EFFECT OF AN EDUCATIONAL PROGRAM ON NURSES' PRACTICE REGARDING MANAGEMENT OF PATIENTS UNDERGOING PERIPHERAL VASCULAR ACCESS

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ABSTRACT

Background: The vascular catheters uses is common in both inpatient and outpatient care that play an integral role in modern health care and are of great clinical value for supporting patient's status. Nursing management of peripheral vascular lines is important. A comprehensive understanding of the procedure features an excellent value so as to scale back the complications arising from peripheral vascular lines. All staff must remember all aspect of care and therefore the principles of safe insertion, injection, dressing change & flushing procedure. **Aim of the study:** To evaluate the effect of an educational program on nurses' practice regarding management of patients undergoing peripheral vascular access. **Research design**: Quasi-experimental design was utilized to conduct the study at Al-Azhar university hospital in New Damietta city. The study nurses consisted of 50 nurses. **Tools:** Two tools were used for data collections**: tool I** Structured interview questionnaire sheet and **tool II** Nurses' practice Observational Checklists. **The Results** less than three quadrant of studied nurses (70%) had satisfactory total practice level immediately post educational program implementation compared to (12%) of studied nurses pre educational program implementation and (22%) of subjects follow up educational program **Conclusion:** There was significant improvement in nurses' practice between pre and immediately post program implementation **Recommendations**: Providing ongoing education and practical training for areas of low practice to make sure the standard of care provided by nurses.

Keywords: Nurses' practice, Peripheral vascular access and vascular catheter management.

INTRODUCTION

Establishing vascular access is one of famous and common procedures administered within the Emergency Department (ED) with high priority for the care of critically ill and unstable patients. The patient's condition often plays a task within the likelihood of achieving vascular access. Vascular Access Devices (VADs) are provided to administer medications, fluids, blood products, and parenteral nutrition. These devices became essential tools within the treatment of the many ill patients who require repeated venous access and are common but integral components of the patient's plan of care (Emergency Nurses Association, 2016).

There are many sorts of vascular access devices or lines which Healthcare team will decide what sort of line patient get supported the needs of the patient. Vascular access devices include intravascular devices inserted into peripheral veins, peripheral arterial devices, central venous catheters and Peripherally Inserted Central Catheters (PICC) (Bodenham, 2017). Peripheral intravenous catheter is that the insertion of a vascular access device into a peripheral vein. This procedure needs manual skills, professional competency, knowledge about the anatomy and physiology of vascular system (Qamar et al., 2017).

Arterial catheterization is usually utilized in the operating room and intensive care unit settings to supply quick access for continuous and real-time systemic blood pressure measurements, blood gas analysis, and other laboratory measurements. Arterial cannulation provides invaluable hemodynamic information that help practitioner in precise treatment of patients during the critical periods of care (Nuttall et al., 2016).

Complications and failure of intravascular devices place significant burden on nursing workloads, patient outcomes and therefore the health care system. The implementation of clinical practice surrounding the insertion and management of intravascular devices is an ongoing challenge to which nurse practitioners (NPs) in vascular access can respond (Ullman, Kleidon & Rickard, 2015). Certified nurses are permitted to perform or assist in cannulation for patients who require vascular devices. Therefore, from initiating cannulation to catheter removal, nurses play a crucial role to stop complications like infection and occlusion (Lang, 2012).

Nurses must be qualified in practical skill performance to ensure quality in patient care. Peripheral Vascular Access (PVA) is one of famous repeatedly performed invasive skills in hospitals. There is a chance about the danger of patient harm accompanied with a lack of skill proficiency in registered nurses. Inflammations, phlebitis, thrombosis, are examples of a consequence caused by poor catheterization. Inappropriate skill performance can also have consequences for the nurses, frustration, making mistakes, and time pressure, and is a reason why newly qualified nurses leave the profession. (Ravik, Havnes & Bjork, 2017).

Nurses practicing vascular access care require the knowledge, skill, and judgment to manage Vascular Access Devices (VADs). As they play a vital role in delivery of care which start from selection of the optimal device and site for cannula insertion; proper site preparation, management, and good removal of vascular access which help in prevention of peripheral vascular access complications. Nursing management should be done on a regular basis to improve overall practice and client outcomes (El-seadi, Maria, Ahmed and Abd El-Hay, 2020).

AIM OF THE STUDY:

Evaluate the effect of an educational program on nurses' practice regarding management of patients undergoing peripheral vascular access.

Research Objectives:

1. Determine factors affecting nurses' practice.
2. Assess nurses' practices regarding management of patients undergoing peripheral vascular access.
3. Design implement and evaluate the effect of an educational program on nurses' practice regarding management of patients undergoing peripheral vascular access quickly post applying the program and 3 months later.

