The Effect of Pre-Procedure Teaching Module for Patients Undergoing Shock Wave Lithotripsy on Anxiety, Claustrophobia, Pain Perception and Urolithiasis Clearance

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Abstract

*Background: Shock wave lithotripsy (SWL) is the best choice treatment for renal stone. **Aim** of the study is to test the effect of pre-procedure teaching module for patients undergoing SWL on patients' anxiety, claustrophobia and pain perception, and stone clearance. **Methods**: A quasi-experimental research design was utilized in this study, **setting**: The study was conducted in SWL unit at Prince Mutaib Bin Abelaziz Central Hospital, Saudi Arabia. **Sample**: A convenience sample consisted of 74 patients they divided equally into study and control groups. **Tools**: (1) An interviewing questionnaire sheet which included two parts; A) demographic and medical data and B) patients' knowledge questionnaire, (2) Beck Anxiety Inventory, (3) Numerical pain rating scale and (3) Visual analogue scale for claustrophobia. **Results**: Before receiving pre-procedure teaching module 100% of patients in both groups had poor level of knowledge. After receiving teaching; the study group had significant improvement in their knowledge, decrease in anxiety, claustrophobia and postoperative pain scores as well as an increase in rate of successful treatment and stone clearance than the control group (p <0.05). **Conclusions**: Overall results revealed that pre-procedure teaching for patients experiencing SWL procedure Led to improvement of patients' knowledge and reduction of anxiety, claustrophobia and pain scores after procedure as well as an increase in rate of successful treatment and urolithiasis clearance in the study group than the control group. **Recommendations**, planned teaching and simple Arabic booklet about SWL, preoperative instructions, post-procedure management, nutritional habits and life style modifications should be provided to patients before SWL.*

Keywords: Pre-procedure teaching module - Shock wave lithotripsy - Anxiety - Claustrophobia - Pain – urolithiasis.

Introduction

Urolithiasis is the formation of calculi at any portion of the urinary tract. Globally about one to fifteen percent of people are high risk for renal stones at different stages of the life (*Morgan and Pearle, 2016*). In 2013, 49 million cases occurred, resulting in about 15,000 deaths (*Naghavi et al.,* **2014** *and Vos* et *al., 2015).*

Since after 1980, Shock wave lithotripsy (SWL) has become the first line of treatment and preferred technique by urologists for kidney and ureteral stone. It is the best treatment for upper ureter stones between 0.4mm and 2 cm in diameter *(Hayes et al., 2015)*. SWL can be an effective treatment for eighty to eighty five percent of simple kidney stones (*Miller & Lingeman*, *2007).* SWL has several advantages when compared with open surgery and endoscopic procedures. It is none invasive, outpatient procedure and needs to less anesthesia. It is easy to be done and had less complications rates *(Haecker & Wess, 2010;* **Chandhoke, 2007***).* Nevertheless, rare complications such as hematoma, petechial hemorrhage and cardiac rhythm disturbance, etc. were reported.

SWL is a way used to break down the urinary calculi into small fragments. The shock-waves produced by the machine are cautiously focused on the area under direction of the ultrasound or x-ray

imagine. The waves move through tissues without causing permanent damage and destroy the stone into micro cutting like sand. Then, these pieces will be put out of the body in the urine over a period of time. It is the more commonly procedure used to treat the stone in all sizes and locations. It is an effective in treating renal stones smaller than 2.5 cm in size, proximal and distal ureter stones ranged from 0.4 to 2 cm *(AL-Hakary et al., 2016; Urology, O. and Mohd et al., 2006).*

Hospital anxiety is common among the majority of the patients before surgery and medical procedures, especially for the patient who has no previous experience. Nonetheless, some clients become so anxious and these normal fears turn into Claustrophobia from the procedure **(Aman, 20013).** Anxiety has been accompanied with several pathophysiological responses such as hypertension and dysrhythmias, high temperature, sweating and nausea. It may cause vasoconstriction, which result in difficulty in obtaining of blood, so the severe pre-procedure anxiety may affect postoperative outcome*s (John, (2009).*

