

# Effectiveness of Self-Care Intervention for Patients with Urolithiasis on Their Practices Regarding Nutrition

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Received June 08, 2019; Revised August 03, 2019; Accepted August 19, 2019

**Abstract Background:** Urolithiasis is a common and important problem in urinary tract and the prevalence of the disease is especially rising in recent years due to changing the lifestyle and diet. **Aim:** This aimed to evaluate effect of self-care intervention for patients with urolithiasis on their practices regarding nutrition. **Research design:** Quasi experimental design was utilized to fulfill the aim of this study. **Setting:** This study conducted in urology department and the urology outpatient clinic at Benha University Hospital. **Sample:** Purposive sample of 84 male and female patients suffering from urolithiasis. The study subjects was divided into two equal groups, the study group (42) and the control group (42). **Tools:** Two tool used in this study. I: Structured interviewing questionnaire; it includes three parts: personal characteristics of patients, patients' medical history and patients' self-care knowledge. Tool II: self-care practices: it includes consumption of permitted foods, consumption of restricted foods, consumption of fluids and practices regarding urolithiasis. **Results:** The majority of both study and control group patients were respectively married, male, worker and more than half of them their age range from 40-60 years old. There was statistically significant difference between the two groups regarding their knowledge and self care practices post intervention compared to pre intervention ( $p < 0.05$ ), with an improvement in self-care practices among the study group compared to the control group post self-care intervention. **Conclusion:** Self-care intervention for study group had a favorable effect on improving their knowledge and self care practices regarding nutrition. **Recommendations:** Continuous educational programs should be planned and offered on regular basis for patients with urolithiasis.

**Keywords:** self care, nutrition, practices & urolithiasis

**Cite This Article:** Manal Hamed Mahmoud, Eman Nabil Ramadan, and Amal Said Taha, "Effectiveness of Self-Care Intervention for Patients with Urolithiasis on Their Practices Regarding Nutrition." *American Journal of Nursing Research*, vol. 7, no. 5 (2019): 856-869. doi: 10.12691/ajnr-7-5-19.

## 1. Introduction

Urolithiasis is a common disease with an increasing incidence and prevalence worldwide [1,2]. Urinary stones are one of the most common consequences of modern life that many factors are involved in its formation [3]. The prevalence of urolithiasis tends to vary among different cultures and geographies. The development and composition of stones are significantly influenced by diet, lifestyle, and comorbidities, [4].

Possible contributory factors for urolithiasis may be due to differences in diet with wealthier populations eating higher levels of salt, protein, calcium and purines. The observation of familial clustering of urolithiasis suggests a genetic basis to its occurrence [5]. Diabetes mellitus also helps in formation of renal stones in multivariable models [6]. The increased incidence and prevalence of urolithiasis are in parallel with the rising incidence of metabolic syndrome. In addition there seems to be a positive association between obesity and the risk of first time and recurrent stone formation with a decreased time to

recurrence in obese patients compared to the normal population [4]. Moreover, Dehydration (caused by warm climate or otherwise) contributes to urolithiasis. Due to a low urinary volume and high urine osmolality, there is increased urinary calcium and oxalate. Similarly working in hot and humid conditions encourages the formation of renal stones [7].

Urinary stones are one of the most common, recurrent painful disorders of urinary tract. Unfortunately, there is no doubt that urinary calculus disease remains a significant health problem [8]. Small stones often pass through the body with little discomfort, but larger stones can be very painful and even block the urinary tract. Kidney stones are more common in adults, but they can also occur in children of any age [9]. While, about half of people will have another stone within ten years [10].

Managing a chronic disease is a complex process that typically requires individuals to manage a number of health-related factors themselves; some diseases require near total self-care. As a result, patient programs have been developed to provide support to individuals with chronic diseases and help them self-manage their

condition as effectively as possible [11]. Supporting self care enables patients to self-identify problems and provides techniques to help them make decisions, take action, and alter behaviors [12].

Great emphasis has been placed on the role of self care in the complex process of care of patient with long-term conditions as patients with renal calculi. Several studies have determined that nurses, among the health professionals, are more recommended to promote health and deliver preventive programs within the primary care context [13]. The concepts of self-care have been increasingly studied over the years. This is due in part to the rising prevalence of chronic diseases and higher rates of healthcare utilization. In light of this finding, self-care is important in improving health outcomes, enhancing quality of life, and decreasing healthcare costs [14].

Self care is the ability of an individual with a chronic disease, to participate in a daily, self-motivated, collaborative (conducted with family, social, and healthcare provider support) process to manage symptoms [15]. This process involves the domains of focusing on illness needs, activating resources, and living with a chronic illness. In chronic conditions, an individual's ability to perform behaviors that will alleviate the pain experience is instrumental in adapting to pain long-term [16].

Nurses, because of their traditional holistic perspective, are well versed in self-care support and must play a leading role in the administration of these systematic educational interventions focused on preserving or enhancing health and self care goal achievement of a patient previously clinically assessed with a chronic disease. Self-monitoring (of symptoms or of physiologic processes) and decision making (managing the disease treatment or exacerbation or its impact through self-monitoring) are the aims of the interventions [17]. In this concern, the researchers tried to focus on the role of the self care intervention toward the patients with urolithiasis.

### 1.1. Significance of the Study

Urolithiasis is a global problem affecting all geographical regions throughout the globe. Annual approximate prevalence is 3-5% and approximate life time prevalence is 15-25%. Urolithiasis tends to be recurrent in most of the renal calculi patients. Recurrence rates of renal stone are approximately 10% year, 50% over a period of 5-10 years and 75% over 20 years period. The incidence rate of urolithiasis varies with geographical region of an individual country. The rate of recurrence of renal calculi in patients after 1st time occurrence is 14% at 1st year, 35% in 5th year and 52% in 10th year [18].

In Egypt, it was found that the total number of patients with urinary stone were 1266 which constituted 10% of total patient admitted in the centers and public hospitals [6]. While incidence rate at Benha university hospital was 500 patients admitted to urology department at year 2018 [19]. For these reasons, the researchers established a self care program for patients with renal calculi to help these category of patients to manage the consequences of their illness and prevent recurrence of stone formation.

### 1.2. Aim of the Study

This study aimed to evaluate effectiveness of self-care intervention for patients with urolithiasis on their practices regarding nutrition.

### 1.3. Research Hypothesis

Self-care knowledge and practice of urolithiasis patients (study group) regarding nutrition will be improved after application of self care intervention.

### 1.4. Design

Quasi experimental design was utilized to fulfill the aim of this study.

### 1.5. Setting

The current study conducted at the urology department and urology outpatient clinic affiliated to Benha University Hospital which is located at Al Qualubia Governorate.