Research Hypothesis:

Nurses' practice regarding management of patients undergoing peripheral vascular access will be enhanced post implementation the program.

Operational definition of patient management:

The formal statement of the prescribed treatment regimen for a patient. This is preferably a written document, as it may sometimes become medico legally important.

SUBJECTS AND METHOD

The materials and method for this research were utilized using 4 main designs as follow:

(I) TECHNICAL DESIGN:

The technical design included research design, setting, participants and tools of data collection.

Research Design:

A quasi experimental design was used pre, post and fallow up after 3month to evaluate the effect of an educational program on nurses' practice regarding management of patients with peripheral vascular access.

Study Setting:

The study was conducted in the intensive care units (ICUs) and Medical Departments at EL-Azhar University Hospital in New Damietta city. The intensive care unit (ICU) contains 15 beds divided into 3 main units: general ICU, cardiothoracic care unit and cardiac care unit. The medical departments contain 56 beds divided into: medical disease unit, tropical unit, chest unit, rheumatic disease unit, neuro disease unit and heart disease unit.

Study samples:

Convenient sample of all available nurses (50 nurses) divided into (36 nurses in I.C.U units divided into 35 female and 1 male, 14 nurses in medical departments) who are caring patients undergoing peripheral vascular access working in the above mentioned units at the time of the study.

Tools of data collection :

Two tools were used:

Tool I: interviewing questionnaire sheet. it included the following:

Part I: - Demographic characteristics of nurses such as age, sex, qualification of nurses, training course regarding peripheral vascular lines, years of experience in ICU& medical department and nurse / patient ratio in the unit (3 open questions and 4 multiple choice questions).

Part II: Factors affecting nurses' practice

It included 11 items related to factors affecting nurses' practice, which divided as the following:

1-Nurses related factors (8 points).

2-Work related factors (1 point).

3-Patients related factors (2 points).

Scoring system:

For the factors affecting nurses' practice; the nurses' answer Yes or No, then scores were converted into a percent score.

Tool II: Nurses' Observational Checklist:

Nurses' observational checklists consisted of 5 checklists and were developed by the researchers post reviewing updated related literatures (Perry, 2015), (Lynn, 2018), (Nettina, 2018) to assess nurses' practice regarding management of patients undergoing peripheral vascular access. It included the following:

1. Insertion of arterial line (28 steps like prepare equipment, hand washing and maintenance of sterile precautions)
2. Obtaining blood sample from arterial line (25 steps)
3. Insertion of intravenous cannula (47 steps)
4. Medication administration through I.V access, changing IV dressing and flushing intravenous (32) steps
5. Blood transfusion (27 steps)

Scoring system:

Concerning nurses' practice, score one was given if done and zero if not done. The total nurses' practice were calculated then converted to percent.

- If score ≥75% referred to satisfactory
- While value <75% referred to unsatisfactory according to(Bedier, Abo El- Ata, Ibrahim,2014) also(Ouda, Mahmoud, Kafl &Soliman,2019)

(II) OPERATIONAL DESIGN

The operational design involved preparation phase, validity, Reliability, pilot study and fieldwork.

The Preparation Phase

It involved reviewing of related and updated literature related to the research topic, different researches and knowledge of different scopes of the problems utilizing all official websites as PubMed, Google Scholar, Scientific books, Articles, Periodicals and Magazines.

Validity

It was done by jury of 9 experts (three assistants professors and two lecturers from medical surgical specialty faculty of nursing port said university & two assistants

professors and two lecturers from Al-Azhar to check for clarity, relevance, comprehensiveness, and easily implementation, needed modifications were done.

Reliability: it was done using alpha Cronbach coefficient to assess the internal consistency of the tool and its value was (0.88) for practice.

Pilot Study

Pilot study was carried out on 10 % (5 nurses) of the study nurses to test the first and second tools before starting the data collection and they excluded from the entire sample of research work. The purposes of the pilot study were to test applicability and clarify of the study tools, and it served to estimate the time needed to complete the tools. It also helped to find out any obstacles and problems that might interfere with data collection, based on the findings of the pilot study, certain modifications of the tool was done.

Field work description

The study started from the 1st of March (2019) to the end of December (2019), through the following phases:

Assessment phase:

During this stage after finishing the study tools, Tool I was developed to determine factors affect nurses' practice. The researcher observed every nurse during the real clinical practice, and then the researcher evaluated the nurse via observational checklist Tool II. The protocol of care was developed based on the identified needs and demands of nurses gathered by the researcher, and in the light of the most recent literature.

