

# The Effect of Health Education Program for Caregivers on Circumcision Outcome in Neonates and Infants

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## Abstract

Circumcision is a surgical excision of the foreskin to the level of the coronal sulcus which may perform in the neonatal period or in later life. Circumcision has many medical benefits such as minimizing urinary tract infection, reduces the incidence of balanitis and enhances of penile hygiene, prevents of penile cancer. However, Circumcision may cause complications such as bleeding, infection, meatitis and adhesions. Some of these complications can be minimized through imparting adequate health education by nursing staff to the caregivers who may influence circumcision outcome. This study aims to identify the effect of health education program for caregivers on circumcision outcome in neonates and infants. **Materials and Method:** A randomized controlled trial design was used for one month's period. Two tools were used, an interview questionnaire sheet was used to assess all caregivers' knowledge about circumcision before & after implementing the program and a post-assessment sheet about circumcision care, circumcision outcome. **Result:** There was an increased in the total knowledge after health education program compared to total knowledge before implementing the program among study group (3.4 to 0.8) and  $p < 0.01$ . Furthermore, There was significant statistical relation between the study group and the total knowledge score and cosmetic satisfaction score of  $Co = 0.2$ . **Conclusion:** demonstration with written instructions offered to caregivers help in early detection of complication which lead to positive outcome. **Recommendation:** Health education is a must and should be given by a qualified nurse supported by a simple clear hand out.

**Keywords:** Circumcision, neonate, infants, Parents education.

## Introduction:

Circumcision is the excision of the foreskin of the penis. About 120 circumcisions are performed every 5 minutes over the world<sup>[1, 3]</sup>. It may perform in the new born period or later in the life<sup>[1]</sup>. It is a widely observed religious practice in Jewish and Islamic societies<sup>[1-3]</sup>. The Jewish and Muslims faith dictates newborn circumcision. It is accomplished on male Jewish infants on the eight day after birth in ceremony called a bris. While practice by Muslims between the age of 7 days and 14 years<sup>[1]</sup>.

Circumcision have a different reasons; the first, medical reasons in present of pathological phimosis, religious is the second followed by social or cultural and finally in many countries circumcision is performed as "a routine – circumcision" in the neonatal period<sup>[4]</sup>.

There are different numbers of techniques used to perform circumcision, Mogen, Gomco and Plastibell clamps<sup>[2, 5]</sup>. A retrospective analysis of 1000 consecutive cases of neonatal circumcisions done with Gomco clamp at the Armed Forces Hospital, Jubail, Saudi Arabia during the period January 1996 through December 1998<sup>[5]</sup>.

The risks of circumcision are related to complications from the procedure. These complications are bleeding, infection, dehiscence (separation of approximated edges of skin), Meatitis (loss of protective foreskin), adhesions, concealed penis, urethral fistula, meatal stenosis, urinary retention and post circumcision phimosis.<sup>[6-8]</sup>

In addition, circumcision cause pain in unanesthetized infants and neonates in form of short term stresses which include increase heart rate, behavioral change, prolonged crying, increased cortisol level and decreased blood oxygenation<sup>[6]</sup>.

The American Academy of Pediatrics emphasized the need to explain post circumcision home care to the caregivers considering the types of procedure. If clamp (Gomco or Mogen) procedure was used, petroleum gauze dressing applied loosely to prevent adherence to the diaper. While if the Plastibell was applied, no special dressing is required and the diaper is applied loosely to prevent friction against the penis. The circumcision is assessed for excessive bleeding in the first few hours after the procedure, every 30 minute for at least 2 hours and then at least 3 hours thereafter and the first urination is recorded. Normally, on the second day a yellowish white exudates forms as a part of granulation process, as healing progress, the exudates disappear<sup>[6,9]</sup>.

Nurses play an important role in parents or caregivers education regarding the care of their circumcised neonates and infants. Nurses must take responsibility for ensuring that parents and caregivers' have an accurate and unbiased information. With successfully nursing education the good impact on the child's health and the circumcision complications will be minimized. For achieving such issue, the current study aims to identify the effect of health education program for caregivers on circumcision outcomes in neonates and infants<sup>[10]</sup>.

*Aim of Study:* This study aimed to identify the effect of health education program for caregivers on circumcision outcome in neonates and infants.

*Hypothesis:* Circumcised male neonates and infants whom Parents or caregivers receive health education program regarding to circumcision and post-circumcision home care will exhibit better outcome than those who receive routine hospital care.

## Materials and Method

**Research Design:** Randomized controlled trial

**Setting:**

The study conducted at one day surgery unit, in King Fahd Hospital of University, University of Dammam at Al-Khobar city.

