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UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

IMPROVING THE KNOWLEDGE OF PORT-A-CATH
CARE FOR NURSES

A Thesis Submitted in Partial Fulfillment
of the Requirements of the Degree of
Master of Science

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School of Nursing
Advanced Nurse Generalist

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This Thesis by: Nguyễn Thị Hòa

Entitled: *Improving the Knowledge of Port-a-Cath Care for Nurses*

Has been approved as meeting the requirement for the Degree of Master of Science in College of Natural and Health Sciences in the School of Nursing, Advanced Nurse Generalist program.

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ABSTRACT

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The purpose of this research project was to evaluate the effectiveness of a training program to improve the knowledge of port-a-cath care for staff nurses. The main objectives were to assess staff nurses' knowledge of the port-a-cath care process before the training program and measure knowledge of the device and the procedures associated with the use and maintenance of the device after training.

The study used a one group pretest and posttest design. Simple random sampling was done in Hoan My Sai Gon Hospital, Ho Chi Minh City, Vietnam ($N = 90$). The study instrument was a questionnaire that consisted of 31 questions regarding knowledge of port-a-cath care. Data were analyzed using *t*-test and analysis of variance to determine the knowledge difference before and after a 40-minute training session.

Only 8.89% of 90 nurses had received some training on port-a-cath care in their previous education and 91.11% had not been trained on port-a-cath care. The rate of nurses who took care of patients with port-a-cath was as follows: never—58.89%, one to five times—31.11%, 6-10 times—2.22%, and >10 times—7.78%. In summary, the study intervention significantly increased nurses' knowledge concerning port-a-cath care. The nurses achieved an average of 12.5 points on the pretest (40.4%). However, nurses' scores increased an average of 27 points posttest (88.1%).

Keywords: Port-a-cath, nurse's knowledge, effectiveness of training program.

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CHAPTER I

INTRODUCTION

Quality and safety in health care are the most essential components of care that hospital leaders and management address with medical and nursing staff. To improve the American health care system, the Institute of Medicine (IOM, 2001) identified six dimensions to enhance quality improvement to the health care system. These six aims included safe, effective, patient-centered, timely, efficient, and equitable healthcare (IOM, 2001). The IOM defined patient safety simply as “the prevention of harm to patients” (Aspden, Corrigan, Wolcott, & Erickson, 2004, p. 1). Safe health care is the freedom from accidental or preventable injuries as a result of medical interventions (Mitchell, 2008). Since nurses are essential to providing care for patients in a hospital, this research focused on providing proper training for nurses to enhance high quality and safety in health care. Increasing nurses’ knowledge and skills related to port-a-cath is essential to enhance compliance with the processes for port-a-cath care and to minimize complications. The following complications are common when proper safeguards are not followed: infection, mechanical failure, break in the catheter, and/or tearing the port-a-cath (Samad & Ibrahim, 2015).

The use of port-a-caths has increased over the past few years due to advances in chemotherapy treatment and need for frequent access to large vessels. Despite the risk for complications, port catheters provide significant advantages including patient comfort and ability to continue activities of daily living, long-term use, and low infections rates

(Samad & Ibrahim, 2015). Additionally, data showed the number of these devices is on the rise around the world; however, Asia and specifically in Vietnam, there is little research related to port-a-cath use. One of the studies from Vietnam did, however, show there were 399 patients with a new port-a-cath at Hospital of Hanoi Medical University for the period from 2013 to 2018 (Chau, Nhuan, & Hieu, 2018). Despite the growing use of the port-a-cath in Vietnam, undergraduate nursing programs have not included any training related to port-a-cath care processes. Therefore, it was not unusual for staff nurses who worked in oncology wards or in oncology hospitals to lack knowledge and skill regarding the use and care of this device. Nurses have not been prepared to care for the patient with a port-a-cath (Ministry of Education and Training, 2007). Port-a-cath is often used in oncology with cancer patients who need chemotherapy multiple times over a long period time. Therefore, nurses in the oncology department care for patients with a port-a-cath more frequently than other nurses in other care settings. However, patients with chronic diseases and other health conditions might have a port-a-cath and be admitted to other units in the hospital other than the oncology department. Thus, it is essential all clinical nurses are prepared to care for patients with a port-a-cath (Garajová, Nepoti, Paragona, Brandi, & Biasco, 2013). Having a port-a-cath is considered to be a risk for patient safety and for quality of hospital care as its use has been associated with infections and other complications, especially if nurses do not possess sufficient knowledge of caring for patients with port-a-caths (Kleinpell, Munro, & Giuliano, 2008).

These infections are often local bloodstream infections. Their pathology can be fungal and these infections are known for having complications (Lebeaux et al., 2014). However, complication rates for those who have a port-a-cath are less than those of a

Hickman line (Ng et al., 2007). Additionally, a port- a-cath is safer and cheaper than a Hickman line for patients requiring infusion chemotherapy (Ng et al., 2007). Despite being a relatively low-risk device, infections are still common in the case of immunosuppressed patients with a port-a-cath (West & Jin, 2016). Therefore, staff nurses must demonstrate competency when taking care of patients with implanted devices to ensure their safety and well-being.

Hoan My Sai Gon hospital (HMSG) is a large private medical facility that serves middle- and upper-class patients. Additionally, it continues to promote HMSG cultural heritage by committing to treating patients in the most effective way. The ultimate goal of a hospital is to ensure increased satisfaction of its patients. Therefore, the nursing managers of HMSG) hospital identified the need to train the nursing staff to care for patients with a port-a-cath.

The number of HMSG patients with port-a-caths is about 12 a month and this number is likely to increase. Research from the Cardiac Center in Hanoi showed the number of patients with a port-a-cath was 399 from 2013-2018 (Chau et al., 2018), indicating many patients will need specialized care that warrants training on the part of nursing staff to ensure patient safety is not jeopardized. This education focus aligns with the leadership's focus on control of the rate of infections related to patient care, high quality services, and safety of patients in the hospital.

Unfortunately, administrative initiatives to eliminate patients' healthcare risks and increase the quality of services received are not enough. One of the reasons for having the aforementioned issues is a lack of knowledge and practical skills of medical personnel with regard to following necessary guidelines for patients with a port-a-cath.

Specifically, the lack of skills and knowledge related to port-a-cath infection prevention as well as its care might result in many complications for patients (Tsai et al., 2008).

Hence, the administration of the hospital must implement various methods to improve the quality of port-a-cath related service to ensure patient safety and prevent complications in the hospital. For this purpose, the leadership of the hospital supported a port-a-cath training program.

Problem Statement and Purpose

The aim of this study was to evaluate the effectiveness of a training program to improve the knowledge of port-a-cath care by staff nurses. The main objectives were to evaluate staff nurses' knowledge about the port-a-cath care process before and after a training program and measure knowledge of the device and the procedures associated with the use and maintenance of the device.

Research Question

The following research question guided this study:

Q1 Is the training program to improve the knowledge of port-a-cath care for staff nurses effective?

Significance of the Study

The number of patients with a port-a-cath in hospitals is increasing; thus, nurses are more likely to be responsible for the care and maintenance of a port-a-cath. This study was important to identify knowledge levels and deficits of nurses regarding the port-a-cath. Providing education and training to nurses regarding a port-a-cath increases knowledge and confidence of the nurse as well as enhances quality and safety for patients with this device.

Theoretical Framework

The theoretical framework used to guide this study was Benner's (1984) novice to expert theory of nursing. This theory discusses the development of knowledge and practices of nurses as they transition from no experience to expertise (see Figure 1). "Benner's model describes five stages of nursing development: novice, advanced beginner, competent, proficient, and expert. There are distinct differences in the practice abilities and experience levels within the five stages" (Benner, 1984, p. 1).



Figure 1. Benner theory of nursing (Benner, 1984).

Benner's (1984) theory of novice to expert nursing allows for an assessment of progress within the development of knowledge nursing practice and skill development—in this research, port-a cath care by nurses. According to this theory, knowledge

increases and nursing care and practices are enhanced with continuing education and practice opportunities. Nurses continue to develop proficiency and confidence in their nursing practice. This theory supported continued development and education for nurses to develop new skills and enhance competency of the nurse skill set. This theory is useful in guiding care managers in planning and directing staff development to insure high quality care and safe practices for patients.