The educational program preparation phase

The educational program was prepared according the identified needs of nurses which obtained during assessment phase. This phase involved the following:

Setting objectives:

The aim of educational program was to enhance nurses' practice regarding care of patients with peripheral vascular access.

The content preparation:

Content included all aspects related to caring of patients with peripheral vascular access considering the following:

1. Anatomy and physiology of vascular system.
2. Intravenous catheter (definition, indication, site of insertion, procedure of I.V Catheter insertion and complications of I.V catheter).
3. Blood transfusion (nursing role before, during and after blood transfusion and complications of blood transfusion).

4. Arterial line (uses, sites of insertion, contraindications of uses, arterial line procedure, nursing role with arterial line and complications of arterial line).
5. Arterial blood gas sampling.
6. Invasive arterial blood pressure measurement.

Action plan:

The researchers formulated a plan for educational program application.

Educational program involved four sessions was delivered throughout 12 weeks, and The session timing was between morning and afternoon shift, and every session took about 30 to 45 minutes, The total number of groups were 10 groups (for each 5 nurses). Each group was given the freedom to choose their optimal time for receiving the educational program. Also, the teaching strategy of the educational program followed based on by:

A- Selecting the proper teaching method such as lecture, small group discussion, demonstration and re-demonstration)

B- Selecting the proper teaching media such as (handout, audio-video material.

Handout includes theoretical content and procedure steps was prepared to facilitate remember knowledge and steps about care of patients undergoing peripheral vascular access.

1. Educational program application phase:

Before start, the nurses were classified to 10 groups each group included 5 nurses, then each group was joined at a conference room in separate manner, the session was taken at available time according work load during the morning shift and afternoon shift . The educational program was implemented for twelve weeks. Each session took 30-45 minutes.

- At the start, the researcher spoke about introduction and its importance, educational program plan plus, learning objectives were also explained to each group.

The educational program was implemented to nurses in terms of four sessions. The following schedule was applied:

- A hard photocopy of handout submitted to every participant to facilitate recalling the knowledge and steps during explanation of theoretical part and demonstrate the skills steps of the program.
- The program was presented in easy and summarized form utilizing variety of teaching methods as small group discussions, lectures, demonstration and re-demonstration and proper media as audio-video material.
- At the start of every session, the researcher started with a brief summary about last session content, followed by of the objectives of the current session.

- The researcher applied all the steps in front of the participants and discussed them concerning the rationale and the precaution for every step.
- At the end of the researcher's asked the nurses any vague steps needed repetitions or exploring before re-demonstration.
- The researcher focused on the session was performed for training purpose not for evaluation, so mistakes and forgetting were permitted and corrected properly by the researcher.
- Finally, the researcher gave her feedback starting with positive points then negative ones and any missing points or mistakes were corrected immediately to prevent other nurses from falling into the same mistakes. Also nurses were asked to give their feedback about the researcher.

Session	Time	Content
1st session	15 Minutes 15 Minutes 15 Minutes	• Anatomy and physiology of vascular system • Peripheral Intravenous catheter, indications, sites of insertion, procedure of insertion, • insertion of intravenous fluids, complications of intravenous catheter& nursing role
2nd session	15 Minutes 15 Minutes 15 Minutes	• blood transfusion • nursing role before, during and after transfusion • complications of blood transfusion
3rd session	15 Minutes 15Minutes	• Arterial catheter • Uses& contraindications of arterial catheter, Sites of insertion &Allen's test
4th session	15 Minutes 15 Minutes	• Nursing role during insertion • Nursing role with arterial blood gases
5th session	15 Minutes 15 Minutes	• Nursing role with invasive blood pressure measurement • complications of arterial catheter

2. Evaluation phase:

The program outcome was evaluated via Tool II, first evaluation immediately after program implementation, and second evaluation after three months.

Immediately post application of the program, nurses' practice was evaluated via Tool II. The second evaluation after three months, nurses' practice was observed and evaluated by using Tool II.

ADMINISTRATIVE DESIGN:

An official permission for data collection in Al-Azhar university hospital was obtained from the hospital administrative personnel by submission of a formal letter from the vice dean of the faculty of nursing in Port Said university. Meeting and discussion were held between the researcher and the nursing administrative personnel to make them aware about aims and objectives of the research, as well as , to get better cooperation during the implementation phase of the research , also nurses' oral consent were obtained before starting data collection.

Ethical Considerations:

The ethical research considerations including the following: Explain the aim of the study to the director of the unit to take his/her permission to do this study, The agreement for participation of the participants was taken after aims of the study have been explained to them, they were given an opportunity to refuse to participate and they were assured that the information collected would be treated confidentially and used for the research purpose only.

