

Knowledge and Self-care Practices among Patients Undergoing Percutaneous Nephrostomy Tube

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Abstract

Percutaneous nephrostomy is a urinary diversion technique, commonly used to temporarily solve problems of a mechanical nature, and sometimes becomes a permanent urinary diversion. Patient's knowledge regarding disease and self-care practices are important to achieve the desired treatment targets. **Aim of the study:** To assess knowledge and self-care practices among patients undergoing percutaneous nephrostomy tube. **Research design:** A descriptive design was used. **Setting:** The study was conducted at urology surgery department and urology outpatient clinic in Fayoum University Hospital. **Methods:** A purposive sample of 60 adult patients from both genders undergoing percutaneous nephrostomy tube insertion. **Tools:** Three tools were used included: Structured Interview questionnaire, patients knowledge assessment questionnaire and patients practice observational checklist. **Results:** There was a low satisfactory level of knowledge and poor self-care practices among studied patients related to nephrostomy tube care. **Conclusion:** It can be concluded that, the highest percentage of patients had poor knowledge and self-care related to tube care, urinary bag care and prevention of infection. **Recommendations:** Design and apply nursing guidelines to improve knowledge and self-care practices regarding percutaneous nephrostomy tube care.

Key words: Knowledge, Self-care, Percutaneous Nephrostomy tube, Urinary obstruction.

Introduction

Urinary obstruction is one of the most common conditions affecting the urinary system and a significant cause of hydronephrosis and subsequent renal impairment (Peteinaris, et al., 2020). A percutaneous nephrostomy tube (PCN) is a narrow-gauge pigtail drain inserted into the renal pelvis to divert urine away from the ureter and bladder into an external drainage bag. PCN is often temporary and removed when the obstruction has resolved or can be bypassed with an internalized ureteric stent, or when the therapeutic intervention is complete. However, in rare cases (e.g., advanced cancer or retroperitoneal fibrosis) a nephrostomy may be permanent or semi-permanent (Martin & Baker, 2019).

Patient knowledge regarding disease and self-care practices are found to be important for patients to achieve the desired treatment targets and contribute meaningfully in the management of their disease (Niguse,

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et al., 2019). In health care, self-care means that patients and families should be allowed to make decisions and take initiative, responsibility and participate in matters regarding their own health.

Nurses are a perfect reference point for both patients and families when it comes to ensure knowledge of self-care and adaptation to the new situation with the highest possible quality of life. Hence, health professionals must dynamically and carefully intervene in improving patients' self-care ability through well-designed and effective caring systems (**Riegel et al., 2021**).

Significance of the study:

Although PCN is a common procedure there are no extents from complications. In adults, sub-acute to chronic complications including infection, dislodgement, and kinking are reported as high as 45% (**Yoo, et al., 2021**). approximately 4 to 8% of PCNs, complications arise necessitate specialized care or lengthy hospitalization.

the role of nurses is crucial in educating patients on self-care and in preparing them for the entire process by resolving their concerns as often as necessary, by involving their families, providing coping strategies, and monitoring them to ensure that patients' needs are met (**Capilla-Díaz et al., 2019**). Patients and families must have sufficient knowledge to deal with this process, as well as all the support necessary to respond to any potential complications.

Aim of the study

The study aimed to assess knowledge and self-care practices among patients undergoing percutaneous nephrostomy tube through:

- Assess patient's knowledge regarding percutaneous nephrostomy tube.
- Assess patient's self-care practices regarding percutaneous nephrostomy tube.

Research question:

What are the level of knowledge and self-care practices among patients undergoing percutaneous nephrostomy tube?

Subject and Method

Research Design:

A descriptive exploratory research design was utilized to conduct the study.

Setting:

This study was conducted at Urology Outpatient Clinic and Urology Surgery department in Fayoum University Hospital. The Urology Outpatient Clinic consists of 2 sections; the first sections consists of physician office, the second section is an examination room. The Urology Surgery department consists of 3 sections; the first sections for male and it includes 16 beds , the second section for female and it includes 9 beds, the third section for nurses. The nursing section includes an office, medication section and needed equipment.