### 1.6. Sample

Purposive sample of 84 male and female patients suffering from urolithiasis with age ranged from 20 to 60 years old were recruited from urology out-patients clinic of Benha University Hospital. The study subjects was divided into two equal groups, the study group (42 patients) and the control group (42 patients)

### 1.7. Exclusion Criteria

Patients with bleeding tendencies, active urinary tract infection, pregnancy, distal ureteral obstruction, suffering from deafness, or patients with mental or severe cerebral vascular diseases that may affect cognitive ability.

### 1.8. Sample Size Calculation

According to Benha University Census [19], the number of patients with urolithiasis were 500 patients. Sample size determined by the use of Epi info 7 program, the calculation was based on the following:

Population size= 500  
 Expected frequency=50%  
 Acceptance Error = 10%  
 Confidence coefficient= 95%  
 Minimum sample size= 82

## 2. Tools of the Study

**Tool I: Structure interview questionnaire**, consisted of three parts:

Part (1): personal characteristics of the study participants; included age, sex, marital status, residence, education and occupation,.

Part (2): patients' medical history; involved type of associated chronic diseases, previous hospital admission with urinary tract stones, place of stone, number of

recurrence, methods of treatment, stone side, number of stones, stone size and location of stones.

Part (3): self-care knowledge assessment sheet; prepared by the researchers after reviewing of the related literature [20,21,22]. It included 13 question about the definition of urolithiasis, causes, risk factors, signs and symptoms, factors affecting formation of stones, diagnostic investigation, factors preventing formation of stones, recurrence of stone and how to manage it.

#### **Scoring system:**

Answer scores were given as the following:

One mark for correct answer

Zero for incorrect answer

Marks were ranged from 0 to 13 marks.

The total marks were summed, percentage was calculated for all participants and judged as the following:

Satisfactory knowledge level  $\geq 60\%$

Unsatisfactory knowledge level  $< 60\%$ .

**Tool II: Self-care practices;** prepared by the investigator after distinctive reviewing of the current literature [23-28]. It divided into four subscales as the following:

#### **1-Self-care practices regarding consumption of permitted foods:**

It is a likert like scale with four responses; daily (3 marks), weekly (2 marks), monthly (1 mark) and never take it (0 mark). It contained 8 items about eating white meat, fresh fruits, fish and sea foods, fiber such as oats / bran, egg, liver, vegetables such as spinach / turnips and whole grains.

#### **2-Self-care practices regarding consumption of restricted foods:**

It is a likert like scale with four responses; never take it (3 marks), monthly (2 marks), weekly (1 mark) and daily (0 mark). It involved 10 items about eating canned food, salty foods, fast foods, sweetened foods, carbohydrates, milk and dairy products, red meat, chocolate, citrus foods as lemon and orange, foods rich in oxalates such as tomatoes and legumes

#### **3-Self-care practices regarding consumption of fluids:**

It is a likert like scale with four responses; daily (3 marks), weekly (2 marks), monthly (1 mark) and never take it (0 mark). It included 10 items about drinking plenty of fluids during hot weather, fever, diarrhea, exercises, great physical effort, avoid drinking water from unhealthy resources, avoid drinking cola, avoid drinking stimulants, as tea and coffee, drinking fresh fruit juice as cranberry juice, check the amount of urine that should not be less than (2.5) liters / 24 hours, replace the lost fluid if working for long periods in hot areas such as kitchen and oven drink enough fluids with or between meals, drink water before bedtime and after wake up.

#### **4-Common self-care practices regarding urolithiasis:**

It is a likert like scale with three responses; usually done (2 marks), occasionally done (1 mark) and not done (0 mark). It comprised 11 items regarding eating balanced meals, exercising regularly, doing regular checkup, Keeping weight within normal range, avoid smoking, avoid drinking alcohol, taking medicine with a prescription, following medication system, following diet regimen, ask for medical help as needed and avoiding excessive intake of calcium tablets and vitamin D, E.

#### **Scoring system:**

Self-care practices regarding consumption of permitted foods (8 items):

8 items x (0-3) = scores ranged from 0 - 24

Self-care practices regarding consumption of restricted foods (10 items):

10 items x (0-3) = scores ranged from 0 - 30

Self-care practices regarding consumption of fluids (10 items):

10 items x (0-3) = scores ranged from 0 - 30

Common self-care practices regarding urolithiasis (11 items):

11 items x (0-2) = scores ranged from 0 - 22

#### **Total self-care practices:**

Total scores ranged from 0 to 108 score

This scores converted to percentage and categorized as the following:

Satisfactory level of practices  $\geq 70\%$

Unsatisfactory level of practices  $< 70\%$

#### **Content validity**

All tools of the current study were reviewed by five experts, three professors in the field of medical surgical, one professors in community health nursing and one assistant professor in urology to ensure its clarity and applicability. The tools were modified according to the experts' opinion on simplicity of the sentences and suitability of the content.

#### **Reliability**

The reliability was done by Cronbach's Alpha coefficient test which revealed moderate to high reliability of each tool. The internal consistency of the first tool was 0.876 and internal consistency of the second tool was 0.857.

#### **Ethical Considerations**

An ethical approval was obtained from the ethical committee of Faculty of Nursing at Benha University to conduct this study after explaining its aim. In addition, informed oral consent was obtained from the participants of the study. The patients were informed about the purpose and nature of the study. The researchers emphasized that the participation is voluntary; confidentiality and anonymity of the subjects were assured through coding of all data. Each patient has the right to withdraw from

the study at any time without any rational and this data will not be reused without a second permission from them.

#### **Pilot Study**

A pilot study was achieved on 10% of the study sample (8 patients) to test the clarity and appropriateness of the study tools, estimate the time needed for data collection, and examine the feasibility of conducting the research. Minimal modifications were done and those patients were excluded from the actual study.

#### **Field Work**

An official permission to conduct the proposed study was obtained by the researcher from the manager of hospital and the head of urology outpatient clinic at Benha University Hospital to conduct the study after explaining its purpose. The study was carried out through four phases: preparatory, planning, implementation, and evaluation. These phases were carried out over a period of six months from the beginning of September 2018 to the end of February 2019.

**Preparatory phase:** This phase was pertaining to construction of the study tools and production of the self care intervention by the researcher based on extensive review of current, related literature [22,23,29,30,31,32]; it was written by simple Arabic language and contained pictures for more illustrations to facilitate patients' understanding. The intervention included the necessary information related to urolithiasis definition, risk factors, causes, diagnosis, investigations, management, types of restricted foods as well as permitted foods and fluids, in addition to self care practices that can be managed by patients.

**Planning phase:**

**General objective:** The general objective of the self-care intervention was to improve knowledge and practice of urolithiasis patients regarding nutrition .

**Specific objectives:** By the end of the intervention program, the urolithiasis patients should be able to:

- Define the meaning of urolithiasis.
- Enumerate the, risk factors and causes of urolithiasis.
- Identify the signs and symptoms of urolithiasis.
- Identify the required investigations and methods of treatment of urolithiasis.
- List most common recurrent type of stone and factors increase stone formation.
- Discuss the precautions for prevent recurrence, management of stone recurrence and methods of prevention during sleep.
- Explain self-care practices that can be managed by patients.

