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A study to identify the knowledge on the management of peripheral venous catheters among nursing students at University of Thi-Qar in a view to develop nursing care protocol

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Abstract---Background: Adherence to the best standards of nursing practice is the fundamental principle to improve patient outcome and prevent nursing procedure related-infections. Venipuncture is the most common invasive procedure performed in nursing care. Its poor performance could expose patients to bloodstream-related infections and generating major economic costs for health service providers. Nurses have a crucial role in the management of peripheral venous catheters across all health care settings. Aim of the study: The aim of this study was to assess nursing students' knowledge towards management of peripheral venous catheters evidence-based guidelines. This is the first Iraq study specifically designed to assess knowledge of management of peripheral venous catheters. The study was undertaken to inform curriculum development and to improve the resultant quality of care and patient health outcomes. Results :The study result showed that nursing students' had good knowledge 5 (8.33%) and 50 (83.33%) of them were having average knowledge, and 5 (8.33%) were having poor Conclusions: In general, the study referred to a low mean total of knowledge score of 3rd year post-basic nursing students that needs to be improved. knowledge.

Keywords---peripheral venous catheters, nursing students, nursing college, nursing protocol.

Introduction

Venipuncture A procedure in which a needle into a vein to obtain a used to take blood from a vein, sample of the biochemical, or bacteriological analysis .Venipuncture may also be done to remove extra red blood cells from the blood, to treat certain blood disorders. Also called blood draw and phlebotomy. Peripheral vascular catheters (PVC) are the most frequently used invasive medical devices in hospitals, with 330 million sold each year in the USA alone . One in three UK inpatients at any one time has at least one PVC in situ according to the Scottish National Prevalence survey ^{1,2}. Nurses staff are at the forefront of provide Intravenous therapy . It is declared that only trained and competent personnel using strict aseptic techniques should be involved in Intravenous or cannula care Additionally, the Nursing and Midwifery Council (NMC), (2008) assured all practitioners must deliver care based on the best available evidence and/or best practice, and it must be kept up-to-date throughout each health professionals working life for safe and effective practice ³.Better knowledge and skill of nurses can minimize infusion-related complications and affect patient safety, satisfaction, health care costs, and length of hospital stay ⁴.

Several nursing activities are expected to be known by nursing students during their study period . Nursing students' education should be relevant, has good quality, and adhered to their future professional ⁵. A nursing or medical student requires a summed up of theoretical knowledge and skills to effectively serve with their profession . Despite the usefulness of clinical guidelines, it is declared that there is still a lack of knowledge adherence to guidelines. Assessing nursing students' knowledge about PVC management is essential to recognize their level of understanding about PVC ⁶. However, there are limited pieces of evidence on nursing students' knowledge of evidence-based guidelines on the peripheral venous catheter are limited ⁷.

These guidelines have been developed by Center for Disease Control (CDC) for healthcare personnel who insert intravascular catheters and for persons responsible for surveillance and control of infections in hospital, outpatient, and home healthcare settings. ⁸. Based on these guidelines recommendations, studies have been conducted to assess nurses' adherence to these guidelines. A multicenter survey from Italy reported that the low mean level (mean = 5.3) of staff nurses' knowledge ⁹. Another study survey In Australia and New Zealand, a of pediatric ICU nurse knowledge found the mean total knowledge score of 5.5 ¹⁰. Likewise, a pilot study among Jordanian oncology nurses displayed a low mean level of knowledge (2.6) ¹¹. Evidence showed that a better test score was associated with a higher level of education, an increased year of training experience, wards attended and an area of work ¹².

Theoretical Framework

Bandura's theory of self-efficacy indicates that high confidence in knowledge and skills influences a person's persistence with challenging tasks such as patient safety. Hence, confident clinicians are likely to believe their actions and decisions shape events¹³ and are therefore more likely to persist with efforts to improve patient outcomes, such as management of peripheral venous catheters and prevention to complication. As nurses have the opportunity to significantly impact this problem¹⁴, it is important that student nurses' are educationally prepared to contribute to management of peripheral venous catheter and prevention to complication, both during their time as students and when they become Registered Nurses. It is essential that graduate nurses have sufficient knowledge and skills to management of peripheral venous catheters and to prevention to complication.

