Effect of an Instruction Intervention about Body Fluid Balance Assessment on Knowledge and Practice among Nurses in Intensive Care Unit

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Abstract: **Fluid balance is an important concept for maintaining normal body function and consistency especially patients with critical illness. Aim: to determine the effect of an instruction intervention about body fluid balance assessment on knowledge and practice among nurses in intensive care unit.**

Design: quasi experimental one group Pretest - Posttest research design was utilized. Sample: a convenience sample of nursing staff (79 nurses) working in intensive care unit at Menoufia university hospital have an instruction intervention about body fluid balance assessment.

Tools: two tools were utilized for data collection; tool 1: Structured interview schedule which divided into two parts; part 1: characteristic of nursing staff, part two : Structured interview questionnaire to assess nurses' knowledge about body fluid balance. tool 2: Observational checklist to assess nurses' practice for assessing body fluid balance that divided into three parts; part 1: assessment for patient's fluid status. part 2: measuring of fluid input, part 3: measuring of fluid output.

Results: There was a significant improvement of nurses' knowledge and practice regarding fluid balance assessment in intensive care unit after implementing an instruction intervention. Conclusion: Implementing an instruction intervention about body fluid balance assessment for nurses who working in intensive care unit leading to increasing level of knowledge and improving nurses' practice when providing patient care.

Recommendation: Training and education about body fluid balance assessment at intensive care unit is a very important for fostering high standards of nursing practice and patient care.

Keywords: **An Instruction Intervention, Body fluid balance, Intensive Care Unit.**

1. INTRODUCTION

Assessment of body fluid and maintaining its' balance is a very important concept especially for critically ill patients. Fluid Balance means the balance between intake and output of body fluids which aid to maintain normal metabolic function within the body. Accurate measurement of body fluid is the main task of nurses who working in intensive care unit (ICU) as patients complain from serious problems that affect body function, hence the nurse should monitor , assess body fluid and determine balance between fluid intake and output to prevent patients 'complications[1].

Recording twenty four hours of daily fluid intake and output is an important measure in patients' sheet. Fluid intake which indicates all fluid arrives the body through mouth in the form of fluid, intravenous solutions or medications, Nasogastric tube feed, and total parenteral nutrition. Fluids output means all fluids that leave from the body through urine, stool, vomiting, nasogastric tube aspiration, insensible losses, surgical wound drainage, chest drains.When the result between the fluid intake and output are equal that indicates fluid balance [2] . Evaluating and documenting patients' fluid balance is of the great importance in the understanding and management of the patients' clinical status especially critically ill

patients who complain from diseases that result in accumulation of body fluid as in hypertension, tissue and peripheral edema, respiratory failure, and increased cardiac demand[3].

Smith and Roberts (2011) [4] reported that all fluid intake and output that enter the body by any routes must be recorded by using quantifiable amounts. This means that the nurse must know the amount of an intravenous fluid and medication in milliliters, in addition to any fluid drinking through mouth should be documented in milliliters, also fluid output from the body documented clearly in this manner in twenty four hours to assess the fluid balance for patient. The correct technique for assessment and recording of fluid intake and output chart not accepted and practiced from the nurses who need more training and education.

Payen et al. (2008) [3] concluded that body fluid imbalance was associated with increasing mortality rate in intensive care unit. Also Asfour (2016) [5] concluded that nurses should have knowledge and skills for assessing and monitoring body fluid. Inaccurate assessment and documentation of body fluid can lead to severe problems in body homeostasis especially for critically ill patients who have serious health problems in addition to inaccurate administration of fluids and medications that lead to disturbance of body homeostasis and hemodynamic instability[6].

Therefore, it is very important for nurses who work in intensive care unit to perform correct, appropriate assessment and monitoring of body fluid to promote patients' safety [7]. So, the aim of this study was to determine the effect of an instruction intervention about body fluid balance assessment on knowledge and practice among nurses in intensive care unit.

1.1. Significance of the study:

Critically ill patients suffering from serious diseases that leads to severe complications and disturbance in haemostatic mechanisms of the body. Frequent assessment and maintaining of body fluid balance is very important for promoting patient safety when providing care. So that the nurse must be trained and educated to ensure accurate assessment and documentation of patient fluid intake and output chart.