**Implementation phase:** Researchers interviewed patients in control and study groups individually. At preliminary interview, the researchers introduced them self to set off line of communication, explain the nature, purpose of the study, fill out the study tools and scheduled with them the instructional sessions(study group). The researchers started to make individual interview with each patient as the first 42 patients assigned for control group as well the last 42 patients assigned for study group. The researchers met patients three days per week (Saturday,

Monday and Wednesday). After filling the study tools the researchers prepared the instructional intervention by the using of power point presentation as well as video tapes and posters, after that they distributed the study group into small groups including 3-5 patients in each group and conducted the instructional sessions distributed into five sessions for each group. Moreover the researchers handed the booklet of intervention to the patients.

**Evaluation phase:** Is the last phase carried out to both groups after two months from implementation of the intervention to evaluate its effect by the using of the same pre-test tools for knowledge and self care activities. The researchers evaluated the control group firstly and then the study group to achieve fairness of the results.

### 3. Statistical Analysis

The collected data were organized, categorized, analyzed using spss 11.0 statistical software packages. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and mean and standard deviations for quantitative variables. Correlation coefficient, T- test for comparison of means and Chi- square test was used for comparing frequency between studied groups. Statistical significance was considered at P- value < 0.05.

### 4. Results

**Table 1:** illustrated that the majority of both control and study group subjects were respectively married 90.4% & 88%, male 69% &73.8%, worker 57.2% & 61.9% and more than half 59.5% & 64.3% of them their age range from 40-60 years old. As regards residence, it was found that around two thirds 69% & 66.7% of study and control group were resided in rural areas. No significant statistical differences were seen between the two groups  $p > 0.005$ .

**Table 1. Distribution of personnel characteristics of the both groups (N=84)**

Socio demographic characteristics	Items	Study group (n=42)		Control group (n=42)		X <sup>2</sup>	P-value
		N	%	N	%		
Age	- <40	5	11.9	6	14.3	0.1679	0.919465
	- 40-60	27	64.3	25	59.5		
	- >60	10	23.8	11	26.20		
	<b>X± SD</b>	<b>51.476 ± 9.322</b>		<b>51.833 ± 9.809</b>			
Gender	-Male	29	69	31	73.8	0.2333	0.629063
	-Female	13	31	11	26.20		
Level of education	-Illiterate	10	23.8	11	26.2	0.4608	0.927416
	-Primary	4	9.6	5	11.9		
	-Secondary	20	47.6	17	40.5		
	-University	8	19	9	21.4		
Marital status	-Single	8	19	5	11.9	0.8199	0.663675
	-Married	24	57.2	26	61.9		
	-Divorced	10	23.8	11	26.2		
	-Widow						
Residence		0	0.0	0	0.0	0.2133	0.898825
		38	90.4	37	88		
		2	4.8	2	4.8		
		2	4.8	3	7.2		
Residence	-Rural	29	69	28	66.7	0.0546	0.815276
	-Urban	13	31	14	33.3		

The result is significant at  $p < .05$ .

**Table 2. Distribution of the study subjects according to their Medical history of the both groups (N=84)**

Medical history	Items	Study group (n=42)		Control group (n=42)		X2	P-value
		N	%	N	%		
Type of chronic disease	Hypertension	16	38.1	15	35.7	0.3462	0.7276
	Diabetes mellitus	14	33.3	14	33.3		
	Cardiovascular diseases	6	14.3	6	14.3		
	Respiratory diseases	3	7.1	3	7.1		
	Liver disease	4	9.5	4	9.5		
	Recurrent urinary tract infections	18	42.8	18	42.8		
Previous hospitalization with urinary tract stones	Yes	32	76.2	30	71.4	0.2463	0.61966
	No	10	23.8	12	28.6		
Place of stones	kidney stone	6	14.3	8	19	0.4132	0.813337
	ureteral stone	31	73.8	30	71.4		
	Bladder stone	5	11.9	4	9.5		
Number of recurrence	Only one time	11	26.2	10	23.8	0.2049	0.902634
	Two times	15	35.7	17	40.5		
	More than 2 times	16	38.1	15	35.7		
Methods of treatment	By medication and fluid	4	9.5	5	11.9	0.4952	0.919936
	ESWL	22	52.4	20	47.6		
	Open surgery	8	19	7	16.7		
	Endoscope	8	19	10	23.8		
Stone side	Right side	25	59.5	27	64.3	0.2019	0.653173
	Left side	17	40.5	15	35.7		
Number of stone	Single	16	38.1	14	33.4	0.20740	0.6488070
	Multiple	26	61.9	28	66.7		

\*ESWL :Extracorporeal shock wave lithotripsy, n.s=The result is not significant at p < .05.

**Table 3. Distribution of mean score of both groups related to knowledge about urolithiasis pre and post intervention(N= 84)**

Items	Pre Intervention				Post Intervention			
	Study group		Control group		Study group		Control group	
	X	SD	X	SD	X	SD	X	SD
Stone definition	0.785	0.41	0.80	0.39	0.95	0.21	0.83	0.37
T test	0.2742				1.8012			
p-value	0.784				0.0754			
Causes of stone	0.309	0.462	0.166	0.372	0.761	0.425	0.238	0.425
T test	1.5624				5.6393			
p-value	0.122				0.0001 ***			
Risk factors	0.691	0.451	0.690	0.462	1.00	0.00	0.785	0.410
T test	0.0100				3.3984			
p-value	0.9920				0.0010**			
Signs and symptoms	0.738	0.439	0.735	0.458	0.857	0.349	0.928	0.257
T test	0.0306				1.0616			
p-value	0.9756				0.2915			
Required investigations	0.166	0.372	0.166	0.372	0.690	0.462	0.214	0.410
T test	0.0000				4.9941			
p-value	1.000				0.0001 ***			
Methods of preventions	0.332	0.492	0.333	0.471	0.642	0.479	0.357	0.479
T test	0.0000				2.7266			
p-value	1.0000				0.0078**			
Most common recurrent type of stone	0.119	0.323	0.095	0.293	0.714	0.451	0.142	0.349
T test	0.3567				6.5005			
p-value	0.722				0.0001***			
Methods of treatment	0.095	0.293	0.119	0.323	0.523	0.499	0.166	0.372
T test	0.3567				3.7172			
p-value	0.722				0.0004 ***			
Precautions for prevent recurrence	0.761	0.425	0.785	0.410	0.857	0.349	0.640	0.473
T test	0.2634				2.3924			
p-value	0.7929				0.0190*			
Factors increase stone formation	0.880	0.323	0.880	0.323	0.952	0.212	0.690	0.462
T test	0.0000				3.3403			
p-value	1.000				0.0013***			
Methods of prevention during sleep	0.190	0.392	0.285	0.451	0.500	0.500	0.261	0.439
T test	1.0303				2.3279			
p-value	0.305				0.0224 *			
Relation of stone with food type	0.119	0.323	0.071	0.257	0.595	0.490	0.142	0.349
T test	0.7536				4.8801			
p-value	0.453				0.0001***			
Management of stone recurrence	0.952	0.212	0.833	0.372	0.976	0.152	0.833	0.372
T test	1.8012				2.3062			
p-value	0.075				0.0236 *			
Total	6.095	1.129	6.166	1.110	10.047	1.731	6.500	1.200
T test	0.2906				10.9137			
p-value	0.772				0.0001 ***			

\* Statistical significant at p < 0.05 \*\* Statistical significant at p < 0.01 \*\*\* Statistical significant at p < 0.00.