STATISTICAL DESIGN

At the end of the fieldwork, the collected data organized, tabulated and statistically analyzed using statistical package for social science (SPSS) version 16 for windows.

Chi square (X^2) or Mann-Whitney test (Z) was utilized for categorical data in the form of frequency and percentage. The student (t) test was utilized for quantitative data in the form of mean± SD, and to compare among two means.

RESULTS:

Table (1): shows that more than four fifths (84%) of the studied nurses were at age group 20-30 years old. most of studied nurses (98%) were females and less than three quarters of studied nurses (72%) were working at I.C.Us, more than two thirds of studied nurses (70%) had diplome level of education, four fifth of studied nurses (80%) had no any training courses, more than one third of studied nurses (38%) had more than three years experiences and half of studied nurses (50%) had number of patients one / more than two patients.

Table (2): illustrated that all studied nurses (100%) had satisfactory practice levels related flushing procedure immediately post educational program implementation comparing to (2%) of studied nurses pre educational program implementation and more than three quarters (78%) follow up educational program implementation.

Moreover, most of nurses (98%) had unsatisfactory practice levels related adding medication to I.V container, change I.V dressing and flushing procedure pre educational program implementation comparing to (52,5,0%) of studied nurses post educational program implementation and (64,40,22%) of studied nurses follow up educational program implementation.

Table (3): represents that most of studied nurses (96%) reported shortage of nurses and about three quadrant of them(74%) mentioned lack of self-confidence and deficiency of nurses knowledge whereas less than three quadrants (70%) report conflict between nurses' aspects and absence of cooperation between nursing staff as factors related to nurses.

Regarding factors related to working environment less than three quadrants (70%) of studied nurses reported no written instructions regarding infection control and change cannula.

Concerning factors related to patients' most of studied nurses (96%) reported Psychological status of patient and inability to cooperate during nursing care provision

Figure (1): clarifies that less than three quadrant (70%) of nurses had satisfactory total practice level immediately post educational program implementation compared to (12%) of studied nurses pre educational program implementation and (22%) follow up educational program.

Table (4): illustrates that, there was significant relation among demographic characteristics of the participated nurses and their practices regarding years of experience pre, immediately post and follow up educational program implementation while there was significant relation among demographic characteristics of the nurses and their practices related to training courses at follow up after educational program implementation whereas p value was < 0.05.

Table (5): shows the differences in nurses' practice throughout the program implementation. There was statistically significant difference between pre and immediately post program implementation. Also there was statistical significant

difference was notices among pre & follow up program application except in practice related to change I.V dressing.

Table (6): shows that there was significant relation among factors affecting nurses' practice and demographic characteristics of the participated nurses regarding mainly to years of experience, education level and age whereas p value was < 0.05.

Table (7): illustrates that, there was significant relation among factors affecting nurses' practice and their practice post educational program whereas p value was < 0.05.

Table (1): Demographic characteristics of the studied nurses (n=50):

Item	No	Percentage (%)
Age (years)		
20 – 30	42	84.0
31 – 40	6	12.0
41 – 50	2	4.0
Over 50	0	0
Mean ± SD	27.2±5.2	
Gender		
Female	49	98.0
Male	1	2.0
Department		
I.C.Us	36	72.0
Medical units	14	28.0
Education level		
Diplome	35	70.0
Technical institute	6	12.0
B.SC.	7	14.0
Post graduate	2	4.0
Training courses		
Yes	10	20.0
No	40	80.0
Experience / years		
Less than one year	17	34.0
1 – 3	14	28.0
More than three years	19	38.0
Mean ± SD	2.04±.85	
Nurse/patient ratio		
One / patient	4	8.0
One / two patients	21	32.0
One / more than two patients	25	50.0

Table (2): Nurses' practices pre, immediately post and follow up after educational program (n=50):

Nurse's practices	Pre				Immediately post				Follow up			
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory	
	No	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**
Prepare equipment to insert arterial line	30	60.0	20	40.0	47	94.0	3	6.0	45	90.0	5	10.0
Nursing role during insertion of arterial line	11	22.0	39	78.0	33	66.0	17	34.0	22	44.0	28	56.0
Removal arterial line	14	28.0	36	72.0	44	88.0	6	12.0	30	60.0	20	40.0
Obtaining sample from arterial line	43	86.0	7	14.0	48	96.0	2	4.0	47	94.0	3	6.0
Intravenous cannulation	13	26.0	37	74.0	31	62.0	19	38.0	15	30.0	35	70.0
Adding medication to I.V container	1	2.0	49	98.0	24	48.0	26	52.0	18	36.0	32	64.0
Change I.V dressing	1	2.0	49	98.0	45	90.0	5	10.0	30	60.0	20	40.0
Flushing procedure	1	2.0	49	98.0	50	100.0	0	0.0	39	78.0	11	22.0
Blood transfusion	27	54.0	23	46.0	48	96.0	2	4.0	41	82.0	9	18.0

