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Effect of Pre-Designed Instructions for Mothers of Children with Hypospadias on Reducing Postoperative Complications

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Abstract
Hypospadias is a common congenital anomaly with a prevalence estimated to be as high as 1 in 125 live male births. Complications after surgical procedures are possible. The incidence of complications can be reduced by meticulous preoperative planning, and judicious postoperative care. So the aim of the study was to investigate the effect of pre-designed instructions for mothers of children with hypospadias on reducing postoperative complications. A convenient sample consists of 60 mothers of children with hypospadias were included in the study. The sample was divided into 2 equal groups; the control group and the study group. Pre-post quasi experimental design was utilized to perform the aim of the study. The study was conducted in the pediatric surgical department and urology outpatient clinic at one Pediatric Hospital in Cairo. Three tools were carried out; first a questionnaire sheet (pre-post test) to assess mothers' knowledge about hypospadias, and includes also demographic data, second tool; observational checklist to evaluate mothers' practices regarding hypospadias, third tool, postoperative complications assessment sheet, which was examined occurrence of early postoperative complications. And pre-designed instructions were provided for those mothers preoperatively. The study results revealed that a highly significant difference was present between the control and the study group regarding mothers' knowledge in post-test. The majority of mothers in the control group and the study group had inadequate level of knowledge about hypospadias in pre-test. While more than two fifth of mothers in the study group had adequate level of knowledge in post-test. The results proved that the mothers' practices in post-test were increased more than in pre-test, less than half of the mothers in pre-test were not satisfied about performing diaper care correctly, however in post-test more than three quarters of those mothers were performed this procedure correctly, and there were highly statistical significant difference between pre and post-test. Regarding early postoperative complications; the results demonstrated that more than two thirds of children in pre-test, while less than two fifth in post-test suffering from postoperative complications as; infection, urinary tract obstruction and bleeding. The difference between pre and post-test was significant. The current study concluded that the pre-designed instructions for mothers of children with hypospadias were efficient by means of marked improvement of the knowledge and practices of the study group, which support the research hypotheses. So the results indicated that children with hypospadias were fewer early postoperative complications in the study group than the control group. The study recommended that important of pre-designed instructions for mothers of children with hypospadias for reducing postoperative complications. Also highlighting additional researches about assessment of mothers' knowledge and practice in relation to care provided to their children with hypospadias. In addition to a longer follow-up is necessary to monitor the late post operative complications.
Keywords: Hypospadias, children, preoperative, pre-designed instructions, postoperative complications, mothers' knowledge, practices.

1. Introduction

Hypospadias is a common congenital anomaly with a prevalence estimated to be as high as 1 in 125 live male births. There has been a clear increase in the frequency of hypospadias. Most reports of outcomes after repair is short-term and few appropriately focus on the management of surgical complications (Christopher & Terry' 2011).Complications of hypospadias surgery are higher than other reconstructive procedures. The incidence of complications can be reduced by meticulous preoperative planning, and judicious postoperative care. Hypospadias occurs when the urethra (the opening where the urine comes out) is on the underside of the penis instead of the tip. Hypospadias may be mild, moderate, or severe, depending on how far back the opening is and how much chordee (downward curve), if any, is present. The cause is not known, but it can occur in other family members. Boys with hypospadias urinate in a downward stream rather than out and away from the body. This causes wet clothes and shoes. If not repaired, hypospadias may make future sexual intercourse difficult, and could affect fertility. The operation involves making a new opening on the tip of the penis. If a chordee is present, it will be corrected at the same time. After healing most boys have normal function and appearance of the penis (Coran, Arnold, Scott, Adzick, Kummel, Thomas, Martin, Laberge, Shamberges, Robert, & Caldamone, 2012). Worldwide, hypospadias surgery is known to be challenging and technically demanding. Surgery is needed to fix hypospadias. The type of surgery depends on many things including the position of the opening and the amount of foreskin. The surgery is usually done when the child is between 6 and 12 months of age. Most times, the surgery can be done without the child spending the night in the hospital. The risks of

hypospadias surgery; the child will get anesthesia and be asleep during the surgery. In most healthy boys, anesthesia is safe. The further the opening is away from the tip of the penis, the higher the chance of problems after surgery (Palmert & Dahms, 2010). The incidence of hypospadias is increasing in both Europe and North America but the reasons are not yet clearly understood (Wilcox, Godbde & Cooper, 2014). Acute complications occur within 7-10 days following surgery and require a proper assessment and decision making for management. Mismanagement can result in failure of the procedure, and complication rates are higher. A proper preoperative assessment and planning is must for good results. A mistaken attempt to apply a minor hypospadias repair to a major deformity would lead to complications and failure (Bhat & Mandal, 2008). The complications rate of hypospadias correction is considerable, from 30 to 50%. Early complications such as: bleeding, bruising, wound dehiscence, flap or graft necrosis, urinary tract infections and urinary tract obstruction (Wilcox, et al., 2014). Hypospadias repair requires delicate handling of loose and fragile tissue susceptible to edema and infection. Complications depend on the type of hypospadias, surgical technique, size of the penis, age of the child, and experience of the operating surgeon. In many countries with advanced medical and social development, the actual trend is towards earlier intervention with ever-shorter hospitalisation. However, many boys do still have to remain in hospital for considerably longer. The norm in many centres is now for a single-stage repair during the first year of life undertaken as a day-case. No difference in the complication rate between day surgery and traditional hospitalization in hypospadias (Marrocco, Vallaciani, Fiocca & Calisti, 2014). Early, day–case repair may be a safe, realistic and desirable proposition when sophisticated surgery and anesthesia can be combined with high standards of community aftercare (Landrigan, Garg & Droller, 2009). The mother should be instructed about other postoperative complications as; it is normal for bruising and swelling to the penis to develop within the first 24 hours. This will take a few weeks to settle. If the child was old age, this should be explained to him. The nurse must advise the mother that the child wears loose fitting clothing to go home in and for the next few days after surgery to help prevent discomfort. Occasionally a dressing is put on over the penis. This dressing usually falls off on its own. However, if it is still in place by the time the child is allowed a bath, the dressing can be soaked off in the bath. Sometimes it may take a few consecutive baths before the dressing comes off completely (Wenli, Yuehong, Amy, Dominic & Brad 2012). If bleeding occurs, apply gentle pressure to the incision for 5 minutes. If bleeding does not stop or starts again, call the surgeon. It was recommend that bathe the child once a day and as needed (after bowel movements) in plain water for 5-10 minutes. The child may be given a bath on the day of surgery if necessary. However, the mother should discuss this with the surgeon. Some parents have found a bath ring is more comfortable for their baby. Never leave the child alone in the bath. A follow-up visit should be scheduled for four weeks after the tube is removed. And it should include an early evaluation within 3 months of surgery, followed by a review at 1or 2 years, and again at 4 or 5 years. The quality of micturition should be assessed subjectively, and when possible confirmed objectively with uroflowmetry and perhaps a bladder pre and post-micturition ultrasound evaluation. If the child is toilet trained, the surgeon need to observe him urinating while standing up at his next office visit. Encourage the child to drink on his way to the office so that he will be ready to urinate when you arrive (Leung & Robson, 2012). Mother's co-operation is crucial specially in young infants and an open system with a dripping stent and double diaper method of diversion will adequately contain the urine drainage and also prevent the child from interfering with the operation site. A wide lumen indwelling silicone Foley catheter is preferred in the older children. A proper preoperative assessment and planning is must for good results and decrease complications. The choice of dressings, addition of prophylactic antibiotics and decisions about urinary diversion are not universally agreed. These remain areas of individual surgeon preference, influenced by the severity of the hypospadias and the type of surgical repair employed. This is not reconstructive surgery for the occasional operator; therefore a standard practice of at least 40 to 50 cases per year is desirable (Manzoni & Reali, 2013). Janson, (2014) emphasized that most boys go home the day of surgery. There may be some soreness or pain in the penis and abdomen (belly). Medicine will be prescribed for pain. The pain is usually worst the first 3 days after surgery. The mothers should give the child Ibuprofen or Acetaminophen for the first 3 days. After the first 3 days, stop regular use and give the medication only as needed. Medicine may also be given to prevent bladder spasms. The child may be fussy and need to be held more. If the child has a catheter, the mothers will be given an antibiotic upon discharge from the hospital. Continue to give the antibiotic for several days after the removal of the catheter. Encourage the child to drink lots of fluids. Sponge-bathe should be applying for the child until the dressing is removed. The mother can give her child tub baths when the dressing falls off or two days after the surgery, whichever occurs first. The child can take a tub bath even while the catheter is in. When resuming regular bathing for the child, use tepid water without soap. Don't scrub the area and don't directly wash the penis; just allow the water to soak the area. Gently pat the area dry with a clean towel (Khan, Zic & Boorman, 2011). There may be a catheter or stent (small plastic tube) in the penis to drain the urine for several days after surgery, and to maintain patency of the urethral canal. It is usually stitched in place. The surgeon will let the mothers know how long the tube needs to remain in place. Typically this is one to two weeks after surgery. Call the physician to coordinate removal. Special care of this tube is not needed. Once the tube is removed, the child will likely have burning with