**Subjects:**

All neonates and infants who appointed to previously mentioned setting throughout one month's period were selected and randomly divided into two groups study (18) and control (16), and fulfilled the following criteria: **Inclusion Criteria:**

Newborns older than 24 hours and infants

**Exclusion Criteria:**

- Evidence of a coagulopathy.
- Small penis due to prematurity
- Penile scrotal congenital anomalies.
- Sever illness or Infection.

## Tools

Two tools were developed and used by the researcher after reviewing of the related literature.

**Tool I: an interview questionnaire sheet (Before and after)implementing health education program:** it was used to assess caregivers' knowledge about circumcision such as, definition, how it is done, benefits, early & late complications and intervention care .In addition to their socio demographic data such as age, level of education and occupation.

**Tool II:** was used to assess post circumcision care and neonates' and infants' circumcised site. In addition to their socio-demographic data as age and their medical condition as clotting time and platelets count. It was consisted of three parts:

- I. **Assessment of care:** it included assessment of, dressing, applying local antimicrobial, appropriate diaper practice, emollient on glans and local hygiene.
- II. **Assessment of complication:** it assessed the following; bleeding, urine retention, crying, pain, excoriation/ balanitis, device malfunction, skin separation, adhesion and physician visit.
- III. **Assessment of degree of cosmetic satisfaction:**  
First assessment was be done on fourth day after circumcision by telephone call/ or in clinic using first and second parts of tool II, Second assessment done on follow up visit after ten to thirteen days of circumcision to assess the degree of cosmetic satisfaction using the following category, it developed by the researcher based on the adopted pediatric penile perception score and Hypospadias objective penile evaluation- score<sup>[12, 13]</sup>.
  - **Fully satisfied**, (normal locking circumcised penis, the head of the penis appears smooth with no sheath covering it).
  - **Partially satisfied doesn't want revision /correction** (redundant prepuce covering proximal glans, buried penis partial torsion <45 degree).
  - **Partially satisfied wants revision/ correction** (Redundant prepuce covering > 1/3<sup>rd</sup> proximal glans, torsion >45 degree, (painful erection short frenulum)).
  - **Dissatisfied.**
    - ✓ >1/2 glans covered.
    - ✓ Dorsal curvature.
    - ✓ Unsightly skin tag.
    - ✓ Glans excoriation + fibrotic stenosis and meatus.
    - ✓ Urethrocutaneous fistula.

A comparison between the study and control group before and after the program done to identify the effect of

health education program for caregivers on circumcision outcome in neonates and infants.

**Methods:** The permission obtained from the responsible authorized personnel in King Fahd Hospital of the University, University of Dammam at Al- Khobar city for conducting the study. Ethical approval asserted from the ethical committee in University of Dammam. Verbal consent obtained from the parents and caregivers' of neonates' and infants' who will participate in the study. Confidentiality and anonymity of individual response guaranteed. The study tools developed by the researcher after reviewing of the related literature. Content Validity done for the tool by 5 experts in pediatric field. Before and after health education program test done to assess caregiver's knowledge about circumcision and regarding care of their circumcised neonates' and infants' before and after implementing a health education program using (tool I) to both groups. The researcher developed health education program content based on the study group caregivers' need and after reviewing of the related literature for the study group caregivers'. It will fulfilled the following objectives:

- Identify expected outcome and able to define variation of complication and precaution.
- Identify importance of post circumcision home care.
- Discuss discharge instructions about home care after circumcision such as: bathing, activities allowed and complications to be prevented.

**The content of the health education program included:**

- Definition and methods of circumcision
- Benefits of circumcision
- Post circumcision healing process.
- Early and late complications.
- Post circumcision home care and discharge instructions
- Follow up care.

**Implementation of the health education program applied as follow:**

- It was carried out at One Day Surgery Unit, morning shift before circumcision and the time needed was 20 minutes.
- Mother class, discussion, pamphlets, boaster and video was be used as a teaching strategies and aids.

**Caregiver's knowledge assessment score:**

Nursing Outcomes classifications was used as scale to evaluate knowledge of caregivers before and after implementing health education program using the following score category:

0= none which mean Dependent for all information

1= limited which mean requires assistive person and resources

2=Moderate, require assistive resources

3=Substantial, Independent with minimal cues

4=Extensive, Independently verbalize/demonstrates information without cues.