CHAPTER II

LITERATURE REVIEW

Port-a-cath is a medical device that provides direct access to large blood vessels. The name port-a-cath is a combination of “portal” and “catheter.” The portal is a chamber that is implanted under the skin usually in the upper chest below the collarbone and appears like a bump under the skin (Hamstra, 2018). The portal is a soft flexible tube-like end of the central venous catheter that is threaded into a large vein above the right side of the heart (West & Jin, 2016). A port-a-cath can be used for prolonged intravenous infusions, antibiotics, blood products, blood draws for testing, or chemotherapy in cancer patients (McLoughlin et al., 2017). A port-a-cath is less obvious than a tunneled catheter and requires very little daily care (Elkhoury, Boeckx, Chahine, & Feghali, 2008). The port-a-cath is accepted as a safe and effective method of providing long-term intravenous infusions. This method was first introduced in the 1980s and used for children undergoing chemotherapy for cancer. Ports are commonly used in children and adult cancer patients because of low complication rates (Sheppard, LeDesma, Morris, & O’Connor, 1999).

The port-a-cath system consists of two parts: the portal chamber made of metal and the surface covered with silicone film and connected to the catheter. There are many types of portal chamber systems: titanium portal chamber, titanium and plastic portal chamber, and portal chamber made entirely of plastic single lumen and double lumen (Dougherty, 2006). Figure 2 shows a cross section of an implanted port.

Portacath

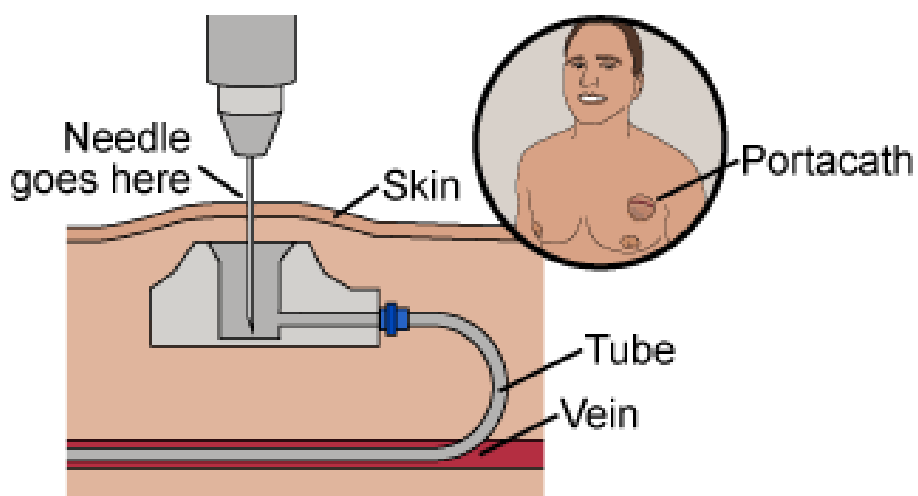


Figure 2. Cross section of a port-a-cath (Nurse.org, 2019).

The port-a-cath is designed for repeated venous access. The benefits of port-a-cath include quicker access to the patient's vein, especially for patients with small or damaged veins or patients who are anxious about needles. Further, there is a reduced risk of skin, tissue, muscle, and vein damage, and a decreased rate of bruising or bleeding for patients with bleeding problems. A special needle that is inserted in a port-a-cath for a transfusion could remain in the port-a-cath for up to seven days if no signs of infections are present and the patient using the medication is stable. The port-a-cath could remain in place for weeks, months, or years. A port-a-cath usually remains in place in a patient on average two to six years (Ruebner et al., 2006). Using a port-a-cath increases a patient's comfort and quality of life compared with long-term intravascular catheters (Vescia et al., 2008).

Use and Contradictions for Accessing a Port-a-Cath Safely

Use

A port-a-cath is utilized when long-term infusion treatment is indicated. Small peripheral veins of the body are sensitive to chemotherapy drugs, are unsuitable for large volumes of fluids, and repeated needle sticks could cause vein injury or thrombosis. Some diseases require continuous infusions and are combined in the postoperative period with other treatments such as radiation. After cancer treatment has been stabilized, patients can continue to use the port-a-cath in palliative care and pain treatment.

Risks Associated with a Port-a-Cath

Patients who might develop complications after having a port-a-cath are patients with an existing or frequent skin infection, venous thromboembolism, and patients with coagulopathy. A number of articles showed other risks associated with port-a-cath are infection, hemorrhage, a break in the catheter, and tearing of the port-a-cath (Beckers, Ruven, Seldenrijk, Prins, & Biesma, 2010; Nakazawa, 2010; Vallés et al., 2008). Additionally, blood platelets below 50,000/m³ could pose a potential adverse risk for the insertion of a port-a-cath (Loh & Chui, 2007). To avoid complications, a port-a-cath is protected and covered with an opstickin for long-term use such as Tergaderm or gauze (Camp-Sorrell & Matey, 2017).

Advantages of Port-a-Cath

Port-a-caths are inserted in subclavian and internal jugular arteries (Hadaway, 2010; Wilkes, 2010). Evidence showed the needle could be left safely in a port-a-cath for seven days without removal or reinsertion (Camp-Sorrell & Matey, 2017). Moreover, port-a-caths are convenient for easy access infusion and drawing blood because the

needle can be inserted or taken out from a port-a-cath easily without any damage to the blood vessel. Additionally, there is no restriction on physical activity including bathing or swimming. Inserting ports offer some advantages such as reduced risk of infection as opposed to the Hickman line (Ng et al., 2007) and the device is relatively low-maintenance (Dougherty, 2011). Similarly, in a comparison study of the Hickman line and port-a-cath in terms of associated complications for patients with malicious tumors who were undergoing chemotherapy, the results showed complication rates of a port-a-cath were less than the Hickman line. Further, the port-a-cath was shown to be safer and cheaper than the Hickman line (Ng et al., 2007).

Disadvantages

When having a port-a-cath inserted, a specialist is needed to perform the procedure. Moreover, some risks are associated with minor surgery when placing the port-a-cath (e.g., infection, bleeding and pneumothorax). However, this risk is under 1% (Dougherty, 2006). Rate of developing infections depends on various factors but they are generally uncommon (Dougherty, 2011). A port-a-cath is usually removed and replaced with another one if there is an infection. Blood clots can form in a port-a-cath, resulting in reduction or loss of the port-a-cath effectiveness. This situation is quite common: 12% to 64% of patients with a port-a-cath report loss of full function of the port-a-cath due to clotting (Dougherty, 2011). However, a patient's port-a-cath could return to normal function after washing with heparin and sodium (Dougherty, 2006).

Nursing Care of a Port-a-Cath

The care and use of the port-a-cath is a nursing skill that requires the nurse to insert a special needle into the port-a-cath. There are several important steps when

accessing the port-a-cath as well as care and maintenance. When accessing the port or inserting the needle, it is essential to ensure the device is sterile. A port-a-cath is a closed system; thus, it is necessary to avoid air blockages, infections, and only use special needles for port-a-caths. Therefore, it is critical to have only highly trained and skilled personnel to access port-a-caths. To ensure patency of the catheter, staff nurses must wash port-a-caths with heparin and sodium monthly when the system is not in use (Dougherty, 2011).

Port-A-Cath Procedures

Tools. A variety of access tools are required for an intravenous port-a-cath: nippers, gauze, cotton wool, two inox chums, a hole with cloth, and 'cytocal' needle No. 22. Additionally, a clave button and a pair of sterile gloves are required. It is common to use urgo pads (150 x 90 mm), one tube and a 10ml syringe, one bottle of 0.9% Natrichlorid, one bottle of 0.9% Natrichlorid, 100ml control fluid of 1ml = 60 drops, mix needle, feeder bottle, cotton wool sterile box, pea pod, povidine 10%, hand drape, silk tape, hanging pillar, watch, common waste container, infectious waste container, sharps container, and anti-shock box (Dougherty & Watson, 2011). The special needle used in the port-a-cath is designed to prevent damage to the portal septum. These needles are called non-coring, cytocal, or huber needles (Gabriel, 2008; Weinstein & Plumer, 2007).