urination the first few times. If this becomes intolerable for the child, or they are unable to urinate at all, call the surgeon (Janson, 2014). Appignani, Prestipino, Bertozzi, Nardi & Falcone (2009) mentioned that children who don't have a catheter may complain of discomfort or cry while urinating through the repaired area for one or two days. If the child wears a diaper, the catheter will drain into his diaper. If the child is older, the catheter will drain into a bag on his leg. Urine may leak around the tube or spurt through the tube. This is common and is not a problem, as long as most of the urine drains through the tube. Excessive leaking might indicate the tube is blocked. If the mothers suspect this, or if the tube comes out, call Pediatric Urology. Recently the children with hypospadias can anticipate a successful surgical intervention, and decrease complications that can affect lifelong of their life by imperative of preoperative instructions (Pfeil & Lindsay, 2010). The Institute of Pediatric Urology, (2014) added that children with hypospadias are often discharged within 1 day of surgery. Discharge teaching should include instructions for mothers about: care of the reconstructed area (dressing, stent and prevent adhesions), medications (antibiotics, pain management), hygienic care (bathing, diaper care), diet and activities. Tsiligiri, (2010), stated that preoperative teaching can relieve some of mothers' anxiety about the future appearance and functioning of the penis, and improve post-operative care. Parental especially mothers involvement in quality of care related to hypospadias repair, Caroline, (2014) reported that how parents' views are informing improvements in communication and clinical practice. It is proved that the child recover earlier when the parents involved in care, so it is important to explain the procedure, educate parents about the care after leaving the hospital and to make sure that there are no questions unanswered. The new techniques, the nursing management and the parents' contribution in care promote to reduce hypospadias hospitalization and so, the less suffering (Kraft, Shukla & Canning, 2010). Mothers need information about the admission, the procedure itself, possible complications, and both the short and long-term surgical outcomes within individual units (Springer, 2014). They need to know the length of stay and what community support is available at discharge. Providing such information, especially in detail, can be difficult at the initial outpatient consultation. Although information is given to the family when the child is first seen in clinic, often the child is only a few months old. Planned surgery is usually undertaken around 18 months of age, some 12 to 16 months after the initial consultation, so recall of information may not be easy. The mothers should be instructed from the nurse after surgery to double diaper of the baby. If the child wears diapers, use two diapers for added protection and cushioning. If the child is going home with a tube in his penis or bladder, the nurse will show the mother how to arrange the double diapers. The inner diaper is for his bowel movements and the outer diaper will absorb his urine. If the mother notices a dry diaper, call the surgeon. A spot of blood on the diaper is normal. Avoid applying powder or ointments to your son's genital area. Some parents apply antibiotic ointment, such as bacitracin, in the outer diaper to prevent the child's penis from sticking to the diaper. This isn't necessary, but doesn't harm the repair. If the child has a loose bowel movement and soils his surgical dressing, clean it with soapy water and a washcloth, gently wiping away from his penis (Manzoni & Reali, 2013). Temporary urinary diversion is routinely employed after hypospadias repair in children. Open urinary drainage using the double diaper technique is a method very often used of short-term catheter management after pediatric urethral surgery. Nowadays the disposable diaper was used. Once the plastic dressing is off, apply an antibiotic ointment to the incision at each diaper change, or 4 times a day for boys not in diapers, for 1 week. Let it melt around the area; do not try to spread it. The ointment helps prevent infection around the stitches. A larger diaper over the regular size diaper can provide extra padding. Loose fitting, comfortable clothes (such as sleepers, sweat pants, or gym shorts) will be best after surgery. It helps to use clothes that are a size larger than normal (Badawy & Fahmy, 2013). The child should rest at home for a few days and should not take part in any sport or sit astride any toys until all the bruising and swelling has resolved. This may take up to six weeks. This is to prevent the wound getting knocked which may lead to bleeding and damage to the hypospadias repair. Please encourage quiet play. Watching television, playing board games or walking the child in a stroller is encouraged. Avoid contact sports, gym, sandboxes, bicycles and straddling toys. Older children should avoid strenuous activities such as wrestling, gymnastics and bike riding for three weeks. There is no need to restrict the activities of infants, except for swimming and rigorous sandbox play (Wenli, Yuehong, Amy, Dominic & Brad 2012). Regarding the diet; Kazemi & Gholizade, (2013) demonstrated that the child can resume a normal diet at home. Encourage fluids — for example, ice pops, juice, soup — to keep the child's urine clean. Some children may have nausea or vomiting from the anesthesia, but most will be fine. Gradually, the child's appetite will return to normal and he can have any food he likes. The mothers should call the surgeon if the plastic dressing slides down toward the base of the penis, or plastic dressing seems too tight, or child pulls the plastic dressing off, or bleeding from the incision that does not stop after 5 minutes of gentle pressure, or problems with the catheter or stent for example; no urine coming out, leaking around tube, tube seems to have moved in or out, tube falls out, pain that is not relieved with the prescribed medicine, vomiting the day after surgery, temperature higher than 102° F, increasing swelling, redness, or pain in the penis, and cloudy drainage coming from the incision (Toorn, De Jong, De gier, Callewaert, Horst, Steffens, Hoebeke, Nijman & Bush, 2013).