1.2. Aim of the study:

This study aimed to determine the effect of an instruction intervention about body fluid balance assessment on knowledge and practice among nurses in intensive care unit.

1.3. Research Hypotheses:

A-There will be an increase in nurses' knowledge and practice score related to body fluid balance assessment among intensive care unit nurses after providing an instruction intervention about body fluid balance assessment than pre-intervention.

2. SUBJECTS AND METHODS

2.1. Design:

A quasi experimental research design with pre-posttest was utilized to achieve aim of the study.

2.2. Setting:

This study was conducted at intensive care unit of Menoufia University hospital, Egypt.

2.3. Subjects:

A convenience sample of 79 nurses who working at intensive care unit of Menoufia University hospital, Egypt.

2.4. Tools of the Study:

Two tools were utilized by the researcher as the following:

2.4.1. Tool 1: Structured interview schedule which divided into two parts:

Part 1: Characteristic of nursing staff which include information about age, gender, level of education, years for experience, and pervious participation of fluid balance assessment program .

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Part 2: Structured interview questionnaire to assess nurses' knowledge about body fluid balance. This part consisted of eleven questions as importance of body fluid, percent distribution of body fluid, causes of Hypovolemia, signs and symptoms of Hypovolemia, complications of Hypovolemia, causes of Hypervolemia, signs and symptoms of Hypervolemia, complications of Hypervolemia, methods for measuring fluid input, methods for measuring fluid output, indications for using fluid balance chart.

Scoring system: each question scoring from 0-2.zero means incorrect answer, 1 means correct incomplete answer and 2 means correct and complete answer. All items scores were summed up and the total scores were from (0-22). The scoring system was categorized as follow: a) Good knowledge (16.5 to 22) 75% to 100%. b) Fair knowledge (from 13 to less than 16.5) 60% to less than 75%) Poor knowledge (less than 13) less than 60%.

2.4.2. Tool 2: Observational checklist to assess nurses' practice for assessing and measuring body fluid to maintain balance. This part consists of twenty three items which divided into three parts;

Part one: Consists of six items that include assessment for patient's fluid status that include: weight, vital signs (temperature, pulse, respiration, blood pressure), abnormal breathing sound, peripheral edema, postural hypotension, laboratory findings for complete blood count, kidney function test (urea, creatinine) and electrolytes.

Scoring system: each item scoring from 0-2.zero means the nurse don't perform the practice, 1 means the nurses sometimes done the practice and 2 means the nurses always done the practice All items scores were summed up and the total scores of part one was from (0-12). The scoring system was categorized as follow: a) Competent nursing practice from 75% to 100% (from 9 to 12) and b) Incompetent nursing practice less than 75% (less than 9).

Part two: Consists of eight items including measuring of fluid input that means all fluid entering the patient's body including; all drinks through mouth and measured by standardized sized cups, liquid foods, intravenous fluids: (type of IV fluid, infusion rate, amount of IV fluid), blood transfusion (type, amount), all intravenous medication (IV) given as boluses, nasogastric tube feed, water, flushes/boluses, total parenteral nutrition (record the hourly rate), nursing documentation for fluid input items.

Scoring system: Each item scoring from 0-2.zero means the nurse don't perform the practice, 1 means the nurses sometimes done the practice and 2 means the nurses always done the practice. All items scores were summed up and the total scores of part two for fluid input were from (0-16). The scoring system was categorized as follow: a) Competent nursing practice from 75 % to 100 % (from 12 to 16) and b) Incompetent nursing practice less than 75% (less than 12).

Part three: consists of nine items including measuring fluid output: all fluid leaves the patient's body including; urine, stool/stoma output, Vomiting can be estimated if unable to measure, Nasogastric (NG) tube aspiration, Perspiration/insensible losses (lung; 300, skin; 600), drainage from surgical drains, chest drains, weighing pads and nursing documentation for fluid output to estimate balance between input and output.

Scoring system: Each item scoring from 0-2.zero means the nurse don't perform the practice, 1 means the nurses sometimes done the practice and 2 means the nurses always done the practice. All items scores were summed up and the total scores of part three were from (0-18). The scoring system was categorized as follow: a) Competent nursing practice from 75 % to 100 % (from 13.5 to 18) and b) Incompetent nursing practice less than 75% (less than 13.5).