Accessing a port-a-cath with a needle. To be able to access a port-a-cath with a needle, it is necessary to apply the aseptic technique, release any gases, find the upper face of the injection chamber, and hold tightly. Further, the nurse should insert the needle perpendicular to the port-a-cath, press until it reaches the bottom, and wash

it with 20 ml of NaCl at 0.9% solution. It is important not to pump solution when a nurse feels it is difficult to pump solution. Then it is required to insert sterile gauze under the needle and apply a bandage. When the current injection chamber is ready, inject the medicine, fluids, or draw blood (Dougherty, 2011).

Removing needle from port-a-cath. To appropriately implement the removal of a needle from the port, it is especially important to follow these eight steps: (a) employ an aseptic technique, (b) remove the gauze under the needle, (c) disinfect the skin around the needle, (d) wash 20 ml NaCl 0.9%, (e) inject 3 ml of Heparin (100-500IU/ml) into the port, (f) pump (hold positive pressure) and remove the needle, (g) press the skin for about two minutes (avoid hematoma), and(h) clean the skin with sterile gauze (Dougherty, 2011).

Drawing Blood for Testing

To draw blood for testing, it is especially important to follow these 12 steps: (a) implement the aseptic technique, (b) remove the gas, (c) find the upper face of the injection chamber, (d) hold it tightly, (e) insert the needle perpendicular to port-a-cath, (f) press it until it reaches the bottom, (g) attach a 5 ml syringe, (h) draw 3 ml of blood, (i) attach a new 5 ml syringe, (j) take the amount of blood needed, (k) wash 20 ml NaCl 0.9%, and (l) withdraw the needle (Dougherty, 2011).

Pump Maintenance

To wash the pump, one must follow the needle access and needle removal process to ensure the patient's safety and increase life of the port-a-cath. The port-a-cath must maintain a solution containing anticoagulant (Heparin) at the appropriate concentration, a heparin lock, to prevent blood clots from forming inside the catheter.

This process is a nursing responsibility and is performed by a staff nurse. To ensure safety of a port-a-cath, it must be flushed with about 10 to 20 ml of 0.9% sodium immediately after the end of the injection and implementation of a Heparin lock (3 ml Heparin, 100 to 500 IU/ml.) During periods when a port-a-cath is not used, the patient must go to a hospital or clinic for care of the heparin lock every four weeks (Dougherty, 2011). Washing the pump when the system is not in use is very important to prevent the risk of thrombosis (Arch, 2007; Kreis et al., 2007).

Complications Related to Use of Port-a-Cath

Advancements in implanted venous access devices for long term use have resulted in comfort and safety for the patient undergoing prolonged treatment. However, complications after placement of vascular access devices such as the port-a-cath could result. It is important for the nurse to be aware of potential complications and respond appropriately and timely to ensure early resolution of the issue. The most frequent complication associated with long-term use of an implanted vascular access device such as a port-a-cath is infection. Other complications along with symptoms, cause, solutions, and prevention measures are summarized in Table 1 (Nishinari, Wolosker, Bernardi, & Yazbek, 2010; Wolosker et al., 2004; Zerati, Wolosker, de Luccia, & Puech-Leo, 2017). This summary information provides guidance to nurses who are caring for patients with a port-a-cath to ensure high quality and safe care.

Table 1

Issues Related to Port-a Cath

Symptoms	Complications	Causes	Solution	Prevention
In the skin where the needle is placed: swelling, redness, or exudate, pus. -Patient pain in the needle position -Patient has a fever -The blood of the injection chamber has results positive	Infections	Do not adhere to sterile techniques when inserting needles, changing bandages or when performing infusion orders Plug the needle at the old position when removing the needle → ulcer skin, establishing abscesses	Ask physician: Implement physician orders test: blood at port-a- cath and transplant peripheral blood Care for infected skin Implement drugs according to orders physician	Follow sterile process when taking care of port-a-cath and when performing the infusion orders. Monitor vital signs. Monitor the skin where the needle is located. Not insert the needle when the skin at port-a-cath have signs of infection Do not re-insert the needle at the position you just removed.
Infusion does not flow The pump is injected but not draining.	System congestion	the infusion system is folded, twisted patient's posture catheter touch on the wall of vein -The needle is position incorrectly	Check the infusion system: locked Is the infusion folded, twisted? Change of posture Guide patients to inhale deeply, - Guide patients to cough. → try to withdraw with 10ml syringe containing Natrichlorid 0.9% after each move. Return the needle position by retracting the syringe, otherwise the needle can be re-insert. If the infusion still does not flow → ask physician.	Comply with the injection chamber with sodium 0.9% after care or blood test. Proper pumping method to clean port-a-cath and keep positive pressure in port-a-cath. Use the locking clamp properly -Transmission tracking: fluid flow must be continuous. -Discovering patients and relatives when the end of the infusion must immediately call to nursing.

Table 1 continued

Symptoms	Complications	Causes	Solution	Prevention
Swelling of the skin around port-a-cath The patient is suffering from pain at the position around the injection Insert the needle, there was a fluid, bleeding	Blood clots, subcutaneous fluid in the port-a-cath's under skin	Place the needle in the wrong position, the tip of the needle has not reached the bottom Disconnect between the catheter and chamber Insert the needle several times in a row and try to pump the fluid when blocked Needle slipped out of the silicon membrane	Check the position of the needle, draw back the syringe for blood, if not available -aks physician -X-ray, ultrasound Monitor at the injection position, take care wound.	When inserting the needle, touch the bottom of port-a-cath. Do not insert the needle many times in a row, do not try to pump the fluid when it is blocked - Stretching the needle insert time, waiting for the silicon membrane to be closed
Threaded neck venous edema catheter	Broken catheter	Use smaller syringes 10ml Try to use pump pressure when port-a-cath is blocked	Stop infuse Ask physician -X-ray position port-a-cath	Do not use syringe <10 ml to pump Do not try to use pressure to pump when chamber blocked injection

Effectiveness of Training Programs of Port-a-Cath Care for Staff Nurses

To locate relevant literature on the topic of effectiveness of training programs on the use of port-a-caths by staff nurses, the following key search terms were used: Port-a-cath, nurse's knowledge, effective of training program, implantable, totally implantable central venous. The studies identified in the search provided a comprehensive picture regarding the topic of current research.

Tsai et al. (2008) investigated the effectiveness of a computer-based simulation program to train staff nurses to administer injections via port-a-cath. In this research, the authors divided 77 novice nurses into two groups: 40 nurses in the experimental group

and 37 nurses in the control group. The nurses in the experimental group were trained to use a port-a-cath via the simulation program for three weeks. The results of the study revealed the knowledge score in the experimental group was higher than in the control group. Participants in the experimental group were also found to be more confident about their clinical skills.

Similarly, Ozden and Caliskan (2012) analyzed the level of nurses' knowledge of port-a-cath care in the Internal Medicine Department at the University of Turkey Hospital. In a pretest-posttest design, 45 staff nurses participated in this study. Staff nurses received in-service training on inserting a needle into a port-a-cath for two hours every day for two weeks. The questionnaire included 14 questions to determine individual knowledge level of staff nurses and 30 questions about nursing care processes of port-a-caths. The results showed significant differences between nurses' level of knowledge of port-a-caths before the training and after the training was provided ($p = .029$).

Moreover, according to Khalil, Youssef, and Moustafa (2017), a statistically significant correlation was found between previous training in using and managing port-a-caths staff nurses compared to those who had not been trained. The study involved over 100 staff nurses of oncology at critical care units in Egypt. Based on the results of this research, the authors recommended hospital leaders organize training programs for their staff to improve their knowledge of port-a-cath care and to ensure their awareness of current standards and guidelines for nurses (Khalil et al., 2017).

To explore the level of knowledge of nurses about port-a-caths and identify managements strategies of port-a-caths, Alkan et al. (2017) conducted a cross-sectional

study with 363 nurses in seven cancer centers in four different cities in Turkey; 147 (40.5%) of the participants had greater than 10 years of experience whereas 13.8% had less than one year of experience working with cancer patients. The results showed the knowledge of port-a-cath care negatively correlated with work experience in the field ($r = -0.168, p = .001$). This research highlights the importance of post-graduate education and training of working nurses. Specifically, nurses who practice in settings where port-a-caths are routinely used should be provided with updates regarding the management and complications of port-a-caths (Alkan et al., 2017).

