

Nurses' Role Regarding Care of Patients with Fluid and Electrolyte Imbalance undergoing urinary diversion

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Abstract

Background: Fluids and electrolytes imbalances are the most frequently reported problems in urinary diversion patients. The nurse plays a major role through identifying causes, manifestation and management of this problem. Moreover life threatening nature of these imbalances makes nurses a particularly important area for nursing assessment and care. **Aim of the study was:** To assess nurses' knowledge and practice regarding care of patient with fluid and electrolytes imbalance undergoing urinary diversion. **Subjects and method:** **Research design:** A descriptive design was utilized. **Setting:** The study was conducted in the urology department at Zagazig University and AlAhrar Hospitals at Zagazig City in Sharkia Government, Egypt. **Subjects:** A convenience sample of all available (50) nurses. **Tools of data collection:** Two tools were used to collect the study data. **Tool I:** An Interview questionnaire was used about personal characteristics of study nurses, nurses' knowledge, and **Tool II:** An observational checklist to assess nurses' practices. **Results:** The present study revealed that 78.0% of studied nurses had an unsatisfactory level of knowledge and 82.0% had an unsatisfactory level of total practice **Conclusion:** There was no statistical significant difference between total knowledge, and total practice. **Recommendation:** continuous education, in service training program and providing standardized procedure of fluid and electrolytes balance booklet for increasing the knowledge and practice regarding fluid and electrolyte imbalance for patient's undergoing urinary diversion.

Keywords: Nurses role, Fluid, Electrolytes Imbalance &, Urinary Diversion Patient.

Introduction

Water is the chief component of the body. The percentage varies with age, sex and body builds⁽¹⁾. Around 52% of total body weight in women and 60% in men is fluid. This consists of water and molecules containing, for example, sodium, chloride and potassium. These compounds dissociate into particles which carry electrical charge; these particles in solutions are called electrolytes⁽²⁾.

Fluid balance refers to the balance between input and output which is the essential to perform the metabolic function effectively⁽³⁾. Potential and actual disorders of fluid and electrolyte balance occur in every setting, with every disorder, and with a variety of changes that affect healthy people (eg, increased fluid and sodium loss with strenuous exercise and high environmental temperature, inadequate intake of fluid

and electrolytes) as well as those who are ill. Therefore proper and accurate documentation of intake fluid and output is essential to prevent the complications of fluid imbalance in critically ill patients⁽⁴⁾.

Urinary diversion is one of several surgical procedures to reroute urine flow when blocked from its normal pathway. Urine flow may be blocked because of an enlarged prostate, injury to the urethra, birth defects of the urinary tract, kidney, ureter, or bladder stones, tumors of the genitourinary tract⁽⁵⁾. Some diversions result in a stoma. Following urinary diversion, there are a number of electrolyte abnormalities that occur when intestinal segments are incorporated into the urinary system. These include hypokalemia, hypocalcemia and hypomagnesemia⁽⁶⁾.

The role of nurse after urinary diversion includes assessing patient for signs and symptoms of complication that occur after the surgery and prevent it ⁽⁷⁾. The knowledge and practices of nurses about fluid monitoring and electrolytes administration is necessary to provide the good quality of patient care and this is the responsibility of urologic nurses to closely observe and monitoring the all parameters of urinary diversion patients. Moreover, In order to maintain the health, the homeostasis dynamics and balance process is most important ⁽⁸⁾. It is essential that nurses implement appropriate correct recording, accurate calculation and fluid balance monitoring, intake and output volumes assessment, daily observation sheet, which are nursing interventions, vital signs, medical procedures to provide safe patient care ⁽⁹⁾.