Table 2 demonstrated that recurrent urinary tract infection was the most common chronic disease among study and control groups 42.8% & 42.8%, followed by hypertension 38.1% & 35.7% and diabetes mellitus 33.3% & 33.3% respectively. 76.2% & 71.4% of them were previously admitted to hospital with urinary tract stones, especially ureteral stones 73.8% & 71.4% and exposed to multiple stones 61.9% & 66.7% respectively. In addition, 52.4% of the study and 47.6% of the control groups were exposed to extracorporeal shock wave lithotripsy as a method of treatment. No significant statistical differences were observed between two groups with p-value >0.05.

Table 3 reveals an improvement in the mean score of the study group in all items related to knowledge about urolithiasis post intervention compared to pre intervention. There is statistical significant differences between both study and groups post intervention ( $p < 0.05$ ) except stone definition and signs and symptoms of urolithiasis ( $p > 0.05$ ).

Figure 1 represents that the minority of the study and control groups (16.7% & 14.3%) respectively have satisfactory total knowledge score pre intervention, while post intervention the majority of the study group only

have satisfactory score (78.6%).

Figure 2 demonstrates that the minority of the study and control groups 19% & 21.4% respectively have satisfactory total self-care practices score pre intervention, while post intervention the majority of the study group only 73.8% have satisfactory score.

Table 4 shows that there is no statistical significant differences between both groups pre intervention regarding self practices towards permitted foods ( $p > 0.05$ ). While There are statistical significant differences between both groups post intervention ( $p \leq 0.05$ ). There is an enhancement in self-care practices score regarding permitted food among the study group post intervention rather than pre intervention.

Table 5 illustrated that there is no statistical significance differences were observed between both groups toward their self-care practices regarding restricted food pre intervention ( $p > 0.05$ ). While there are statistical significant differences between both groups post intervention regarding restricted food ( $p < 0.05$ ). There is a development in self care practices score regarding restricted food among the study group post intervention rather than pre intervention.

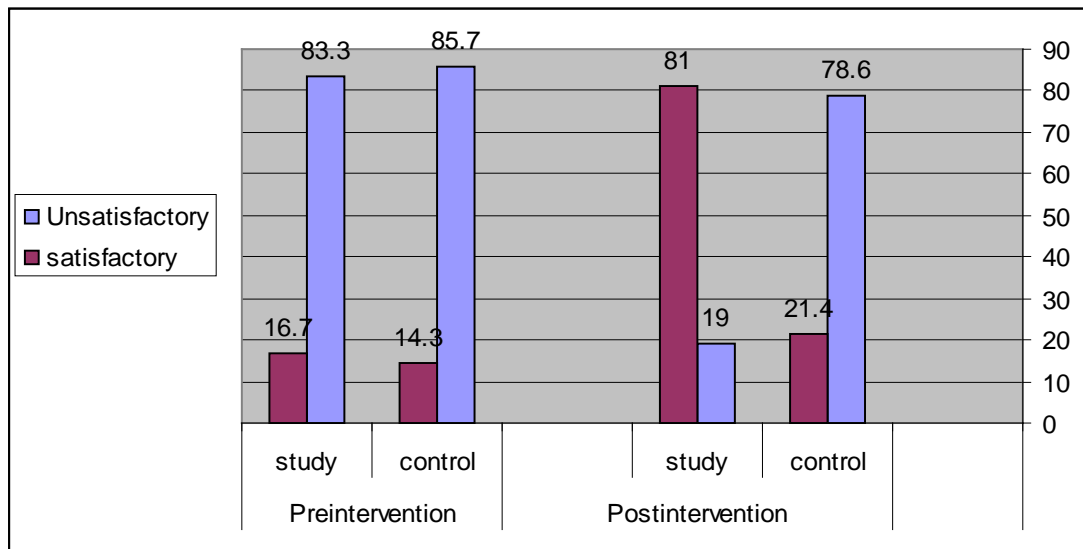


Figure 1. Percentage distribution of total self-care knowledge score of the study and control group pre and post intervention (N=84)

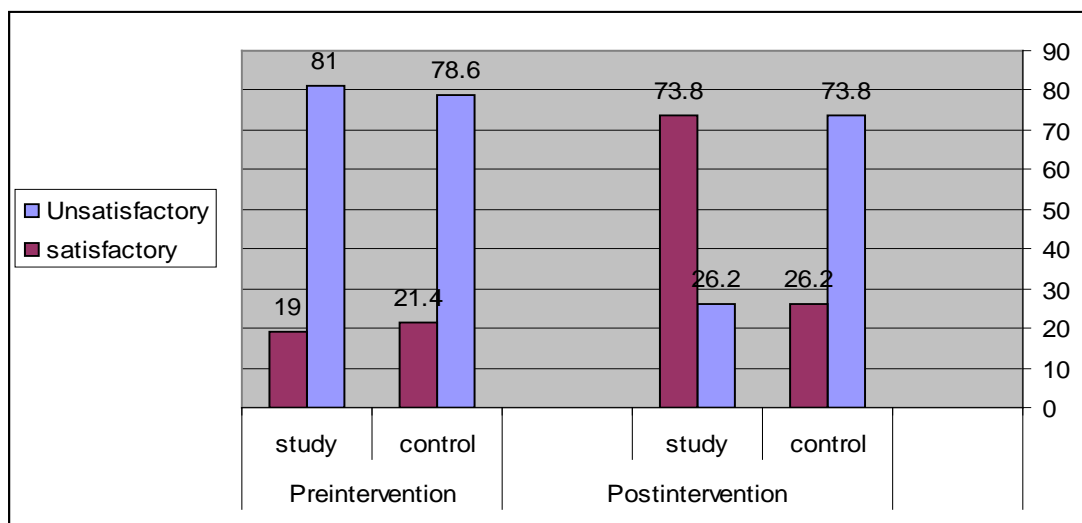


Figure 2. Percentage distribution of total self-care practices regarding nutrition of the study and control group pre and post intervention (N=84)

Table 6 presents that there is a progress in self-care practices score regarding drinking fluid among the study group post intervention compared pre intervention. There are no statistical significant differences between both groups pre intervention regarding drinking fluid ( $p > 0.05$ ), while there are statistical significant differences between them post intervention ( $p < 0.001$ ), except related to reduce drinking cola drinks and stimulants as tea and coffee ( $p > 0.05$ ) respectively.