Garajová et al. (2013) investigated various complications associated with the use of port-a-caths. Study participants were 252 patients with cancerous tumors. The study findings showed the main complications of using port-a-caths included thrombosis (1.58%), infections (1.58%), persistent pain or discomfort (1.19%), and dislocations of the port-a-cath (0.79%). Additionally, the median time when any type of complications occurred was 4.5 months. Thus, even though the port-a-cath was considered to be a relatively safe device, certain complications and infections could happen. Therefore, it is important that hospital staff and nurses are aware of these potential complications to minimize the risk for the patients.

The aforementioned studies showed a clear picture of potential complications of having a port-a-cath, especially if nurses did not possess sufficient knowledge regarding the device and its safety. Nurses' skills and knowledge about port-a-caths in the studies included knowledge about insertion of needle in the port-a-cath as well as care and complications of having port-a-caths. Additionally, related research focused on definitions of port-a-caths, normal indication of port-a-caths, contraindicating evidence of

the safety of port-a-caths, preparation tools for the care process, infection control measures related to port-a-cath use, patient education, regulation of port-a-caths, and heparinization care of port-a-caths (Khalil et al., 2017).

Hoan My Sai Gon Hospital

Hoan My Sai Gon Hospital was established in 1997; the hospital has become a reliable and familiar destination for people in the city of Ho Chi Minh and neighboring provinces and cities. In 2011, Hoan My Sai Gon Hospital joined Fortis International Group and the hospital was renamed Hoan My Saigon General Hospital. Hoan My Saigon General Hospital joined the Clermont Group to develop into Hoan My Medical Group (Vietnam) with a system stretching from the central to the south of the country with eight hospitals and one clinic.

Currently, Hoan My Saigon General Hospital (HMSG) has 261 beds, 12 functional rooms, and 18 clinical and subclinical departments. Each day, the hospital receives an average of 2,400 outpatients; the number of inpatients averages 250 patients per day. Total number of employees is approximately 730. Among them are 102 doctors (Ph.D.: 3, Master's: 25, Specialty I: 30, Specialty II: 12, Bachelor: 32), 230 nurses, 71 technicians, 34 medical secretaries, 41 midwives, and 53 pharmacists (Master's: 5, University: 12, College: 09, and High School: 27) and other staff.

In summary, the literature reflected the growing need for continuing education opportunities for working nurses to ensure their knowledge and practice skills meet the advances in health care. Nurses need the knowledge and skills to ensure safe and quality care for patients with medical devices such as the port-a cath. Thus, it is imperative for

hospitals to provide ongoing education and updates to ensure nurses are prepared to meet the care needs of each patient.

CHAPTER III

METHODOLOGY

In this chapter, the methodology used to conduct the study is presented. Included are descriptions of the design, setting, sample, procedure, instruments, analysis, and ethical consideration.

Research Design

A non-experimental field study approach was used to conduct this investigation. Data for this study were collected through a pretest-posttest method. This approach was appropriate for the purpose of describing the outcomes of an education program. The study was prospective and longitudinal in nature and the data were quantitative.

The study was a one group pretest-posttest design. This research design helped assess the changes in nurses' knowledge of port-a-cath care after attending a specialized training program. The one-group pretest-posttest design also aligned with Benner's (1984) novice to expert nursing theory. The researcher used the pretest results to determine the nurses' level of knowledge and designed an appropriate training program to accommodate their educational needs.

Study Time and Location

The research took place from July 10, 2019 to July 11, 2019. The study location was HMSG Hospital in Ho Chi Minh City in Vietnam.

Target Population and Participants

The target population for this research was nurses at HMSG Hospital in eight clinical departments. Nurses working in and who cared for patients in eight clinical departments of HMSG hospital were invited to participate in this the study; these departments included Emergency, Intensive Care Unit, Internal Medicine, Internal Medicine 2, Cardiology and Endocrinology, Gastrointestinal Surgery, General Surgery, and Faculty of Treatment. The researcher met with head nurses of each clinical department to introduce the purpose of the study. The researcher then explained the conditions and benefits of participation in the study to the nurses. In addition, the information about the study time and when nurses could participant in the program to continue their education was provided.

Selection Criteria

Nurses from eight clinical departments of HMSG hospital in Vietnam who were employed at the hospital at the time of the study were asked to participate in the study. In addition, only those nurses who were interacting and providing care to patients directly and had an intermediate education level or higher degrees were included. The final criterion was volunteer participation in the study, which was documented on the written consent form.

Exclusion Criteria

Those nurses who were not present during the study period due to being away studying or were on maternity leave were excluded. Finally, those participants who were not able to complete the questionnaire were placed in the exclusion group.

Sample Size

The sample size was determined based on the following formula (Yamane, 1967):

$$n = \frac{N}{1+N(e)^2} = \frac{210}{1+210.(0,05)^2} = 138$$

Whereas:

n = sample size

N = population size

e = accuracy level

Based on this formula, 138 nurses from eight clinical departments were selected to provide their responses on the questionnaire. The study used a stratified random sampling method (see Table 2). The participants were chosen randomly from eight clinical departments. Due to the specifics of the study location, a stratified random sampling method was considered the most reliable.

Table 2

Stratified Random Sampling

Department	Clinical nurses	Sample
Emergency department	30	20
ICU	32	21
Internal medicine department	22	15
Internal medicine department 2	8	5
Cardiology and endocrinology department	32	21
Gastrointestinal surgery	26	17
General surgery	38	25
Faculty of treatment as required (VIP)	22	14
Total	210	138

Data Collection Instrument

In this research, a questionnaire was used to collect the data. The questionnaire consisted of two parts with a total of 43 questions. Part one of the instrument included 12 questions that covered information pertaining to the participants' demographic characteristics. The questions related to participants' age, gender, number of years of experience working as a nurse, qualifications, training participation, experience with port-a-caths, approximate number of patients with port-a-caths, and any self-identified need for additional training related to port-a-caths.

Part two of the questionnaire had 31 questions divided into three subgroups: A, B, and C. Subgroup A covered basic information about port-a-caths (eight questions from 1-8) and subgroup B was dedicated to taking care of port-a-caths (19 questions from 9 to 27). Finally, subgroup C was designed to assess participants' knowledge of potential complications associated with having a port-a-cath (four questions from 28 to 31).

All items on the questionnaire were multiple choice; there were four choices for each question but only one of the options was correct. The participants received a score of 0 for answering incorrectly and a score of 1 when selecting the correct response. The maximum score was 31.

The level of knowledge was classified based on the Bloom's (1968) cut-off point. The knowledge was considered "good" if the score was within the 80 to 100% range. The average score was within 60%-79% and a weak score was under 59% (Bloom, 1968). The questionnaire results were evaluated by three highly-qualified medical and nursing experts: Dr. Tran Dinh Thanh, the Head of Oncology Department; Dr. Cao Thi

Kim Lien from the General Planning Department; and Dr. Pham Ba Thi My Nghiem, a senior nursing instructor at Hoan My Medical.

Data Collection Procedures

The proposal was approved by the Hospital Scientific Research Council (see Appendix A. Approval was then obtained by the University of Northern Colorado's Institutional Review Board (IRB, see Appendix B). After approvals were obtained, the researcher introduced the research objectives to nurses. Nurses who met selection criteria and agreed to participate in the research signed the consent form (see Appendix C). The next step was to administer the questionnaire to the participants as a pretest (see Appendix D). Participants were instructed to answer all of the items within the expected time of 20 minutes. After that, the questionnaires were collected to be evaluated. All data for this study were collected from July 10, 2019 to July 11, 2019.

The training program was scheduled and implemented. The education program introduced basic and more advanced content related to providing care of the subcutaneous injection chamber for patients. The content of the program also included information regarding nursing care of port-a-caths and management of potential complications. The content of the education program was reviewed and approved by Chief Medical Officer and the Chief of Nursing Officer of HMSG Hospital.

The training time was 40 minutes for one day. The training was provided by the researcher who is a bachelor nurse employed by HMSG hospital and works in the nurse room. The researcher was certified and responsible for continuous education and training for nurses in HMSG. After the training was complete, the supervisor in the nurse room

administered the questionnaire to study participants, which was the posttest. The respondents completed the questionnaire within the allotted 20 minutes.