Significance of the study:

The complications associated with urinary diversion are both acute and chronic. One of the most common metabolic consequences and complications are fluid and electrolyte imbalances that affect the patients' hemodynamic Stability ⁽¹⁰⁾. It is essential that urologic nurses should be aware of these abnormalities, blood electrolytes and acid-base status should be closely monitored for several months following surgery for the early detection of potential life-threatening metabolic abnormalities, implement appropriate correct recording, accurate calculation and fluid balance monitoring, so that, this study will be carried out in an attempt to help in assessing nurses' role regarding care of patients with fluid and electrolyte imbalance undergoing urinary diversion at Zagazig University and AlAhrar hospitals.

Aim of the study:

This study aimed to assess nurses' knowledge and practice regarding care of patients with fluid and electrolyte imbalance undergoing urinary diversion at Zagazig University and Al-Ahrar hospitals.

Research Questions:

1. What is the level of nurses' knowledge regarding care of patients with fluid and electrolyte imbalance undergoing urinary diversion?
2. What is the level of nurses' practice regarding care of patients with fluid and electrolyte imbalance undergoing urinary diversion?

Subjects and methods:

Research design:

A descriptive design was used

Study setting:

The current study was carried out in the urology department at Zagazig University and AlAhrar Hospitals at Zagazig City in Sharkia Government, Egypt.

Study subjects:

A convenience sample of all available nurses 50 working in urology department in surgery hospital at Zagazig University and AlAhrar Hospitals.

Tools of data collection:

Two tools were used to collect necessary data. **Tool I: Nurses' Structured Interview Questionnaire:** Composed of two parts:

Part 1: used to assess personal characteristics as: age, sex, years of experience as a general and in urology department, education level, marital status, and attendance in training courses.

Part 2: used to assess nurses knowledge regarding care of patients with fluid and electrolyte imbalance undergoing urinary diversion including four different sections (nurse's knowledge about fluid, electrolyte balance, causes, manifestation of fluid and electrolyte imbalance, urinary diversion and nursing care). It was adapted and modified by the researcher ⁽¹¹⁾.

Scoring system:

The total score of the knowledge was 84 grades (100%). Each complete

correct answer scored one grade, zero for incorrect answer or don't know. For each area of knowledge, the score of the items was summed- up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into percent scores. Knowledge was considered satisfactory if the percent score was equal or above 60% and unsatisfactory if less than 60% based on statistical analysis.

Tool II- Observational checklists for nurses

It was used to assess level of nurses' practices regarding care of patients with fluid and electrolytes imbalance undergoing urinary diversion. Attenuated observational checklist was developed by the researcher. It consists of four parts (vital signs by Lynn & Lebon ⁽¹²⁾, Intake and output measurement, Doyle GR & McCutcheon ⁽¹³⁾, arterial blood sampling, World health organization ⁽¹⁴⁾, and caring of stoma and change urinary bag Perry et al., ⁽¹⁵⁾. For observational checklist consisted of given score one for done step and score zero for the not done, the scores of the items were summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into percent scores. The nurses had satisfactory level of practice when the total score equal or above 60% and unsatisfactory if it below 60% based on statistical analysis.

Content validity& Reliability:

The tools were revised by a panel of five experts from nursing staff which included two professors and three assistant professors of medical surgical nursing that revised the tool's content for clarity, relevance, comprehensiveness, understanding, and ease for implementation. All recommended modifications were done. Reliability was measured by Alph Cronbach for knowledge

questionnaire was 0.81. Reliability of practice checklist was 0.94.

Fieldwork

Once the approval was granted to progress in the study, the researcher started to organize a schedule for collecting the data. The researcher visited study setting to be familiar with work process, time of work and observe nurses attending the study settings to a set schedule for data collection. The researcher used to go to the study setting for interviewing the nurses who fulfill the criteria. The purpose of the study was explained to each nurse individually, and then the nurses were asked to participate in the study. Each nurse observed for 2 shifts at morning and afternoon for three times then she will ask to fulfill the questionnaire sheet. As the researcher was observing nurses practical skills about studied procedure. The time needed to complete the checklist varies between 30-45 minute.