2. Significance of the Study

Throughout scientific examination in pediatric surgical departments at one Pediatric Hospital, in Cairo; it was observed that the number of children with hypospadias was raised more than before. There were approximately 200 cases diagnosed as hypospadias through the year 2013 (Computer & Statistics Center, CUSPH, 2014). The researcher was noticed that children with hypospadias undergoing surgical repair were predisposed for numerous early complications due to be deficient of knowledge and insufficient care given by the mothers for their children. As well as consequence of teaching instructions for mothers of those children which required, and should be related to importance of preoperative knowledge and practices, and related effects on reducing postoperative complications. And the long life effect on their children' sexual status. So starting review of literature for children with hypospadias. Additionally children with hypospadias, the genitalia may look ambiguous at birth, resulting in emotional and psychological stress for parents, and fears related to normal sexuality (Center for the Study & Treatment of Hypospadias, 2013). Unfortunately, in Egypt, there are restricted researches on hypospadias in the pediatric nursing field. In addition to, taking into consideration the reality that the mothers offer care for their children, for that reason it is imperative for those mothers to instructing them about hypospadias. Therefore, the aim of the study was to investigate the effect of pre-designed instructions for mothers of children with hypospadias on reducing postoperative complications.

3. Aim of the Study

The aim of the study was to investigate the effect of pre-designed instructions for mothers of children with hypospadias on reducing postoperative complications.

4. Research Hypothesis

The study was examining the following research hypotheses:

1- Mothers of children with hypospadias were preoperatively instructed will have better knowledge and practices than not instructed mothers.

2- Mothers of children with hypospadias were preoperatively instructed will have less postoperative complications for their children than not instructed mothers.

5. Subjects and Methods

5.1 Research Design

A pre-post quazi experimental design was utilized to perform the aim of the study.

5.2 Sample

A convenient sample consists of 60 mothers of children with hypospadias. The sample size was divided into two equal groups: 30 (study group; those mothers of children with hypospadias were exposed to preoperative pre-designed instructions), and 30 (control group; those mothers of children with hypospadias were not exposed to preoperative pre-designed instructions).

5.3 Inclusion Criteria

- Children' age from birth to 6 years.
- Pre and post operative children.
- The primary and recurrent cases.
- The children should be free from other associated or congenital anomalies.

5.4 Setting

The study was utilized in pediatric surgical department and urology outpatient clinic at one Pediatric Hospital in Cairo, Egypt.

5.5 Ethical Considerations

The research approval was obtained from the director of the Pediatric Hospital, and from the head of the pediatric surgical department in the hospital to help data collection procedures. As well as consent was obtained from the mothers after the researcher informed them about the aim of the study. Moreover mothers, who agreed to participate in the study, informed that all data gathered during the study were confidential. Also they have the right to withdraw from the study at any time.

5.6 Data Collection Tools

Data were collected for the current study through the following three tools, which were designed by the researcher based on reviewing the necessary literature, and used for both control and study groups as follow:

1- A questionnaire sheet (pre-post test); to assess mothers' knowledge regarding their children with

hypospadias, and created of open and closed questions, as well as data related to definition of hypospadias, signs and symptoms, duration of illness, medical data, preoperative care, postoperative care, discover of disease, prognosis, child' activities postoperative, complications of surgery. Also includes socio-demographic characteristics of the studied sample (mothers and their children with hypospadias), as age, gender, educational level, and address (contains 32 questions).

2- Observational checklist (diaper care); it was developed to evaluate mother's practices, and the effect of the pre-designed instructions for mothers of children with hypospadias on reducing postoperative complications; it includes 22 items for the control and the study group postoperatively. Each correct item get one score.

3- Postoperative complications assessment sheet; which was examined occurrence of early postoperative complications immediately (1-7 days) after surgical repair for those children.

Mothers' pre-designed instructions; that provided for those mothers preoperatively, and focused on the items related to postoperative care required for those children with hypospadias, such as infection prevention, hygiene, feeding, activities, sleeping, and appropriate positioning of those children, handling, wound care, pain, bleeding, fever, and follow-up.

5.7 Scoring System

A scoring system was developed to evaluate together mothers' knowledge and skills for their children with hypospadias. Every item in knowledge items scored as 2 for (yes), 1 for (no), and 0 for (I don't know)

- Total knowledge score:
  - Poor level of knowledge= 0-50
  - Good level of knowledge= 51-62
  - Excellent level of knowledge= 63-84
- Level of practices was classified into 3 levels {for diaper care a total (22) score was then reached}:
  - Level {1} appropriate: when the score was reach 60% and more of the total score.
  - Level {2} moderate: when the score was ranged from 50% to less than 60% of the total score.
  - Level {3} inappropriate: when the score was less than 50% of the total score.

5.8 Validity and Reliability

For face validity the tool for the study was provided to a panel of four experts to test the content validity. Reliability was measured by using Cronbach's alpha coefficient test to splits all questions on instrument and computes all correlation value for them.