Training

Training content included the following contents from the literature review: information about port-a-caths, assignment, risks associated with a port-a-cath, advantages of a port-a-cath, disadvantages, care of port-a-caths, intravenous access for port-a-cath, accessing port-a-cath with needle, removing needle from port-a-cath, drawing blood for testing, washing pump when the system is not in use, and accidents related to use of port-a-cath.

Ethical Considerations and Protection of Human Subjects

All study participants volunteered to participate in the study; thus, it was entirely their decision to participate in the study. All responses were kept confidential and anonymous. Participants were informed they could withdraw from the study at any time. Their decision to do so was respected and did not result in any loss of benefits to which they were otherwise entitled.

Approval of this study by the University of Northern Colorado's IRB was granted on July 10, 2019 (see Appendix B). Any changes to the original summary of the study protocol submitted with the original application was addressed in the manner prescribed by UNC's IRB committee. Precautions and safeguards were taken to ensure the safety and comfort of the subjects. All subjects identified as eligible to participate in this study were approached by the researcher and the study explained in the subject's "every-day" language.

Descriptive Analysis

The pretest and posttest results of the questionnaire were compared to determine if the nurses' knowledge of port-a-cath care improved after the training program was implemented. Additionally, this researcher attempted to determine if there was a relationship among factors such as age, professional qualifications, and years of work experience was sufficient regarding the specifics of knowledge about port-a-cath care. SPSS version 20 was used to analyze the data. Analysis of variance (ANOVA) and chi-square test were utilized to measure associations and significance of differences between data sets.

The data were analyzed in three stages. The first stage was analysis and computation of descriptive statistics and the distribution of data. The second stage was to compare pretest and posttest results of the questionnaire to determine if the nurses' knowledge of port-a-cath care improved after the training program had been implemented. The third stage was to determine if there was a relationship among factors such as age, professional qualifications, and sufficient years of work experience regarding the specifics of knowledge about port-a-cath care.

Data were analyzed using the Statistical Package for the Social Sciences. A Type I error of 5% was used for all tests of statistical significance. Choice of parametric or nonparametric statistical test employed was based on the level of measurement, number of data points, and normality of the data.

CHAPTER IV

RESULTS

The findings of this study are presented in separate sections. The first section is a brief description of the demographic data of the sample. The second section addresses the results of pretest and posttest knowledge about port-a-cath care. The questionnaire had a Cronbach alpha of 0.8.

Description of the Sample

The demographic data are summarized in Table 3. The sample included 90 nurses who worked in eight clinical department at HMSG hospital. The nurses were comprised of 80 females and 10 males who ranged in age from 23 to 47 years.

Table 3

Demographic Description of Sample

Characteristic	<i>n</i>	%
Gender		
Male	10	11.1
Female	80	88.9
Years in Nursing		
1 year	7	7.8
2 – 5 years	33	36.6
6 – 10 years	32	35.6
11 – 15 years	12	13.3
16 + years	6	6.6
Years in nursing at HoanMy		
1 year	17	18.9
2 – 5 years	29	32.2
6 – 10 years	27	30.1
11 – 15 years	11	12.2
16+ years	6	6.6
Unit worked at hospital		
Internal medicine 2	2	2.22
ICU	11	12.22
Cardiology and endocrinology	17	18.8
Gastrointestinal	12	13.34
General surgery	05	5.55
Internal medicine	15	16.67
VIP	12	13.33
Emergency department	16	17.77
Highest Education level		
Intermediate	23	25.6
College	17	18.9
University	49	54.4
Postgraduate	1	1.1
You are attending classes:		
Associate	3	3.3
University transfer	34	37.8
Master	0	0.0
Transformation	3	3.3
No	50	55.6

Table 3 continued

Characteristic	<i>n</i>	%
Previous education about port-a-cath care		
Yes	8	8.99
No	82	91.1
Number of times you took care of the patient with port-a-cath		
Never	53	58.9
1 – 5 times	28	31.1
5 – 10 times	2	2.2
➤10 times	7	7.8
Number of times you have directly established the transmission line or removed the line for port-a-cath on the patient		
Never	60	66.7
1 – 5 times	21	23.3
5 – 10 times	2	2.2
➤10 times	7	7.8
They need to be trained in knowledge and skills to take care of port-a-cath?		
Yes	84	93.3
No	5	5.6
No response	1	1.1

Nurses' Knowledge of Port-a-Cath Maintenance

In this section, nurses' knowledge of taking care of port-a-caths is reported. The topic area of the nurses' knowledge was evaluated prior and after a planned education program. Appendix D provides the study survey that included the information about taking care of port-a-caths.

The pretest and posttest amount of correct and incorrect responses for each question are located in Table 4. An improvement (a positive difference) was observed between the scoring of correct answers from the results of the pretest to the results of the post-test. A paired sample *t*-test was conducted to assess if there was an increase in nurses' knowledge after the education program as reflected by an increase in the number

of correct responses from the pretest to the posttest. In summary, the study intervention significantly increased nurses' knowledge of port-a-cath care. Nurses achieved an average of 12.5 points (40.4%) in the pretest. According to Bloom's (1968) point, this was a weak score. The nurses achieved an average of 27 points (88.1%) in posttest. According to Bloom's, it was a good score.

Table 4

Results of Pretest and Posttest for Knowledge of Port a-Cath

Knowledge	Pretest Score		Posttest Score	
	<i>n</i>	%	<i>n</i>	%
1. Port-a-cath is composed of:				
Correct	8	8.9	89	98.9
Incorrect	82	91.1	1	1.1
2. Types of port-a-cath:				
Correct	39	43.3	87	96.7
Incorrect	51	57	3	3.3
3. Port-a-cath is usually placed in the following veins				
Correct	55	61.1	87	96.7
Incorrect	35	38.9	3	3.3
4. Case which physician order insert port-a-cath for patients				
Correct	56	62.2	83	92.2
Incorrect	34	38.8	7	7.8
5. Contraindication to insert port-a-cath for patients				
Correct	49	54.4	72	80
Incorrect	41	46.6	18	20
6. Total average needle piercing times on port-a-cath in patient				
Correct	43	47.8	85	94.4
Incorrect	47	52.2	5	5.6
7. Physician's order is used for postoperative testing to confirm the position of port-a-cath				
Correct	66	73.3	87	96.7
Incorrect	24	26.7	3	3.3
8. The first time Vietnam insert port-a-cath for patients				
Correct	23	25.6	88	97.8
Incorrect	67	74.4	2	2.2
9. The average time for postoperative wounds to insert port-a-cath in patient's body				
Correct	24	26.7	78	86.7
Incorrect	66	73.3	12	13.3
10. For patients with port-a-cath, nurse will change the dressing				
Correct	22	24.4	83	92.2
Incorrect	68	75.6	7	7.8
11. The time when patient must wash port-a-cath by medical staff				
Correct	35	38.9	80	88.9
Incorrect	55	61.1	10	11.1
12. The quantity of sodium need to wash port-a-cath				
Correct	13	14.4	76	84.4
Incorrect	77	85.6	14	15.6

Table 4 continued

Knowledge	Pretest Score		Posttest Score	
	<i>n</i>	%	<i>n</i>	%
13. Skin disinfectant solution in the process of insert a transmission line for por-a-cath				
Correct	49	54.4	79	87.8
Incorrect	41	45.6	11	12.2
14. After insert the transmission line for port-a-cath, the needle can save at maximum in port-a-cath				
Correct	37	41.1	82	91.1
Incorrect	53	58.9	8	8.9
15. Particularly chemical transfer should be done				
Correct	43	47.8	82	91.1
Incorrect	47	52.2	8	8.9
16. Type of needle used to inject directly into port-a-cath				
Correct	57	63.3	87	96.7
Incorrect	33	36.7	3	3.3
17. The size of the needle most commonly used to inject directly into port-a-cath in adults				
Correct	25	27.8	85	94.4
Incorrect	65	72.2	5	5.6
18. Proportion of Heparin and NaCl 0.9, then take 3ml to flush port –a-cath in the long time no use				
Correct	27	30	78	86.7
Incorrect	63	70	12	13.3
19. To prevent catastrophic catheter complications, tearing of port-a-cath requires				
Correct	41	45.6	75	83.3
Incorrect	49	54.4	15	16.7
20. The following statements is correct when taking care of port-a-cath				
Correct	21	23.3	63	70
Incorrect	69	76.7	27	30
21. Technique to insert the transmission line for port-a-cath, Degrees for needle should be inserted to ensure safety				
Correct	39	43.3	87	96.7
Incorrect	51	56.7	3	3.3
22. Which of the following statements is CORRECT in the infusion process for patients with port-a-cath				
Correct	31	34.4	71	78.9
Incorrect	59	65.6	19	21.1
23. When suspecting a transmission system in a port a cath is obstructed, nursing should..				
Correct	57	63.3	77	85.6
Incorrect	33	36.7	23	14.4
24. Gold of avoidance of repeated needle injections in insert the infusion line for port-a-cath				
Correct	21	23.3	74	82.2
Incorrect	69	76.7	26	17.8
25. Which syringe size is inappropriate when used in port-a-cath				
Correct	25	27.8	71	78.9
Incorrect	65	72.2	29	21.1