**Data Analysis**

Statistical analysis was performed by using statistical Package for the social studies social sciences (SPSS). Version 20.0 Comparison was made between study and control groups from both care givers and neonates and infants whom circumcised by using Wilcoxon Test and Mann-Whitney test (M-WT) for quantitative variable and Fisher Exact test(FET) for Qualitative variables. P-value less 0.05 was considered as statically significant and highly significant when p. value less than or equal 0.01.

**Results:**

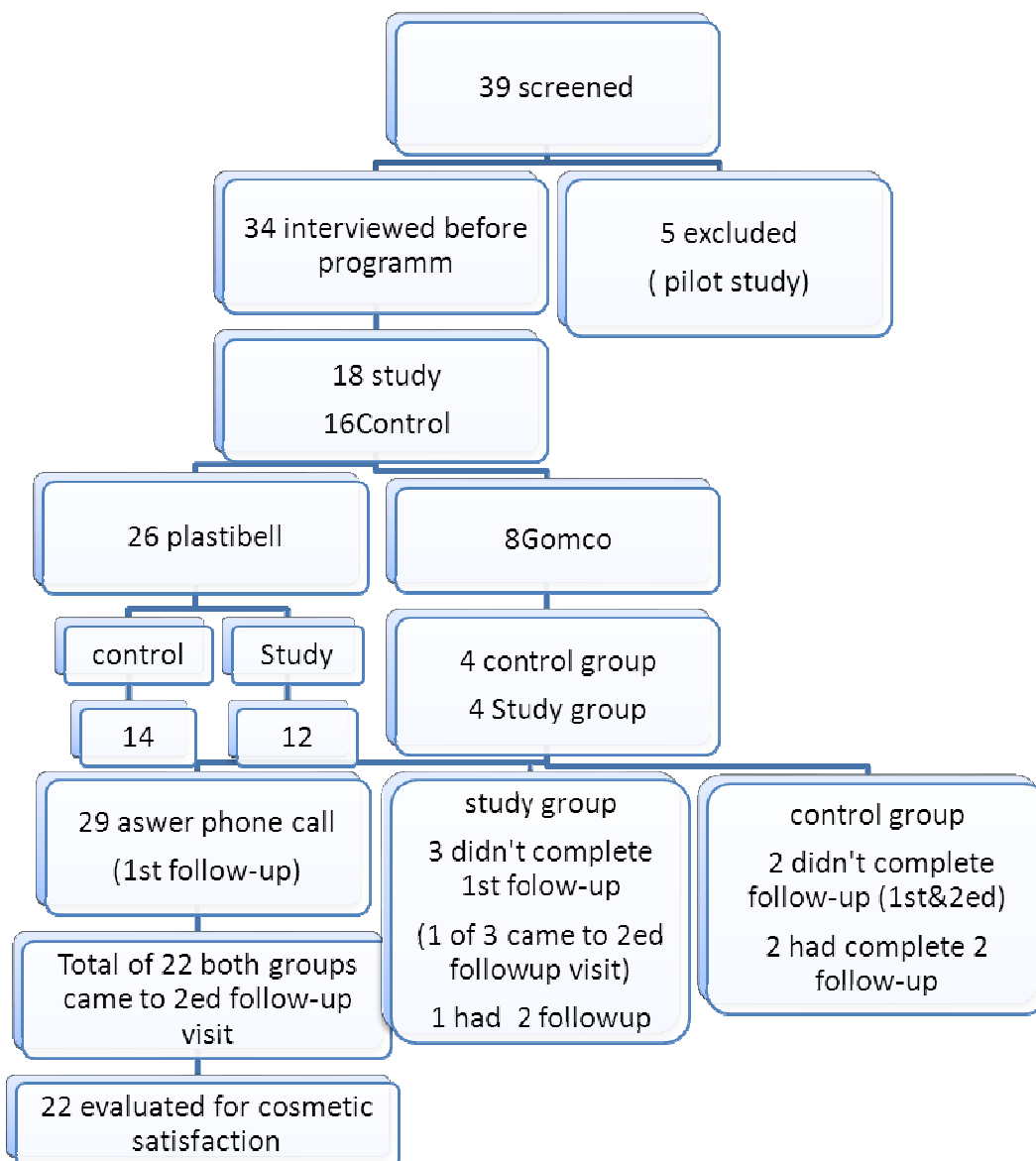


Figure (1) Cohort profile:

A total of 39 subjects were screened, of whom 34 enrolled and underwent circumcision procedure. Of 5 neonates and infants with their care givers excluded from study as pilot sample, 34 interviewed before program and divided randomly every other one to study and control groups(18,16) respectively. Plastibelling and Gomco technique were used for circumcision. First evaluation Post circumcision done at day 4 using telephone call, 29 caregivers answer while the rest of them 5 were not answer. Regarding second evaluation from 10 and 14 days post circumcision at the hospital, 22 of them came while the rest of them (12) didn't came. For they were satisfied with circumcision outcome or unavailability of transportation to the hospital for follow-up.