5.8.1 Data Collection Procedures

The procedures of data collection were the same for both groups, except that the study group was exposed to the pre-designed instructions preoperatively, while the control group was exposed to the routine care of the surgical department. After explaining the aim of the study by clear and simple manner to the mothers of children with hypospadias, then they were interviewed individually preoperatively to fulfill the questionnaire sheet (pre-post test) to assess their knowledge about the preoperative care for their children with hypospadias (control and study groups), the interview lasted for 20 minutes for each mother. Then the mothers' pre-designed instructions were delivered to the study group during the hospitalization of the child (3-5 mothers) as mother class. Pre-post test was replicated at urology outpatient clinic for both groups after surgical operation (1-7 days) to assess the improvement in mothers' knowledge and practices. After that an observational checklist (diaper care) was measured {from 1-7 day} to evaluate the effect of the pre-designed instructions for both groups (study & control). Then the early postoperative complications were assessed immediately (1-7 days) postoperatively by assessment sheet. All questions raised by the mothers about the illness and post-operative care were answered. Discussions of concerned issues were also allowed. Posters and brochures were prepared by the researcher and used for clarification. Data were collected over a period of six months, started from July to December 2013. During this period, the researcher stayed 2 hours daily/ 2 days weekly.

5.8.2 Statistical Procedures

Data were categorized and analyzed using Statistical Package for Social Science (SPSS windows) version 20. Numerical data were coded and summarized by using mean ± SD, and range for quantitative variables. Qualitative data were expressed as frequency and percentage. Relations between different numerical variables were tested by using Pearson correlation. Probability (p-value) less than 0.05 was considered statistically significant and less than 0.001 was considered as highly statistically significant. Statistics used such as t-tests, chi-square test, and test of correlation (r-test) were used to test the research hypotheses, and investigate the differences in the mothers' demographic characteristics between the study and control groups. The research hypotheses are tested at alpha level of 0.05 is statistically significance.

6. Results

The findings of the study were presented in three parts. The first part was arranged with data regarding to demographic characteristics of the sample. The second part was presented data related to mothers' knowledge and practices regarding care for their and children with hypospadias in the pre and post-test for the control and the study group. The third part was contained data related to postoperative complications of the children with hypospadias.

Table (1): Frequency distribution of the children in the control and the study group {n=60}

Socio-demographic items	Control		Study	
	No.	%	No.	%
Age in years; • Less than one year • <4 • 4-6 Mean ± SD	 2 27 1 2.56±0.79	 6.7 90.0 3.3	 4 26 0 2.67±0.98	 13.3 86.7 0.0
No. of siblings; • 1.00 • 2.00 • 3.00 • 4.00 • 5.00	 8 6 8 5 3	 26.6 20.0 26.7 16.7 10.0	 6 7 10 4 3	 20 23.3 33.4 13.3 10

As showed in table (1) that the majority of children in the control group and in the study group (90% & 86.7%) were aged between one year and less than 4 years with mean and standard deviation (2.56±0.79 & 2.67±0.98) respectively. Moreover, this table added that more than one quarter of children in the control group (26.7%) having 3 siblings in their family, and the same percentage showed that they have one sibling in their family. Also in the study group (33.4%) having 3 siblings in their family. Generally, there were no statistically significant differences between the control and the study group in relation to children age, and numbers of siblings.

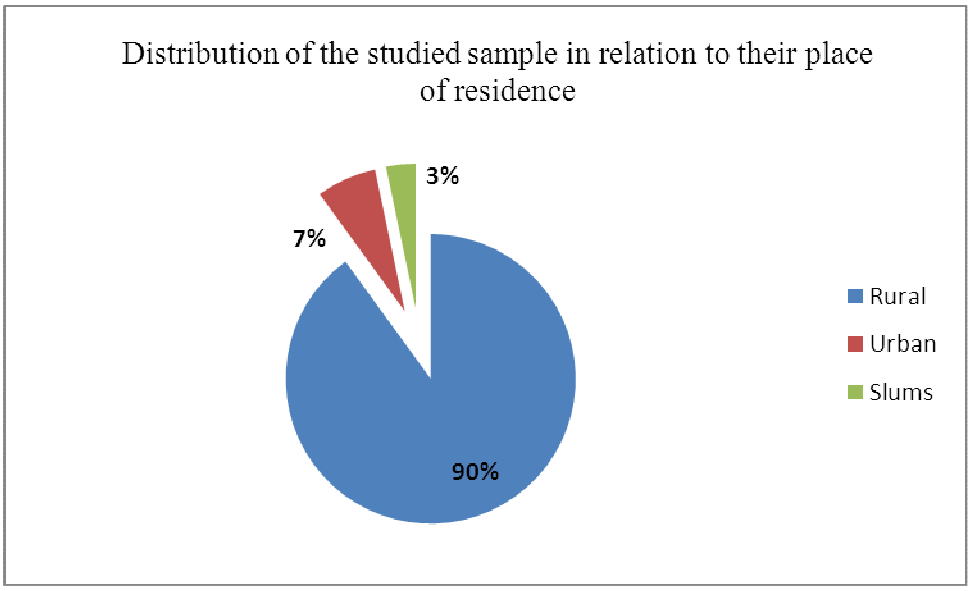

Figure (1): Distribution of the studied sample in relation to their place of residence

Figure (1) revealed that the majority of studied sample (90%) was from rural areas and only 7% were from urban areas.

Table (2): Frequency distribution of the parents in the control and the study group {n=60}

Socio-demographic items		Control No. %	Study No. %
Fathers' age by years	25-	16 53.3	14 46.7
	35-	12 40.0	13 43.3
	45-	2 6.7	3 10
Mean ± SD		32.06±4.44	31.87±5.01
Mothers' age by years	20-	11 36.7	13 43.3
	30-	18 60.0	15 50
	40-	1 3.3	2 6.7
Mean ± SD		37.5±4.96	36.89±5.11

Table (2) revealed that more than half (53.3%) of children in the control group and more than two fifth (46.7 %) of children in the study group their fathers were aged between 25 years and less than 35 years, with mean and standard deviation (32.06±4.44) & (31.87±5.01) respectively. Furthermore, this table included that near two thirds of children in the control group (60%), and half (50 %) of children in the study group their mothers were aged from 30 years to less than 40 years with mean age and standard deviation (37.5±4.96) & (36.89±5.11) respectively. Generally, there were no statistically significant differences between the control and the study group in relation to fathers' age and mothers' age.

Table (3): Frequency distribution of the studied sample in relation to parents' education {n=60}

Socio-demographic items		Control No. %	Study No. %
Father's education	Illiterate	11 36.7	9 30.0
	Can read and write	4 13.3	6 20.0
	Primary education	8 26.7	7 23.3
	Preparatory education	1 3.3	2 6.7
	Secondary school	5 16.7	4 13.3
	University education	1 3.3	2 6.7
Mother's education	Illiterate	9 30.0	10 33.4
	Can read and write	4 13.3	3 10.0
	Primary education	6 20.0	7 23.3
	Preparatory education	4 13.3	5 16.7
	Secondary school	6 20.0	4 13.3
	University education	1 3.3	1 3.3

As showed in table (3) more than one third and less than one third (36.7% & 30.0%) of fathers of children with hypospadias in the control group and in the study group were illiterate respectively, in addition to only (3.3% & 6.7%) of them were both preparatory and university education in the control group and in the study group respectively. In relation to mothers' education, the results showed that (30%&33.4%) of them in the control group and in the study group respectively were illiterate, and only (3.3%) were university educated in both groups. In general, there were no statistically significant differences between the control and the study group in relation to fathers' education and mothers' education.

