

Knowledge of Staff Nurses Regarding Medical Device Related Pressure Injury (MDRPI)

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Abstract: A study was conducted to assess staff nurses' knowledge Regarding Medical Device Related Pressure Injury (MDRPI) in Kannur. The study aimed to assess staff nurses' knowledge of Medical Device Related Pressure Injury (MDRPI). To investigate the association between staff nurses' knowledge of Medical Device Related Pressure Injury (MDRPI) and their selected demographic variables. The study used a non experimental descriptive design. The sample included 30 nurses from St. Martin De Porres Hospital in Cherukunnu, Kannur. The data was gathered using a self - administered questionnaire comprising 35 questions. Descriptive and inferential statistics, such as percentage and frequency, were used to analyse the data. Using the chi - square test, the association between knowledge and some specific demographic variables was examined. The findings of the study revealed that majority of staff nurses, 12 (14%) had moderately adequate knowledge, 9 (30%) staff nurses had adequate knowledge, 9 (30%) had inadequate knowledge, and none of the staff nurses had excellent knowledge regarding Medical Device Related Pressure Injury (MDRPI). Thus, the investigator planned and executed a training programme on Medical Device - related pressure injury for the staff nurses at St. Martin De Porres Hospital.

Keywords: knowledge, staff nurses, Medical Device Related Pressure Injury (MDRPI).

1. Introduction

In healthcare settings, pressure injuries caused by medical devices are frequent. It can be described as a localized injury caused by continuous pressure from a medical device to the skin or underlying tissue. The device's configuration is identical to that of the skin or tissues. Prolonged pressure applied beneath or next to a medical device, such as an intravenous line, catheter, drain device, anti - embolism stocking, intermittent pneumatic compression garments, endotracheal tube or ties, etc., can cause damage to the skin. Although these devices might be an essential component of a medical intervention, caution should be exercised to reduce the possibility of prolonged or excessive pressure exposure—which is the main factor contributing to pressure - related injuries. It was referred to as "Bedsore of the ear" more than 40 years ago.

Any medical device, including splint casts, needle caps, oxygen tubing or masks, tracheal collars, BI PAP, CPAP, masks, IV tubing's, bedpans, cervical collars, excessively tight dressings, and prosthetics, can result in a pressure injury. According to reports, patients who are bedridden for extended periods of time experience pressure injuries related to medical devices. These injuries typically affect the head, neck, face, ankle, foot, coccyx, buttock, and sacrum. Thirty to seventy percent of pressure injuries related to medical devices are said to occur in the ears. Tissue ischemia brought on by pressure damage eventually results in tissue death

The first prospective data on medical device ulcers in children aged 21 days to 8 years was published by Curely et al. in 2003.8% of children developed ulcers as a result of medical devices, accounting for 27% of all ulcerations. The most often used equipment were the oxygen saturation

probe, the bi - level positive airway pressure mask, and the ET tube (74%). Research has demonstrated an inverse relationship between the baby's gestational age and the incidence of pressure - related ulcers from continuous positive airway pressure devices in premature infants. The incidence of pressure - related ulcers was 90% in babies under 28 weeks of gestation, while it was 28% in babies 32 weeks and older. Additionally, the results showed that, out of 2, 745 paediatric patients over a two - year period, 0.5% of patients who are surveyed developed pressure related ulcers from medical devices.

According to research by Davis et al., wearing a neck collar for five days resulted in 33% of pressure ulcers and 44% of half - full thickness wounds. In patients using vasopressors in particular, oximetry probes resulted in 5% of ulcers.73 percent of pressure ulcers caused by medical devices were on the head, face, or neck due to cervical collars, oxygen tubing, or NG tubes; the remaining twenty - three percent were on the heel, ankle, or foot as a result of immobilizers, support stockings, or boots.

The optimal nursing intervention can help avoid pressure injuries related to medical devices. In addition to improving patient health, developing and implementing various programmes and intervention strategies will help nurses become more knowledgeable and can help prevent pressure injuries related to medical devices.

There are distinct aspects to the risk of ulceration and preventive measures for each of the numerous medical devices. The first step in any preventative strategy should be to acquire medical devices, like heel off - loading devices and elastic stockings, in the proper size. It's not a one - size - fits - all situation here. Plans for prevention need to be thorough. Medical professionals ought to be

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knowledgeable about the devices that have caused issues within their healthcare system. The best practices for preventing health issues related to medical devices should be understood by clinicians. In order to create a more comprehensive process for performance improvement, an interdisciplinary team approach is required.

Regular skin checks under devices, frequent device repositioning, the use of secured devices when appropriate, ear protection for oxygen tubing, avoiding placing devices on already damaged tissue, additional padding under devices, and, if at all possible, rotating the placement of NG or ET tubes are some preventive measures. A patient's sensation should be evaluated, their blood flow should be sufficient, they should not be lying down on the tubing, and staff members should be trained in proper device use and pressure injury prevention. The most vulnerable patients are those who are paralysed, anaesthetized, sedated, Without nursing supervision, the pressure applied by a medical device can cause tissue damage, which can happen quickly and become severe, especially if the device is placed over a bony or cartilaginous area such as the nose, ear, wrist, or malleolus. Device - related pressure injury is a common iatrogenic problem, accounting for up to half of all facility - acquired pressure ulcers. Key activities for preventing medical device - related pressure injuries include an ongoing assessment of skin integrity and the use of pressure - reducing devices. able to respond to pressure, or who have a malfunctioning motor - sensory system.

2. Literature Survey

The review of literature was based on studies related to prevalence, awareness, incidence, locations and prevention of Medical Device Related Pressure Injury (MDRPI).