The fieldwork was executed over the period from October, 2019 to March, 2020. The researcher was available one day (Saturday) at Zagazig University hospital and one day (Wednesday) at Al Ahrar Hospital weekly

Pilot study:

A pilot study for tools of data collection was carried out in order to check and ensure the clarity, applicability, relevance and feasibility of the tools. For this study, the researcher selected five (10%) nurses random to participate in the pilot testing of the questionnaire sheet and checklist from urology department and not excluded from the study sample because of no modifications in the tool.

Administrative and ethical considerations:

An official permission for data collection in Zagazig University and Al-

Ahrar Hospitals was obtained from the hospital administrative personnel by the submission of a formal letter from the Dean of the faculty of Nursing Zagazig University explaining the aim of the study in order to obtain permission and help. At the interview, each subject was informed about the purpose, benefits of the study, and nurses were informed that participation is voluntary and they have right to withdraw from the study at any time without given any reason. In addition, confidentiality, and anonymity of the subjects were assured through coding of all data. The researcher assured that the data collected will be confidential and would be used only to improve nurses' knowledge and practice for the purpose of the study.

Statistical analysis:

All data were collected, tabulated and statistically analyzed using SPSS 20.0 for windows (SPSS Inc., Chicago, IL, USA 2011). Quantitative data were expressed as the mean \pm SD & (range), and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage). Percent of categorical variables were compared using Chi-square test or Fisher's exact test when appropriate. Spearman's rank correlation coefficient was calculated to assess relationship between various study variables, (+) sign indicate direct correlation & (-) sign indicate inverse correlation, also values near to 1 indicate strong correlation & values near 0 indicate weak correlation. All tests were two sided. P-value $<$ 0.05 was considered statistically significant (S), and p-value \geq 0.05 was considered statistically insignificant (NS).

Results:

The personal characteristics of the nurses in the study sample (**Table 1**) revealed that the 78.0% of the studied nurses age more than or equal 30 years ranged between 23-56 years old with mean \pm SD 37 ± 8.3 and 72.0% of nurses were female. While 90.0% of

the studied nurses were married. As regard qualification 60.0% of nurses had diploma. Furthermore 90.0% of the studied nurses had total years of experience in hospital more or equal five years, but 76.0 % of the studied nurses had more or equal five years of experience in urology department. In addition 34.0% of the studied nurses had previously attended training courses related to fluid imbalance

Table 2 found that 22.0% of studied nurses had satisfactory level of total knowledge score, while 78.0% of nurses had unsatisfactory level of total knowledge score with Mean \pm SD, 40.8 ± 10.5 .

Table 3 showed that 82.0% of studied nurses had unsatisfactory level of total practice score, while 18.0% of nurses had satisfactory level of total practices score regarding care of patient with fluid and electrolyte imbalance undergoing urinary diversion with Mean \pm SD, 56.34 ± 13.45 .

Table 4 illustrated that there was positive significant correlation between total practice score and total knowledge score r equal 0.618, and also nurses experience in urology department r equal 0.28. But there was negative significant correlation between nurses' practice and age. On the same line there was negative significant correlation between total practice score and experience per years. Also there was negative significant correlation between total knowledge score of studied nurses and age, also experience per years.

Discussion:

The results of the current study revealed that more than three quarter of the studied nurses age between 23-56 years old and were female. A female gender was higher than male due to the most of nurses in the past were female. The most of studied nurses were married and had years of experience in hospital above five years with mean 16.84 ± 9.15 . While more than three quarter of the studied

nurses had years of experience in urology department above five years with mean \pm SD 11.02 \pm 9.32.

In addition more than half of the studied nurses had diploma of nursing. This may be due to elaborate the current condition of nursing qualification for bachelor nursing work as administrator more than practitioner. These findings in the same line with Aslam, et al. ⁽⁴⁾ who reported that roughly two thirds of the studied nurses had diploma of nursing.