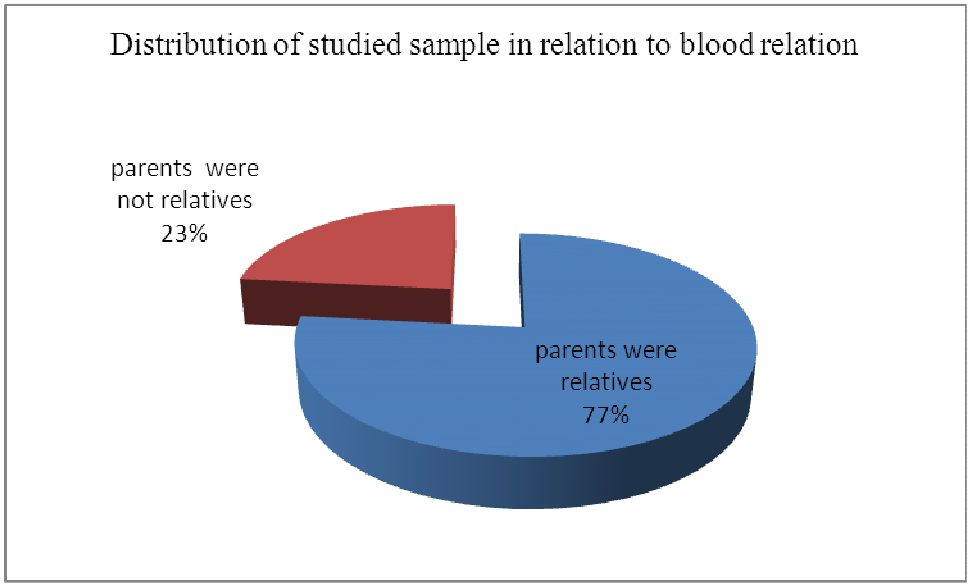

Figure (2): Distribution of the studied sample in relation to blood relation {n=30}

It was illustrated from figure (2) that more than three quarters of parents (77%) were relative, and only 23% from parents were not relative.

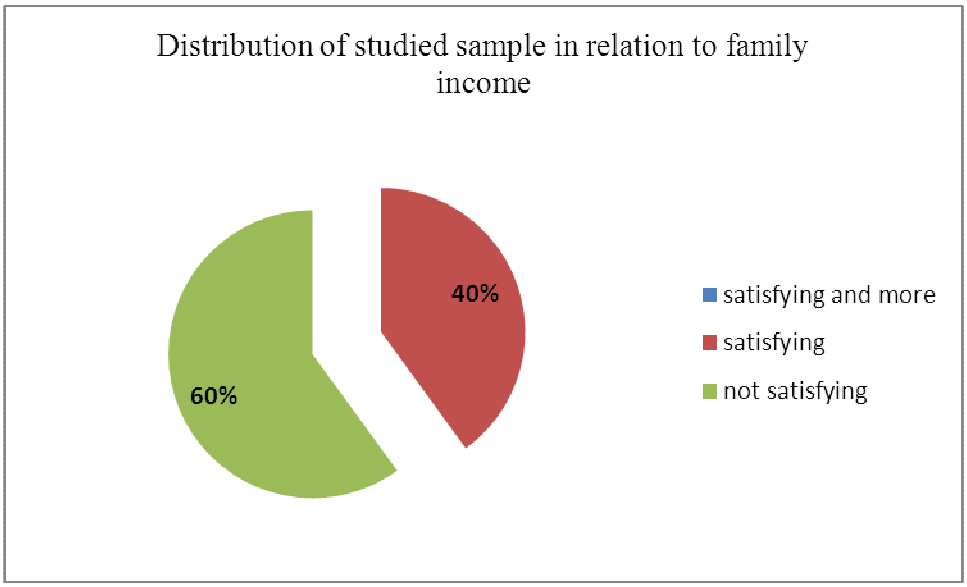

Figure (3): Distribution of the studied sample in relation to family income

As showed in figure (3) that near two thirds of studied sample (60%) have not satisfactory with family income and 40% were satisfactory with family income.

Table (4): Frequency distribution of caring person for children in the control and the study group {n=60}

Socio-demographic items		**Control** No.	%	**Study** No.	%
Caring person for the child	Father	0	0.0	1	3.3
	Mother	28	93.3	26	86.7
	Sister/brother	2	6.7	3	10
Accompanied person during child follow up	Mother	28	93.3	30	100
	Father	2	6.7	0	0.0

As revealed in table (4) that the majority of children in the control group and in the study group (93.3% & 86.7%) respectively; their mothers were the caring persons for them. In relation to accompanied person during the child follow up in the out-patient clinic; the majority of mothers in the control group, and all in the study

group (93.3% &100%) respectively those mothers were accompanied person for their children.

Table (5): Frequency distribution of the children in the control and the study group in relation to medical history {n=60}

Medical history	Control				Study			
	Yes		No		Yes		No	
	No.	%	No.	%	No.	%	No.	%
Pervious hospital admission	3	10.0	27	90.0	0	0.0	30	100.0
Having any medical disorders	5	16.7	25	83.3	2	6.7	28	93.3
Having surgical operation	3	10.0	27	90.0	4	13.3	26	86.7
Accidents	6	20.0	24	80.0	1	3.3	29	96.7
Taking medication regularly	2	6.7	28	93.3	3	10.0	27	90.0
Sensitivity	0	0.0	30	100.0	3	10.0	27	90.0

As observed in table (5) that almost of children in the control group and in the study group have not any pervious medical history i.e. medical disorders, surgical operations, accidents, taking medication regularly, and any sensitivity.