Table (3): Factors affecting nurses' practice during care of patients with peripheral vascular cannula (n=50):

Factors affecting nurses' practice	**Yes**		**No**	
	No	**%**	**No**	**%**
Factors related to nurses				
Absence of clear job description to nursing staff	**22**	**44.0**	**28**	**56.0**
Lack of self-confidence with Lack of continuous training	**37**	**74.0**	**13**	**26.0**
Shortage of nurses numbers	**48**	**96.0**	**2**	**4.0**
Deficiency of nurse's knowledge	**37**	**74.0**	**13**	**26.0**
Lack of nurse's experience	**30**	**60.0**	**20**	**40.0**
Conflict between nurse's aspects & Absence of cooperation between nursing staff	**35**	**70.0**	**15**	**30.0**
Unavailability of time due to increasing of nursing work	**36**	**72.0**	**14**	**28.0**
Absence of monitoring & follow up during work	**23**	**46.0**	**27**	**54.0**
Factors related to working environment				
No written instructions regarding infection control & change cannula	**35**	**70.0**	**15**	**30.0**
Factors related to patient				
Educational level & fear from pain	**36**	**72.0**	**14**	**28.0**
Psychological status of patient &inability to cooperate during nursing care provision	**48**	**96.0**	**2**	**4.0**

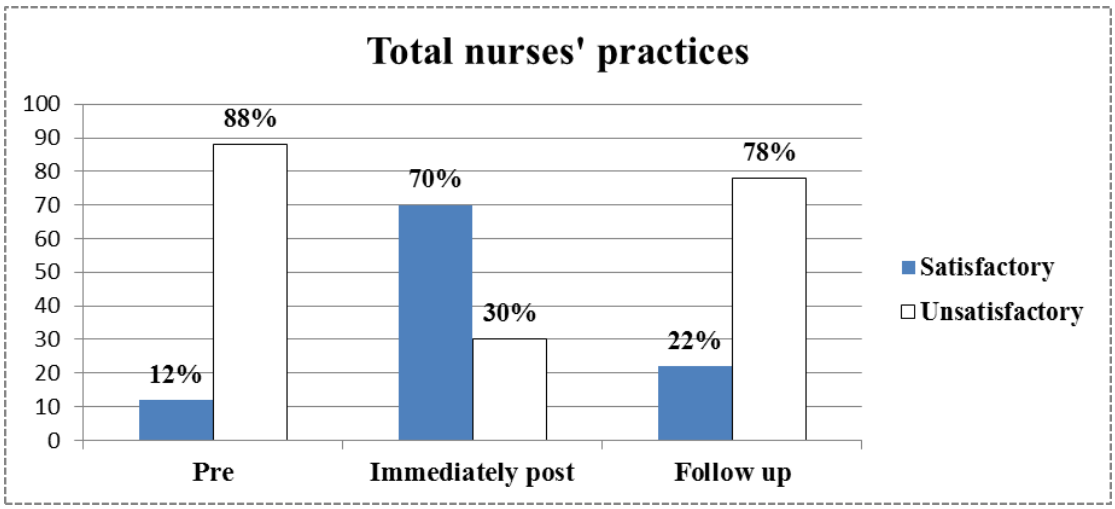

Figure (1): Total nurses' practices pre, immediately post and follow up after educational program (n=50):

Table (4): Relation between demographic characteristics of the studied nurses and their practices pre, immediately post and follow up after educational program (n=50):