Validity and reliability of tools:

All tools were tested for content validity by a panel of experts in medical surgical nursing specialties to ascertain relevance and completeness. The required modifications were carried out.

The tools used in this study were tested for its reliability using test-retest method a person correlation coefficient formula was used .The period between each test was two weeks. It was 0.97for tool one (part two) and 0.92 for tool two.

2.5 Data collection:

Data collection for this study was carried out from July to December 2017. Once permission was obtained to conduct the study, the researchers were initiated data collection.

A pilot study was carried out on 10% of study sample (8 nurses) to test clarity and applicability of tools and modifications were done therefore. Data obtained from the pilot study was excluded from the study.

An official permission to conduct the study was obtained from the responsible authorities after explaining the aim of the study. Formal consent was obtained from each participant. Voluntary participation, anonymity, and confidentiality were all guaranteed.

A convenience sample of 79 nurses who working at intensive care unit of Menoufia University hospital, Egypt and accepted to participate in the study exposed to an instruction intervention about body fluid balance assessment. The researchers initiated data collection by pre-test using tool 1 and 2. This session took about 45-60 minutes.

After completing pre-test by nurses the researchers determined the nurses' level of knowledge and practice then divided them into eight groups each group consists of 10 nurses, then the researchers administered for each group knowledge about body fluid balance assessment and demonstrate the practice related to assessment and measuring of body fluid input and output in three sessions, one session per week. At the first session the researchers provided an knowledge and procedures related to body fluid balance assessment and measuring was given. It took about 70 – 90 minutes. In the second session the researchers provided revision with the nurses by using demonstration and redemonstration and allowed the nurse to ask any questions. This session took about 50 – 60 minutes. In session three the researchers evaluated nurses' knowledge and practice about body fluid balance assessment by using post-test assessment using tool 1 and 2. This session took about 45-60 minutes.

Data were collected, analyzed and comparison was done between pre and post intervention for study group to determine the effect of an instruction intervention about body fluid balance assessment on knowledge and practice among nurses in intensive care unit.

Statistical analysis:

Results were statistically analyzed by using SPSS version 20 which the following statistics were used. Descriptive statistics: in which qualitative data were presented in the form numbers and percentages. Analytical statistics: Chi-square test ($\chi 2$): was used to study the association between two qualitative variables. P value < 0.05 is considered significant.

3. RESULTS

Table 1 showed that more than half of studied sample at the age between 25 - 35 years old (67.1%), about three quarter of the sample were female (74.7%). about half (44.3%) was have technical institute of nursing education. About one third (39.2%) of the studied sample had experience from five to ten years, most of the studied sample were not participate of any fluid balance assessment (66 %).

Table 2 illustrated that there was a highly statistically significant increasing in nurse's knowledge related to fluid input and output post intervention than pre intervention for all items that include importance of body fluid, percent distribution of body fluid, causes of Hypovolemia, signs and symptoms of Hypovolemia, complications of Hypovolemia, causes of Hypervolemia, signs and symptoms of Hypervolemia, complications of Hypervolemia, methods for measuring fluid input, methods for measuring fluid output, indications for using fluid balance chart as p-value < 0.001. In addition to more than half of the nurses have poor knowledge (60.8%) pre intervention, while (81.0%) of nurses had good knowledge at post intervention.

Table 3 clarified that there was statistically significant improvement in nurse's practices related to nursing assessment when measuring fluid input and output post intervention than pre intervention for weight as p-value < 0.05 and a highly statistically significant improvement for vital signs (temperature, pulse, respiration, blood pressure), abnormal breathing sound, peripheral edema, postural hypotension, laboratory findings for complete blood count, kidney function test (urea, creatinine) and electrolytes as p-value < 0.001. Also most of nurses (89.9%) had incompetent nursing practice related to nursing assessment pre-intervention, while post intervention (72.2%) of nurses had competent practice.