Table 7 shows that pre intervention there is no statistical significance differences were observed between both groups related to common self-care practices regarding urolithiasis ( $p > 0.05$ ), while there are statistical significant differences between them post intervention ( $p < 0.05$ ), except related to don't smoke and do not drink alcohol ( $p > 0.05$ ). There is an advancement in common self care practices score regarding urolithiasis among the study group post intervention compared to pre intervention.

**Table 4. Distribution of mean score of self-care practice regarding permitted food of both groups pre and post intervention(N= 84)**

Permitted foods	Responses	Pre Intervention				Post Intervention			
		Study group		Control group		Study group		Control group	
		No	%	No	%	No	%	No	%
-White meat	*Daily	0	0.0	0	0.0	23	54.8	1	2.4
	*Weekly	29	69	34	80.9	16	38.1	34	80.9
	*Monthly	13	31	8	19.1	3	7.1	7	16.7
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	1.5873				28.25			
p-value	0.207712				0.000001***				
-Fish and Sea foods	*Daily	1	2.4	1	2.4	18	42.8	1	2.4
	*Weekly	27	64.2	34	81	22	52.4	35	83.3
	*Monthly	14	33.3	7	16.7	2	4.8	6	14.3
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	3.1366				20.1754			
p-value	0.208398				0.000042***				
-Fresh fruits	*Daily	3	7.1	4	9.5	31	73.8	5	11.9
	*Weekly	39	92.9	38	90.5	11	26.2	37	88.1
	*Monthly	0	0.0	0	0.0	0	0.0	0	0.0
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.1558				32.8611			
p-value	0.693012				0.0002***				
-Fiber such as oats /bran	*Daily	2	4.8	7	16.7	31	73.8	9	21.4
	*Weekly	40	95.2	35	83.3	11	26.2	33	78.6
	*Monthly	0	0.0	0	0.0	0	0.0	0	0.0
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	3.1111				23.1			
p-value	0.07776				0.000002***				
-Egg	*Daily	9	21.4	11	26.2	34	80.9	10	23.8
	*Weekly	33	78.6	31	73.8	8	19.1	32	76.2
	*Monthly	0	0.0	0	0.0	0	0.0	0	0.0
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.2625				25.2477			
p-value	0.608408.				0.000001***				
-Liver	*Daily	1	2.4	1	2.4	25	59.5	1	2.4
	*Weekly	31	73.8	32	76.2	12	28.6	35	83.3
	*Monthly	7	16.7	7	16.6	4	9.5	4	9.5
	*Never take it	3	7.1	2	4.8	1	2.4	2	4.8
	X2	0.2159				33.7425			
p-value	0.974987				0.000001***				
-Vegetables such as spinach / turnips	*Daily	2	4.8	2	4.8	31	73.8	2	4.8
	*Weekly	40	95.2	40	95.2	11	26.2	40	95.2
	*Monthly	0	0.0	0	0.0	0	0.0	0	0.0
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.2625				41.975			
p-value	0.608408				0.000001***				
-Whole grains	*Daily	0	0.0	0	0.0	28	66.6	0	0.0
	*Weekly	39	92.8	37	88.1	13	31	38	90.4
	*Monthly	2	4.8	4	9.5	1	2.4	3	7.2
	*Never take it	1	2.4	1	2.4	0	0.0	1	2.4
	X2	0.7193				7.7652			
p-value	0.697921				0.020598*				

\* Statistical significant at  $p < 0.05$ . \*\*\* Statistical significant at  $p < 0.001$ .

Table 5. Distribution of mean score of self-care practices regarding restricted food of both groups pre and post intervention (N= 84)

Restricted foods	Responses	Pre Intervention				Post Intervention			
		Study group		Control group		Study group		Control group	
		No	%	No	%	No	%	No	%
Canned food	*Daily	0	0.0	0	0.0	34	80.9	0	0.0
	*Weekly	13	31	24	57.1	5	11.9	24	57.1
	*Monthly	21	50	13	31	0	0.0	14	33.4
	*Never take it	8	19	5	11.9	3	7.2	4	9.5
	X2	5.8449				6.1302			
	p-value	0.053				0.046*			
Fast meals	*Daily	0	0.0	0	0.0	30	71.4	1	2.4
	*Weekly	22	52.4	28	66.7	9	21.4	29	69
	*Monthly	18	42.8	10	23.8	2	4.8	10	23.8
	*Never take it	2	4.8	4	9.5	1	2.4	2	4.8
	X2	3.6724				43.322			
	p-value	0.15				0.000001***			
Milk and dairy products	*Daily	0	0.0	0	0.0	32	76.2	1	2.4
	*Weekly	28	66.7	30	71.4	6	14.3	31	73.8
	*Monthly	11	26.2	10	23.8	3	7.1	8	19
	*Never take it	3	7.1	2	4.8	1	2.4	2	4.8
	X2	0.3166				48.6192			
	p-value	0.85				0.000001***			
Carbohydrates (starches and sugars)	*Daily	0	0.0	0	0.0	34	80.9	1	2.4
	*Weekly	33	78.6	37	88.1	1	2.4	37	88
	*Monthly	8	19	4	9.5	6	14.3	3	7.2
	*Never take it	1	2.4	1	2.4	1	2.4	1	2.4
	X2	1.5619				66.2195			
	p-value	0.45				0.000001***			
Chocolate and sweet potatoes	*Daily	0	0.0	0	0.0	34	80.9	1	2.4
	*Weekly	34	80.9	32	76.2	7	16.6	34	80.9
	*Monthly	8	19.1	10	23.8	1	2.4	7	16.7
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.2828				53.3948			
	p-value	0.59				0.000001***			
Citrus foods as lemon and orange	*Daily	0	0.0	0	0.0	34	80.9	1	2.4
	*Weekly	39	92.8	37	88.1	7	16.7	37	88
	*Monthly	3	7.2	5	11.9	1	2.4	4	9.5
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.5526				53.3688			
	p-value	0.45				0.000001***			
Red meat and shellfish	*Daily	0	0.0	0	0.0	13	31	0	0.0
	*Weekly	40	95.2	37	88.1	28	66.6	28	66.6
	*Monthly	2	4.8	3	7.1	1	2.4	13	31
	*Never take it	0	0.0	0	4.8	0	0.0	1	2.4
	X2	0.2683				10.9756			
	p-value	0.60				0.004**			
Foods rich in oxalates such as legumes and tomatoes	*Daily	0	0.0	0	0.0	33	78.5	0	0.0
	*Weekly	40	95.2	40	95.2	8	19.1	39	92.8
	*Monthly	0	0.0	0	0.0	0	0.0	1	2.4
	*Never take it	2	4.8	2	4.8	1	2.4	2	4.8
	X2	0				6.2778			
	p-value	1				0.043*			
Salty food	*Daily	15	35.7	18	42.9	29	69	19	45.2
	*Weekly	27	64.3	24	57.1	13	31	23	54.8
	*Monthly	0	0.0	0	0.0	0	0.0	0	0.0
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.4492				4.8611			
	p-value	0.50				0.02*			
Sweetened Food	*Daily	0	0.0	0	0.0	30	71.4	0	0.0
	*Weekly	39	92.8	38	90.5	12	28.6	39	92.9
	*Monthly	1	2.4	3	7.1	0	0.0	3	7.1
	*Never take it	2	4.8	1	2.4	0	0.0	0	0.0
	X2	1.3463				6.5739			
	p-value	0.51				0.01*			