To our knowledge, this is the first study aimed to evaluate post-basic nursing students' knowledge using evidence-based guidelines to prevent infection related to a peripheral venous catheter in Iraq. The finding of the present study is a useful baseline for future similar studies for improving nursing students' knowledge. It also gives direction to Thi-qar University nursing educators, driving forces, for their future roles to determine nursing education curriculum and standards, and prepare students to successfully acquire knowledge. Because of the impact of student nurses' knowledge on patient safety and outcome, the current study aimed to examine post-basic nursing students' knowledge of evidence-based guidelines about peripheral venous catheter procedure management.

Material and Methods

Design of the Study: a quantitative approach with descriptive study was carried out to identify the knowledge on the management of peripheral venous catheters among nursing students at Thi-qar University. The study was carried out over a 12-month period during the period from January 8, 2021 to July 5, 2021.

Administration Arrangement: after getting the approval of the council of nursing college and clinical research ethics committee the study, the researcher submitted a detailed description including the objective and methodology (questionnaire) of the study and distributed it to each department involved in the study in nursing college.

Ethics approval and consent to participate: After explaining the study objective to him / her, the researcher obtained an independent, informed verbal consent to participate from each nursing student. And written informed consent was taken from all participants before enrolled to participate in the study. All voluntary participants were provided it by filling it in the written questionnaire. The participants also were ensured about the anonymity and confidentiality of the data as well as voluntary participation in the study. Furthermore, the students also were informed that they could withdraw from the study at any time they wanted.

The Sample of the Study : All post-basic nursing students who were studying at the time of data collection ($n = 60$) were included in the study. A convenience sample was employed to collect data from all 3rd year post-basic nursing students who attended theoretical lessons about the management of PVCs (expected from the first year of the degree program). Nurses who were seriously sick/ill and missed class during the data collection period were excluded from the study.

The sample size: The sample size ($n = 60$) was determined by a single population proportion formula using the Cochran formula with precision of 0.3% and confidence interval of 95%.

Data analysis: We asked department heads to supervise the study and assign one of their nursing educators for facilitating data. The department heads were responsible to ensure completion of the questionnaire, avoid consulting other students and resources/references needed to answer the items. The participants were informed about the purpose of the study, to individually administer, complete and 20 minutes allowed for returning the questionnaire. Questionnaires were distributed and administered to all voluntary participants available during the data collection at the same. Data facilitators collected each filled questionnaire in an envelope to guarantee the confidentiality and anonymity.

The Study Instrument: for the purpose of the present study, a questionnaire was designed and constructed by the researcher to measure the study variables. Such a construction was employed through the review of literature and related studies. The questionnaire consisted of two parts which are Part I: Socio-Demographic Data and Clinical information, Part II: Knowledge on the management of peripheral venous catheters.

Statistical Analysis : The data analyzed through the application of statistical procedures and using the package of SPSS version (20). Descriptive data analysis including Mean, Frequencies (f) and percentages (%) were computed for variables and group comparisons done using the chi-squared test .

Validity: The validity of the instrument was established through a panel of (6) experts. to investigate clarity, relevancy, and adequacy of the questionnaire to achieve study objectives.

Reliability: The results of the reliability showed a very high degree of accuracy and internal consistency of the main sections of the questionnaire answers, all of which were measured using the main statistical parameter: Alpha Cronbach, revealing that the coefficient of the individual correlation is (0.73).

