Effect of Educational Program on Nurses knowledge & Practice towards Patients with Implantable Port Catheter

By:

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ABSTRACT

Implantable port catheter device is a small reservoir connected to a venous catheter and positioned in the subcutaneous tissues. It was first uses in oncologic patients in the early 1980s. Currently, the device has become an integral part of daily clinical routine. Nurse's who are knowledgeable and competent in the basic aspects of port-a-cath care able to ensure specific patient needs are met and prevent further complications, so implementing educational program on nurses' caring for patients with implantable port catheter is very important to prevent complications such as port occlusion, displacement of the port catheter, bleeding & infection. **Aim of the study:** Assess the effect of educational program on nurses' knowledge and practice toward patients with implantable port catheter. **Study design:** A quasi-experimental design with pre, post assessment. **Setting:** This study was conducted at the Radiotherapy oncology and nuclear Medicine center (outpatients' clinic) affiliated to Ain Shams University Hospital. **Subjects:** a convenient sample of all available nurses working in the previous mentioned setting (30 nurses). **Procedure:** data were collected using two tools as follow: 1-self administered nurses' questionnaire, 2-nurses' observational checklists for accessing/de-accessing, flushing, and removal of the non-coring safety needle of implanted port catheter. The researcher developed and implemented a training program to participants. **Results:** there were highly statistically significant differences regarding nurses' knowledge & practice pre and post educational program at $p<0.001$. **Conclusion:** Educational program has statistically significant effect on knowledge and practice of nurses' knowledge and practice toward patients with implantable port catheter. **Recommendations:** Continuous educational sessions and awareness to the staff helps to improve nurses' knowledge and practice for Port-A-Catheter.

Key words: Educational program, implanted port catheter.

Introduction

An implanted port is shaped like a disk. It is placed (implanted) under the skin during surgery. They are designed for safe, easy, and repeated access. Port-A-Caths are tunneled right atrium catheters that feature a subcutaneous portal with a self-sealing septum that may be accessed by needle puncture through intact skin **(Diaz et al., 2017).**

Some of the advantages of Port-A-Caths are that they require little manipulation, also have few complications, and promote a more positive body image and maintenance of routine lifestyle activities. **(Technical Skills Program of Queen's University, 2017).**

Ports can be used for administering fluids, medications (including chemotherapeutic agents), blood product, and total parenteral nutrition, and to obtain blood specimens. A variety of implantable ports is used clinically that varies in reservoir size, profile, portal body material, and the chemical composition of the catheter **(Schiffer, Mangu & Wade, 2013).**

Each type of catheter or port has some risks. The risks may include infections, blockage or clots, and other problems that are less common (infiltration and extravasation). There are special instructions for catheters or ports that reduce the risk of these problems **(Nourbakhsh et al., 2013)**.

Care and maintenance of implanted ports requires vigilance and attention to detail to prevent complications and maintain patency this care including: flushing, locking, dressing, change of needle and minimizing the risk of contamination by scrubbing the access port with an appropriate antiseptic **(Nourbakhsh et al., 2013)**.

Nurse's who are knowledgeable and competent in the basic aspects of port-a-cath care able to ensure specific patient needs are met and prevent further complications **(Khalil, Youssef & Moustafa, 2017).** In-service education is one aspect of staff development, ongoing in all health care institution and refers to skill development for the direct care givers **(Jackson, 2007).**

Continuing education include programs and activities designed for improving specific on the job skills (in-service or staff developments), for providing contents related to professional practice, for increasing personal or professional growth, and for increasing individual professional awareness. Programs or activities designed to improve or add a specific on the job skills primarily benefit the employee who may be willing to subsidize these activities **(Camp-Sorrell, 2010).**

Significance of the Study:

During the last decade the implantable ports have become a reliable access device that can be used to administer fluids, medications, and blood products, and to obtain blood samples. While the implanted port needs little or no care by the patient, the nurse must be able to use this device safely, recognizing and intervening appropriately if they occur.

Aim of the Study

The present study aimed to:

Assess the effect of educational program on nurses' knowledge and practice toward

patients with implantable port catheter through the following:

1. Assessing the nurses' knowledge and practice regarding implantable port catheter.

2. Developing and implementing educational program for nurses caring for patients with implantable port catheter.

3. Evaluate the effect of educational program on nurses' knowledge and practice toward patients with implantable port catheter.

Research Hypothesis:

The current study hypothesized that:

The educational program intervention will improve and affect positively on the nurse's knowledge and practice toward patients with implantable port catheter.