\* Statistical significant at  $p < 0.05$ , \*\* Statistical significant at  $p < 0.01$ , \*\*\* Statistical significant at  $p < 0.001$



**Table 6. Distribution of mean score of Self-care practices regarding drinking fluid of both groups pre and post intervention (N= 84)**

Activities related to fluids	Responses	Pre Intervention				Post Intervention			
		Study group		Control group		Study group		Control group	
		No	%	No	%	No	%	No	%
Drink plenty of fluids in hot weather, sweating, hard work or exercise	*Daily	1	2.4	1	2.4	30	71.4	1	2.4
	*Weekly	23	54.7	22	52.4	8	19.1	23	54.7
	*Monthly	18	42.9	19	45.2	4	9.5	18	42.9
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.0492				43.2962			
	p-value	0.975676				0.00001***			
Drink a large amount of fluids in the case of fever and diarrhea	*Daily	1	2.4	2	4.8	31	73.8	2	4.8
	*Weekly	27	64.3	23	54.7	5	11.9	22	52.3
	*Monthly	14	33.3	17	40.5	6	14.3	18	42.9
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.9437				42.1886			
	p-value	0.62				0.00001***			
Drink water before bedtime and when you wake up in the morning	*Daily	3	7.2	2	4.8	29	69	2	4.8
	*Weekly	15	35.7	14	33.3	8	19.1	15	35.7
	*Monthly	24	57.1	26	61.9	5	11.9	25	59.5
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.3145				38.9799			
	p-value	0.85				0.00001***			
Drink enough fluids with or between meals	*Daily	1	2.4	1	2.4	11	26.2	1	2.4
	*Weekly	26	61.9	25	59.5	28	66.7	24	57.1
	*Monthly	15	35.7	16	38.1	3	7.1	17	40.5
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.0519				18.441			
	p-value	0.9744				0.000099***			
Reduce drinking cola drinks	*Daily	0	0.0	0	0.0	33	78.6	1	2.4
	*Weekly	23	54.8	27	64.23	7	16.6	30	71.4
	*Monthly	16	38.1	13	1	2	4.8	11	26.2
	*Never take it	3	7.1	2	4.8	0	0.0	0	0.0
	X2	0.8303				0.5714			
	p-value	0.66				0.44			
Reduce the consumption of stimulants such as tea and coffee	*Daily	0	0.0	0	0.0	13	31	1	2.4
	*Weekly	23	78.6	19	45.2	28	66.6	20	47.6
	*Monthly	19	21.4	23	54.8	1	2.4	21	50.0
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.7619				2.4456			
	p-value	0.38				0.11			
Increase the intake of juices such as cranberry juice	*Daily	0	0.0	0	0.0	31	73.8	2	4.8
	*Weekly	36	85.7	37	88	9	21.4	25	59.5
	*Monthly	6	14.3	5	12	2	4.8	15	35.7
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.1046				42.9554			
	p-value	0.7463				0.00001***			
Avoid drinking water from unhealthy resources such as rivers, wells and ponds	*Daily	2	4.8	2	4.8	28	66.7	2	4.8
	*Weekly	28	66.6	26	61.9	8	19	27	64.3
	*Monthly	12	28.6	14	33.3	6	14.3	13	30.9
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.2279				35.4266			
	p-value	0.89				0.00001***			
Check the amount of urine that should not be less than (2.5) liters / 24 hours	*Daily	0	0.0	0	0.0	8	19	1	2.4
	*Weekly	9	21.4	10	23.8	27	64.3	11	26.2
	*Monthly	30	71.4	31	73.8	7	16.7	30	71.4
	*Never take it	3	7.1	1	2.4	0	0.0	0	0.0
	X2	1.069				26.4786			
	p-value	0.58				0.00001***			
Replace lost fluids if working for long periods in hot areas such as kitchen and oven	*Daily	13	31	12	28.6	33	78.6	12	28.6
	*Weekly	27	64.3	29	69	9	21.4	30	71.4
	*Monthly	2	4.7	1	2.4	0	0.0	0	0.0
	*Never take it	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.4448				21.1077			
	p-value	0.80				0.000004***			

\* Statistical significant at p < 0.05, \*\* Statistical significant at p < 0.01, \*\*\* Statistical significant at p < 0.001.