**Table (I): Percent distributions of newborns and infants in the study and control groups according to their age**

<b>Subjects</b> <b>Age(days)</b>	<b>Study group</b> <b>n =18 (%)</b>	<b>Control group</b> <b>n =16 (%)</b>	<b>Test of</b> <b>significant</b>
<b>Early neonates &lt; 7days</b>	0(0.0)	1(6.2)	
<b>Late neonates(7-28 days)</b>	2(11.1)	2(12.5)	
<b>Post neonates(&gt;28 days)</b>	16 (88.9)	13(81.3)	
<b>Minimum- Maximum</b>	20- 120	2-100	
<b>Mean ±SD</b>	40.6 ±22.1	36.1±21.3	
<b>Median (IQR)</b>	31.5(15)	30(16)	<b>Z=0.990 P=</b> <b>0.3</b>

Table (I) shows percent distributions of newborns and infants in the study and control groups according to their age. The age of study group ranged from 20 to 120 days with a median value of 31.5 days while in control group ranged from 2 to 100 days with a median of 30 days.

**Figure (2): The Median distribution of study group before and after health education program in relation to the general knowledge score about circumcision.**

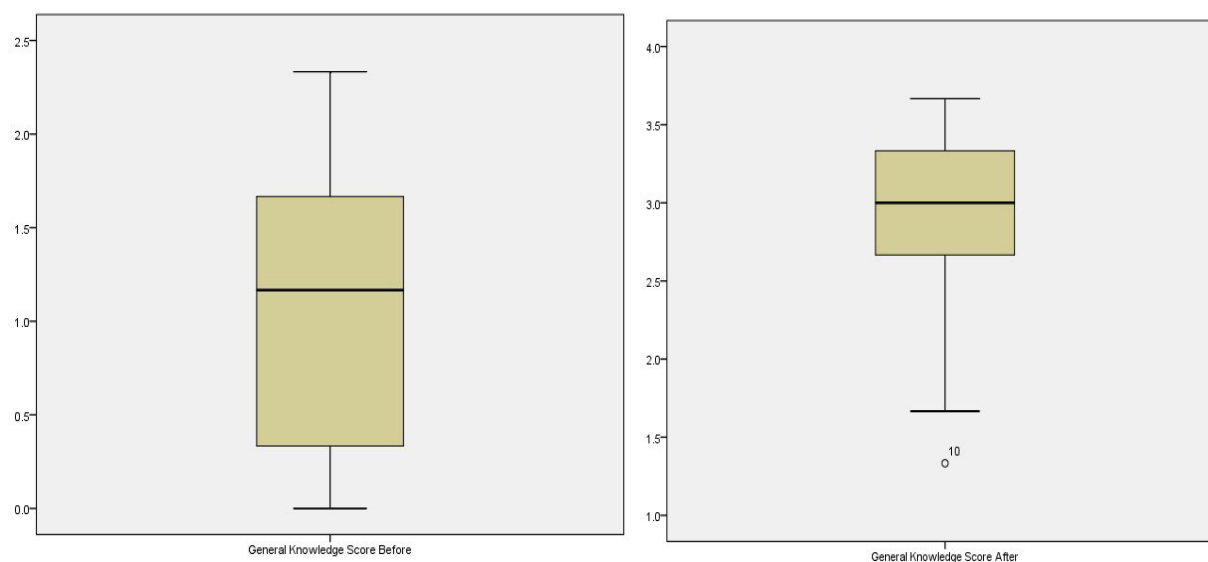
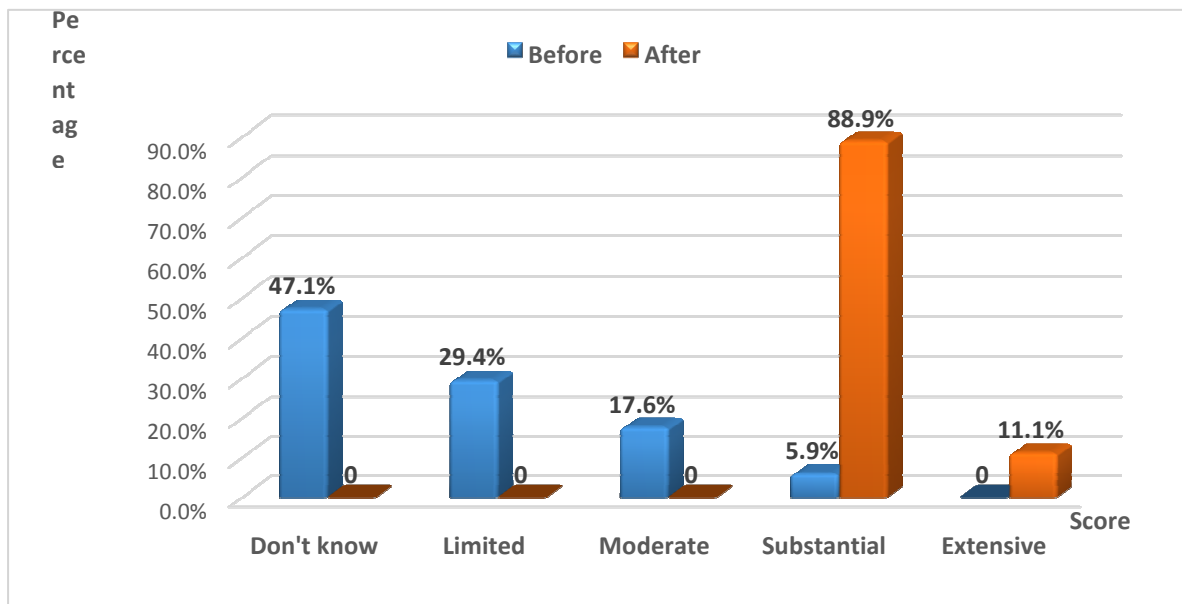