Table 4 illustrated that there was a highly statistically significant improvement in nurses' practices related to measuring fluid input post intervention than pre intervention for all items that include all drinks through mouth, liquid foods, intravenous fluids, blood transfusion, all intravenous medication (IV) given as boluses. nasogastric tube, total parenteral nutrition as p-value < 0.001. Also two third of nurses (73.4%) had incompetent nursing practice related to measuring fluid

input pre-intervention, while most of nurses (82.3%) had competent nursing practice related to measuring fluid input post-intervention

Table 5 clarified that there was a highly statistically significant improvement in nurses' practices related to measuring fluid output post intervention than pre intervention for all items that include urine, stool/stoma output, Vomiting can be estimated if unable to measure, Nasogastric (NG) tube aspiration, Perspiration/insensible losses, drainage from surgical drains, chest drains, weighing pads or estimation of fluid on a pad, and Nursing documentation for all items of fluid output at fluid balance chart as p-value < 0.001. Also the majority of nurses (74.7%) had incompetent nursing practice pre intervention, while the majority of nurses (73.4%) had competent practice post intervention related to measuring fluid output .

Table 6 presented the relationship between nurses' knowledge score and level of practice regarding body fluid balance assessment post intervention in ICU: The finding revealed that there was highly statistically significant relation between nurses' knowledge score and level of practice regarding body fluid balance assessment post intervention, as most of nurses' who had good knowledge had competent nursing practice post intervention as p-value < 0.001.

Table (1): Sociodemographic characteristics of nurses at intensive care unit

Sociodemographic Data:	Study group N=(79)	
	N	**%**
Age (years):		
- < 25-	21	26.6
- 25-35	53	67.1
- >35	5	6.3
Gender:		
- Male	20	25.3
- Female	59	74.7
Educational level:		
- Nursing Diploma	15	19.0
- Technical Institute of Nursing	35	44.3
- Bachelor of Nursing	29	36.7
Years of experience:		
- Less than one year	14	17.7
- 1 – 5 years	23	29.1
- 5 – 10 years	31	39.2
- More than 10 years	11	14.0
Previous participation of fluid balance assessment program:		
- Yes	13	16.5
- No	66	83.5

Table (2): Number and percentage distribution of nurses' knowledge related to fluid input and output pre and post intervention in intensive care unit

Nurses' knowledge	Study group (79)				X^2	p value
	Pre- intervention		Post – intervention			
	No	**%**	**No**	**%**		
Importance of body fluid:						
Complete correct answer	10	12.7	62	78.5		
Incomplete correct answer	23	29.1	13	16.4	75.61	<0.001
Incorrect answer	46	58.2	4	5.1		
Percent distribution of body fluid						
Complete correct answer	9	11.4	67	84.8		
Incomplete correct answer	18	24.1	10	12.7	92.85	<0.001
Incorrect answer	52	64.5	2	2.5		

Causes of Hypovolemia:						
Complete correct answer	12	15.2	69	87.3		
Incomplete correct answer	20	25.3	7	8.9	85.10	<0.001
Incorrect answer	47	59.5	3	3.8		
Signs and symptoms of Hypovolemia						
Complete correct answer	14	17.7	71	89.8		
Incomplete correct answer	23	29.1	7	8.9	74.65	<0.001
Incorrect answer	42	53.2	1	1.3		
Complications of Hypovolemia						
Complete correct answer	16	20.3	68	86.1	71.59	<0.001
Incomplete correct answer	13	16.4	6	7.6		
Incorrect answer	50	63.3	5	6.3		
Causes of Hypervolemia:						
Complete correct answer	8	10.1	58	73.4	78.98	<0.001
Incomplete correct answer	10	12.7	13	16.5		
Incorrect answer	61	77.2	8	10.1		
Signs and symptoms of Hypervolemia						
Complete correct answer	16	20.3	60	76.0		
Incomplete correct answer	11	13.9	17	21.5	73.06	<0.001
Incorrect answer	52	65.8	2	2.5		
Complications of Hypervolemia						
Complete correct answer	13	16.5	61	77.2	63.39	<0.001
Incomplete correct answer	18	22.7	11	13.9		
Incorrect answer	48	60.8	7	8.9		
Methods for measuring fluid input						
Complete correct answer	19	24.1	63	79.7	56.35	<0.001
Incomplete correct answer	21	26.6	13	16.5		
Incorrect answer	39	49.3	3	3.8		
Methods for measuring fluid output						
Complete correct answer	21	26.6	69	87.3		
Incomplete correct answer	23	29.1	7	8.9	61.08	<0.001
Incorrect answer	35	44.3	3	3.8		
Indications for using fluid balance chart	18	22.8	59	74.7		
Complete correct answer	10	12.7	12	15.2	53.35	<0.001
Incomplete correct answer	51	64.5	8	10.1		
Incorrect answer						
Knowledge score						
Good	14	17.7	64	81.0		
Fair	17	21.5	11	14.0	70.57	<0.001
Poor	48	60.8	4	5.0		