Finding of this study clarified that one third of studied nurses had previously attended training course about fluid and electrolyte imbalance. This result may be due to that there is no special hospital policies that regulate the continuous training for nurses who worked at urology department which lead to lack nurses' knowledge and complex assessment required for patient with fluid and electrolyte imbalance undergoing urinary diversion.

This result contradicted with Leilah, et al. ⁽¹⁶⁾ who reported that the majority of the studied nurses had previously attended training program about fluid and electrolyte. But less than one third of studied nurses had previously attended training course about urinary diversion.

According to total nurses' knowledge regarding care of patient with fluid and electrolyte imbalance undergoing urinary diversion, The current study clarified that more than three quarter of the studied nurses had unsatisfactory level of knowledge. This obligation of nurses' knowledge at this urology department might be as a result of lack of refreshment of the nurses' knowledge. Additionally, the nurses in Egypt are not utilized the autonomous self-learning. Another cause for lack of knowledge is nurses' exhaustion due to increased work load which may hinder their ability to read and update their knowledge.

In the same consequence with Hassan, et al. ⁽¹⁷⁾ who reported that more than two third of nurses knowledge concerning fluid and electrolyte imbalance changed into unsatisfactory. This is contraindicated with Asfour, ⁽⁹⁾ who reported that more than half of staff nurses were have adequate information regarding fluid balance monitoring.

Concerning total nurses' practice regarding care of patients with fluid and electrolytes imbalance undergoing urinary diversion, this study revealed that more than three quarter of the studied nurses had unsatisfactory practice level. This could be attributed to the unsatisfactory knowledge of the studied nurses which reflects negatively on their practices, in addition to lack of orientation program prior to work in urology department and shortage of staff nurses specially with Bachelor degree in nursing which lead to work over load in these department. Moreover, unavailability of guideline books, lack of interest, lack of motivation and insufficient financial reward to the nurses, lack of in-service training course and lack of job description. All these contributed to the unsatisfactory practice level of nurses regarding care of patients with fluid and electrolytes imbalance undergoing urinary diversion.

Also this finding in the same line with peter, ⁽¹⁸⁾ who reported that, staff nurses had below average level of interpretation for fluid and electrolytes imbalance. This is contraindicated with Eldsouky, Taha, & Saleh, ⁽¹⁹⁾ who reported that, the majority of the staff nurses had adequate practice regarding assessment of fluid and electrolyte balance.

Finding of the current study revealed that there was positive significant correlation between total practice score of the studied nurses and total knowledge score. This could be as increase practice with

knowledge. Our finding is supported with Kanakalakshim, ⁽²⁰⁾ who reported that found a positive correlation coefficient between level of knowledge and practice. Also this finding in the same line with peter, ⁽¹⁸⁾ who reported that there was positive correlation between practice of studied nurses and knowledge regarding fluid and electrolyte imbalance.

The result of this study showed that there was positive correlation between total practice of the studied nurses and experience in urology department. This could be increase practice with experience. This contradicted with Leilah, et al. ⁽¹⁶⁾ who reported that there no statistical significant differences were noted between nurses' level of practice and years of work experience.

The result of the present study showed that there was negative correlation between total knowledge score of studied nurses and age, also experience per years. This finding contradicted with Kanakalakshim, ⁽²⁰⁾ who reported that there was positive association between total level of knowledge of the studied nurses regarding fluid and electrolyte replacement therapy and age, religion, marital status, education, year of

experience designation and area of work.

Conclusion:

Based on the results of the present study, it could be concluded that, more than three quarter of the studied nurses had unsatisfactory level of total practice and total knowledge score regarding care of patient with fluid and electrolyte imbalance undergoing urinary diversion. In addition, there was no statistical significant difference between total nurses' knowledge and total practice score.

Recommendations:

Based on the results, the study recommended that, in-service training programs for updating the knowledge and practice, educational posters in urology department include an outline concerning definition, causes, signs and symptoms of fluid and electrolyte imbalance and care of patient with urinary diversion may be more beneficial for nurses. Supervisor nurse should maintain patients to nurses' ratio inside urology department to provide adequate time for competent patients' care. Further studies are needed to identify effects on educational program on nurses' role.