Figure (2) shows that the median of the general knowledge score among study group was statistically significant where  $P < 0.001$ .

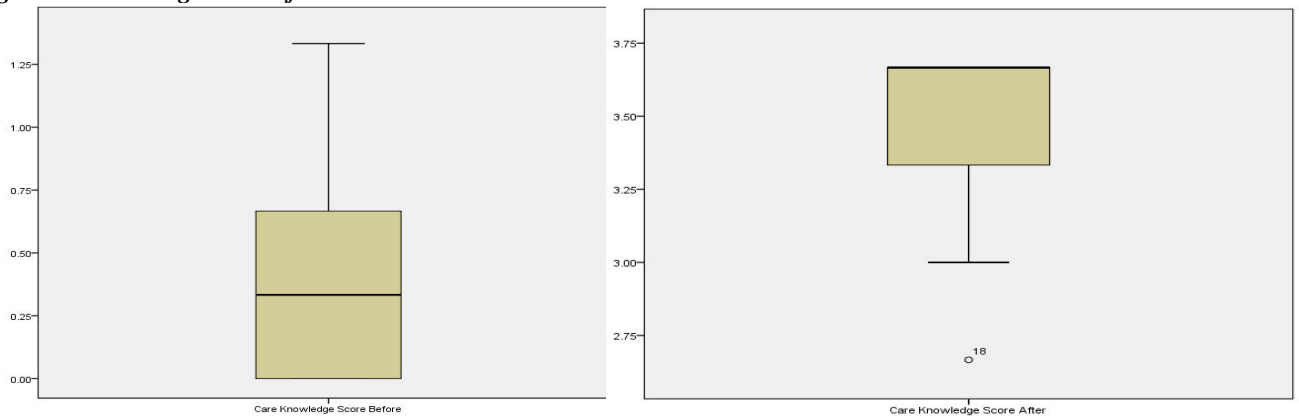
**Figure (3): percent distribution of study group before and after health education program according to the knowledge score about home care post-circumcision**



MCNP=0.008

Figure( 3) portrays that “don’t know” knowledge score before program stated by 47.1% while after the program “substantial” knowledge score was the highest percent 88.9% among study group. Statistically there was a significant difference where  $p < 0.008$ .

**Figure (4): The median distribution of study group before and after health education program about the general knowledge score of circumcision care**



Z=3.748 P<0.001.

Figure (4) shows that the median of general knowledge score of circumcision care among study group was statistically significant where  $P = < 0.001$ .