X^2 means Chi-Square Test   significance P value < 0.05

Table (3):Nurses' practices related to assessment for patient's fluid status pre and post intervention in intensive care unit

Observational checklist	Study group (79)				X^2	p- value
	Pre- intervention		Post – intervention			
	No	%	No	%		
Part one: Items for nursing assessment: **Weight:**						
Done always	2	2.5	10	12.6		
Done sometimes	9	11.4	18	22.8	10.76	0.005
Not done	68	86.1	51	64.6		

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Vital signs (temperature, pulse, respiration, blood pressure):						
Done always	25	31.6	62	78.5		
Done sometimes	13	16.5	13	16.5	46.16	<0.001
Not done	41	51.9	4	5.0		
Abnormal breathing sound:						
Done always	3	3.8	47	59.5		
Done sometimes	29	36.7	14	17.7	71.48	<0.001
Not done	47	59.5	18	22.8		
Peripheral edema:						
Done always	4	5.0	59	74.7		
Done sometimes	18	22.8	8	10.1	81.21	<0.001
Not done	57	72.2	12	15.2		
Postural hypotension:						
Done always	7	8.9	49	62.0		
Done sometimes	12	15.2	13	16.5	55.55	<0.001
Not done	60	75.9	17	21.5		
Laboratory findings(full blood count, urea, creatinine, electrolytes):						
Done always	6	7.6	52	65.8		
Done sometimes	20	25.3	11	13.9	58.94	<0.001
Not done	53	67.1	16	20.3		
Practice score for part one:						
Competent	8	10.1	54	68.4	60.52	<0.001
Incompetent	71	89.9	25	31.6		

X^2 means Chi-Square Test   significance P value < 0.05

Table (4): Nurses' practices related to measuring fluid input pre and post intervention in intensive care unit

Observational checklist	Study group (79)				X^2	p- value
	Pre- intervention		Post – intervention			
	No	%	No	%		
Part two: Items for measuring fluid input: **All drinks through mouth:**						
Done always	18	22.8	63	79.7		
Done sometimes	28	35.4	9	11.4	51.66	<0.001
Not done	33	41.8	7	8.9		
Liquid foods:						
Done always	8	10.1	59	74.7	70.83	<0.001
Done sometimes	20	25.3	11	13.9		
Not done	51	64.6	9	11.4		
Intravenous fluids						
Done always	47	59.5	72	91.1		
Done sometimes	23	29.1	5	6.3	21.28	<0.001
Not done	9	11.4	2	2.6		
Blood transfusion:						
Done always	42	53.2	70	88.6		
Done sometimes	26	32.9	8	10.1	24.86	<0.001
Not done	11	13.9	1	1.3		

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All Intravenous drugs given as boluses:						
Done always	14	17.7	68	86.0	70.00	<0.001
Done sometimes	12	15.2	7	8.9		
Not done	53	67.1	4	5.1		
Nasogastric tube feed, water, flushes:						
Done always	18	22.8	63	79.7		
Done sometimes	24	30.4	10	12.7	53.11	<0.001
Not done	37	46.8	6	7.6		
Total parenteral nutrition:						
Done always	17	21.5	59	74.7		
Done sometimes	24	30.4	12	15.2	46.78	<0.001
Not done	38	48.1	8	10.1		
Nursing documentation for all items of fluid input at fluid balance chart.						
Done always	21	26.6	60	76.0		
Done sometimes	33	41.8	15	19.0	40.74	<0.001
Not done	25	31.6	4	5.0		
Total practice score of part two:						
Competent	21	26.6	65	82.3	49.40	<0.001
Incompetent	58	73.4	14	17.7		

X^2 means Chi-Square Test   significance P value < 0.05

Table (5): Nurses' practices related to measuring fluid output pre and post intervention in intensive care unit

