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Study to Assess the Knowledge and Practice Among Cardiac Nurses About Infusion Therapy Using Syringe Pump

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ABSTRACT

The use of electronic syringe infusion pumps to administer therapeutic agents is a common practice in hospitals, particularly among patients who require slow injection treatments. For these patients and their practitioners, it is crucial that the administration of drugs (especially for those having a small therapeutic index) via the syringe pump be consistent, predictable, and reliable. The present study was intended to assess the knowledge and practice among cardiac nurses about infusion therapy using syringe pump. The objectives were to assess the knowledge and practice among cardiac nurses about infusion therapy using syringe pump and to find out the association between knowledge and selected variables. The objectives were to assess the knowledge and practice among cardiac nurses about infusion therapy using syringe pump and to find out the association between knowledge and selected variables. The study was done by quantitative approach and research design used was descriptive design. Data was collected from 60 cardiac nurses from SCTIMST Thiruvananthapuram, working in CSICU, CHICU, CHW and CCU. Convenient sampling technique was used for selection of samples. The data was collected using a self-administered questionnaire to assess the cardiac nurses knowledge about infusion therapy using syringe pump and check list to assess the practice. The data was analyzed and interpreted using descriptive and inferential statistics. The present study emphasized to assess the knowledge and practice among cardiac nurses about infusion therapy using syringe pump. Majority (92%) cardiac nurses had good knowledge score (26) with a maximum obtainable score of 9. For practice all participant's (100%) had good practice. There was association between knowledge and selected socio-demographic variables such as age, gender, educational qualification and years of experience.

KEY WORDS: Knowledge, Infusion therapy, Syringe pump

INTRODUCTION

Syringe pumps are essential in clinical settings for their precision in delivering fluids, drugs, or nutrients over extended periods. This is particularly important for medications that require very low infusion rates, as even slight deviations can impact patient outcomes. The ability to program infusion speeds and times enhances their utility, allowing healthcare providers to tailor treatments to individual patient needs, manage pain, or maintain critical fluid balance. With advancements in technology, these pumps have become even more user-friendly and reliable, improving patient safety and care efficiency[1].

The use of electronic syringe infusion pumps to administer therapeutic agents is a common practice in hospitals, particularly among patients who require slow injection treatments. For these patients and their practitioners, it is crucial that the administration of drugs (especially for those having a small therapeutic index) via the syringe pump be consistent, predictable, and reliable. In current practice, it is nurses who are responsible for preparing and administering drugs via syringe pumps, but the steps between the prescription and administration of the drug involve many participants, not only nurses. This multiplicity of actors and actions increases the risk of error[2].

Education and implementation of technology is imperative to improve medication safety and prevent work arounds or unintended consequences of safety technology[3].

Syringe pumps are vital for delivering precise amounts of medication, especially in pediatric care where dosages often need to be very accurate due to smaller body sizes. Their ability to control infusion rates allows for sustained delivery of medications over extended periods, which is crucial for managing conditions that require continuous treatment. Additionally, in research settings, syringe pumps facilitate accurate dosing for experiments involving small volumes, ensuring consistency and reliability in results. Their versatility makes them essential tools in both clinical and research environments[4].

Smart IV pumps have been introduced to enhance safety in medication administration by minimizing errors. These pumps often feature advanced technology, such as drug libraries, dose error reduction systems, and real-time monitoring, which can help healthcare providers deliver medications more accurately. However, while they have the potential to reduce errors, studies on their effectiveness in improving overall medication safety have shown mixed results. Some research suggests that while Smart IV pumps can reduce specific types of errors, the complexity of their use and reliance on user input can sometimes lead to new types of errors. Continuous training and vigilance are crucial to ensure that these devices enhance patient safety as intended[5].

A study on the mixed blessings of smart infusion devices and health care, highlights several important aspects of technology integration in clinical practice. The study showed that how technology and individual and team behaviour influence each other, as well as care performance and outcome. There were numerous examples of nurses using pump safety features in the manner other than how they were intended to be used. The study data suggested that even with features that are intended to promote safe use, nurses still experience conditions that may induce error, or waste time and resources[6].