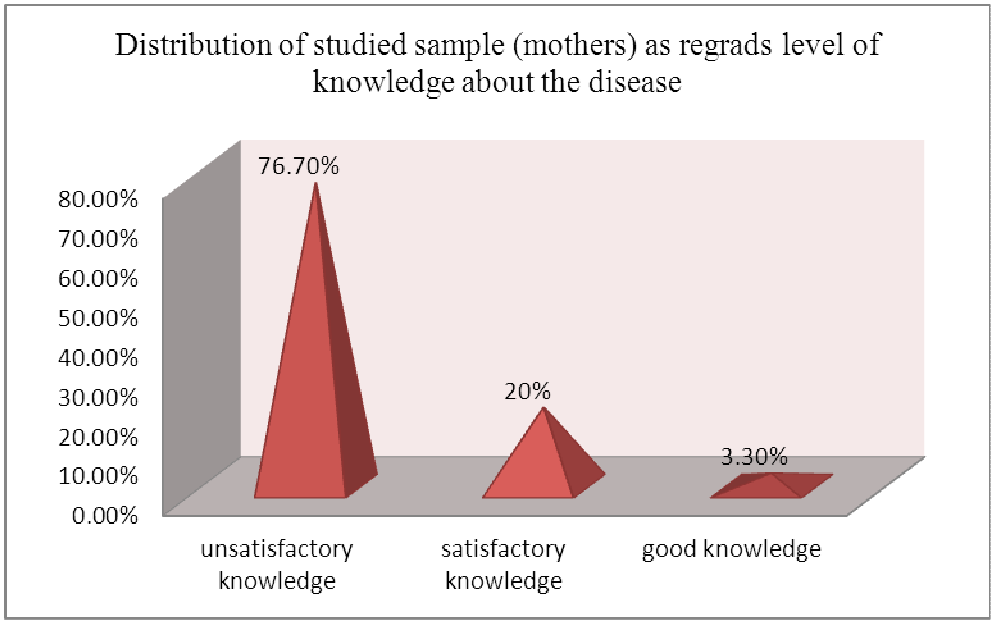

Figure (4): Distribution of the studied sample (mothers) as regards level of mothers' knowledge about disease {n=30}

Figure (4) showed that more than three quarters of mothers (76.7%) have unsatisfactory level of knowledge about the disease, while 20% of those mothers have satisfactory level of knowledge and only 3.3% have good knowledge about the disease.

Table (6): Correlation between mothers' level of knowledge about the disease and study variables among the study group {n=30}

Study variables	Level of knowledge	
	R	P
Age	.005	.981
Place of residence	.116	.542
Father age	-.245	.192
Mother age	-.250	.182
Father level of education	.593*	.001
Mother level of education	.481*	.007
Parents were relatives	.332*	.043
Family income	-.228	.226

As showed in table (6) among the study group; there were statically significance correlation between level of knowledge about the disease and father's level of education, mother's level of education, and parents were relatives.

Table (7): Correlation between types of mothers' knowledge about the disease and study variables among the study group {n=30}

Study variables	Level of mothers' knowledge about					
	Definition of the disease		Signs and symptoms of disease		Seeking medical help	
	R	P	R	P	R	P
Child' age	.284	.129	.287	.124	.078	.682
Child' rank	.456*	.011	-.144	.448	.114	.547
Place of residence	.217	.250	.176	.352	-.073	.701
Father age	.006	.975	-.121	.524	-.643**	.000
Mother age	.032	.867	-.191	.312	-.393*	.032
Father' level of education	.235	.211	.449*	.013	.081	.669
Mother' level of education	.375*	.041	.385*	.036	.318	.087
Parents were relatives	.371*	.044	.268	.153	-.247	.187
Family income	-.407*	.026	-.386*	.035	-.150	.429

As showed from table (7) among the study group; there were statically significance correlations between mothers' knowledge about definition of the disease in relation to ranking of the child, mother' level of education, parents were relatives, and family income. In addition; the table showed that there were statistical significance correlations between mothers' level of knowledge about signs and symptoms of the disease in relation to fathers' level of education, mothers' level of education and family income. Moreover this table revealed that there were statistical significance correlations between father age, mother age and mothers level of knowledge about seeking medical help for their children with hypospadias.

Table (8): Correlation between types of mothers' knowledge about the disease and study variables among the study group (cont.) {n=30}

Study variables	Level of mothers' knowledge about					
	Complications of the disease		Surgical operation		Post-operative care	
	R	P	R	P	R	P
Age	.033	.861	.007	.971	.108	.571
Ranking	.088	.643	-.266	.156	-.150	.429
Place of residence	-.004	.984	-.021	.913	-.083	.664
Father age	-.272	.146	.040	.835	-.083	.661
Mother age	-.281	.132	-.092	.629	-.143	.451
Father level of education	.783**	.000	.581**	.001	-.042	.825
Mother level of education	.565**	.001	.686**	.000	-.258	.168
Parents were relatives	.151	.427	.255	.175	-.121	.526
Family income	-.155	.414	-.255	.173	.099	.602

As showed in table (8) among the study group**;** there were statically significance correlations between mothers' knowledge about complications of the disease in relation to fathers' level of education and mothers' level of education. As well as; it was clear from this table that there were statistical significance correlations between mothers' level of knowledge about surgical operation in relation to fathers' level of education and mothers' level of education. Moreover, the table revealed that, there are no statistical significance correlations between mothers' level of knowledge about postoperative care and all study variables.

Table (9): Correlation between types of mothers' knowledge about the disease and study variables among the study group (cont'd.) {n=30}

Study variables	Level of mothers' knowledge about					
	Wound dressing		Care for urinary catheter		Follow-up	
	R	P	R	P	R	P
Age	-.047	.805	.329*	.016	-.288	.123
Ranking	.354*	.045	-.225	.232	-.159	.402
Place of residence	.091	.631	.318*	.047	-.180	.341
Father age	-.140	.459	-.094	.620	-.087	.647
Mother age	.048	.800	.942*	.014	-.115	.544
Father level of education	.093	.625	.801*	.048	-.292	.118
Mother level of education	.124	.515	-.134	.480	.307*	.029
Parents were relatives	.149	.430	.371*	.043	.071	.708
Family income	-.074	.697	-.044	.819	.526**	.003

* P-Value < 0.05

** P-Value < 0.01

As observed in table (9) among the study group; there was a statically significance correlation between mothers' level of knowledge about wound dressing and child ranking. Furthermore, there was statistical significance correlations between mothers' level of knowledge about caring of urinary catheter in relation to age of the child, place of residence, age of the mother, father's level of education, and parents were relatives. The table also revealed that, there were statistical significance correlations between mothers' level of knowledge about importance of follow up in relation to mothers' level of education and family income.

Table (10): Variation among pre and post-test in relation to total mothers' knowledge scores in the study group {n=30}

Variable	Pre-test	Post-test	t	p
	M±SD	M±SD		
-Mother's knowledge about hypospadias	12.84±1.24	5.37±0.91	28.59	0.000*
-Mother's knowledge about pre-operative preparation	19.10±2.43	25.02±1.78	11.15	0.000*
- Mother's knowledge about post- operative preparation	36.24±3.12	31.98±1.73	4.45	0.000*
Total knowledge scores	68.18±6.79	62.55±4.42	5.62	0.000*

* p-value < 0.05

Table (10) revealed that there were highly statistically significant differences between pre and post-test in relation to total knowledge scores of the mothers (t=28.59, p=0.000; t=11.15, p=0.000; t=4.45, p=0.000 respectively).