Observational checklist	**Study group (79)**				X^2	**p- value**
	Pre- intervention		**Post – intervention**			
	No	**%**	**No**	**%**		
Part three: Items for measuring fluid output:						
Urine output:						
Done always	29	36.7	65	82.3		
Done sometimes	20	25.3	12	15.2	40.29	<0.001
Not done	30	38.0	2	2.5		
Stool or stoma output:						
Done always	21	26.6	53	67.1		
Done sometimes	13	16.5	18	22.8	40.47	<0.001
Not done	45	56.9	8	10.1		
Vomiting estimated if unable to measure:						
Done always	14	17.7	39	49.4		
Done sometimes	17	21.5	22	27.8	26.07	<0.001
Not done	48	60.8	18	22.8		
Nasogastric (NG) tube aspiration:						
Done always	16	20.3	50	63.3		
Done sometimes	19	24.1	22	27.8	44.58	<0.001
Not done	44	55.6	7	8.9		
Perspiration/insensible losses:						
Done always	23	29.1	67	84.8		
Done sometimes	26	32.9	9	11.4	51.86	<0.001
Not done	30	38.0	3	3.8		
Drainage from surgical drains:						
Done always	18	22.8	53	67.1		
Done sometimes	21	26.6	17	21.5	37.29	<0.001
Not done	40	50.6	9	11.4		

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Chest drains:							
Done always	11	13.9	57	72.2		69.90	<0.001
Done sometimes	16	20.3	17	21.5			
Not done	52	65.8	5	6.3			
Weighing pads or estimation of fluid on a pad:							
Done always	18	22.8	60	76.0		50.13	<0.001
Done sometimes	23	29.1	14	17.7			
Not done	38	48.1	5	6.3			
Nursing documentation for all items of fluid output in fluid balance chart.							
Done always	28	35.4	64	81.0		34.45	<0.001
Done sometimes	30	38.0	11	13.9			
Not done	21	26.6	4	5.1			
Total practice score of part three:							
Competent	20	25.3	58	73.4		36.56	<0.001
Incompetent	59	74.7	21	26.6			

X^2 means Chi-Square Test   significance P value < 0.05

Table (6): The relationship between nurses' knowledge score and practices level regarding body fluid balance assessment at post intervention in intensive care unit

Nurses' practice	Study group (79)						X^2	p- value
	Nurses' knowledge							
	Good (64)		Fair (11)		Poor (4)			
	No	%	No	%	No	%		
Nurses' practices related to nursing assessment:								
Competent	54	84.4	0	0.00	0	0.00	42.43	<0.001
Incompetent	10	15.6	11	100.0	4	100.0		
Nurses' practices related to measuring fluid input:								
Competent	63	98.4	2	18.2	0	0.00	61.03	<0.001
Incompetent	1	1.6	9	81.8	4	100.0		
Nurses' practices related to measuring fluid output:								
Competent	55	85.9	1	9.1	0	0.00	37.12	<0.001
Incompetent	9	14.1	10	90.9	4	100.0		

X^2 means Chi-Square Test   significance P value < 0.05

4. DISCUSSION

The nurse must assess and monitor for body fluid input and output by using a quantifiable amount. The Accurate fluid balance monitoring is a very important component for ensuring safety when providing patient care especially for critically ill patients. Accurate recording is essential in fluid balance assessment while inaccurate monitoring and documentation can lead to severe patient's complications [8].

Concerning sociodemographic characteristics of intensive care unit nurses:

The current study revealed that the study sample consists of 79 nurses whose characteristics include the following; more than half of studied sample at the age between 25 - 35 years old, about three quarter of the sample were female, about half was have technical institute of nursing education. About one third of the studied sample had experience from five to ten years, most of the studied sample were not participate of any fluid balance assessment. This result is consistent with **Eldsouky, Taha and Saleh, 2016**[9] who conducted a study about nurses' knowledge and practice concerning fluid and electrolyte balance among patients with congestive heart failure, they founded that the majority of nurses who working at Zagazig University Hospitals in medical and cardiac ICU units were females, their age were below thirty years and had experience less than ten experience years. In additional to another study by **Vijayan, 2011**[10] who conducted research to evaluate the practices and knowledge of nurses regarding fluid and electrolyte administration in post-operative cardiac surgical patients admitted in ICU that found two third of nurses in cardiac were related to the age group 23-35years and most of them were female.