**Table 7. Common self-care practices regarding urolithiasis among both groups pre and post intervention (N= 84)**

Usual self activities	Responses	Pre Intervention				Post Intervention			
		Study group		Control group		Study group		Control group	
		No	%	No	%	No	%	No	%
I eat balanced meals	*Usually done	4	9.5	2	4.8	34	80.9	5	11.9
	* Occasionally done	36	85.7	37	88.1	7	16.7	34	80.9
	* Not done	2	4.8	3	7.1	1	2.4	3	7.2
	X2	0.8804				40.3446			
	p-value	0.64				0.000004***			
I exercise regularly, like walking and jogging	*Usually done	6	14.3	7	16.7	32	76.1	7	16.7
	* Occasionally done	25	59.5	24	57.1	8	19.1	27	64.3
	* Not done	11	26.2	11	26.2	2	4.8	8	19.1
	X2	0.0973				29.9399			
	p-value	0.95				0.00001***			
I do regular checkups even when I do not get sick	*Usually done	2	4.8	1	2.4	14	33.3	1	2.4
	* Occasionally done	24	57.1	22	52.4	26	61.9	25	59.5
	* Not done	16	38.1	19	45.2	2	4.8	16	38.1
	X2	0.6774				22.1752			
	p-value	0.71				0.000015***			
Keep my weight within normal range	*Usually done	5	11.9	5	11.9	26	61.9	6	14.3
	* Occasionally done	29	69	29	69	15	35.7	31	73.8
	* Not done	8	19.1	8	19.1	1	2.4	5	11.9
	X2	0				20.7319			
	p-value	1				0.000031***			
I do not smoke	*Usually done	33	78.6	33	78.6	20	47.6	32	76.2
	* Occasionally done	2	4.8	3	7.1	14	33.4	4	9.5
	* Not done	7	16.6	6	14.3	8	19	6	14.3
	X2	0.2769				8.6105			
	p-value	0.87				0.13498			
I do not drink alcohol	*Usually done	32	76.2	33	78.6	39	92.8	25	59.5
	* Occasionally done	7	16.7	4	9.5	2	4.8	10	23.8
	* Not done	3	7.1	5	11.9	1	2.4	7	16.7
	X2	1.3336				12.8958			
	p-value	0.51				0.1584			
I just taking medicine with a prescription	*Usually done	2	4.8	1	2.4	33	78.6	2	4.8
	* Occasionally done	39	92.8	40	95.2	9	21.4	40	95.2
	* Not done	1	2.4	1	2.4	0	0.0	0	0.0
	X2	0.346				47.0694			
	p-value	0.84114				0.000031***			
I follow my medication system	*Usually done	9	21.4	6	14.3	34	80.9	5	11.9
	* Occasionally done	30	71.4	31	73.8	7	16.7	33	78.6
	* Not done	3	7.2	5	11.9	1	2.4	4	9.5
	X2	1.1164				40.2641			
	p-value	0.57				0.00001***			
I follow my diet regimen	*Usually done	2	4.8	1	2.4	33	78.6	2	4.8
	* Occasionally done	40	95.2	41	97.6	9	21.4	40	95.2
	* Not done	0	0.0	0	0.0	0	0.0	0	0.0
	X2	0.3457				47.0694			
	p-value	0.5565				0.00001***			
Ask for medical help if you notice signs and symptoms of kidney stones	*Usually done	1	2.4	2	4.8	32	76.2	2	4.8
	* Occasionally done	41	97.6	40	95.2	9	21.4	39	92.8
	* Not done	0	0.0	0	0.0	1	2.4	1	2.4
	X2	0.3457				45.2206			
	p-value	0.556569				0.00001***			
I avoid excessive intake of calcium tablets and vitamin D & E	*Usually done	5	11.9	7	16.7	30	71.4	6	14.3
	* Occasionally done	28	66.7	27	64.3	10	23.8	28	66.7
	* Not done	9	21.4	8	19	2	4.8	8	19
	X2	0.4103				28.1263			
	p-value	0.81				0.00001***			

\*Statistical significant at  $p < 0.05$ , \*\*Highly Statistical significant at  $p < 0.01$  \*\*\* Highly Statistical significant at  $p < 0.001$ .

**Table 8. Correlation coefficient for patients knowledge and self-care practices regarding nutrition of study and control group (N=84)**

Variables	r\ p values		Pre Intervention				Post Intervention			
			Study group (n=42)		Control group (n=42)		Study group (n=42)		Control group (n=42)	
	r	p	r	p	r	p	r	p		
Knowledge with self care practices	0.29818	0.05518	0.2362	0.132079	0.4651	0.001913***	0.2884	0.063995		

It is clearly shown from [Table 8](#) that, there was a positive correlation between pre and post intervention among study group knowledge and self care practices with statistical significance post intervention (p values of  $\leq 0.001$ ). Regarding control group, knowledge was positively correlated with self care activities pre and post intervention without statistical significant differences were observed (p value  $> 0.05$ ).

## 5. Discussion

Kidney stone disease remains a major public health burden. Its pathophysiologic mechanisms are complex, majorly because it is polygenic disorder. Dietary agents play an essential part in urinary calculus formation, and dietary alteration can reduce the risk of stone recurrence. Treatment is successful if attended in early stage itself [\[33\]](#).

**Concerning socio-demographic characteristics of the studied sample**, the current study revealed that more than two thirds of patients in both study and control groups were male. These results agree with study by [\[21\]](#), who conducted a study on assessment of patient's knowledge about avoidance of recurrent urolithiasis reported that more than two thirds of the study sample were male. This may be related to anatomical difference between males and females; in which male urethra is longer than female which, this may cause accumulation and stagnation of urine in the bladder for longer times.

As regard the age of both groups in the current study, about two thirds was ranged from 40-60 years. These results agree with study by [\[23\]](#), who conducted a study on Knowledge, attitude and practice of kidney stone formers in Armenia regarding prevention of kidney stone disease and found most of patient's age ranged from 40-50 years, this may be related to the fact that prevalence of urolithiasis increased with aging.

Also the results revealed that around two thirds of study and control group were resided in rural areas. This may be due to geographical place of Benha University Hospital which near to patients from rural areas. This supported by findings of [\[34\]](#), who conducted a study on prospective randomized trial of extracorporeal shock wave lithotripsy for nephrolithiasis-initial results in Egypt, who reported that the majority of the studied sample was lived in rural areas, and explained that lack of education, poor sanitation, and poor media in rural areas place people at higher risk for disease. Moreover, results of this study revealed that the majority of the studied patients were educated and worked. In this regard [\[35\]](#), who conducted a study on impact of nursing interventions and patients education on quality of life regarding renal stones treated by percutaneous nephrolithotomy in Egypt found the majority of the studied patients were educated and worked.

**Regarding medical history of the studied sample**, our result showed that recurrent urinary tract infection was the most common chronic disease among study and control group subjects. This was in agreement with the results of [\[36\]](#), who conducted perspective study on 500 elderly patients undergoing extracorporeal shock waves lithotripsy in Baghdad, and reported that vast majority of the studied sample had previous history of urinary tract infection.

This is consistent with the study of [\[37\]](#), who stated that bacteria and urinary stone disease are clinically associated because they often occur in the same patients and patients with urolithiasis often have positive urine and/or stone cultures.

Also the present study indicated that recurrent urinary tract infection was the most common chronic disease followed by hypertension, diabetes mellitus, cardiovascular and respiratory diseases. This agree with [\[38\]](#) and [\[39\]](#) who studied impact of health education program for elderly patients undergoing extracorporeal shock waves lithotripsy on clearance of urolithiasis and found that the majority of the study and control groups had chronic diseases, for hypertension, diabetes, cardiovascular and respiratory diseases. There is a relatively strong association between kidney stones and various morbidities, including hypertension, self-report history of cardiovascular disease and stroke [\[40\]](#). These findings contradict [\[41\]](#) who studied causes and risk factors of urolithiasis in Alexandria, and founded the commonest causes were gout and hyperparathyroidism.

**Regarding history of urinary stone and best method of treatment**, the current study represented that, nearly three quarters of both study and control group subjects were previously admitted to hospital with urinary tract stone. This result agree with [\[42\]](#) who studied impact of using lithotripsy on clearance of renal stones in Ein-Shams University hospital, and found that more than half of the studied sample had a previous history of renal stones. In addition nearly half of both groups were exposed to Extracorporeal Shock Wave Lithotripsy as method (ESWL) of treatment. Also, [\[39\]](#), stated that ESWL is a non-invasive procedure which uses shock waves to fragment calculi. This proficiency is the most widely used method for dealing renal and ureteral stones. These results agree with [\[43\]](#) who conducted a study in Australia involved specific patients undergoing ESWL and confronted that ESWL became the treatment choice for renal and upper ureteral stone among elders with a highly success free rate of 85-90%.