The patients who feel anxiety about the surgery should ventilate his feeling to health care team; this is often beneficially for patients who have high-risk surgery. The nurse and other health team must play an active role in reassuring and managing anxiety by advising the patient to trust himself and his surgeon and give him full information about the nature of procedure, preoperative preparation, anesthesia methods, and ideal behaviors during postoperative management **(Aman, 20013 [6]; Pritchard, 2009).** It is better to involve the family in psychological preoperative care to maximize feeling of patient security. The good physical and psychological preparation for patients and their families' in preoperative course help them to do well in managing the patients during postoperative phase **(Townsend & Beauchamp et al., 2015.)**

Necessary preparations by teaching patients before surgery can reduce anxiety through giving of anticipatory information. It directly affects the patients' safety and has become standard care basics **(The Joint Commission. Ambulatory Health Care: 2011).** Preoperative teaching must meet the deficit in patients' knowledge related to the surgical procedure, which may help in alleviating their fears, and improve surgical outcomes *(Lubin et al., 2013).*

It is beneficially for the patients to learn about pain control after surgery. They should be directed to ask the analgesic before the pain become severe. They are taught about rating their pain on pain scale. This will help the health care personnel in evaluating degree of their pain. They are also taught about none pharmacological strategies to control the pain. *(Wicker &Neill, 2010).*

There are a very few researches about the effect of education on patient knowledge, anxiety level, claustrophobia, postoperative pain and urinary stones clearance so the present research checks the impact of pre-procedure teaching module for patients experiencing SWL on anxiety, pain perception, claustrophobia and urolithasis clearance.

Significance of the study

In the existing time, SWL is considered the preferable therapy for upper renal stones *(Lingeman et al., 2009)*. Few researches were conducted about its advantages, necessary preparations, precautions before, during and after procedure and the instructional plan to prevent future urinary stone *(Mohamed et al., 2015).* This procedure may result in fear and anxiety which may influence patient's perception for pain and affect the completion of the session by reducing patient adherence" to a medical regimen *(Ngee-Ming, 2014).* Little practical information is available about pre-procedure teaching and its effect on pre-procedure anxiety that may affect the feeling of pain and patient's compliance with medical instructions.

Aim of the study

The aim of the current study is to test the effect of Pre-procedure teaching for patients undergoing sessions of shock wave lithotripsy on patients' anxiety level, pain perception, claustrophobia and clearance of urolithiasis.

Hypotheses

1. Pre-procedure teaching module will increase knowledge of the study group as compared to the control group.

2. Pre-procedure teaching module will reduce anxiety among subjects of the study group when compared to the control group. . .
3. Pre-procedure teaching module will improve pain control among subjects of the study group during after sessions of shock wave lithotripsy when compared to the control group.
4. Pre-procedure teaching module decreases claustrophobia among subjects of the study group as compared to the control group.
5. Pre-procedure teaching module will increase the rate of successful treatment and Urolithiasis clearance among the patients in the study group as matched to the control group at the same number of SWL sessions.

Material and method

Research design: A pretest-posttest control group quasi-experimental design was used this study.
Setting: The current study took place in SWL unit at Prince Mutaib Bin Abelaziz Central Hospital.

Sample

The sample of patients for this study included anyone who presented to the unit of SWL and had inclusion criteria. A convenience sample included 74 patients who agreed to take part in the study and who had the cited criteria. The patients were separated into intervention and control group. The intervention group received the designed instructions by the researchers before SWL procedure, while the control group did not receive any instructions prior to SWL procedure other than the routine hospital instructions. Patients examined in this unit were on a waiting list and were given an appointment for the examination.

Inclusion criteria

The subjects were eighteen years old and more (male and female), with renal and ureter stones and does SWL procedure for the first time.

Exclusion criteria

The investigators reject clients with previous experience of SWL sessions, anxiety disorders and clients who had difficulties to understand the information and instructions in the teaching module.