Subject:

Based on sample size equation (Steven, 2012), 60 adult patients from both genders, recruited from the previously mentioned setting undergoing percutaneous nephrostomy tube participate in this study. The sample size was calculated by adjusting the power of the test to 80% and the confidence interval to 95% with margin of error accepted, adjusted to 5%.

$$n = \frac{N \times p(1-p)}{\left[\left[N-1 \times \left(d^2 \div z^2 \right) \right] + p(1-p) \right]}$$

- P= 0.5
- N= Total population
- Z= Z value “1.96”
- D= Standard Error
- n= sample size

Inclusion criteria:

- Adult Patients from both gender agree to participate in the study.
- Patient undergoing percutaneous nephrostomy tube insertion.

Exclusion criteria:

- Pregnant patient.
- Marked obesity (BMI >40 kg/m²).
- Patient with active urinary tract infection.

Tools of Data Collection:

Three tools were used to collect the data according to the following :

Tool I: Structured Interview questionnaire

It developed by the researcher based on relevant, current national and international literature (Amirhosseini, et al., 2020) and consists of three parts that were fulfilled by the researcher and it's includes: demographic characteristics (age, gender, marital status, occupation, residence). Health related data and Post-operative data which include: side of nephrostomy tube and duration of hospital stay.

Tool II: patients knowledge assessment questionnaire.

This tool developed by the researcher based on relevant, current literature (Abdel Fattah, et al., 2015) to assess patient's knowledge regarding percutaneous nephrostomy tube, including two parts:(1) Patients' knowledge regarding anatomy and physiology of urinary system, percutaneous nephrostomy tube and it's possible complications, it consists of 10 multiple choice questions (MCQ), (2): Patients' knowledge regarding care of percutaneous nephrostomy tube and home care (11 multiple choice question(MCQ)).

Scoring system: the questionnaire consisting of 21 questions, the correct answer was scored 1 point and incorrect answer was scored 0 point, and satisfactory level was detected based on statistical analysis as following :

Satisfactory knowledge level $\geq 70\%$

Unsatisfactory knowledge level $\leq 70\%$

Tool (III): patient's practice observational checklist.

This tool developed by the researcher based on relevant, current literature (Abdel Fattah, et al., 2015) (Buttisha, et al., 2019), to assess self-care practices of patients with percutaneous nephrostomy tube. Consists of 5 main parts as the following:

Part I: to assess patient's practice regarding nephrostomy tube care (4 items).

Part II: to assess patient's practice regarding care of the urinary bag (8 items).

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Part III: to assess patient's practice regarding percutaneous nephrostomy wound care (8 items).

Part IV: to assess patient's practice regarding prevention of infection (7 items).

Part V: to assess patient's practice regarding daily measurement of intake and output (4 items).

Validity:

The content validity of the tools was done by a panel of 5 experts in nursing and medicine, who reviewed the content of the tools for comprehensiveness, accuracy, clarity, relevance and applicability. Suggestions were given and modifications were done.

Reliability:

Reliability of the tool was tested to determine the extent to which the questionnaire items are related to each other. The Cronbach's alpha model, which is a model of internal consistency, was used in the analysis. Statistical equation of Cronbach's alpha reliability coefficient normally ranges between 0 and 1. Higher values of Cronbach's alpha (more than 0.7) denote acceptable reliability

Ethical consideration:

An official permission was obtained from the administrative authority of the selected setting for the current study. The researcher obtained consent from the studied patients, explaining the purpose and nature of the study, stating the possibility to withdraw at any time. Confidentiality of data assured by using codes to identify participants.

Pilot study:

A Pilot study was carried out with 10% (not less than 10 patients) of the sample under study to test the applicability, clarity and efficiency of the tools, then the tools modified according to the results of the pilot study. Modifications included: rephrasing and rearrangement of some questions. After modification, the final form of the tools were developed. Patients who shared in pilot study excluded from the study sample.