Sree Chitra Tirunal Institute For Medical Sciences and Technology (SCTIMST) is a tertiary care center. Majority of patients in cardiac intensive care units and wards are getting infusion therapy in this hospital. Nurses are working in these intensive care units and wards are involved in administering medication using syringe pump should have enough knowledge about infusion therapy using syringe pump. Practices of filling drugs in infusion pump require extreme care to ensure accuracy as well as uniform concentration. So this study is undertaken to assess the knowledge and practice among cardiac nurses about infusion therapy using syringe pump.

STATEMENT OF THE PROBLEM

Study to assess the knowledge and practice among cardiac nurses about infusion therapy using syringe pump.

OBJECTIVES OF THE STUDY

1. To assess the knowledge and practice among cardiac nurses about infusion therapy usingsyringe pump.

2. To find out the association between knowledge and selected variables.

OPERATIONAL DEFINITION

KNOWLEDGE

In this study knowledge refers to analyze the scores obtained from the cardiac nurses (CSICU, CHICU, CCU, CHW) using a self structured questionnaire about infusion therapy using syringe pump.

PRACTICE

In this study practice refers to using an observational checklist, assess the practical ability of cardiac nurses during starting the infusion therapy using syringe pump.

CARDIAC NURSES

In this study cardiac nurses refers to registered staff nurses from both sex, either permanent or temporary those who are working in CSICU, CHICU, CCU AND CHW.

SYRINGE PUMP

In this study syringe pump refers to a device, used to gradually administer small amounts of fluid (with or without medication) to a patient.

MATERIAL AND METHODS

RESEARCH DESIGN

The research approach adopted for this study was quantitative approach and the design used for this study was descriptive design.

SETTING OF THE STUDY

This study was conducted in various department of SCTIMST Thiruvananthapuram such as CSICU, CHICU, CCU and CHW.

POPULATION

The population for the study was cardiac nurses.

SAMPLE

The sample for the present study was cardiac nurses working in CSICU, CHICU, CCU and CHW in SCTIMST, Thiruvananthapuram.

SAMPLING TECHNIQUE

With the help of convenient sampling technique, 60 cardiac nurses were selected as sample for the study.

DEVELOPMENT AND DESCRIPTION OF TOOLS IN THE STUDY

The research tool was devised on the basis of related literature and under the guidance of subject experts. An intense search of literature and extensive consultation with experts in SCTIMST were done in selecting the appropriate tool. The items of the tool were collected, scrutinized, and checked for any overlapping,

cross checking were done and modification made in consultation with experts. Content validity done by seven expert. Additions and suggestions given by the expert were incorporated and tool was finalised.

Tool-I

Questionnaire to assess the socio- demographic data it consist of five questions regarding, age, gender, unit of working, qualification and years of experience.

Tool-II

In tool II knowledge of cardiac nurses are assessed by using self-structured multiple-choice questionnaire with 4 responses.

There are 9 questions based on the knowledge assessment of cardiac nurses in the field infusion therapy using syringe pump. Total 15 minutes was given to answer the questionnaire; each correct answer carry one mark and wrong answer carry zero marks.

MARKS	RANKING
Below 5	Poor
5-8	Good
9	Very good

Tool-lll

In tool lll check list practice of the cardiac nurses is observed while starting infusion therapy using syringe pump. There are 13 practice while starting the infusion therapy using syringe pump. Each correct practice carry one mark and wrong practice carry zero marks.

MARKS	RANKING
Below 9	Poor practice
12-9	Good practice
13	Very good practice

DATA ANALYSIS

Analysis of data were done using SPSS. The socio- demographic variables and knowledge were analyzed by descriptive statistics and expressed in terms of frequency and percentage. Association between knowledge and socio- demographic variables were assessed by independent t test.

RESULTS

Socio- demographic data.

Among 60 cardiac nurses, majority of cardiac nurses 53% belonged to the age group of 21-30.Among the sample 80%were female and most of them belonged to an educational qualification of BSC Nursing (70%) and majority of them had >6 years of experience (60%). Among 60 sample, 85% had good knowledge Score (5-8) and 7% had very good knowledge score 9 and 8% had poor knowledge score < 5. For practice all participant's (100%) had good practice.

Association between knowledge and selected demographic variables

The study revealed that there was statistically significant association between knowledge and age (p=0.0001), years of experience (0.0001).

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