Item	Pre		X^2	Sig	Immediately post		X^2	Sig	Follow up		X^2	Sig
	Satisfactory	Unsatisfactory			Satisfactory	Unsatisfactory			Satisfactory	Unsatisfactory		
	N (%)	N (%)			N (%)	N (%)			N (%)	N (%)		
Age (years):												
20 - 30	6(100.0)	36(81.8)	1.29	.522	33(94.3)	9(60.0)	9.97	.007	9(81.8)	31(79.5)	.608	.738
31 - 40	0(0.0)	6(13.6)			2(5.7)	4(26.7)			1(9.1)	6(15.4)		
41 - 50	0(0.0)	2(4.5)			0(0.0)	2(13.3)			1(9.1)	2(5.1)		
Gender												
Female	6(100.0)	43(97.7)	.139	.880	35 (100.0)	14(93.3)	2.38	.123	11(100.0)	38(97.4)	.065	.799
Male	0(0.0)	1(2.3)			0(0.0)	1(6.7			0(0.0)	1(2.6)		
Education level												
Diplome	6(100.0)	29(65.9)	2.92	.404	27(77.1)	8(53.3)	6.10	.107	9(81.8)	28(71.8)	1.79	.617
Technical institute	0(0.0)	6(13.6)			2(5.7)	4(26.7)			2(18.2)	4(10.3)		
B.SC.	0(0.0)	7(15.9)			4(11.4)	3(20.0)			0(0.0)	5(12.8)		
Post graduate	0(0.0)	2(4.5)			2(5.7)	0(0.0)			0(0.0)	2(5.1)		
Training courses			.855	.652			2.39	.302			9.1	**.031**
Yes	2(33.3)	8(18.2)			7(20.0)	3(20.0)			9(81.8)	8(20.5)		
No	4(66.7)	36(81.8)			28(80.0)	12(80.0)			2(18.2)	31(79.5)		
Experience / years												
Less than one year	5(83.3)	12(27.3)	7.6	**.022**	16(45.7)	1(6.7)	7.79	**.020**	8(72.7)	13(33.3)	7.91	**.042**
1 - 3	0(0.0)	14(31.8)			7(20.0)	7(46.7)			0(0.0)	12(30.8)		
More than three years	1(16.7)	18(40.9)			12(34.3)	7(46.7)			3(27.3)	14(35.9)		

X^2 – Chi square test significant level $p< 0.05$

Table (5): Difference in nurses' practices throughout the program implementation (n=50):

Item	Before/ Immediate				Before / Follow up			
	Before Mean±SD	Immediate Mean±SD	t	Sig	Before Mean±SD	Follow up Mean±SD	t	Sig
Prepare equipment to insert arterial line	5.6±.59	6.5±.76	6.90	.000	5.6±.59	6.1±.66	3.99	.000
Nursing role during insertion of arterial line	8.04±1.6	9.8±1.1	6.19	.000	8.04±1.6	9.3±.89	4.71	.000
Removal arterial line	3.9±1.4	6.04±.92	9.01	.000	3.9±1.4	4.9±.89	4.65	.000
Obtaining sample from arterial line	13.9±1.1	15.4±1.2	6.22	.000	13.9±1.1	14.5±1.1	2.70	.009
Intravenous cannulation	30.02±5.8	34.9±4.3	6.58	.000	30.02±5.8	32.8±2.9	3.03	.004
Adding medication to I.V container	5.7±1.07	7.5±1.4	8.61	.000	5.7±1.07	6.5±1.5	3.91	.000
Change I.V dressing	5.1±1.09	6.2±1.4	4.39	.000	5.1±1.09	4.9±.89	1.13	.263
Flushing procedure	4.1±.99	5.6±1.1	7.80	.000	4.1±.99	4.5±.79	2.19	.033
Blood transfusion	22.6±2.9	24.8±1.7	4.97	.000	22.6±2.9	24.3±1.13	3.63	.001
Total practice score	99.1±13.1	116.9±8.7	10.03	.000	99.1±13.1	107.9±4.2	4.46	.000

t- Paired sample t test significant level p< 0.05

Table 6: Relation between factors affecting nurses practice with demographic data of nurses (n=50)

Item	**Demographic data of nurses**							
	Age		**Gender**		**Education**		**Years of experience**	
	X^2	**Sig.**	**X^2**	**Sig.**	**X^2**	**Sig.**	**X^2**	**Sig.**
Factors related to nurses Absence of job description to nursing staff	2.84	.241	1.29	.254	4.02	.259	5.05	.050
Lack of self-confidence with Lack of continuous training	.477	.788	.224	.636	.994	.803	6.91	.031
Shortage of nurses numbers	.397	.820	.043	.837	.893	.827	.588	.745
Deficiency of nurse's knowledge	6.06	.041	2.90	.088	4.18	.242	.637	.727
Lack of nurse's experience	1.58	.452	1.53	.216	9.62	.022	5.44	.050
Conflict between nurse's aspects & Absence of cooperation between nursing staff	.477	.788	4.64	.031	2.25	.522	4.76	.041
Unavailability of time & increasing of nursing work	7.48	.024	.397	.529	12.7	.005	.410	.815
Absence of monitoring & follow up during work	2.55	.279	1.19	.274	5.06	.050	4.38	.038
Factors related to work environment No written instructions regarding infection control & change cannula	2.84	.241	.802	.371	3.54	.316	5.37	.048
Factors related to patient Educational level & fear from pain	4.97	.038	1.10	.293	6.42	.038	5.16	.050
Psychological status of patient &inability to cooperate during nursing care provision	.529	.768	9.18	.002	4.70	.194	1.45	.484