SUBJECTS AND METHODS

I. Technical Design:

The technical design entails the study design, setting, subjects, and tools for data collection.

Research Design:

A quasi-experimental design with pre and post assessment was utilized to accomplish the aim of this study.

Research Setting:

The present study was conducted at the radiotherapy oncology and nuclear medicine center (out patients' clinic) affiliated to Ain Shams University Hospital.

Subjects:

A convenient sample of all available nurses working in the previous mentioned setting (30 nurses).

Tools of data collection: *Two tools were used in the current study as follows:*

1- Self Administered Nurses' Questionnaire: It was developed by the researcher in Arabic language, based on the related literature **(Matsubara & Domenico, 2015; Ibrahim, 2015 & Yaakup, Eng & Shah, 2014),** it's composed of two parts:

- Part I: consisted of nurses demographic data including age, gender, education level, occupation ...etc.
- Part II: consisted of nurses knowledge test regarding implantable port catheter. It was developed by the researcher in simple Arabic language, consisted of 50 questions (25 true and false & 25 MCQ). One score was given for each correct answer, and Zero for the incorrect or unanswered one. The total scores of the knowledge test was 50 scores distributed as follow:
  - **Part I**: Indications & contraindications of implanted port catheter 15 questions.
  - **Part II**: Insertion of implanted port catheter 10 questions.
  - **Part III:** Removal of implanted port catheter 10 questions.
  - **Part IV:** Nursing care of implanted port catheter 15 questions**.**

The knowledge level was graded into:

- ≥75% (≥ 37 grades) satisfactory knowledge.
- < 75% (< 37 grades) unsatisfactory knowledge.

2- Observational Checklists: to assess nurse's practice for port catheter (Accessing/ De-accessing, flushing, and removal of the non-coring safety needle of implanted port catheter). These checklists were developed by the researcher after reviewing the related literature **(Weinstein, Hagle & Plumer's , 2014 & Ang, 2013).**

Scoring system

The scoring of the observational checklists was graded as follow:

- Accessing/ De-accessing checklist consisted of 21 steps.
- Flushing checklist consisted of 15 steps.
- Removal checklist consisted of 5 steps

Every step was done correctly by the nurse was given one score. While the step that was not done or done incorrectly was given zero score.

The total scores for every checklist and for all checklists together was calculated and changed into percentage. The level of practice was categorized into adequate or inadequate as follow:

- ≥ 85% considered competent level of practice.
- <85% considered incompetent level of practice.

The Educational Program for Nurses Caring for Patients with Implanted Port Catheter:

The program duration was one month starting from beginning of August 2017 till the end of same month, it's classified on 3 days/wk (1 day theoretical & 2 practical days), and available room with data show and studying board at selected class at oncology department were used in lectures and practical training.

Educational booklet was designed in Arabic Language and guided by images, it developed by the researcher based on the results obtained from assessment of the nurses' knowledge and practice, as well as literature review from (**Pires & Vasques, 2014, and Deshmukh & Shinde , 2012).**

The booklet divided into 4 parts as follow; (1) general knowledge about implanted port catheter which included (definition, components, uses, and advantages, sites of insertion, insertion, and removal). (2) General instructions about nursing care of catheter. (3) Complications and its signs and symptoms and how to deal with it if it occurred. (4) Care of catheter included (Accessing/ de-accessing flushing & removal).

The booklet was revised by a group of fife experts in Medical Surgical Nursing and two experts' physicians from radiotherapy oncology and nuclear medicine center at faculty of Medicine, at Ain Shams University for the content validity. Based on the opinion of a panel of experts some modifications were done, and then the final forms were developed.

II- Operational Design:

- **Preparatory phase:**

It included reviewing of related literature, and theoretical knowledge of various aspects of the study using books, articles, Internet, periodicals and magazines to develop data collection tools.

- **Validity & Reliability:**

Validity: assessing face and content validity of the suggested tools through a jury of

seven experts (4) assistant professors and (1) professor of Medical Surgical Nursing as well as (2) Oncologists at Ain-Shams University. Who reviewed the instrument, for clarity, relevance, comprehensiveness, understanding, and easiness for administration, minor modifications were required.

Reliability: Alpha Chronbach test was used to measure the internal consistency of the study tools. In which self administered nurses questionnaire was reliable at (0.84), and observational checklist was reliable at (0.91).