Table (11): Level of mothers' knowledge in the pre - post test for the control and the study group in percentage distribution

Level of mothers' knowledge	Control				Study			
	Pre		Post		Pre		Post	
	No.	%	No.	%	No.	%	No.	%
High level	0	0.0	0	0.0	0	0.0	13	43.3
Adequate level	3	10.0	4	13.3	0	0.0	13	43.3
Inadequate level	27	90.0	26	86.7	30	100.0	4	13.4
Total	30	100.0	30	100.0	30	100.0	30	100.0

Table (11) proved that the majority (90.0%) of mothers in the control group and all mothers (100.0%) in the study group had inadequate level of knowledge about hypospadias in the 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.

Table (12): Percentage distribution of mother's practices checklist regarding to diaper care in pre and post-test in the study group {n=30}

Practices	*Pre-test*				*Post-test*			
	Yes	*%*	*No*	*%*	*Yes*	*%*	*No*	*%*
Diaper care:								
• Prepare equipment	8	26.7	22	73.3	27	90	3	10
• Hand wash	11	36.7	19	63.3	24	80	6	20
• Remove soiled diaper	27	90	3	10	28	93.3	2	6.7
• Assess penis & diaper area	7	23.3	23	76.7	26	86.7	4	13.3
• Clean & dry diaper area and wound site gently	9	30	21	70	27	90	3	10
• Apply ointment or petroleum jelly on diaper area as order	8	26.7	22	73.3	23	76.7	7	23.3
• Put new diaper	23	76.7	7	23.3	28	93.3	2	6.7
• Hand wash	13	43.3	17	56.7	22	73.3	8	26.7
• Recording & reporting	4	13.3	26	86.7	24	80	6	20

As regards to mothers practices in pre and post-test; table (12) proved that the mother's practices in post-test were increase more than in pre-test; in relation to performing diaper care procedures checklist as; they did hand washing before starting the procedure (36.7% - 80% respectively), assess penis & diaper area (23.3% - 86.7% respectively), apply ointment or petroleum jelly on diaper area as order (26.7% - 76.7% respectively), as regards recording & reporting (13.3 %) of mothers did it in the pre-test, while the majority (80%) of them did it properly in the post-test .

Table (13): Mothers total scores of practices (diaper care) pre and post-test in the study group {n=30}

Practices	*Pre-test*				*Post-test*			
	Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory	
	No	*%*	*No*	*%*	*No*	*%*	*No*	*%*
Diaper care:	14	46.6	16	53.4	7	23.3	23	76.7
X±SD	1.67±1.8				1.76±0.45			
Test	t=3.0 p=0.004							

*p. value < 0.01

Table (13) revealed that (46.6%) of mothers in pre-test were not satisfied about performing diaper care correctly, however in post-test 76.7% of those mothers were performed this procedure correctly. There were highly statistical significant difference between pre and post-test (p<0.004).

Table (14) Percentage distribution of children's early postoperative complications in the study group {n=30}

Postoperative complications	Pre-test		Post-test		X^2
	No	%	No	%	
- Occurred	21	70	11	36.7	3.19*
- Not occurred	9	30	19	63.3	
Types of complications:					
• Infection	8	38	5	45.5	
• Urinary tract obstruction	6	28.7	2	18.2	
• Bleeding	4	19	0	0.0	
• Pain in surgical wound	3	14.3	4	36.3	

Regarding early postoperative complications which were examined from 1-7 days immediate after surgical operation for children with hypospadias in pre and post-test in the study group; (table 14) revealed that more than two thirds (70%) of children in pre-test, while less than two fifth (36.7%) in post-test suffering from postoperative complications. The difference between pre and post-test was significant (x^2=3.19, p. < 0.01). Concerning types of immediate postoperative complications, the results indicated that (28.7%) of children in pre-test, while (18.2%) in post-test had urinary tract obstruction. And (19%) of those children in pre-test, although no one in post-test had bleeding. Although (45.5%) of those children in post-test had infection.

7. 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. In relation to demographic data; the results showed that, the majority of children in both groups (the control and the study group) were aged between 1-4 years, this results is to some extent supported with Appignani, et al., (2009), who studied family caregivers' with hypospadias, and found that the highest percentage of children were in age between 1-6 years. The current results indicated that near two thirds of children in the control group, and half of children in the study group their mothers were aged from 30 - 40 years. These results is consistent with Caroline (2014), who studied children with hypospadias, and reported that high percentage from parents have approximately same age. The study founded that more than one third of parents of children with hypospadias in both groups were illiterate in both groups. The current results revealed that more than three quarters of parents were relative. On behalf of family income; the study showed that near two thirds of family were not satisfactory with family. Generally, there were no statistically significant differences between the control and the study group in relation to children age, numbers of siblings, parents' age, and parents' education. These results in agreement with Bhat & Mandal, (2008) study, who reported that there were no differences among the studied sample regarding to children age, parents' age, and parents' education. The study revealed that the majority of children in both groups; their mothers were the caring persons for them. In relation to accompanied person during the child follow up; also almost all mothers were this person. Similarly, previous researches for Toorn, et al., (2013) who reported the same results. For clarification; this reflects that the women are able to tolerate the responsibility and burden of caring for their family members specially their ill children. On the same context (Toorn, et al., 2013) clarified that children with hypospadias in their study have not any pervious medical histories or preceding surgical operations, this result is in accordance with the current study; which explained that almost of children in both groups have not any pervious medical histories i.e. other medical disorders, surgical operations, or accidents. It was evident from the current study that there was statically significance correlations between mothers' level of education in relation to mothers' knowledge about hypospadias, and family income. These findings were supported by Massimo, Delphine, Anne-Frédérique, Pierre-Yves, Frédéric, & Pierre (2008) who emphasized in his study on management of severe hypospadias, and mentioned that importance of parents' education and related effects on knowledge about the disease. In the same context, the authors found that positive relation among mothers' knowledge about hypospadias and financial status of the family. Apparently, the current study clarified that there was a statically significance correlation between mothers' knowledge about wound dressing and child ranking. In accordance with Manzoni & Reali (2013) studies of management of hypospadias, he was agreed with the current study, and who stated that there was a relation between parents' knowledge about wound dressing and child ranking. Furthermore, there were statistical significance correlations between mothers' knowledge about caring of urinary catheter in relation to age of the child and age of the mother. These findings be of the same opinion with Coran, et al., (2012), who founded that there was statistical significance associations between mothers' knowledge in relation to caring of urinary catheter with regard to child' age and mothers' age. Moreover, the current study demonstrated that there were statistical significance correlations between mothers' knowledge about importance of follow up in relation to mothers' level of education. These previous findings are incongruent with Manzoni & Reali (2013), who reported that there was no statically significance correlation between parents' knowledge about importance of follow up for their children with hypospadias and mothers' level of education. The current study results explained that there were improvement of mothers' knowledge about hypospadias from low percentage in pre-test to high in post-test, which showed statistically significant difference. This may be due to the fact that improvement that have occurred after the instructions application could be referred to its content, which was developed based on the mothers needs for this knowledge, as well as to its clarity, illustrated with pictures, using simple language, regular replication and discussion to fix this knowledge for mothers in caring of their children with hypospadias. In this respect Kazemi & Gholizade (2013), study on comparison of distal hypospadias repair in circumcised and uncircumcised patients, and identified that there was statistically significant difference between mothers' knowledge in pre and post program application. As well as these results support the first hyposesis which clarified that mothers of children with hypospadias were preoperatively instructed will have better knowledge than the not instructed mothers. Noticeably, the current study proved that the mothers' practices in post-test were increased more than in pre-test; in relation to performing diaper care checklist as; assess penis & diaper area, apply ointment or petroleum jelly on diaper area as order. Mothers in pre-test were not satisfied about performing diaper care correctly, however in post-test; almost of those mothers were performed this procedure correctly. So there were highly statistical significant difference between pre and post-test regarding to mothers practices. The current study was in line with Marrocco, et al., (2014) as they considered that mothers receiving pre designed instructions reported a significant improvement in the daily care difference was detected at 4th and 5th day after surgical repair. As well as, Alison, Janet & Beverley (2009) who studied improvement in clinical

