and vertically oriented meatus and 90% in Mathieu group showed round and regular appearance.

Conclusion

The current study concluded that

The current study results cleared that, the vast majority of mothers in the study group had satisfactory level of knowledge of hypospadias repair compared to minority in control group with highly statistically significant differences P-value at 0.001 between pre and post-test. As well as almost of the mothers in the post-test in the study group had appropriate level of practices in relation to diaper care. Which reflect the effectiveness of preoperative instruction about hypospadias repair for improving mothers' knowledge and practice. And also, there was no statistically significant correlation between mothers' knowledge and their demographic characteristics, except for age. The children in the study group developed less post-operative complications at the first postoperative day, 7th day and at 1st month of surgical repair. There were statistically significance differences between family history, history of circumcision and postoperative complication in children with hypospadias repair.

Recommendation

Based on the findings of the current study; the following recommendations were suggested:

- Continuous training for pediatric surgical nurses about the importance of preoperative teaching instructions for the mothers of about hypospadias repair should be conducted.
- Educational sessions for mothers should be developed, implemented and evaluated by multidisciplinary team to maintain better post-operative outcomes for children.
- The pediatric surgery unit should maintain continuing education and orientation programs for all health care team dealing for children with hypospadias.
- Pediatric surgical unit should be provided with Arabic booklet, brochure and posters about postoperative care for children undergoing hypospadias repair.
- Spreading awareness about postoperative care of hypospadias through mass communication in pediatric surgery unit by utilizing posters, banners, local cable channels, …. etc.

References

1. Al-Tamimi, S. H., Al-Quraishi, F. S., & Naji, A. A. (2019).Maternal and fetal risk factors associated with hypospadias in a sample of Iraqi boys. Medical Journal of Babylon, 16(3), 174.
2. Asgari S.A., Safarinejad M.R., Poorreza F., Safaei A., Ghanaie A.M. And Shahab E. (2015).The Effect of Parenteral Testosterone Administration Prior To Hypospadias Surgery: A Prospective, Randomized And Controlled Study. Journal of Pediatric Urology, 11: 143e1-1436.
3. Chou, C. M., Yeh, C. M., Huang, S. Y., & Chen, H. C. (2019).Results of one-stage urethroplasty for hypospadias in pediatrics–single surgeon's experience.
4. Deng, F., Zhao, J., Jia, W., Fu, K., Zuo, X., Huang, L., ... & Liu, G. (2021).Increased hypospadias risk by GREM1 rs3743104 [G] in the southern Han Chinese population. Aging (Albany NY), 13(10), 13898.
5. Elbakry A., Hegazy M., Matar A. And Zakaria A. (2016).Tubularized incised-plate versus tubularization of an intact and laterally augmented plate for hypospadias repair: A prospective randomized study. Arab Journal of Urology, 1-8.
6. Gong, E. M. & Cheng, E. Y, (2017).Current challenges with proximal hypospadias: we have a long way to go. Pediatr. Urol. 13, 457–467.
7. George w, J. Patrick, Shawn, John M,(2020).Holcomb ash crafts pediatric surgery, ,chapter 59,hypospadias, 7th edition ,p 918,919.