- **Pilot Study:**

A pilot study was carried out on 10% of the nurses, who were later included in the main sample study. The pilot study was done in radiotherapy oncology and nuclear medicine center (out patients' clinic) affiliated to Ain Shams University Hospital to ensure clarity, applicability, relevance, feasibility of conduction of study tools and time needed for each tool. Based on the findings of the pilot study, necessary modifications and clarifications of some questions were done.

- **Field Work :**

Preparing and translation of data collection tools were taken about 2 months, starting from May 2017 to June. Data collection was started and completed within 3 months, from July 2017 to the end of September 2017.

Purpose of the study was simply explained to patients who agree to participate in the study prior to any data collection; the study tools were filled in and completed by the researcher on 2 stages (pre & post educational nursing intervention).

The researcher was available at the radiotherapy oncology and nuclear medicine center (out patients' clinic, Ain Shams University hospital 3days/week at morning and afternoon shifts to collect data from the studied nurses. ***The collection of data is done through three phases:***

Assessment Phase: Data collected by the researcher after distribution of the tools for each nurse individually, collection of data was begun by *the knowledge assessment form; it was completed by the nurses within 10- 20 min.* After that, Observational checklists were filled in by the researcher through observing the nurse during Accessing/ de-accessing flushing, and removal. Each of them filled in within about 5- 10 min. Three sessions for each nurse were established for explanation of the educational nursing intervention, each session lasted 60- 90 min).

Implementation Phase: The nurses were given the booklet to start reading it at home and underline any clarifications about the items of booklet. The practical part was introduced to the nurses through demonstration and re-demonstration.

Evaluation phase: After the final session, the same tools were distributed again for each nurse to be answered and the observed for the same checklists to evaluate the effect of educational program implementation.

III- Administrative Design

An official letter was obtained from the faculty of Nursing, Ain Shams University

and directed to the director of Radiotherapy oncology and nuclear Medicine center out patients' clinic at which the study was conducted, explaining the purpose of the study and requesting the permission for data collection from the study group.

- **Ethical considerations:**

Purpose and expected outcomes of the study were explained to each study subject. They were secured that all the gathered data was used for the research purpose only, the study is harmless and their approval to participate is a prerequisite to be included in the study. Each subject was assured that they can quit/withdraw whenever they want.

IV- Statistical Design

The collected data were organized, categorized, tabulated and statistically analyzed using the Statistical Package for Social Science (SPSS), version 15. Data were presented in tables and charts using numbers and percentages. The statistical analysis included percentage, mean and standard deviation (SD), Chi-square (X^2), paired T test, and Pearson coefficient (r).

Significance of results was described as follows:

- Non significant (NS) difference at $p > 0.05$.
- Significant (S) difference at $P < 0.05$.
- Highly significant (HS) difference at $P< 0.001$.

RESULTS

Table (1): showed that the mean age of nurses under the study was (**32.6 ± 8.5**). Regarding their gender, it was found that, majority of nurses (80%) were females and have Diploma/ Technical Institute nurses. In relation to years of experience, it was found that half of nurses (50%) experienced 5 - <10 years. Also, all the nurses under the study don't received training courses or lectures.

Table (2): Regarding the percentage distribution of nurses with satisfactory level of knowledge pre & post educational program, this table reveals that, all items of knowledge parts improved post educational program with highly significant difference at p=<0.001.

Table (3): Regarding the percentage distribution of nurses with competent level of practice pre & post educational program, this table reveals that according practice assessment of (accessing/ de-accessing , flushing & removal) of Port A Cath showing improvement post educational program with highly statistically significant difference at p< 0.001.

Table (4): This table shows that there are highly statistically significant differences between total level of nurse's knowledge pre and post educational program at p< 0.001.

Table (5): This table shows that there are highly statistically significant differences between total level of nurse's practices pre and post educational program at p< 0.001.

Table (6): Reveals that, there are highly statistically significant correlations between total level of nurses' knowledge and practice post implementation of educational program at p< 0.001.

Table (1): Percentage distribution of demographic characteristics among nurses under study

Items	(N=30)	%
Age group (years):		
20 - < 30	10	33
30 - <40	15	50
40 - <50	5	17
Mean ± SD	**35.6 ± 12.5**	
Gender:		
Female	**24**	**80**
Male	6	20
Qualification:		
Bachelor degree	6	20
Diploma/ Technical Institute	**24**	**80**
Years of experience:		
< 5	5	17
5 - <10	**15**	**50**
≥10	10	33
Received training courses or lectures:		
Yes	0	0
No	30	100

Table (2): Percentage distribution of satisfactory level of knowledge among the studied nurses pre & post educational program (No =30).