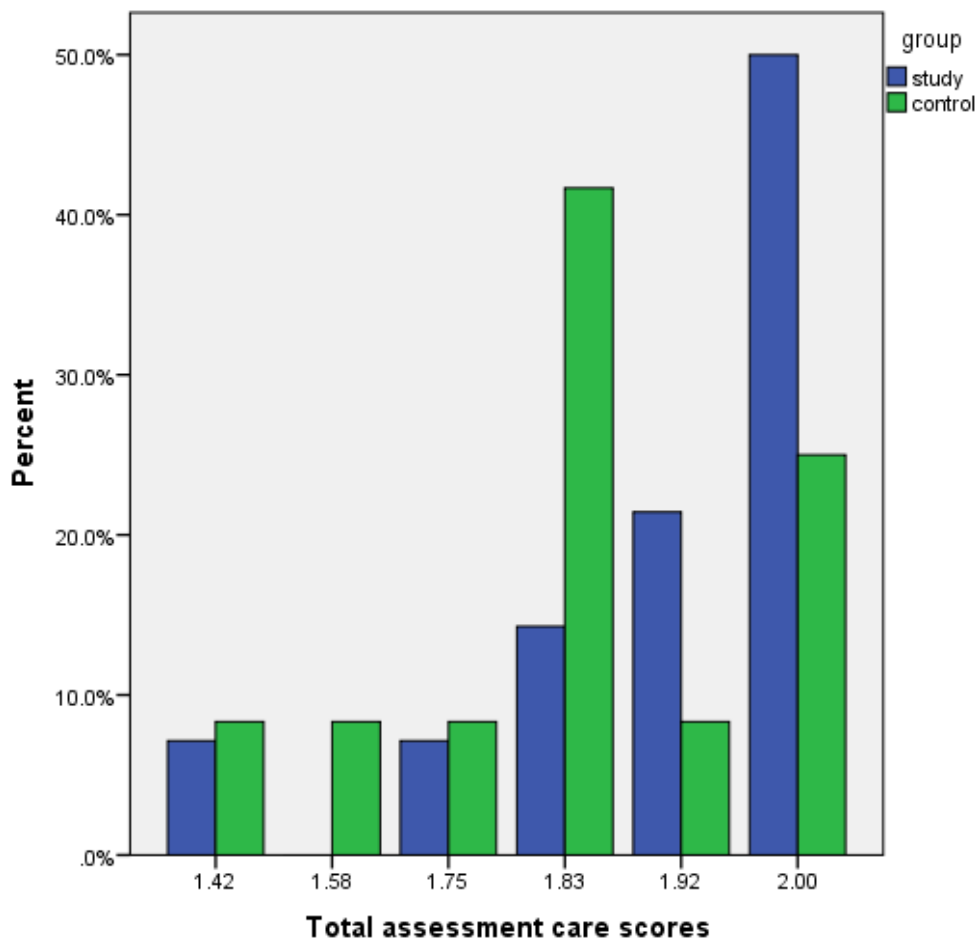


Figure (5) Percent distribution of study and control group in relation to the total assessment care scores.

Figure (5) illustrates that more than fifty percent of study group scored (2), and around forty percent of control group scored (1.83) in relation to total assessment care scores.

Figure (6): Percent distribution of post circumcision complications among study and control groups.