Table 4 continued

Knowledge	Pretest		Posttest	
	<i>n</i>	%	<i>n</i>	%
26. Causes when the infusion does not flow in port-a-cath				
Correct	40	44.4	76	84.4
Incorrect	50	55.6	14	15.6
27. counseling patients with port-a-cath				
Correct	25	27.8	69	76.7
Incorrect	65	72.2	21	23.3
28. Pharyngeal edema where a catheter is inserted in a patient with a port-a-cath thinking immediately about the following complications				
Correct	23	25.6	75	83.3
Incorrect	67	74.4	15	16.7
29. Nurse should comply with the following principles to prevent complications of infection in port-a-cath				
Correct	40	44.4	80	88.9
Incorrect	50	55.6	20	11.1
30. The most common complication in patients with port-a-cath				
Correct	48	53.3	78	86.7
Incorrect	42	46.7	12	13.3
31. Expressions of chest pain, dyspnea, cough, anxiety and fever occur in patients with port-a-cath				
Correct	46	51.1	69	76.7
Incorrect	44	48.9	21	23.3

N = 90

CHAPTER V

DISCUSSION

The purpose of this study was to determine the correct level of theoretical and practical knowledge of the nurses at the study hospital regarding the care of a patient with a port-a-cath. This study investigated if an education program specifically designed to inform nursing staff regarding the proper care of the port-a-cath could improve the level of port-a-cath care knowledge of nurses.

Major Finding

Of the nurses who participated in this study, 90% reported they were not trained to take care of a port-a-cath whereas 41.1% of nurses had direct care for patients with port-a-cath. This research highlighted the need for continuing education in the hospital for nurses. Lack of knowledge by nurses impacts quality of care and increases the risk of complications for patients, nursing, and the hospital.

After a training session, the knowledge of nursing regarding the proper care of the port-a-cath increased significantly. This research supported the effectiveness of continuing education to improve nurses' knowledge. However, continuous training sessions and education opportunities are essential to maintain nursing knowledge levels and skills competencies. To ensure high quality and safe care, healthcare settings must create opportunities and environments for ongoing professional development of nurses. In doing so, hospitals will facilitate the development of nursing staff to move from the novice nurse to the expert nurse.

Strengths and Limitations of the Study

This was an exploratory study conducted at one hospital. The survey was written in the language of the study participants (Vietnamese). The reliability and validity of the study data collection instrument was established; thus, the results of this study were considered reliable and valid. Generalizability of the findings of this study were limited by several factors. The major limitation was this exploratory study was limited to one setting. Therefore, conclusions were based on this limited sample size and must be generalized with caution. The study sample could not be considered representative of nurses who care for patients with port-a-caths in the hospital setting. The number of nurses who took part in this study was less than the computed sample size in the proposal. This situation limited the researcher's ability to generalize the study findings. Although the findings were limited, the results of this study provided support for continuous education—not only about port-a-caths but for other important nursing care topics—for nurses in the setting in which this research was conducted.

Implications for Practice

In order to promote high quality and safe care, nurses need ongoing professional development. It is imperative for healthcare settings to provide relevant education opportunities to enhance nursing care and practice. Further hospitals must be responsible for providing continuous improvement strategies including education and skills development sessions to make sure nurses have the knowledge and tools to provide nursing care safely and appropriately.

Recommendations

Based on the results of this research, it is recommended that the Ministry of Education and Training (2007) of Viet Nam add port-a-cath care topics to the Bachelor of Nursing program curricula in the country. Further, staff nurses and head nurses must have mandatory training on using and maintaining port-a-caths. Finally, it would be incredibly beneficial to update the standards and guidelines of patient care across hospitals in Vietnam and include the latest guidelines on nursing care of port-a-cath devices.

Conclusion

This study provided rich data about nurses' knowledge regarding the care of hospitalized patients with a port-a-cath. Major findings of this exploratory foundational study were as follows: (a) after a planned educational offering, nurses' knowledge about the care of patients with a port-a-cath significantly increased and (b) the frequency with which nurses took care of the patient with a port-a-cath was high: 1-5 times—31.1%, 5-10 times—2.22%, and 10 times—7.8%. This finding in relation to the poor knowledge level on the pretest by these nurses provided solid evidence for the need of hospital-based education. Future research could focus on practice skills for port-a-cath care related to port-a-cath knowledge. It is important to recognize that staff nurses have a significant role in reducing the complications of port-a-caths and are directly in charge of ensuring patient safety as well as increasing the quality of hospital care.

Although the port-a-cath has been used for oncology patients in Viet Nam since 2001 and recently in HMSG, the knowledge level of the nurse who works at HMSG is limited. Even though most nurses in the study had a bachelor's degree in nursing, they

lacked knowledge of port-a-cath care since this information was not usually part of the nursing program curriculum in Vietnam. Therefore, it was alarming that the percentage of nurses who had cared for patients with port-a-cath in this study was 41.5%; yet only 8.89% of nurses had been trained to provide nursing care for port-a-caths in their previous educational experience. Therefore, this study attempted to shed light on the current situation regarding the level of HMSG nurses' expertise related to port-a-cath maintenance and use. The researcher hopes the results of this research will encourage hospital administrators to invest in educational programs and training workshops on the use of the device as well as other important nursing practices and skills throughout the hospital.

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APPENDIX A
APPROVAL FROM HOSPITAL SCIENTIFIC
RESEARCH COUNCIL

SOCIALIST REPUBLIC OF VIET NAM

Independence - Freedom – Happiness

APPLICATION FOR DATA COLLECTION PERMISSION

Dear: Director of Hoan My Sai Gon Hospital

Nurse Room of Hoan My Sai Gon Hospital

My name is Nguyen Thi Hoa

Date of birth: 18/03/1990

Address: 18M Vu Huy Tan street, ward 3, Binh Thanh district, Ho Chi Minh city

Workplace: Hoan My Sai Gon Hospital

I am a currently master student at the University of Northern Colorado, Greeley. In order to collect data and complete a graduation thesis according to the regulations of the University of Northern Colorado, USA. I hereby request that Hoan My Sai Gon Hospital Directorate consider and facilitate me to collect data at clinical unit during the period from 20/06/2019 to 25/06/2019. Project title: Effective of the training program to improve the knowledge of port-a cath care for nurse.

Yours faithfully

Ho Chi Minh, Jun 6, 2019



Confirmation of the hospital director --Approve

BS. Nguyễn Hữu Trâm Em

Signature of the writer

Nguyễn Thị Hòa

APPENDIX B
INSTITUTIONAL REVIEW BOARD APPROVAL



Institutional Review Board

DATE: July 10, 2019

TO: Nguyen Hoa, Bachelor
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1444551-3] EFFECTIVE OF THE TRAINING PROGRAM TO IMPROVE THE KNOWLEDGE OF PORT-A-CATH CARE FOR NURSE

SUBMISSION TYPE: Revision

ACTION: APPROVAL/VERIFICATION OF EXEMPT STATUS

DECISION DATE: July 10, 2019

EXPIRATION DATE: July 10, 2023

Thank you for your submission of Revision materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

Thank you for submitting your revised materials. There were a couple changes on the consent form that were not made. I have revised those for you and included the final approved consent form in your attachments. Please be sure to use this version with your participants. You are now free to begin recruitment and data collection.

Thank you!

We will retain a copy of this correspondence within our records for a duration of 4 years.