Result

Table 1. Distribution of the studied groups according to Sociodemographic characteristics

SDCv.	Classes	F	%
Age Groups	20-21	38	(63.33)
	22-23	18	(30)
	24 & Above	4	(6.67)
	Total	60	100
Sources of Information	Newspaper	00.0	(00.0)
	Internet	08	(13.34)
	Book	15	(25.0)
	All the above	37	(61.66)
	Total	60	100

Table 1 shows the clinical characteristics of the study participants. With regards to their age, the majority 38 (63.33%) were 20-21 years, 18 (30%) were 22-23 years, 04 (6.67%) were 24 and above years. Regarding to the majority of sources of information of students is 01 (0%) from Newspaper, 02 (13.34) from the Internet, 03 (25%) from Book. And other students are 37 (61.66) from Newspaper, Internet, and Book.

Table 2. Distribution of the studied groups according to Sociodemographic characteristics

Variable .	Classes	F	%
Level of Knowledge	Very Good (34–44)	00.0	(00.0)
	Good (23–33)	05	(8.33)
	Average (12–22)	50	(83.34)
	Poor (1–11)	05	(8.33)
	Total	60	100

Table 2 shows the level of knowledge scores among post-basic nursing students 3rd year nursing students. The samples were having good knowledge 5 (8.33%) and 50 (83.33%) of them were having average knowledge, and 5 (8.33%) were having poor knowledge.

Discussion

This study was undertaken to determine the knowledge of towards management of peripheral venous catheters of 3rd year post-basic nursing students at Thi-qar University in Iraq. Adequate knowledge towards management of peripheral venous catheters are needed to ensure healthy outcomes for people in healthcare facilities. the study referred to a low mean total of knowledge score of 3rd year post-basic nursing students .

These results agree with results obtained from a study among Jordan oncology nurses done by (Al Qadire et al., 2017)¹¹. which indicated the low management of peripheral venous catheters knowledge scores . This may indicate that classroom educational material may not consider the full range of risk /contributory factors for complication of peripheral venous catheters ; meaning that students may not be optimally prepared for their roles in the prevention of harm to patients.

Another study conducted by (Simonetti et al., 2015⁷; Cicolini et al., 2014⁹ ; Ullman et al., 2014¹⁰) the study evaluated post-basic nursing students' knowledge of PVCs procedure management. It reflected a low mean total score (4.1±1.52). This report revealed an unsatisfactory level of knowledge of CDC's main recommendations . The present study result is lower than the previously reported results in Italy, Australia and New Zealand (mean = 5.5), and Spain.

These resources could be the lack of experienced and skilled nurse educators who are considered as input for nursing students. Nurse educators in our country (IRAQ) are hired to university for teaching as graduates from the university with null experience in clinical service, not strictly adhere to nursing curriculum and standards which in turn impedes training qualified professional nursing students. The second is lack or absence of common national guidelines, lack of sufficient equipment, and less opportunity for updated evidence in nursing areas. Furthermore, post nursing students did not read repeatedly to acquire knowledge because their curricula supported them, paying off less energy for scoring a better score. Therefore, nursing educators' adherence to the participants' curriculum as per the standards of nursing practice and providing continuous training programs about PVC procedure management as substantial key improvements recommended strongly.

Conclusions and Recommendation

The findings this study evaluated post-basic nursing students' knowledge of management of peripheral venous catheters, they were having good knowledge 5 (8.33%) , 50 (83.33%) of them were having average knowledge, and 5 (8.33%) were having poor knowledge. Further study will be necessary to extend the knowledge of nursing students about procedures of management of peripheral venous catheters involving clinical of 3rd year post-basic nursing students who have an average score and all stages post-basic nursing students .

Clinical implications

Poor knowledge toward management of peripheral venous catheters could undesirably affect preventive care strategies. Curriculum developers may find the results of this study useful to tailor specific educational programs to increase knowledge about management of peripheral venous catheters, and personal capability towards prevention and improved management of peripheral venous catheters future registered nurse cohorts.

Limitations of the study

The study presents some limitations that need to be considered. The study was monocentric and analyzed from a small size, which may affect the generalization of these findings.

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