Concerning nurses' knowledge and practice related to body fluid balance assessment at pre and post intervention at intensive care unit

Nurses' knowledge related to body fluid balance assessment among intensive care unit, the present study concluded that more than half of the nurses had poor knowledge before intervention, This result was the same line with **Aslam et al.(2017)**[11] who founded that nurses' knowledge and practices regarding fluid and electrolytes administration is low which affect in the quality of nursing care among the public hospitals. Also **Asfour (2016)**[5] founded that more than a third of nurses had inadequate knowledge related to measuring fluid input and output, so in-service education should be conducted to improve nurses" knowledge.

While the nurses had good knowledge after providing an instruction intervention about body fluid balance assessment , this result in the same line with **Kol, Ilaslan, Turkay, (2017)** [12] who concluded that continuous in-service training for nurses is considered very important concern that help the professional nurse to know the new in the nursing science which enhance nursing practice. **Also Odell et al., (2009)**[13] and **Forneis, Peden-McAlpine, (2009)** [14] founded that nurses caring patients for 24-h should have clinical competence that help them to make decision-toward patient' care, so educational program and training courses are considered the two important components for developing nursing staff.

Concerning nurses' practice related to body fluid balance assessment among nurses in intensive care unit, the current study conducted that about two third of ICU nurses had incompetent and incomplete nursing practice related to assessment of fluid balance and measuring fluid input and output pre-intervention, which improved at post intervention after providing an instruction about body fluid balance. This findings was the same line with **Perren et al (2011)** [15] who found that evaluate fluid balance was inaccurate in one third of critically ill patient with incomplete recording ranging from -3606 mL to+2020 mL. Also **Johnson and Monckhouse (2009)**[16] concluded that discrepancy between fluids administered and fluids documented in patients' chart. **Diacon and Bell (2014)**[17] who mentioned monitoring of fluid balance chart for more than two thirds of critically ill patients increased more than 50 mL from the wanted balance.

In relation to post an instruction intervention about body fluid assessment there is an improvement of nurses performance, the researchers opinion about this improvement through giving an instruction intervention about body fluid balance assessment in the form of theoretical part and demonstration and redemonstration of the practical part for nursing staff, this findings is on the same with **Vincent and Mahendiran (2015)** [18] that reported monitoring of fluid balance is inaccurate for all wards that lead to a negative effect on the safety of patients. This problem can be overcome by increasing awareness and education about the importance of maintaining fluid equilibrium. Also **Eldsouky, Taha and Saleh, (2016)** [9] mentioned that there was an enhancement of nurses' practice about fluid and electrolyte balance among patients with congestive heart failure after providing an education program about body fluid monitoring. **Chaghari et al (2004)** [19] stated that Empowering education is a model designed for in-service training for nurses that advisable to match the training programs according to educational needs related to practical skills for nursing staff. The empowering education assisted nurses for completing the professional tasks competently and correctly.

Regarding relationship between nurses' knowledge score and practices level regarding body fluid balance assessment at post intervention in ICU.

The finding revealed that there was statistically significant relation between nurses' knowledge score and level of practice regarding body fluid balance assessment post intervention. This result is consistent with **Yousefi et al (2012)** [20] they mentioned that nurses can participate in the educational programs to promote their knowledge and practice to provide correct and safe patient care. Also **Tina et al., (2001)** [21] mentioned that decreasing knowledge level at the initial baseline data assessment for the nurses in ICU that also reflected in the nurses' practice at pre-intervention of the program, that converted to a significant improvement of both knowledge and practice after intervention.

5. CONCLUSION AND RECOMMENDATIONS

The current study concluded that implementing an instruction intervention about body fluid balance assessment for nurses who working in intensive care unit leading to increasing level of knowledge and improving nurses' practice when providing patient care. This study recommended that Training and education about fluid balance assessment at intensive care unit is a very important for fostering high standards of nursing practice and patient care.

REFERENCES

[1] Gonzalez F, Vincent F. The fluid balance in the critically ill patients: what are we talking about? Minerva Anestesiol 2011;77(8):766-7.