Table 1: Frequency and Distribution of Personal Characteristics Data of Studied Nurses (n=50)

Items	No	%
Age (years)		
≥30years	39	78.0
<30 years	11	22.0
Mean ±SD	37±8.3	
Range	23-56	
Sex		
Male	14	28.0
Female	36	72.0
Marital status		
Single	5	10.0
Married	45	90.0
Qualification		
Bachelors	5	10.0
Technical institute	15	30.0
Diploma	30	60.0
Years of experience		
≥5 years	45	90.0
<5 years	5	5.0
Mean ±SD	16.84±9.15	
Range	3-39	
Experience urology Department.		
≥5 years	38	76.0
<5 years	12	24.0
Mean ±SD	11.02±9.32	
Range	1-38	
Training course urinary diversion		
Yes	13	26.0
No	37	74.0
Training course about fluid and electrolyte imbalance		
Yes	17	34.0
No	33	66.0

Table 2: Mean, Standard Deviation and Range for Nurses' Knowledge Regarding Fluid and Electrolytes Imbalance for Patients with Urinary Diversion (n=50)

Nurses' Knowledge	Mean \pmSD	Range
Nurses' Knowledge Regarding Fluids and Electrolytes Balance for Urinary Diversion Patient(36)*	16.5 \pm 4.16	6-23
Nursing Knowledge Regarding Causes of Fluid and Electrolyte Imbalance for Urinary Diversion Patients (11)*.	4.5 \pm 2.1	.0-10
Nursing Knowledge about Urinary Diversion (21)*	12.3 \pm 3.6	6-20
Nursing Knowledge Regarding Nursing Care Provided to Urinary Diversion Patients(16)*	7.5 \pm 3.5	2-16

*() maximum score

Table 3: Number and Percentage Distribution of Total Nurse's Knowledge regarding care of Patients with Fluid and Electrolytes Imbalance Undergoing Urinary Diversion (n=50)

Items	No	%
Total Knowledge Level(84)*		
Satisfactory	11	22.0
Unsatisfactory	39	78.0
Mean \pmSD	40.8 \pm 10.5	
Range	22-61	

*() maximum total score of nurses knowledge

Table 4: Nurses' Practices Regarding Care of Patients with Fluid and Electrolytes Imbalance Undergoing Urinary Diversion (n=50)

Nurses' Practice	No	%	
Total Practice about Vital signs	Satisfactory	42	84.0
	Unsatisfactory	8	16.0
Total Practice about Intake and Output Measurement.	Satisfactory	32	64.0
	Unsatisfactory	18	36.0
Total Practice about Arterial Blood Sampling	Satisfactory	2	4.0
	Unsatisfactory	48	96.0
Total Practice Regarding Care of Stoma and Change Urinary Bag	Satisfactory	2	4.0
	Unsatisfactory	48	96.0

Table 5: Number and Percentage Distribution of Total Nurses' Practices Regarding Care of Patients with Fluid and Electrolytes Imbalance Undergoing Urinary Diversion (n=50)

Items	No	%
Total Practice Level(110)*		
Satisfactory	9	18.0
Un Satisfactory	41	82.0
Mean ±SD	56.34±13.45	
Range	(32-89)	

*() maximum total score of nurses practice

Table 6: Correlation Matrix between Total Knowledge Score, Total Practice Score, Age of Nurses, Experience, and Experience in Urology Department Per Years (n=50).

		Knowledge	Practice	Age	Years of experience	Years of experience in urology department
Knowledge	R	-	0.618	-0.312	-0.381	0.243
	P	-	0.0001*	0.027*	0.006*	0.089
Practice	R	0.618	-	-0.282	-0.36	0.28

(r) Correlation coefficient significant $p < 0.05$. * insignificant $p > 0.05$

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