**As regard knowledge about urolithiasis pre intervention among the study subjects**, there is lack of patient knowledge among both groups regarding disease process. This can be explained by the fact that patients didn't receive enough information from health care team regarding their conditions which leading to lack of knowledge about medications, diet, wound care, rest and activity. In the same line, [\[44\]](#) who studied the most effective treatment modalities for management of urolithiasis in Cairo University and founded that the majority of the studied group had poor knowledge about stone disease and methods of treatment modalities. As well [\[45\]](#) noted that the majority of the studied sample had unsatisfactory level of knowledge about urinary tract stones among the studied sample. This is in agreement with these results of [\[27\]](#), who reported a great lack of studied patients' knowledge about urinary tract stone disease, causes, risk factors, signs & symptoms, methods of treatment and disease prevention prior the application of educational program in Egypt.

**The current study findings** revealed an improvement in knowledge satisfactory level group in all items related to knowledge about urolithiasis post intervention

compared to pre intervention. This was congruent with [46] who stated that patient education is the most helpful approach for preventing recurrences of urinary tract stone. This is compatible with [27] who revealed that patient's knowledge was significantly improved after implementation of the educational program for the study group,

Results showed that there was highly statistical significant difference in knowledge post intervention between the study group who had received self care intervention compared to the control group ( $P \leq 0.001$ ). These results were supported by [47] who stated that effective education will result in changes that illustrate increased information about health related issues for long period of time. Effective health education will yield short and long term changes in knowledge background that reduce the incidence of many disease complications. In addition, [35] demonstrated that , improving patients' level of knowledge had a significant effect on reducing or preventing postoperative complications and improving self-care practices and patient quality of life. So, patients after percutaneous nephrolithotomy are in essential need for special nursing interventions and education to help them to avoid many postoperative complications and thus improve their health and self- care practices.

There were statistical significant differences between both groups post intervention regarding self care activities related to permitted food. There is an enhancement in self-care practices score regarding permitted food among the study group post intervention rather than pre intervention. Supporting to these study findings, [30] in their study about effects of dietary interventions on 24-hour urine parameters in patients with idiopathic recurrent calcium oxalate stones, illustrated that ,dietary changes, is often recommended, these include getting regular food, maintaining healthy food (vegetables, fruits and fibers) and adhering to dietary recommendations. Moreover, [33], who demonstrated a study about review on urolithiasis pathophysiology and aesculapian discussion, represented that, an individualized treatment plan incorporating dietary changes supplements and medications can be developed to help prevent that formation of new stones.

**The current study findings** revealed, there is no statistical significance differences were observed between study and control groups toward their self-care practices regarding restricted food pre intervention( $p > 0.05$ ). While there are statistical significant differences between both groups post intervention regarding restricted food ( $p < 0.05$ ). As well, there is a development in self-care practices score regarding restricted food among the study group post intervention rather than pre intervention. This was in agreement with [48] who mentioned that outcomes of ESWL procedure is greatly depend on knowledge by instructions that should be followed prior, during and after procedure which affect also on patients self-care practices. Supporting to these study findings, [35] reported that, the study group patients were having self-care than control group subjects. This could be due to the effect of nursing interventions and patients education (teaching booklet) for study group patients.

Also, results of the current study presents that there is a progress in self-care practices score regarding drinking fluid among the study group post intervention compared

pre intervention. This could be due to the effect of self care intervention and patients education (teaching booklet) for study group patients. There are no statistical significant differences between both groups pre intervention regarding drinking fluid ( $p > 0.05$ ), while there are statistical significant differences between them post intervention ( $p < 0.001$ ) except reduce drinking cola drinks and stimulants as coffee and tea. This could be due Egyptian culture that consider coffee, tea and cola drinks as popular drinks in Egypt and it has very high consumption rate among Egyptian people.

This result is similar with [49] the general recommendation of urolithiasis prevention from the European Association of Urology and other literatures, which recommends fluid intake of 2.5-3 liters/day [50], and [52] As well, [53] who demonstrated that increased fluid intake could be used as a strategy to prevent primary urolithiasis. However, to prevent recurrence of urolithiasis, increased fluid intake with urine volume target of  $>2,000$  mL/day could be recommended. High fluid intake, enough to produce at least 2.5 L of urine per day, should be the initial therapy to prevent stone recurrence [54]. In addition, [22], who accomplished a study on Knowledge, attitudes, and practice patterns of recurrent urinary stones prevention in Saudi Arabia, noted that most of study's respondents agreed with the recommendations of increasing fluid intake for prevention of stone recurrence and apply them in their practice.

Results of this study represented that there was improvement in common self- care practices regarding urolithiasis as, eating balanced meals, exercising regularly, doing regular checkup, Keeping weight within normal range, taking medicine with a prescription, following medication system, following diet regimen, ask for medical help as needed and avoiding excessive intake of calcium tablets and vitamin D,E among the study group post intervention compared to pre intervention. Also there was a significant statistical differences between study and control group regarding common self care practices score post intervention except avoid smoking, avoid drinking alcohol because the majority of patients in both groups non smoker and didn't consume alcohol drinks. These findings were supported by [29], who conducted a study about evaluation of health behaviors in patients with kidney stones in Sari/Iran and concluded that by correction of unsafe health behaviors and supervision of health personnel on a regular and continuous exercise, getting enough fluid and healthy diet, can be effective in preventing of the disease and reducing the recurrence of the urolithiasis.

**Correlation Coefficient for patients Knowledge and self-care practices among study and control group**, It is clearly shown in this study findings that, there was a positive correlation between pre and post intervention among study group knowledge and self-care practices with statistical significance at p values of  $\leq 0.001$  post intervention. Supporting to theses study findings [55] who stated that , Statistically significant associations were also detected between knowledge scores and practice score .Contradiction to this study findings, [56] This study suggested that there was a disconnection between the knowledge level of participants and their level of self care practices.

## 6. Conclusion

According to study results and research hypothesis the level of knowledge and self-care practices regarding nutrition among the study group was improved post intervention compared to pre intervention. Statistical significant differences occurred between two groups regarding their knowledge and self-care practices toward permitted, restricted food and drinking fluids as well as common self-care practices regarding urolithiasis favoring the study group. Positive correlation occurred between knowledge and self-care practices of both groups.

## 7. Recommendations

Based on results of the present study the following can be recommended:

A continuous educational programs should be planned and offered on regular basis for patients with urolithiasis within urology department and outpatient clinic.

Arabic booklet with simple language and many simple photos should be available and provided for those high risk group including instructions to be followed, diet and life style modifications that prevent formation of urinary stones.

Further research on larger probability sample is recommended to achieve generalize capability and wider employment of self-care practices.

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