[2] Sheppard M. (2001). Maintaining an accurate fluid and electrolyte balance. Nursing Times 97:23:40-1.

[3] Payen D., de Pont A, Sakr Y, Spies C, Reinhart K, Vincent JL. (2008). A positive fluid balance is associated with a worse outcome in patients with acute renal failure. Crit Care; 12(3):R74. http://ccforum.com/content/12/3/R74.

[4] Smith J., Roberts R. (2011). Vital Signs for Nurses. An Introduction to Clinical Observations. Oxford: Wiley-Blackwell.

[5] Asfour I. H. (2016). Fluid Balance Monitoring Accuracy in Intensive Care Units. IOSR Journal of Nursing and Health Science; 5 (4): 53-62.

[6] Bouchard J, Soroko S, Chertow G, Himmelfarb J, Ikizler T, Paganini E et al. (2009). Fluid accumulation, survival and recovery of kidney function in critically ill patients with acute kidney injury. Kidney Int;76:422-7.

[7] Boyd J, Forbes J, Nakada T, Walley K, Russell J. (2011). Fluid resuscitation in septic shock: A positive fluid balance and elevated central venous pressure are associated with increased mortality. Crit Care Med;39(2):259-65.

[8] Welch K. (2010). Fluid balance. Learning Disability Practice; 13: 6, 33-8.

[9] Eldsouky S.E., Taha N. M., Saleh M. D. (2016). Nurses' knowledge and practice concerning fluid and electrolyte balance among patients with congestive heart failure, Zagazig Nursing Journal; 12(1): 114-21.

[10] Vijayan A. (2011). A study to assess the knowledge and practices of staff nurses regarding fluid and electrolyte administration in post operative cardiac patients admitted in CSICU and CSW, SCTIMST, Available at: dspace.sctimst.ac.in/jspui/bitstream/123456789/1603/1/477.pdf; retrieved on 29/12/2017.

[11] Aslam S.,Afzal M., Kousar R.,Waqas A., Gilani S.(2017). the Assessment of Nurses' Knowledge and Practices about Fluid and Electrolytes Monitoring and Administration among Cardiac Surgery Patients: A Case of Punjab Institute of Cardiology, Int. J. Appl. Sci. Biotechnol. Vol 5(2): 208-215.

[12] Kol E., Ilaslan E., Turkay M. (2017). Training needs of clinical nurses at an university hospital in Turkey, Nurse Education in Practice, 22, 15-20.

[13] Odell, M., Victor, C., Oliver, D., 2009. Nurses' role in detecting deterioration in ward patients: systematic literature review. J. Adv. Nurs. 65 (10), 1992-2006.

ISSN 2394-7330

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[14] Forneris, S.G., Peden-McAlpine, C.J., 2009. Creating context for critical thinking in practise: the role of preceptor. J. Adv. Nurs. 65 (8), 1715e1724.

[15] Perren A, Markmann M, Merlani G, Marone C, Merlani P. (2011). Fluid balance in critically ill patients Should we really rely on it? Minerva Anestesiol;77(8):802-11.

[16] Johnson R, Monkhouse S. (2009). Postoperative fluid and electrolyte balance: alarming audit results. Journal of Perioperative Practice,19(9): 291-4.

[17] Diacon A, Bell J. (2014). Investigating the recording and accuracy of fluid balance monitoring in critically ill patients. S Afr J Crit Care; 30(2):55- 7.

[18] Vincent M. and Mahendiran T. (2015), Improvement of fluid balance monitoring through education and rationalisation, BMJ QualImprov Rep; 4 (1).

[19] Chaghari M., Saffari M., Ebadi A., AmeryounA. (2004). Empowering Education: A New Model for In-service Training of Nursing Staff, Nurs Times, May 18;100 (20):36-9.

[20] Yousefi H., Nahidian M., Sabouhi F. (2012). Reviewing the effects of an educational program about sepsis care on knowledge, attitude, and practice of nurses in intensive care units, Iran J Nurs Midwifery Res. 17(2 Suppl1): S91–S95.

[21] Tina D., and Steven P., Wainwright and Jenifer Wilson-Barnett (2001): An evaluation of a teaching intervention to improve the practice. Journal of Clinical Nursing, Volume (10), Issue(5), p.p 682–696.