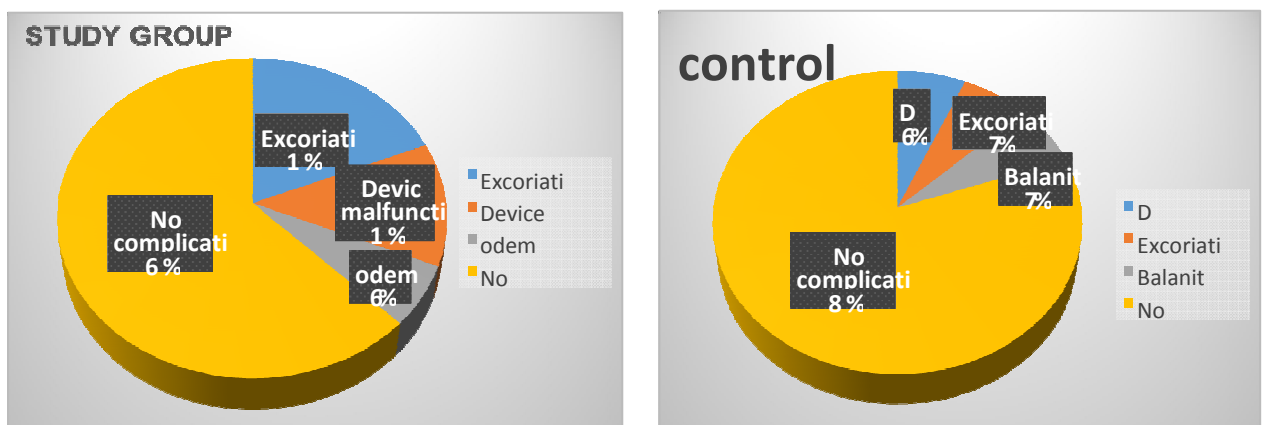


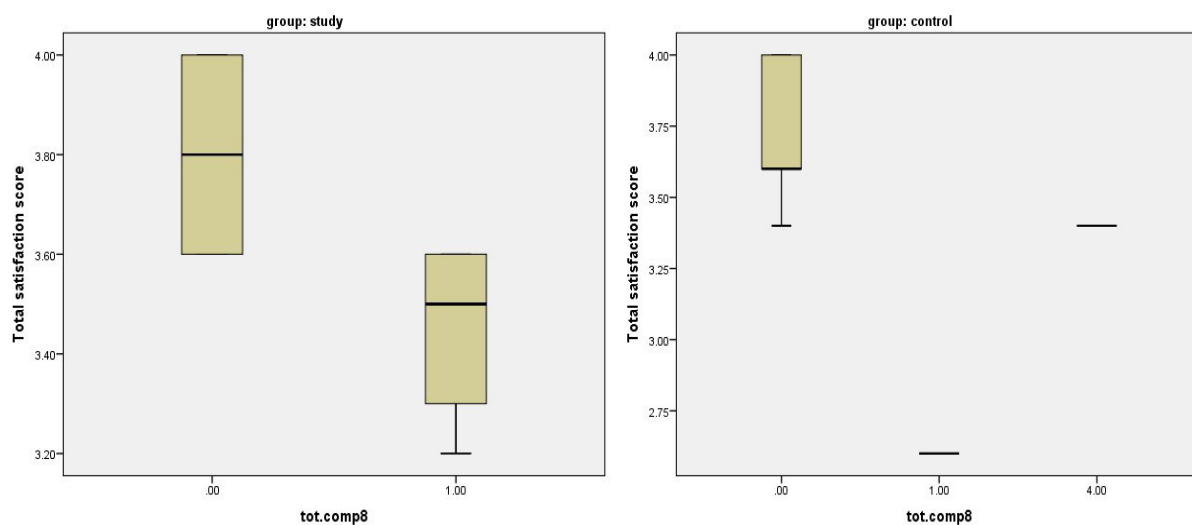
Figure (18) Shows that in the study group sixty three percent were free from complications: while the rest(37%) had: excoriation (19%), Device malfunction (12%) and edema (6%). On the other hand the control group presented with 20% distributed as balanitis(7%), Device malfunction (6%), Excoriation (7%).

**Table (2) the relation between post circumcision complications and median of circumcision cosmetic satisfaction.**

Satisfaction \ Complications	Study group Satisfaction n=12	Control group Satisfaction n=10
Number of complications		
One complication	3.8	3.6
Four complication	3.5	3.4
Test of significant	Z=2.311* P=0.02*	X##=4.354 P=0.1

Table (2) shows that there was a statistical significant difference between post circumcision complications & cosmetic satisfaction among study group where  $Z=2.311$  and  $p=0.02$ .

**Figure (7): The relation between total cosmetic satisfaction score and total complications among study group and control group.**



$Z=2.311^* P=0.02^*$

Figures (7) shows that there was an improvement in the median value among study group where median= (3.8) with total complications score = zero. Also, there was an improvement of median total cosmetic satisfaction score among control where median value # (3.6 to 2.25) and total complication score (0 to 1)

## DISCUSSION

Circumcision is the most commonly performed surgical procedure done today. Circumcision has many medical benefits such as minimizing urinary tract infection, reduce sing the incidence of balanitis, enhancement penile hygiene and preventing penile cancer. However, Circumcision may cause complications as bleeding, infection and adhesions. Most parents choose to have circumcision due to social, cultural and religious reasons [2, 5]. It is still done due to medical indications. Therefore Muslim countries like Saudi Arabia like to practice it as an integral part related to religion. Regardless the reasons, most parents are not properly counseled about circumcision care. Registered nurses, surgical technicians, or nurse aids were performed male circumcision procedures in some countries [32]. Also, it is very important to perform the procedure as humanely as possible with minimal risk and good cosmetic outcomes [14].

All over the world, a lot of studies handled circumcision in general. Meanwhile, the present study considered a unique study that emphasizes the effect of implementing health education program on circumcision outcomes in KSA.

Thoai D Ngo et al. (2013), mentioned that follow up visits take place on the day of the procedure and at post-operative days 3, 7 and 30, with additional visit as necessary. Caregivers were asked to use mobile outreach site for post operation follow-up [32]. Similarly, Bailey et al (2013) reported that circumcised male experienced a serious complications resulted from poor training, and inadequate patient follow-up. These goes in same plan of present study that had close monitoring for patient condition and cosmetic satisfaction post circumcision that helped in early detection of complications [32].