practices and how parents' views their children with hypospadias, and described postoperative nursing management in collaboration with each family following surgery, and clarified that the involvement of parents especially the mothers in decision-making has been at the heart of development in the care of boys who have hypospadias repair, also afford additional benefit of developing a home care and diaper care following hypospadias repair (Michael & Bruce, 2010). From my point of view; although practical evidence is still awaited, nursing care is vital for the successful pre-, peri- and post-operative care. Concerning early postoperative complications for children with hypospadias which were examined immediately (1-7days) after surgical operation in pre and post-test; the study results proved that occurrence of postoperative complications were reduced in post-test (36.7%) less than in pre-test in the study group. The difference between pre and post-test was significant. These results were in equivalence with Massimo et al., (2008) study on the subject of management of severe hypospadias, and who reported that occurrence of complications were 33%. Furthermore these findings were to some extent supported by (Beuke & Fisch, 2009) who studies strategies after complications of hypospadias repair, and stated incidence of complications ranged from 6 to 30%, varying with the severity of the hypospadias. Nuininga, Verschuren, Feitz, Keating, Snodgrass & Mesrobian, (2011) found that early complications rates in boys with multiple unsuccessful hypospadias repairs of 25·4%. Although; Michael & Bruce, (2010) who studying hypospadias repairs and paying specific attention to important aspects of nursing care, were including preparing for surgery, and added that; presence of children's departments preadmission clubs to prepare children and their parents for surgery are a part of routine care. Incidence of these complications can be minimized (< 5% in distal hypospadias and < 10% in proximal hypospadias) by surgical expertise, preoperative planning, choosing appropriate surgical technique, operating in childhood, using magnification, fine suture material and judicious postoperative management. Pertaining to types of early postoperative complications, the current results indicated that occurrence of infection were (45.5%) in children with hypospadias in post-test. In agreement with Bhat & Mandal, (2008) study of acute postoperative complications of hypospadias repair, and reported that postoperative cares are of paramount importance in order to minimize the risks of infections and wound dehiscence. Massimo et al., (2008), added that it appears essential to keep the penis still during the first healing phase to improve the outcome and reduce the child's discomfort. This results in argument with Ratan, Sen & Ratan, (2009), who highlighted incidence of infection, and serious sepsis was rare, but mild and localized infection can occur because of compromised vascularity, humidity, high temperature, and proximity to a potentially contaminated area, the incidence of infection was reported very high (53%). As infection is rare in hypospadias repairs. However, if it occurs the results can be disastrous. Therefore, preoperative povidine iodine scrubbing, the use of antibiotic solution during surgery, avoiding haematoma and a traumatic handling of tissue are frequently recommended (Asklund, Jorgensen, Skakkebaek & Jensen (2010). Bhat & Mandal, (2008) study at Pediatric Urology, Royal Manchester Children's Hospital, UK, reported that there is no urinary tract obstruction as postoperative complication, this findings was disagreement with the current study, which recorded that (18.2%) of children in post-test were suffering from urinary tract obstruction. In relation to rate of bleeding (19%) of those children in pre-test, although no one in post-test had bleeding in the current study. This is in conformity with Ververidis, Dickson & Gough (2010) study on the subject of nursing intervention in children with hypospadias complications, and stated that bleeding rate was 30% in the two groups, the difference was significant. Finally, in equivalence with Brouwers, Feitz & Roelofs, (2011), who confirmed that there was evidence to show children with hypospadias will recover better with less complications, when their mothers have been well informed by pre designed instructions and have good knowledge on hypospadias and how to deal with those children. Moreover these results were supported the second hyposesis; which stated that the mothers of children with hypospadias were preoperatively instructed will have less postoperative complications for their children with hypospadias than not instructed mothers.

8. Conclusion

Based on the findings of the current study, it was concluded that the pre-designed instructions for mothers of children with hypospadias were efficient by means of marked improvement of knowledge and practices of the study group, which support the research hypotheses. Mothers of those children were preoperatively instructed were less early postoperative complications than not instructed mothers for their children with hypospadias. As well as there were highly statistically significant differences between pre and post-test in the study group in relation to mothers' knowledge about hypospadias, important of preoperative instructions and postoperative care for those children. And almost of mothers in post-test in the study group had appropriate level of practices in relation to diaper care. In consideration of the valid body of knowledge about important of preoperative instructions for mothers of children with hypospadias for reducing postoperative complications, now it is time for instructing the mothers and training them by applying the needed procedures related to their children with hypospadias.

9. Recommendations

The study recommended that:

1- Important of preoperative instructions for mothers of children with hypospadias for reducing postoperative complications.
2- Highlighting additional researches about assessment of mothers' knowledge and practices in relation to care provided to their children with hypospadias.
3- A longer follow-up is necessary to monitor the late post operative complications.

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