X^2 – Chi square test significant level p< 0.05

Table 7: Relation between factors affecting nurses' practice with their practice throughout educational program (n=50)

Item	Practice of nurses					
	Pre		Immediate		Post	
	X^2	Sig.	X^2	Sig.	X^2	Sig.
Factors related to nurses Absence of job description to nursing staff	1.42	.233	.758	.384	.147	.701
Lack of self-confidence with Lack of continuous training	1.49	.221	1.86	.172	.701	.403
Shortage of nurses numbers	.284	.594	.893	.345	.133	.715
Deficiency of nurse's knowledge	.191	.662	.599	.439	2.74	**.050**
Lack of nurse's experience	.126	.722	6.26	**.001**	4.78	**.029**
Conflict between nurse's aspects & Absence of cooperation between nursing staff	1.49	.221	.316	.574	.701	.403
Unavailability of time & increasing of nursing work	.096	.756	.019	.691	.045	.832
Absence of monitoring & follow up during work	.440	.507	1.69	.193	.206	.650
Factors related to work environment No written instructions regarding infection control & change cannula	.315	.575	2.61	.106	4.06	**.044**
Factors related to patient Educational level & fear from pain	.011	.917	.549	.334	3.45	**.043**
Psychological status of patient &inability to cooperate during nursing care provision	.758	.384	.265	.607	.355	.552

X^2 – Chi square test significant level $p< 0.05$

DISCUSSION:

The result of present study revealed that more than four fifths of the studied nurses were at age group 20-30 years old. majority of nurses were females and less than three quarters of them were working at I.C.Us, more than two thirds of them had diplome level of education, four fifth of them had no any training courses, more than one third of them had more than three years experiences and half of them had number of patients one / more than two patients.

As regard to Nurses' practices regarding management of patients undergoing peripheral vascular access, the majority of nurses had unsatisfactory practice levels related adding medication to I.V container. It might be due to absence of performing aseptic technique in proper way. Also labeling of container is not always done or incomplete. This finding was disagreeing with (Australian commission on safety and quality in health care, 2015) & (cleary, 2013) which emphasized on adding medication to intravenous solution bags must be done correctly and under aseptic technique.

In the case of flushing procedure of intravenous catheter, the majority of nurses had unsatisfactory levels of practice regarding flushing procedure pre educational program. It might be due to absence of performing flushing technique (procedure steps) within the ideal manner for example; absence of explaining procedure to patient due to increase patients numbers versus the number of nurses, absence of universal precautions of infection control as hand washing and wearing gloves during care or absence of sufficient time to perform that because decrease number of staff nurses per shift. These all factors increased overload of work on nurse. This finding was in agreement with (Andersson, 2015) who performed an observational study at a local hospital in Tanzania and through her observation found that some nurses disinfected their hands before putting on gloves, while others placed on the gloves immediately. A few nurses used contaminated gloves or didn’t wear gloves at all. Regarding the utilization of apron, nurses either wore an apron that had already been used several times.

Also according to current study results, nurses shown unsatisfactory practice related to explaining procedure to patient in area of flushing IV lines. This could be

due to increasing number of patients who nurses deal with, staying of patient several days in hospital or lack of communication skills to nurses. this result completely disagree with (Major & Holmes, 2008) who investigated nurse with the gift of making her patients feel at home and free from fear, provides an atmosphere of peace, serenity and security which is so important an adjunct to the relaxation of mind and body necessary for recovery from disease. As this quotation indicates, good communication has long been recognized in nursing as a skill essential for achieving immediate work goals and for contributing to patients' wellbeing and Accelerating their recovery.

According to changing IV dressing in the present research only more than half of nurses shown satisfactory levels about changing IV dressing immediately post program implementation. This perhaps due to organizational factors as absence of necessary supplies for care at sometimes. This result was disagreeing with (Winfield et al 2010) who emphasized on a sterile dressing shall be applied and maintained on vascular and nonvascular access devices. We should always have been using either sterile gauze or sterile transparent semi-permeable dressings to cover the catheter site. Using no sterile tape to stabilize I.V. catheters exposes patients to infectious material from 50% to 100% of the time. A sterile dressing over a well-stabilized catheter results in lower complication rates, reduced hospital time, increased healthcare worker safety, and lower overall costs to patients and institutions.

As regard to factors affecting nurses' practice regarding peripheral vascular access. According to the result of present study, the majority of nurses mentioned that shortage of nurses, lack of self-confidence and unavailability of time due to increasing of nursing work are factors affect nurses' performance. In the current study these factors are interrelated and perhaps formed sensation of injustice and unfairness in nurses as they exposed to stressful and difficult situations while they caring patients. This in turn led to occupational burnout and nurses takes vacations which led to shortage of nurses, increasing of nursing work and increase conflict between nurses about work. Meanwhile lack of self-confidence came from the young age of nurses.