8. Grove, S. K., & Gray, J. R. (2018).Understanding Nursing Research E-Book: Building an Evidence-Based Practice.7th.ed. Elsevier Health Sciences.
9. Hassouna, A. A. E., Arnous, A. A., Taman, E. A., & Elsayaad, I. M. (2020).Comparative study between Mathieu repair and Snodgrass repair in distal hypospadias. International Journal of Medical Arts.
10. Hadidi AT.(2017). History of hypospadias: Lost in translation. Journal of pediatric surgery.; 52(2):211-7.
11. Haider, N., Hashim, I., Iqbal, M. A., Wasti, A. R., Chaudhary, S. H., Ahmad, A., & Saleem, M. (2019).Outcome of urethral mobilization and advancement after anterior hypospadias surgery. Annals of Pediatric Surgery, 15(1), 1-4.
12. Hamid, R., Baba, A. A., & Shera, A. H. (2014).Comparative study of Snodgrass and Mathieu's procedure for primary hypospadias repair. International Scholarly Research Notices, 2014.
13. Hockenberry, M. J., & Wilson, D. (2018). Wong's nursing care of infants and children.E-book., Elsevier Health Sciences. Chapter 24., the child with renal dysfunction, P .817.
14. Jawale, S. A. (2017).Ten Commandments of hypospadias surgery. J Pediatr Neonatal Care, 6(6), 00268.
15. John, Stephen M,Kevin M,Noel A,Mark S, (2020).Urological surgery ,oxford specialist hand books in surgery, chapter 14 ,pediatric urology ,p726.
16. Lisa S,Andria M,Marilyn J,David W,Cheryl C, (2019).Wong's Nursing Care of infants and children section X,childhood nutrition and elimination problems,new edition ,p586.
17. Linda A, Angela E, (2019).Comprehensive review for the NCLEX-RN Examination ,chapter 37 , Renal and Genitourinary problem , 8 edition, p 459.
18. Mohamed, A, S., Kamed, M, W., Mohamed, A.,H., & Marwa, A. I. (2018). Effect of Preoperative Instructions for Mothers on Selected Postoperative Outcomes among their Children with Hypospadias. The Medical Journal of Cairo University, 86(June), 2079-2090.
19. Mohamed, S. A. (2019).Effect of Pre-designed Instructions for Mothers of Children with Hypospadias on Postoperative Complications.
20. Marrocco G., Vallaciani S., Fiocca G., Calisti A. (2014).Hypospadias Surgery: a 10-year Review. Pediatric Surgery International; 20: 200–203.
21. Makki, Y., Ishtiaq, F., Khan, W. S., Aziz, N., & Fazal, S. (2020).The outcome of limited urethral mobilization urethroplasty for anterior hypospadias. The Professional Medical Journal, 27(01), 210-216.
22. Maher, M., Chasapi, M., & Dalal, M. (2017).Hypospadias: an algorithm for repair with the aid of the microscope in 102 patients. Plastic and Aesthetic Research, 4, 64-69.
23. Mohammed, M., Bright, F., Mteta, A., Mbwambo, J., Ngowi, B. N., Mbwambo, O., ... & Mganga, A. (2020).Long-term complications of hypospadias repair: a ten-year experience from northern zone of Tanzania. Research and Reports in Urology, 12, 463.
24. Nyongole, O. V., & Mgaya, D. S. (2020).A single center experience of Hypospadias Repair in Dar es Salaam, Tanzania. The Journal of Medical Research, 6(5), 225-229.
25. Pan, P. (2019). Can grafted tubularized incised plate urethroplasty be used to repair narrow urethral plate hypospadias? Its functional evaluation using uroflowmetry. Journal of Indian Association of Pediatric Surgeons, 24(4), 247.
26. Roychoudhury, A. (2019). A Clinical Study Of Complications Of Snodgrass Urethroplasty For Hypospadias. International Journal Of Medical Science And Diagnosis Research, 3(4).
27. Renaux-Petel, M., Mure, P. Y., Gorduza, D. B., & Mouriquand, P. (2019). Hypospadias. In Pediatric Surgery (pp. 549-560). Springer, Berlin, Heidelberg).
28. Rasool, n. (2019).Outcome of hypospadias surgery in children. The professional medical journal, 26(04), 639-645.
29. Sheikh, m. A., latif, t., & ahmad, j. A. M. (2019).Hypospadias repair in children: 10-years experience at shaikh zayed hospital lahore. The professional medical journal, 26(07), 1020-1026.
30. Springer, A., Van Den Heijkant, M., & Baumann, S. (2016).Worldwide prevalence of hypospadias. Journal of pediatric urology, 12(3), 152-e1.
31. Tessier, B., Sfar, S., Garnier, S., Coffy, A., Borrego, P., Gaspari, L & Kalfa, N. (2021).A cover flap reduces the rate of fistula after urethroplasty whatever the severity of hypospadias. World Journal of Urology, 39(7), 2691-2695.
32. Weed H. And Baddour L. (2015).Postoperative fever. Avail-able at www.uptodate.com/contents/postoperative-fever.
33. World health organization, children-reducing-mortality (19 September 2019).Available from. https://www.who.int/news-room/fact-sheets/detail/children-reducing-mortality [Last accessed on 2020 March18].
34. Yadigar, M. A., Abbas, Y. I., & Aljomaily, F. S. S. (2019).Tubularized incised plate (Snodgrass) urethroplasty as the surgical technique of choice for repair of distal and midshaft hypospadias in Tikrit Teaching Hospital. Diyala Journal of Medicine, 16(1), 63-69.