APPENDIX C

**CONSENT FORM FOR HUMAN PARTICIPANTS
IN RESEARCH: ENGLISH AND VIETNAMESE**



Institutional Review Board

CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH
UNIVERSITY OF NORTHERN COLORADO

Project Title: Effective of the training program to improve the knowledge of port-a-cath care for nurse

Student Researcher: Nguyen Thi Hoa

Research Advisor: Faye Hummel, RN, PhD, CTN-A, ANEF, School of Nursing

Purpose: The purpose of assessing the level of knowledge about caring for patients with port a cath.

Objective: This project sets to

- Determine the rate of staff nurse have right knowledge of port a cath care before training for staff nurse;
- Determine the rate of staff nurse have right knowledge of port a cath care after training for staff nurse;
- Compare the difference of knowledge level before and after training for staff nurse.
-

Participants will receive a questionnaire (as a pre-test) which have a clearly instruction to do. After 20 minutes, researcher will collect the questionnaire.

Next, Researcher will train on knowledge of taking care of port- a- cath for patients, content: basic information about port- a- cath, taking care of port a cath and complications. Training time: 40 minutes.

Then, researcher will give the questionnaire to the study participants (post-test- 20 minutes). Researcher will use the same questionnaire for both the pre- and post-test. Researcher collected the questionnaire and thank you. Total time: 80 minutes.

All responses will be kept confidential and anonymous. All questionnaires will be scanned into a password protected computer and then “shredded” (permanently destroyed). All study data and information will then be kept on a thumb drive in a locked drawer in a locked cabinet. There are no anticipated risks by participation in this survey. If you complete the survey, it will be assumed that you have communicated consent for your participation. You may keep this form for future reference.

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision

will be respected and will not result in loss of benefits to which you are otherwise entitled.

Please take your time to read and thoroughly review this document and decide whether you would like to participate in this research study. If you decide to participate, your completion of the research procedures indicates your consent. Please keep or print this form for your records. If you have any concerns, please contact the Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

Please give the completed questionnaire to the researcher (the one who gave you the form).

Committee Contact information:

Student Researcher: Nguyen Thi Hoa, Master's -student

Email: hoa.nguyen.rainbow@gmail.com or hoa.nguyen1@hoanmy.com

Phone: (84 8) 984567459

Research Advisor: Faye Hummel, RN, PhD, CTN-A, ANEF, School of Nursing Email: Faye.Hummel@unco.edu



Institutional Review Board

MẪU ĐỒNG Ý CHO NGƯỜI THAM GIA NGHIÊN CỨU TRONG NGHIÊN CỨU TRƯỜNG ĐẠI HỌC BẮC COLORADO

Tên đề tài: Hiệu quả chương trình tập huấn kiến thức chăm sóc buồng tiêm tĩnh mạch dưới da của điều dưỡng

Sinh viên nghiên cứu: Nguyễn Thị Hòa

Người hướng dẫn: Faye Hummel, RN, PhD, CTN-A, ANEF, School of Nursing

Mục đích: Đánh giá hiệu quả chương trình tập huấn kiến thức chăm sóc người bệnh có buồng tiêm tĩnh mạch dưới da của điều dưỡng tại Bệnh viện Hoàn mỹ sài gòn năm 2019.

Mục tiêu:

- Khảo sát tỉ lệ ĐD có kiến thức đúng trước khi huấn luyện kiến thức chăm sóc người bệnh có buồng tiêm dưới da.
- Khảo sát tỉ lệ ĐD có kiến thức đúng sau khi huấn luyện kiến thức chăm sóc người bệnh có buồng tiêm dưới da.
- So sánh tỉ lệ ĐD có kiến thức đúng trước và sau khi huấn luyện kiến thức chăm sóc người bệnh có buồng tiêm dưới da.

Trước tiên nghiên cứu viên sẽ gửi cho bạn 1 bộ câu hỏi để các bạn trả lời theo hướng dẫn cụ thể trong vòng 20 phút, sau đó thu lại. Tiếp theo các bạn sẽ được nghiên cứu viên huấn luyện về chăm sóc buồng tiêm dưới da, cách chăm sóc, các thông tin cần thiết và các biến chứng thường gặp trong vòng 40 phút. Sau đó các bạn sẽ được phát lại bộ câu hỏi post test (giống pre test) và thực hiện trả lời lại khoảng 20 phút. Thu lại bộ câu hỏi và kết thúc.

Tất cả các phản hồi sẽ được giữ bí mật và ẩn danh. Tất cả các dữ liệu sẽ được lưu vào một máy tính được bảo vệ bằng mật khẩu, các bản tài liệu giấy sẽ được hủy bởi máy cắt giấy. Tất cả dữ liệu và thông tin nghiên cứu sau đó sẽ được lưu giữ trong một tủ có chìa khóa. Không có rủi ro dự đoán khi bạn tham gia vào cuộc khảo sát này. Nếu bạn hoàn thành khảo sát, bạn đã truyền đạt sự đồng ý cho sự tham gia của bạn. Bạn có thể giữ mẫu này để tham khảo trong tương lai.

Sự tham gia là tự nguyện. Bạn có thể quyết định không tham gia vào nghiên cứu này và nếu bạn bắt đầu tham gia, bạn vẫn có thể quyết định dừng bất cứ lúc nào. Quyết định của bạn sẽ được tôn trọng và sẽ không dẫn đến việc mất các lợi ích mà bạn được hưởng.

Đọc xong những điều trên và có cơ hội hỏi bất kỳ câu hỏi nào, vui lòng ký tên bên dưới nếu bạn muốn tham gia vào nghiên cứu này. Một bản sao của mẫu này sẽ được trao cho bạn để giữ lại để tham khảo trong tương lai. Nếu bạn có bất kỳ mối quan tâm nào, xin vui lòng liên hệ với Văn phòng Nghiên cứu, Kepner Hall, Đại học Bắc Colorado Greeley, CO 80639; 970-351-1910.

Vui lòng cung cấp sự đồng ý này và bảng câu hỏi hoàn thành cho nhà nghiên cứu (người đã đưa cho bạn mẫu đơn).

Thông tin liên lạc:

Nhà nghiên cứu sinh viên: Nguyễn Thị Hoa, Sinh viên điều dưỡng.

Email: hoa.nguyen.rainbow@gmail.com or hoa.nguyen1@hoanmy.com

Phone: (84 8) 984567459

Người hướng dẫn: Faye Hummel, RN, PhD, CTN-A, ANEF, School of Nursing Email:

Faye.Hummel@unco.edu

APPENDIX D
QUESTIONNAIRE

PART I. DEMOGRAPHIC

Instructions: My colleague please fill in your personal information in the box or write circle in your answer

1. Age:.....
2. Sex:.....
 - Male Female
3. Number of years working as a nurse: years months.
4. Number of years working as a nurse in HoanMy:.....years.....months.
5. Unit working in hospital.....
6. Highest education level:
 - a. Intermediate b. College
 - c. University d. Postgraduate
7. You are attending classes:
 - a. Associate college
 - b. University transfer
 - c. Master
 - d. Transformation
 - e. No
8. Previous education about port-a-cath care:
 - a. Yes b. No
9. Ignore this question if you haven't been trained to take care of port-a-cath
 You were trained to take care port-a-cath times
 First time: AtNumber of hours:..... Previouslymonths ... years.

The second time: AtNumber of hours:Previously months ...years.