Tools: Four tools were used to in data collection

I. An interviewing questionnaire sheet: This **questionnaire** was designed by the researchers and composed of 2 parts:
- **Part 1: Demographic and Medical Data:** such as level of education, type and location of the stone.
- **Part 2: Knowledge assessment questionnaire:** researchers designed it after revising the extensive literature. It consisted of 10 questions to assess patient's knowledge about SWL, contraindications, preparation, complications, and post-procedure management. The scoring system for the questionnaire was as follows; the correct complete answer was given the score of "1", the correct incomplete answer was given "0.5" and the wrong answer was given the score of "zero". Knowledge level is categorized as following:
- **Poor: (0 to 5.5) below 60% of the total knowledge score.**
- **Average: (6 to 7.5) represent 60% to 75% of the total knowledge score.**
- **Good:** (8 to 10) above 75% of the total knowledge score.
Percentage = Obtained score /total score x 100. Based upon scoring system

II. Beck Anxiety Inventory (BAI) (*Beck AT, Steer RA, 1993*).

BAI measures the severity of anxiety. It was designed for individuals who were 17 years old or older and took 5 to 10 minutes to complete. The BAI contains 21 questions, each answer being scored on a scale value of 0 (not at all), 1(mildly), 2 (moderate) and 3 (severely). The higher scores indicate more severe anxiety symptoms. The scoring system is as follows: 0 – 9: normal anxiety; 10 – 18: mild anxiety; 19 – 29: moderate anxiety and 30 – 63: severe anxiety.

III. Horizontal visual analogue scale of 10 cm (0-100 mm). This was used for **assessment of claustrophobia.** Higher score indicates greater intensity of claustrophobia **(Wewers & Lowe 1990).**

IV. Numeric Pain Rating Scale from 0-10 (Stratton Hill, 1997).

It is an 11-point scale for patients self-reporting of pain. It is for adults and children of 10 years or older. The rating is described as follows: 0- no pain, 1-3 mild pain, 4-6 moderate pain and 7-10 severe pain.

Reliability assessment

These tools were tested and reviewed by the researcher, then by a panel of 6 medical and nursing experts for tools content validity. Their views were elicited about the tools' format layout, consistency and scoring system. Reliability of all items of the interview questionnaire sheet was done using test – retest which revealed that all items were significant and has a correlation coefficient above the significance level (r= 0 .75).

Pilot study

It was performed before data collection on (10%) of the sample to test the tentative developed tools for clearness and applicability, and to estimate the time needed for data collection. Needed modifications were carried out.

Fieldwork

Data were collected over a period of about 7 months started from Saturday 23 - 11 -2015 to the 31 - 6 - 2016 It was conducted in two phases: preparatory and implementation phase.

Procedure: phases of the current study

I-Preparatory phase

This phase included preparation of the study tools and pre-instructional module. The module was formulated by the researchers to provide patients with information about SWL meaning, machine description, contraindications, preparation, post SWL complications and postoperative management after reading extensive literature.

II: Implementation phase

- Administrative approvals for collecting data were gotten from the hospital manager and the head of SWL unit. The purpose of the study was discussed with the manager, head of SWL unit and the nurse who is responsible for patient preparation of department to increase their collaboration. Method of data collection was explained, and a list of patients' names with the schedule of patients was obtained.
- Oral permissions were taken from patients to share in the study for each patient.
- At the 1ist interview, the researchers introduced themselves to initiate a line of communication and explained nature and purpose of the module. Each patient was individually assessed for their level of knowledge, anxiety and claustrophobia before receiving teaching module as well as before beginning the procedure of SWL examination. Patients who could not read or write were helped by the researchers to fill out the sheet. English tools were translated into Arabic for Arabic speaking patients.
- Patients were divided study group (37) and control group (37). The instructions designed by the researchers were given and explained to the study group as a manipulation of the independent variable. The dependent variables were the subjects' knowledge, anxiety and pain level, claustrophobia intensity as well as rate of successful treatment and urolithiasis clearance.
- Patients were recruited from the SWL unit appointment book at Prince Mutaib Bin Abdel Aziz Central Hospital
- The patients who had inclusion criteria were divided as following (number 1 usually for the study group and number 2 for the control group, number 3 was for the study group, number 4 was for the control group and so on.
- One to 2 patients were interviewed each day based on patients' response. Thirty to 45 minutes were spent with each patient for filling assessment sheet according to patients' response.