Aron J. et al. (2013) and Horowitz & Gershbein (2013), reported that circumcision complications occur more frequently with increase of the patient age. These agree with present study which found that the older median age (45) days developed four complications while (38.5) days developed one complication. This is in accordance of facts that due to hormonally mediated increase in penile, prepuce size and vascularity with age [33]. Mayer et al (2003), found that some subtle anatomic variations are significantly associated with late complications [33, 34].

Parents should be counseled in details and should be required to provide their informed consent that the possible health benefits of child hood circumcision don't outweigh the reported complication rate, and that they have weighted the health benefits against the risk in the light of their religious, cultural, and personal preferences [34]. The American Academy of Pediatrics (AAP) (2013), recommended the creation, revision, and enhancement of educational materials to assist parents of male infant with care after circumcision [34]. These agree with the present study that showed improvement of total knowledge score among study group after implementation of health education program with median value (before 0.8 to after 3.4) and  $p < 0.001$ . This is in agreement with APP (2013) who stressed the importance of information about circumcision given to caregivers as it had an important role in decreasing severity of complications [34].

Health education is one of the nurse's roles in neonatal circumcision, so parents should be instructed about the proper post-operative care and the care of the penis after circumcision that has an objective of minimizing post-operative complications [33].

Aron et al (2013), reported that most infections can be prevented with proper patient preparation, gloves wearing and local wound care including cleaning the penis, and application of antibiotic ointment with diaper change [33]. This agree with the present study that showed more than 50% of study group had score 2 regarding care while 40% of control group had score =1.83. This was helping in reducing severity of complications among study group whom receive health education program.

Bailey et al (2013) reported that the adverse events following circumcision can be categorized as either early or late complications. Early one as surgical site infection tends to be minor and quit treatable. Late complications such as inadequate skin removal and meatal stenosis; these are commonly treated in outpatient setting [32].

Concerning the results of the present study about post circumcision complications among study and control groups. There were six cases in the study group representing early complications such as excoriation and devise malfunction. This related to an early detection of complications through answering phone call that lead to an early management which reduce the acute one. On the other hand, the control group developed acute complication (balanitis) which required admission to hospital.

These results agree with finding of (Jorgen et al., 2013) whom mentioned that occurrence of two acute complications as superficial skin infections which needed treatment for one week postoperatively [32].

These results agree with finding of (Jorgen et al., 2013) who mentioned that two cases represented by a superficial skin infection as acute complications and treated for one week postoperatively [35].

Jorgen et al. (2013), found that among 20 patients with recorded complication, two patients of them presenting with edema of the penis that needs no treatment [31, 33]. This agrees with the results of the present study which found that edema was presented in 6% of study group which is normally found in the third day of circumcision and no treatment needed.

Idemir M, et al (2008), found that cosmetic results assessed by a blinded urologist were better for the disposable clamp (Plastibell technique) in compare to conventional dissection technique in infants and children. The parents' satisfaction score for the procedures was similar in both groups [35]. This goes in the same line of present study that found no statistical significant difference between the cosmetic satisfaction score and occurrence of complications in both groups. Thoai D Ngo et al. (2013), mentioned that the majority of study patient (99%) were satisfied with counseling process and the outcome of circumcision [32]. This agrees with results of the present study that showed no statistical significant difference among both groups regarding cosmetic satisfaction score post circumcision where  $P=0.6$ .

Finally the study showed better care and expected outcome among caregiver of study group compared to control group. There was an improvement in total knowledge among study group after health education program. This was supported by APP (2013), whom stressed to develop an educational materials for clinician to enhance practitioners' competency in discussing the benefits and risks of circumcision with parents and to offer educational materials to assist parents of male infants with care of circumcised newborn [34].

## CONCLUSION

Simple demonstration with simple basic written instructions offered to caregivers after performing circumcision helped in early detection of complications and early intervention which subsequently improved neonates and infants cosmetic satisfaction. Also, it reduced cost to the hospital and number of visit to the clinic.

## RECOMMENDATIONS

- Health education is a must and should be given by a qualified nurse supported by a simple clear hand out.
- Printed handout about circumcision care should be available for all neonates and infants caregivers in outpatient setting.
- In future, research large sample size will be good to give significant result.

### *Limitation:*

This study was taken more than expected time due to the decreased number during vacation time and number of the patient whom coming to follow up was less due to some reason or because they are satisfied with cosmetic result of the wound.

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