Knowledge assessment Parts	Pre		Post		X2 test		
	Satisfactory		Satisfactory		X2	P	Sig
	NO	%	NO	%			
Indications & contraindications of implanted port catheter	20	67	30	100	33.6	<0.001**	HS
Insertion of implanted port catheter	10	33	20	67	38.7	<0.001**	HS
Removal of implanted port catheter	15	50	25	83	46.6	<0.001**	HS
Nursing care of implanted port catheter	10	33	25	83	36.4	<0.001**	HS

Table (3) Percentage distribution of competent level of practice among the studied nurses pre & post educational program (No =30).

Checklists	Pre		Post		X^2 test		
	Competent		Competent		X^2	P	Sig
	NO	%	NO	%			
Accessing/ De-accessing	0	0	15	50	53.8	<0.001**	HS
Flushing	2	7	10	33	59.3	<0.001**	HS
Removal	4	13	10	33	67.3	<0.001**	HS

Table (4): Distribution of total level of the nurses' knowledge pre, and post implementing educational program (no = 30).

Items	Total Knowledge level						
	Pre		Post		Chi square		
	N	%	N	%	X	P- value	Sig.
Satisfactory knowledge score	15	50	20	67	25.20	<0.001**	HS
Unsatisfactory knowledge score	15	50	10	33	17.18	<0.001**	HS

Table (5): Distribution of total level of the nurses' practice pre, and post implementing educational program (no = 30).

Items	Total Practice level						
	Pre		Post		Chi square		
	N	%	N	%	X	P- value	Sig.
Competent practice score	0	0	15	50	30.15	<0.001**	HS
Incompetent practice score	30	100	15	50	20.16	<0.001**	HS

Table (6): Correlation between total level of nurses' knowledge and practice post educational program (n= 30).

Nurses Practice		Nurses Knowledge				Chi square	P- value
		Satisfactory (n=20)		Unsatisfactory(n=10)			
		No	%	No	%		
Competent (n=15)	**No**	13	65	2	20	21.34	<0.001** HS
	%	76		24			
Incompetent (n=15)	**No**	7	35	8	80		
	%	24		62			

DISCUSSION

Implantable port catheter devices are frequently used to manage patients undergoing long term medications. Though it has many advantages, they are not free from complications. Nurse's who are knowledgeable and competent in the basic aspects of port-a-cath care able to ensure specific patient needs are met and prevent further complications **(Beck, Brant & Donohue, 2016).**

The aim of this study was to assess nurses' knowledge & practices regarding implantable port catheter care pre & post educational program. Research design of the current study is a quasi-experimental design to evaluate the effect of educational program on nurses caring for patients with port a cath. This in the same line, with **(Deshmukh** and **Shinde, 2012)** who studied the impact of structured education on knowledge and practice regarding venous access device care among nurses and using experimental study.

Regarding training program, it was found that all of the studied nurses did not had any training program or written protocol related to care of port a catht patients. Thus reflect a bad care was introduced to the patients before programs. These findings were supported by **Grigges (2005)** who stressed that training programs were required to target the specific needs of nursing staff working at different care settings.

Regarding nurses' satisfactory level of knowledge level about port a cath there is a highly statistically significant difference pre & post implementing educational program. This in the same line, with **Anderson et al (2013)** who stated that, the experimental group's mean score of knowledge was increased in the post-test after structured program. It indicated that the structured education is effective in increasing the knowledge scores of nurses regarding venous access device care.

In the current study practical nurses level was positive post educational program regarding procedures of port a catheter. This in the same line with **Ozden, Caliskan (2012) & Verity et al (2008)** who stated that nurses should be educated about where the implantable port catheter is placed, its period of use following implantation, the amount of normal saline to be used for washing the catheter, the special port needle, and the exchange time of these needles.

CONCLUSION

In the light of the current study, it can be concluded that, the educational program provided for nurses' working with patient on port-a-cath had statistically significant positive effect on their knowledge and practices regarding implantable port-a-cath.

RECOMMENDATIONS

Based on the results of the present study, the following recommendations are suggested:

- Continuous educational sessions to improve nurses' clinical practices and knowledge for Port-a-cath.
- Upgrading nurses' practices about caring of patient's on port catheter through encouraging the nurses attend national and international workshops & conferences relating the same area.
- Further research on a larger scale to validate these findings and to determine if nurses' knowledge of port-a-catheters is sufficient to maintain safety and optimal patient care.

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