- Three tools were used 3 times for the same patients (knowledge questionnaire, anxiety scale, and claustrophobia intensity scale) except for pain scale which was used 4 times as following;
- For the study group, Knowledge assessment questionnaire was tested 3 times. The first time was before giving pre-procedure teaching and booklet. The second time was tested after providing pre-procedure teaching immediately before the first session. It was tested for the third time before the second session.
- For the control group, Knowledge assessment questionnaire was tested three times: at the first interview before SWL session, immediately before the first session and the second session.
- For the study group, patients were assessed for anxiety and claustrophobia intensity before receiving the pre-procedure teaching module, at the first session, and at the second session.
- For the control group; patients were assessed for anxiety and claustrophobia intensity at the first interview, at the first session and at second session.
- For pain assessment, both groups were assessed during and after the first and second sessions. Pain was rated by the patients using.

Researcher interviewed patients of the study group through three educational sessions. The sessions were conducted by the researchers in a simple Arabic language using discussion, posters, and handouts. Each patient obtained a copy of the booklet, which included all educational contents.

Statistical analysis

The percentage distribution mean, and standard deviation, chi-squared test and t-test were used to find out any significant differences between the study and control groups. The level of significance was obtained when $P \leq 0.05$.

Results

Table (1): It is clear from the table that more than half of the study group subjects, and more than two-thirds of the control group subjects were males, and about half of the study group subjects and more than half of the control group subjects aged over years with mean age of (47.76 ± 7.85) and (49.93 ± 11.50), respectively. Moreover, about one-third of both groups had secondary degrees. However (32.5%) (21.7%) of both groups were single, respectively. No significant statistical differences were seen between the two groups in relation to the above-mentioned demographic variables.

Table (2): It shows that the majority of both groups had renal pelvis stone with mean stones size of (14.71 ± 6.54) and (13.82 ± 4.21) for both study and control groups, respectively. Moreover, the majority of both groups had single stone.

Figure (1): it revealed that 100% of both groups had poor knowledge pre-teaching in contrast to post teaching at first session, where (78.4%) and (0%) of both groups had good knowledge.

Table (3): It is obviously noted that, no statistically significant difference was found between both groups pre-teaching. However, a highly significant difference was found between the two groups after teaching in relation to knowledge levels. A highly significant difference was also found between two groups regarding to total knowledge scores post- teaching.

Table (4): concerning the total score of anxiety and its levels, a highly significant difference was found post teaching at 1st session and at the 2nd session there was (59.5%) and (56.7%) of both study and control groups, respectively, had severe degree of anxiety pre-teaching. In contrast, post teaching at 2nd, session (0%) and (37.8%) of both groups had severe anxiety.

Table (5) It is obvious that, no statistically significant difference was found between both groups before pre-procedure teaching in relation to total horizontal visual analogue scale scores of claustrophobia. However, after pre-procedure teaching module was given, a highly significant difference was found between the two groups at the 1st session and at the 2nd session.

Table (6): It showed that, there was a significant lowering of pain score for the study group than the control group when comparing pain score post procedure at the first session and at the 2nd session.

Table (7): In relation to the rate of successful treatment and Urolithiasis clearance, it is obvious that (67.6 %) of the study group subjects were treated successfully after two sessions. However, only (56.76%) of the control groups subjects were treated successfully after two sessions. There was a

significant difference as regards to rate of successful treatment and Urolithiasis clearance between two groups.

Table (8): It indicated that a strong positive correlation between severity of anxiety and claustrophobia, as well between severity of anxiety and pain scores were generated.