Field Work:

- Study was conducted within three months from August 2021 to the end of October 2022.
- Before starting in data collection; the purpose of the study was simply explained to the patients and their families who agree to participate in the study prior to any data collection.
- An oral and written informed consent was obtained from each participant prior to data collection
- the researcher visited the selected setting regularly, four days per week, select patient according to inclusion criteria
- Structured interview schedule was done with every participant alone to assess his/her knowledge and self-care practices. The interview was done after one week of PCN tube insertion at the urology clinic in outpatient department.

Results

Table (1): Frequency and percentage distribution of demographic characteristics for patients undergoing percutaneous nephrostomy tube (N: 60).

Variables	Studied patients (n=60)	
	No.	%
Age		
Mean ±SD	43.7±10.2	
Gender		
Male	41	68.3%
Female	19	31.7%
Marital status		
Single	11	18.3%
Married	49	81.7%
Education level		
Illiterate	15	25%
Read and write	5	8.3%
Basic education	11	18.3%
Secondary	19	31.7%
University	10	20%
Occupation		
Not working	26	43.3%
Literal Work	21	35%
Retired	3	5%
Employee	10	20%
Residence		
Rural	49	81.7%
Urban	11	18.3%

Table (1) illustrates that, as regarding demographic characteristics, the mean age of the studied patients was 43.7±10. More than two third of the studied patients were males 68.3%, added married 81.7 %, completed secondary education 31.7%, majority of them not working 43.3% , regards to residence 81.7% were from rural residence.

Table (2): Frequency and percentage distribution of health related data for patients undergoing percutaneous nephrostomy tube (N:60).

Variables	Studied patients (n=60)	
	No.	%
Diagnosis		
Renal calculi	39	65%
Ureteric stricture	1	1.7%
Prostatic hypertrophy	10	20%
Radical cystectomy	3	5%
Hemorrhagic cystitis	4	6.7
Ureteric obstruction	3	5%
Co morbidity		
No	39	65%
Diabetes Mellitus	9	15%
Hypertension	5	8.3%
Chronic lung disease	1	1.7%
Others	6	10%
Surgical history		
No surgeries	28	46.7%
Urological surgeries	14	23.3%
Others	18	30%
Unilateral	60	100%
Mean /SD (days)	10.2 / 4.7	

Table (2) illustrated that there was high percentage of renal calculi diagnosis among studied patients 65%, added majority of them had no comorbidities 65%, added having no surgical history 28 %, and all study sample have a unilateral percutaneous nephrostomy tube 100%.

Table (3): Frequency and percentage distribution of knowledge levels for patients undergoing percutaneous nephrostomy tube (N:60).

Variables	Studied patient(N=60)	
	No.	%
Knowledge		
Unsatisfactory level	58	96.7%
Satisfactory level	2	3.3%

Table (3) showed that; there was a high percentage of unsatisfactory level of knowledge 96.7% regarding percutaneous nephrostomy tube among studied patients.

Table (4): Frequency and Percentage distribution of practice levels for patient undergoing percutaneous nephrostomy tube (N:60).

Variables	Studied patients (N=60)	
	No.	%
Self-care practice		
Poor	57	95%
Good	3	5%

Table 4: illustrates that, 95% of the studied patients had poor level of self-care practice regarding percutaneous nephrostomy tube, while only 5% had good level of practice.

Table (5): Correlation between total knowledge score and total self-care practices among patients with percutaneous nephrostomy tube (N=60).

Item	Total knowledge score	
	R	P-value
Total self-care practice score	0.481	<0.001**

Table (5): illustrates that, there was a highly statistically significant positive correlation between total knowledge and total self-care practices among patients with percutaneous nephrostomy tube with p-value <0.001.

Discussion

Placement of percutaneous nephrostomy (PCN) tube is usually done to decompress the obstruction and to restore the renal function. Many complications may result either from insertion procedure or presence of catheter in the body. Patients who do not have the resources or skills to effectively manage their condition are subject to resulting complications (Hautmann, 2019).