The present study result was congruent with (Negussie, 2010) who studied factors affecting performance of nurses in public hospitals and health centers in Addis Ababa , the study found that the majority of nurses revealed that the allocated staff in their ward is not sufficient to cover the current workload. Thus, it can be

concluded that there are insufficient nurses allocated to wards to provide nursing care. The majority of nurses also revealed that necessary instruments are not available in their ward. Organizational factors that are linked to the day-to-day environment in which health workers carry out their duties.

In this respect (Said, Yassien & Ameen, 2020) performed a study to assess factors affecting nurses' performance toward central line associated blood stream infection in critical care units and reported that shortage in nursing staff number, the nurses' job satisfaction levels presence of clear instruction, availability of equipment, presence of infection control strategies are factors affect nurses' performance.

Meanwhile (Urus, Pongtiku, Rantetampang & Mallongi, 2019) studied Factors Affecting Performance of Nurses at Sorong district hospital, Indonesia then found an influence of motivation & reward on performance of nurses. In addition, mentioned effect of work rotation on nurses performance, nurses who are rotated have a good working relationship.

Relation between demographic characteristics of the studied nurses and their practices throughout educational program, there was only significant relation among demographic characteristics of the studied nurses and their practices related to years of experience throughout educational program application. This finding may be due to the more years of work; nurses become better and control their practice in good manner. (Taha & Mohammed,2014) showed a positive correlation among practice, age and years of experience, reporting that more the years of working experience the higher efficiency of nurses clinical practices .However (Abraham ,2018) mentioned that no significant association was observed for practice with demographic characteristics like age, professional qualification and years of experience.

CONCLUSION:

There was significant improvement in nurses' practice between pre and immediately post program implementation. Also, there was significant relation among factors affecting nurses' practice and demographic characteristics of the participated nurses regarding mainly to years of experience, education level and age.

RECOMMENDATIONS :

- Providing continuous nursing education to upgrade their practice concerning patients care with peripheral vascular access.
- Conflict between nurses should be solved by nurse administrator to save their efforts toward patient care.
- Replication of the current study on a large probability sample from different geographical areas to achieve more generalized results.

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تأثير برنامج تعليمي على أداء الممرضين تجاه رعاية المرضى الخاضعين لوصلات الأوعية الدموية الطرفية

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الخلاصة

تعتبر قساطر الأوعية الدموية الطرفية شائعة الإستخدام فى رعاية المرضى وذلك لأنها تلعب دورًا أساسيًا في الرعاية الصحية الحديثة ولها عظيم الأثر فى تقييم حالة المريض. إن الرعاية التمريضية الخاصة بوصلات الأوعية الدموية الطرفية مهمة والفهم الشامل لهذا الإجراء وهذه المهارة له قيمة كبيرة من أجل تقليل المضاعفات الناشئة عن وصلات الأوعية الدموية الطرفية. فيجب على جميع الممرضات أن تكون على دراية بجميع جوانب الرعاية ومبادئ الحقن الآمن وكذلك اتقان عمل غيار على مكان التركيب وعمل تسليك للوصلات . لقد أجريت هذه الدراسة بهدف تقييم تأثير برنامج تعليمي على أداء الممرضات فيما يتعلق برعاية المرضى الخاضعين لوصلات الأوعية الدموية الطرفية. وقد تم استخدام منهج شبه تجريبي لإجراء الدراسة بقسمى العناية المركزة والباطنة بمستشفى جامعة الأزهر بدمياط على خمسين ممرض وممرضة. وقد استخدمت فى هذه الدراسة استمارتين : الاولى استمارة استبيان لمعرفة العوامل المؤثرة على اداء الممرضات فيما يتعلق برعاية المرضى الخاضعين لوصلات الأوعية الدموية الطرفية أما الاستمارة الثانية فهى لملاحظة أداء الممرضات وقد أظهرت نتائج الدراسة أن هناك تحسن في ممارسات الممرضات فيما يتعلق برعاية المرضى الخاضعين لوصلات الأوعية الدموية الطرفية. الخلاصة: لقد حسّن البرنامج التعليمي ممارسات الممرضات فيما يتعلق بوصلات الأوعية الدموية الطرفية. وقد أوصت الدراسة بتقديم خدمات التعليم والتدريب المستمر للممرضات في المناطق ذات الأداء المنخفض لضمان جودة الرعاية المقدمة للمريض.

الكلمات المرشدة: برنامج تعليمي، ممارسات الممرضات ، وصلات الأوعية الدموية الطرفية