Discussion

Today, patients usually undergo medical procedures without receiving enough knowledge about what will happen. This can be disturbing to them psychologically and physically, which may affect them and may cause medical problems. Education and providing the patients with simple explanation about procedure and correct medical guidelines that they must follow help patients to be involved in their care, decrease the anxiety triggered by the procedure, reduce complications and improve outcomes *(Wilson et al., 2016; Guo, 2015)*. Hence, the aim of the current study is to test the effect of Pre-procedure teaching for patients undergoing sessions of SWL on patients' anxiety level, pain perception, claustrophobia and clearance of urolithiasis.

The findings of the existing study will be discussed in the following, headings: demographic and medical data, patients' knowledge, anxiety and claustrophobia pre and post teaching, postoperative pain perception during and after procedure, successful treatment and resolution of the stone after session treatment and urolithiasis clearance.

With regards to demographic data, the findings of the this study revealed that males represent the bulk of both groups and this agreed with (Yu et al., 2016; Scales et al., 2012) who decided that the frequency of urolithiasis in males was higher than the females, this was explained by (Zhao et al 2013) who reported that men excrete less citrate and more calcium than women, which is thought to be linked to higher incidence. It was also concluded that, the lesser levels of testosterone in the women's blood may result in females' protections against oxalate stone. These findings were also explained by (Heller et al., 2002; Stoller & Meng, 2007) who mentioned that the lower risk of stone formation in women may be because of the lower urinary saturation of stone forming salts and the effect of female sex hormones which can prevent renal crystal deposition by preventing the urinary oxalate elimination and the expression of osteopontin. Series

In relation to age our findings showed that, the highest patient's number had age over fifty years. This is similar to (Prezioso et al., 2014) who conducted a study to identify current epidemiology of urolithiasis in Italy using the Health Search. They illustrated that the prevalence of urolithiasis increased between 50 to 70 years old. Furthermore (Yu et al.,2017; University of Maryland, medical center, 2017) investigated that nephrolithiasis is common among postmenopausal women and the risk of renal calculi increases in men beginning from the age of forty and continues to increase until the seventh decade.

Concerning stone locations, the findings of the present study showed that, renal stones had highest percentage as stone location in both groups. This is in line with (Al-Marhoon et al., 2013) who reported the dominance of renal stone among 192 patients treated by SWL the renal stone represented about (85%) of all patients.

Looking at the stone size, the mean stone size was 14.71 ± 6.54 in the study group and13.82 ± 4.21 in the control group. This is synonymous with (Mohammed, et al., 2015) who assessed the effect of health teaching program for old age patients undergoing SWL on urolithiasis clearance. They noted that the mean stone size was (14.71 mm and 17.23 mm) for the study group and control group, respectively. It is also in agreement with (Jain et al., 2016) who mentioned that SWL is the top treatment for urinary Stones between 1 and 2 cm.

The present study findings showed that most of the patients had poor knowledge level about urolithiasis disease, SWL procedure, and post procedure management before giving pre-procedure teaching. These findings are in similar to **(Mohammed et al., 2015)** who conducted a study to test the effect of teaching program for elderly patients undergoing SWL on urolithiasis clearance. They found that most of the studied subjects in the study and control group had poor level of knowledge about urinary calculi and SWL procedure. The findings were also supported by **Ahmed (2007)** who told the most useful treatment modalities for urolithiasis management in Cairo University and established that the majority of the study group had poor knowledge about lithotripsy as a safe treatment modality.

After conducting the pre-procedure teaching module for the study group, patient's knowledge had significantly improved. This is similar to **(Mohammed et al., 2015)** who reported that patient's knowledge was improved after carrying out the educational program for elderly patients about SWL. Moreover, this is also supported by (Ong, et al., 2009) who provided the patients with preoperative education through digital video disc and evaluated its effect on patient information and readiness for participations in postoperative care activities which resulted in an increase in patients' knowledge after education. The findings agreed with (Bytzer & Lindeberg, 2007) who indicated that giving information increased knowledge and decreased anxiety among patients of the study. So, the hypothesis Number one was supported which stated that Pre-procedure teaching module increases knowledge of the study group.