The present study findings revealed that, the mean age of the studied patients was 43.7±10. More than two third of the studied patients were males, which was interpreted as the possibility of benign prostatic hypertrophy, carcinoma, and the higher incidence of urinary out flow obstruction and urinary stones especially

in men older than 50 years. Added, majority of the studied patients were married, completed secondary education, majority of them not working, majority of them were from rural residence.

This findings in line with **Buttisha, (2019)**, who conducted a study of " Self-Care Practices among Adult Patients with Percutaneous Nephrostomy Tube " in Egypt demonstrated that, high percentage of participants were in the middle adulthood, Also males represented a higher percentage. In addition, no work status among participants and the higher percent of them lived in rural areas.

As well, this findings agree with **Mohamed & Fashafsheh (2019)** who conducted " Effect of educational intervention and telephone follow-up program on knowledge, practice and quality of life among patients with urinary diversion: A quasiexperimental study" in Egypt, reported that majority of studied patients in study and control group were males, married and not working.

As regarding diagnosis; study findings revealed that there was a high percentage of renal calculi diagnosis among studied patients. This findings may be explained as renal calculi is an increasing urological disorder of high prevalence and recurrence rates that can occur at any age and can result in urinary tract obstruction. This explanation was supported by **Byers & Rochon (2018)** who demonstrated that, obstructive hydronephrosis have varying etiology based on the patient's age. In adults, the most common cause is urolithiasis. In addition, this finding agree with **Elbatanouny, et al. (2020)** who reported that , Egypt was identified as one of stone-forming belt countries.

The present study findings revealed that all study sample have a unilateral percutaneous nephrostomy tube. This may be due to small sample size as well as rare incidence of bilateral obstruction. This explanation was supported by **Han & Han (2019)** who conducted a study about " Bilateral Ureteral Obstruction Related to Pelvic Rhabdomyosarcoma Presenting with Acute Kidney Injury: A Case Report." revealed that bilateral renal obstruction is a rare critical condition, requiring a prompt diagnostic approach and treatment to restore the renal function.

The findings of the present study showed that, the majority of the studied patients had unsatisfactory level of knowledge and PCN tube self-care practice, This finding may be due to the high proportion of the studied patients live in rural areas that had lack of knowledge. In that context, **Chen, et al.(2020)** who stated that, Patients' knowledge may influence both self-care and self-efficacy, as poor knowledge regarding the condition may result in difficulty recognizing and evaluating symptoms, leading to poorer confidence (self-efficacy) in acting upon symptoms and less self-care.

Also this result agree with **Mahmoud, et al.,(2022)** who conducted a study about " Assessment of Self Care among Patients with Ureteric Double-J Stent: Suggested Guideline" reported that, all studied patients with ureteric double J stent had unsatisfactory total knowledge. More than two third of the studied patients had

adequate level of self-care practices regarding personal hygiene, rest and sleep, compliance with treatment, infection prevention and sexual relation respectively. While, all of them had inadequate level of self-care practices regarding physical activity and social and work domain.

The present study findings indicated that, there was a statistical significant positive correlation between knowledge score and practice score, which indicated that an increase in knowledge level will associated with an increase in practice level. The findings was supported by **Tsai & Wang, (2021)** who stated that, self-care behavior was positively and significantly correlated with disease knowledge and Poor disease knowledge contributes to inadequate self-care behavior.

Conclusion

Based on the current findings, it can be concluded that: unsatisfactory level of knowledge and poor self-care practices were reported by a high percent of participants.

Recommendations

Based on the findings of the present study, the following are recommended:

- Implementing self-care practice educational program regarding percutaneous nephrostomy tube.
- Apply designated nursing guidelines to patients undergoing percutaneous nephrostomy tube insertion.
- Simple booklet written in simple Arabic language recommended to developed, and be available for all patients with percutaneous nephrostomy tube included all information about percutaneous nephrostomy tube, complications and tube self-care.

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