10. Number of times you took care of the patient with port-a-cath:

- a. Never
- b. 1-5 times
- c. 5-10 times
- d. > 10 times

11. The number of times you have directly established the transmission line or removed the line for port-a-cath on the patient:

- a. Never
- b. 1-5 times
- c. 5-10 times
- d. > 10 times

12. They need to be trained in knowledge and skills to take care of the subcutaneous injection chamber:

- a. Yes
- b. No

PART II. KNOWLEDGE OF NURSES FOR TAKE CARE PORT-A-CATH

The purpose of these questions is access the knowledge of the care port-a-cath. My colleagues please circle one of the best answers:

A. ABOUT PORT-A-CATH

1. Port-a-cath is composed of

- A. 1 part: chamber
- B. 2 parts: chamber and catheter

- C. 3 parts: chamber, catheter, fixed parts
 - D. 4 parts: chamber, catheter, fixed parts and transitional parts
2. There are several types of port-a-cath
- A. Only 1 type
 - B. 2 types: single port, double port
 - C. 3 types: single port, double port and three port
 - D. 4 types: single port, double port, triple port and combination port.
3. Port-a-cath is usually placed in the following veins, except:
- A. External vein
 - B. Vein under the veins
 - C. Arm veins
 - D. Visible veins
4. Case which physician order insert port-a-cath for patients
- A. Diseases related to the digestive system or prognosis need to use intravenous nutrition for a few weeks.
 - B. Stable cancer treatment, planned to use injection chamber for palliative care and pain treatment with a prognosis of less than 3 months.
 - C. Medication needs to be transmitted into the central vein, blood transfusion, and infusion for 2 weeks.
 - D. The cancer needs to be repeated repeatedly and the drug can cause venous damage or thrombosis
5. Contraindication to insert port-a-cath for patients:
- A. High risk of venous thrombosis

- B. The patient has no coagulopathy
- C. Platelets above 50,000 / m³
- D. Stable cancer treatment, planned to use injection chamber for palliative care and pain treatment with prognosis over 6 months

6. Total average needle piercing times on port-a-cath in patient:

- A. 1000 - 2000
- B. 2000 - 3000
- C. 3000 - 4000
- D. 4000 – 5000

7. Physician's order is used for postoperative testing to confirm the position of port-a-cath:

- A. Radiology
- B. Ultrasound
- C. MSCT
- D. MRI

8. The first time Vietnam insert port-a-cath for patients:

- A. 2001
- B. 2005
- C. 2010
- D. 2015

B. TAKING CARE OF POR-A-CATH

9. The average time for postoperative wounds to insert port-a-cath in patient's body:

- A. 1 week

B. 2 weeks

C. 3 weeks

D. 4 weeks

10. For patients with port-a-cath, nurse will change the dressing:

A. 2 times / day or it is wet

B. Once a day or it is wet

C. Every 2 days or it is wet

D. Every 3 days or it is wet

11. After 3 days of hospitalization and chemotherapy transmitted through port-a-cath, Mr. Nam will discharge. He was advised by a doctor 3 months later to return to re-examination. You are nurse taking care of Mr. Nam, when Mr. Nam is discharged from the hospital, he will be instructed that Mr. Nam will come to a medical facility near his home or hospital to wash port-a-cath according to the dose of heparin recorded in the discharge certificate:

A. Every 2 weeks

B. Every 4 weeks

C. Every 6 weeks

D. Every 8 weeks

12. Mrs. An was hospitalized with gastrointestinal infection. She has a port-a-cath. The doctor order to infuse NaCl 0.9% 500ml XXX drop/min through port-a-cath. After the end of the transfusion, nurse sees the file and knows that Mrs. An will give an extra bottle of Metronidazole 500mg in tomorrow. Nurse should wash port-a-cath with a minimumml 0.9% NaCl, threeway lock and block button.

- A. 5 ml
- B. 10ml
- C. 15ml
- D. 20ml

13. Skin disinfectant solution in the process of insert a transmission line for por-a-cathch is:

- A. Povidine 10%
- B. 0.9% Natriclorua
- C. Old oxygen
- D. Povidine 10% dilute sodium 0.9% in a ratio of 1: 1

14. After insert the transmission line for port-a-cath, the needle can save at maximum in port-a-cath:

- A. 2 days
- B. 3 days
- C. 5 days
- D. 7 days

15. After phycisian finishes the process of insert port a cath, the nurse can immediately infuse the patient through port a cath. Particularly chemical transfer should be done:

- A. After 24 hours
- B. After 48 hours
- C. After 72 hours
- D. After 1 week

16. Type of needle used to inject directly into port-a-cath:

- A. Cytocan needle
 - B. Needle thread is smaller than 24G
 - C. Kim butterfly
 - D. Needle of syringe from 3ml-5ml
17. The size of the needle most commonly used to inject directly into port-a-cath in adults is:
- A. 1 1/2 inch, 19G needle
 - B. Needle 1 inch, 22G or 24G
 - C. Needle 1 inch, 17G or 18G
 - D. Needle 1 inch, 19G or 20G
18. Proportion of Heparin and NaCl 0.9%, then take 3ml to flush port –a-cath in the long time no use:
- A. 10,000 I.U heparin in 10 ml NaCl 0.9%
 - B. 1000 I.U heparin in 10 ml NaCl 0.9%
 - C. 100 I.U Heparin in 10 ml NaCl 0.9%
 - D. 10 I.U heparin in 10 ml NaCl 0.9%
19. To prevent catastrophic catheter complications, tearing of port-a-cath requires:
- A. Use syringe smaller than 10ml
 - B. Do not try to use pump pressure when the injection chamber is blocked
 - C. Check the needle position by retracting the syringe
 - D. When plugging the needle, do not plug the bottom of the injection chamber
20. Which of the following statements is CORRECT when taking care of port-a-cath:
- A. Comply with clean techniques when taking care of port-a-cath

- B. Assess the skin where the needle is located
 - C. Pump the right method to clean port-a-cath and keep normal pressure in port-a-cath
 - D. Do not use the syringe <10ml to pump
21. Technique to insert the transmission line for port-a-cath, Degrees for needle should be inserted to ensure safety:
- A. 90 degrees
 - B. 45 degrees
 - C. 30 degrees
 - D. 15 degrees
22. Which of the following statements is CORRECT in the infusion process for patients with port-a-cath:
- A. Before infusing another infusion solution, rinse the infusion chamber with a 5ml syringe containing NaCl 0.9%
 - B. Finish transmission should rinse port-a-cath with 10ml NaCl 0.9%
 - C. Need to ensure a normal port –a-cath before use
 - D. Should pump with strong pressure when transmitting
23. When suspecting a transmission system in a port a cath is obstructed, nursing should NOT:
- A. Give the patient a change of posture and take a deep breath
 - B. Instruct patients to cough and try to withdraw with 10ml syringe containing 0.9% NaCl
 - C. Pump 10ml 0.9% NaCl with more pressure than usual
 - D. Check if the line is twisted or folded.

24. The avoidance of repeated needle injections in insert the infusion line for port-a-cath in order to:

- A. There is time to wait for the silicon membrane of port-a-cath to be closed
- B. Avoid causing psychological damage to patients
- C. Ensure the principle follows the standards of infection control
- D. Assess the location of needle retraction when stabbing the needle incorrectly:
bleeding, swelling

25. Which syringe size is inappropriate when used in port-a-cath:

- A. 5ml
- B. 10ml
- C. 20ml
- D. 50ml

26. Causes when the infusion does not flow in port-a-cath, EXCEPT:

- A. Because the wiring system is folded, twisted
- B. Due to the patient's posture
- C. Due to catheter pressure
- D. Needle slips out of the membrane of port-a-cath

27. Which of the following statements is INCORRECT when counseling patients with port-a-cath:

- A. Patients can participate in mild to moderate activities, avoiding strong activities such as playing golf, lifting weights, swimming ...
- B. The patient can safely take an MRI scan with magnetic resonance imaging (MRI) with a static magnetic field ≤ 3.0 Tesla

- C. The metal detector at the airport will not harm the patient's port-a-cath
- D. Port-a-cath is not in use and the newly drawn needle can bathe and move gently

C. COMPLICATIONS IN THE CARE OF PORT-A-CATH

28. Pharyngeal edema where a catheter is inserted in a patient with a port-a-cath thinking immediately about the following complications:

- A. Infection
- B. Circuit switches
- C. Tearing port-a-cath
- D. Broken needle

29. Nurse should comply with the following principles to prevent complications of infection in port-a-cath, EXCEPT:

- A. Observe the sterile technique when taking care of port-a-cath and when performing the infusion orders
- B. Monitor the skin where the needle is located
- C. Do not plug the needle when the skin at port-a-cath shows signs of infection
- D. Re-place the needle at the location you just pulled

30. The most common complication in patients with port-a-cath is:

- A. Infection
- B. Hemorrhage
- C. Break the catheter
- D. Tearing port-a-cath

31. Expressions of chest pain, dyspnea, cough, anxiety and fever occur in patients with port-a-cath suggesting:

- A. Pulmonary embolism
- B. Air embolization
- C. Syndrome Twiddlers
- D. Syndrome F. Pinch-off