In reference to the anxiety levels, the results of our study displayed that the intervention group had significant lower anxiety than the control group when comparing anxiety levels after teaching. This might be a result of the pre-procedure teaching which provided the patients with information about procedure, preparation, side effects, and post procedure management. This is constant with (Alanazi, 2014) who stressed that the education before operation deceased preoperative anxiety significantly in clients scheduled for surgical procedures. With respect to previous findings, the second hypothesis was supported which stated that Pre-procedure teaching module reduces anxiety among subjects of the study group.

As regards to claustrophobia, the findings of the current study showed that claustrophobia score was high among patients before teaching. This is reliable with (Enders et al., 2011) who compared between short-bore versus open magnetic resonance imaging (MRI) in relation to claustrophobia. They reported claustrophobic events among the short-bore group were (39%) versus (26%) among the open scanner group. The findings of the current study also revealed that the study group had significant reduction in the total score of claustrophobia after teaching than the control group. This is explained by the effect of patients' teaching in lowering claustrophobia. This is similar to the study of (Mohammed et al., 2013) who investigated the impact of health teaching on lowering anxiety and claustrophobia among females undergoing MRI. They found a highly significant difference in the scores of claustrophobia before the MRI examination and after instructions were given. In the same line (Carlsson, & Carlsson, 2013) conveyed that a trustful interview with the radiographer helped to improve patients' ability to manage fear, discomfort and patients' ability to cope with the scanning procedure. They also suggested a need for individualized information based on patient's participation. Therefore, the 3rd hypothesis of the study was supported which stated that "Pre-procedure teaching module decreases claustrophobia among subjects of the study group as compared to the control group".

The results of this study showed significant lower in the postoperative pain score in the study group than in the control group when comparing the pain of the study group with control group. This might be due to the effect of teaching which included the proper strategies to control postoperative pain. These findings are consistent with (Gräwe et al., 2010) who concluded that preoperative instructions had good outcomes on controlling postoperative pain. Patients' information is an effective addition to the drug pain treatment. The findings were also in agree to the outcome of (Sadati et al., 2013), who established that preoperative nursing visits could decrease postoperative pain and preoperative anxiety in laparoscopic cholecystectomy. So, the part of 4th study hypothesis was supported which stated that "Pre-procedure teaching module improves pain control among subjects of the study group after sessions of SWL when compared to the control group", but the other part which included pain reduction among subjects of the study group during procedure didn't support.

The existing study also revealed that the rate of successful treatment sessions and clearance of urinary stone in the study group was more than the control group after two sessions of SWL (the minimum number of sessions which the patients had to complete the treatment). This might be the effect of teaching where the patients followed the instructions about diet and life style modifications that helped to flush of stone fragments from the urinary tract after SWL. This is in line with (Mohammed et al., 2015) who decelerated that stone clearance rates after SWL increased in the intervention group who received health education about (SWL, care before, during and after SWL procedure, instructions that enhance clearance of stone fragments from the urinary system after SWL)

more than the control group who hadn't received health education program. The previous findings supported the 5th hypothesis which stated that "Pre-procedure teaching module increases in the percent of successful treatment and urolithiasis clearance among the patients in the study group than the control group at the equal number of SWL sessions."

The findings of the present study showed strong positive correlation between anxiety and pain. This is similar to (Ali et al., 2014) they concluded that high level of anxiety prior to surgical operation negatively influence postoperative pain control and increased consumption of analgesics postoperatively. In the same field (Yilmaz et al., 2016) conveyed that there was positive correlation between anxiety level and pain during SWL procedure. The increased anxiety level made the procedure more painful and this finding was statistically significant. Our finding agreed with (Kavakci et al., 2012) detailing that the anxiety levels were moderately correlated with the visual pain scores on the day after the operation ($r = 0.30$, $P < 0.05$).

Recommendations

Based on the findings, the study recommends:

1. Planned pre-procedure teaching should be offered through interviews as regular policies for patients undergoing SWL procedure in a SWL unit.
2. Concise booklet should be delivered for patients before SWL (including simple explanation of SWL, contraindications, pre-procedure instructions to be followed, post-procedure care, life style and nutritional regimen which enhance stone resolution and suppress future formation).
3. Conducting of similar studies on larger sample to achieve generality of the results.

Abbreviation

SWL**:** shock wave lithotripsy

Table 1. Distribution of socio-demographic characteristics among both study and control groups in percentage

Variable	Study group (N=37)		Control group (N=37)		X^2
	No	%	No	%	p values
sex					
Male 27	23	62.16	27	72.97	X2
Female	14	37.84	10	27.03	1. 99 P=.88 N.s
Age:					
30-	9	24.4	6	16.2	1. 43 P=.78 N.s
40-	11	29.7	8	21.7	
50-	17	45.9	23	62.1	
Mean ±SD	47.76±7.85		49.93±11.50		
Education:					
Illiterate	7	18.9	13	35.1	1. 56 P=.86 N.s
Read and write	11	29.7	6	16.2	
Secondary	12	32.5	14	37.8	
university	7	18.9	4	10.9	
Marital status:					
Single	12	32.5	8	21.7	1. 08 P=.58 N.s
married	25	67.5	29	78.3	

N.s = not significant

Table 2. Distribution of stone characteristics among study and control groups in percentage

Group	Study group (N=37)		Control group (N=37)		t-P-value
	No	%	No	%	
Stones location					
Renal pelvis stone	21	56.6	20	54	X2 =0.32
Ureteral stone	16	43.4	17	46	P=.58 N.s
Stones size					
Mean ± SD	14.71 ± 6.54		13.82 ± 4.21		T= 0.81 P=.51 N.s
Number of stone					
Single	29	78.3	25	67.5	X2 =0.86
Multiple	8	21.7	12	32.5	P=.50 N.s

N.s = not significant

Table 3. Differences of knowledge scores among study and control group regarding to SWL procedure throughout study phases

Item	Pre-teaching		Post teaching at 1st., session		At 2nd., session		F-p values
	Mean	**±SD**	**Mean**	**±SD**	**Mean**	**±SD**	
Study (N=37)	4.21	±0.51	9.86	±0.69	9.76	±0.59	**F= 31.81*** P=0.000**
Control (N=37)	4.25	±0.57	4.29	0.56	4.89	±0.66	**F= 1.09**
T-p values	**T=90 P=0.99 NS**		**T=32 P=.000***		**T=30 P=.000***		**P=0.98 N.s**

N.s = not significant

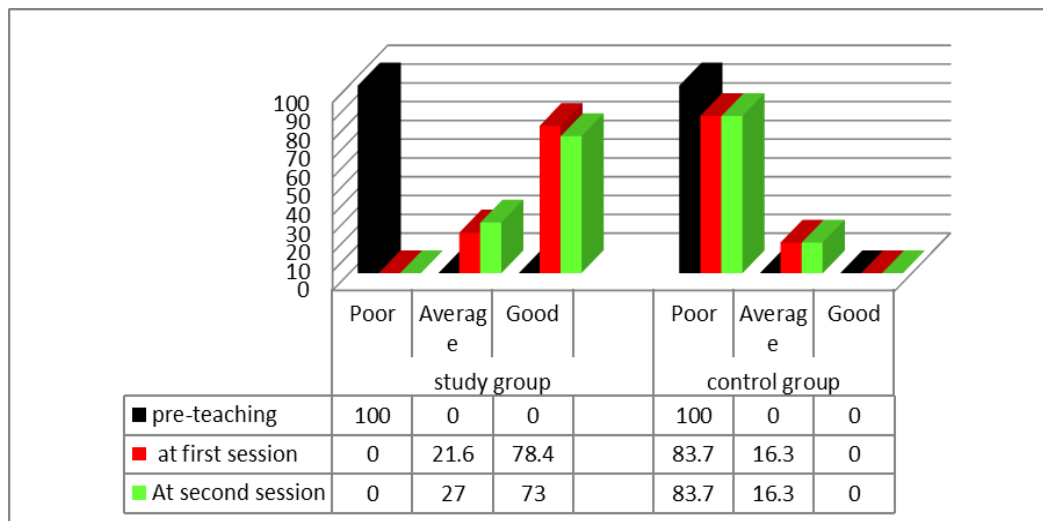|	Poor	Average	Good		Poor	Average	Good
		study group				control group	
■ pre-teaching	100	0	0		100	0	0
■ at first session	0	21.6	78.4		83.7	16.3	0
■ At second session	0	27	73		83.7	16.3	0

Figure 1. Knowledge levels among study and control group regarding to shock wave lithotripsy procedure throughout study phases.

Table 4. Comparison between study and control groups in relation to the severity of anxiety throughout study phases

Anxiety level	Pre-teaching		Post teaching at 1st., session		At 2nd., session		X^2 p value
	Study (N=37) N(%)	Control (N=37) N(%)	Study (N=37) N(%)	Control (N=37) N(%)	Study (N=37) N(%)	Control (N=37) N(%)	
No	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	X^2 = **27.91**
Mild	0(0%)	0(0%)	31(83.7%)	0(0%)	32 (86.5%)	6 (16.3%)	
Moderate	15 (40.5%)	16(43.3%)	6(16.3%)	20 (54.1%)	5(13.5%)	17 (45.9%)	P= .000
Severe	22(59.5%)	21(56.7%)	0 (0%)	17 (45.9%)	0 (0%)	14 (37.8%)	
Mean ±SD	57.1±7.4	54.5±6.8	38.1±5.1	58.1±8.6	38.1±5.1	58.1±8.6	
X^2-p/value	X^2=.87 p=.56 NS		X^2=21 p=..000		X^2=27 p=..000		

N.s = not significant

Table 5. Differences of claustrophobia among study and control group regarding SWL procedure throughout study phases

Item	Pre-teaching		Post teaching at 1st., session		At 2nd., session		F=p value
	Mean	±SD	Mean	±SD	Mean	±SD	
Study (N=37)	64.3	±12.2	39.4	±7.2	35.7	±6.0	**F= 21.91*** P=0.000**
Control (N=37)	62.4	±10.1	59.6	±10.2	58.6	±10.0	**F= 1.89 P=0.99**
T-p values	**T=1.90 P=0.09 NS**		**T=22 P=.000***		**T=37 P=.000***		N.s

N.s = not significant

Table 6. Comparison between study and control groups concerning pain scores

Item	At first session				p values	At second session				p values
	Pain during procedure		Pain post procedure			Pain during procedure		Pain post procedure		
	Mean	±SD	Mean	±SD		Mean	±SD	Mean	±SD	
Study (N=37)	6.15	± 1.85	4.75	± 1.10	**T = 16.11** P=0.00**	5.11	± 1.95	2.25	± 0.01	**T = 18.21*** P=0.00**
Control (N=37)	6.82	± 1.97	6.00	± 1.70	**T = 0.89 P=0.98 NS**	5.42	± 1.97	5.22	± 1.91	**T = 0.99 P=0.18 NS**
T-p values	**T=1.90 P=0.09 NS**		**T=17 P=.00**			**T = 1.80 P=0.17 NS**		**T=15 P=.00**		

*= p values is significant, N.s = not significant

Table 7. The rate of successful treatment sessions and Urolithiasis clearance for study and control groups in percentage distribution

Item	Study (N=37)		Control (N=37)		p values
	No	**%**	**No**	**%**	
No	12	32.4	16	43.24	$X^2=11$ **p=..0.04***
Yes	25	67.6	21	56.76	
Total	37	100	37	100	

*= p values are significant

Table 8. Show correlation between severity of anxiety, claustrophobia, and pain scores

Variables	R value	P value
Anxiety& claustrophobia	.71*	0.03
Anxiety & pain	0.81*	0.04

*= a p value is significant

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