3. Problem Definition

"A study to assess the knowledge of staff nurses regarding Medical Device Related Pressure Injury (MDRPI) in a selected hospital, Kannur. "

3.1 Objectives of the study

- To assess the knowledge of staff nurses regarding Medical Device Related Pressure Injury (MDRPI)
- To find out the association between knowledge of staff nurses regarding Medical Device Related Pressure Injury (MDRPI) and their selected demographic variables.

3.2 Hypothesis

H1 - There will be significant association between knowledge of staff nurses regarding medical device related pressure injury and their selected demographic variables.

3.3 Operational Definition

3.3.1 Knowledge: Defined as the familiarity with medical device related pressure injury acquired through experience or education.

3.3.2 Medical Device Related Pressure Injury (MDRPI):

Refers to the injury that results from the use of devices designed and applied for diagnostic or therapeutic purposes. The resultant pressure ulcer generally closely confirms to the pattern or shape of the device.

3.3.3 Staff Nurse: Refers to a registered nurse employed by a medical facility.

4. Methodology /Approach

4.1 Research Approach

It involves the description of the plan to investigate the phenomenon under study in a structured (quantitative), unstructured (qualitative), or a combination of the two methods. Quantitative research approach was adopted to assess the knowledge of nurses regarding Medical Device Related Pressure Injury (MDRPI)

4.2 Research Design

Research design is the researchers overall plan for answering the research questions or testing the research hypothesis.

The research design used for the research study was non - experimental research category, which is descriptive design.

4.3 Variables

Variables are attributes or characteristics that can have more than one such as height or weight or variables are qualities, properties of people, things or situation that change or vary.

4.3.1 Research Variable

These are qualities, properties or characteristics which are observed and measured in a natural setting without manipulating and establishing cause and effect relationship. In this study the knowledge of staff nurses was the research variable

4.3.2 Demographic Variables

The characteristics and attributes of the study subjects are considered as demographic variables. In this study the demographic variables are age, gender, and educational status years of experience, previous knowledge, ward and experience in multi - specialty hospital.

4.3.3 Extraneous Variables

Extraneous variables are factors that are not the part of study but may affect the measurement of study variables. In this study the extraneous variables are experience in multispecialty hospital and previous knowledge regarding medical device related pressure injury.

4.4 Population

The entire set of individuals or objects have some common characteristics selected for a research study. In this study population were staff nurses.

4.4.1 Target Population

The entire population in which researchers is interested and to which they would like to generalize the research findings.

In this study the target population was staff nurses.

4.4.2 Accessible Population

The aggregate of cases that conform to designated inclusion or exclusion criteria and that are accessible as subjects of the study. In this study accessible population were staff nurses working in St. Martin De Porres Hospital, Kannur.

4.5 Sample

A part or subset of population selected to participate in research study. The sample of this study comprised of staff nurses working in St. Martin De Porres Hospital, Kannur.

4.5.1 Sample Size

The sample size of present study comprised of 30 staff nurses.

4.5.2 Sampling Technique

Sampling is the process of selecting a representative part of population

4.5.2.1 Non - Probability Sampling

Non probability sampling is a technique where in the samples are process that does not give all the individuals in population equal chance of being) gathered w selected in the sample. In this study non probability convenience sampling technique was used to select the samples.

4.5.3 Sample Selection Criteria

4.5.3.1 Inclusion Criteria

- The staff nurses who are willing to participate.
- The staff nurses who have an experience of more than one year.

4.5.3.2 Exclusion Criteria

- The staff nurses who are absent on the day of data collection

4.6 Development and Description of Tool

In the present study, self - administered questionnaire was used to assess the knowledge of staff nurses regarding medical device related pressure injury. It consisted of two sections:

Section A: This section sought information like age, gender, educational status, years of experience, previous knowledge, ward and experience in multi - specialty hospital.

Section B: In this a questionnaire on knowledge regarding medical device related pressure injury was used to assess knowledge of staff nurses, It consisted of 35 questions under the following headings as follows,

Category	Number of Questions
Basic Knowledge	3
Incidence and prevalence	2
Causes	4

Location	5
Staging	3
Risk assessment	8
Prevention	10
Total	35

4.6.1 Scoring Procedure

The correct response was scored 1 and the wrong response was scored 0. The maximum score was 35 and minimum score was 0.

Level of knowledge	Score	Percentage
Excellent	35 - 28	100 - 80
Adequate	27 - 21	79 - 60
Moderately adequate	20 - 14	59 - 40
Inadequate	<13	<39

4.7 Validity

Validity is defined as the degree to which an instrument measures what it is indented to measure. The content validation of the tool was obtained from experts in field of nursing, their opinion, correction and suggestion were considered and tool was modified.

4.8 Data Collection Procedure

A formal official permission to conduct the study was obtained from hospital authorities. The researcher introduced and verbal consent was taken from staff nurses, after providing adequate information regarding the study. And after ensuring the confidentiality of information the questionnaire was issued to the samples and collected after 30 minutes.

4.9 Data Analysis

The data was analyzed using descriptive and inferential statistics.

- Data on socio demographic factors were analyzed using descriptive statistics such as frequency and percentage.
- The association between knowledge score and selected socio demographic variables were analyzed by chi - square test.

4.10 Ethical Consideration

Ethical clearance was obtained from research committee Canossa College of Nursing, Cherukunnu. Permission for conducting study was taken from hospital authorities. Verbal consent was obtained from each staff nurses who were willing to participate in the study after discussing with each of them the purpose of study. All the staff nurses were informed that data collected is confidential and will only be used for research purpose. Keeping in mind the legal rights of subjects only those subjects who were willing to participate were included in study. Thus ethical issues were ensured in the study.

5. Results and Discussion

The present investigation was to assess the knowledge of staff nurses regarding medical device related pressure injury in a selected hospital Kannur.

5.1 Results

The study findings related to frequency and percentage distribution, of staff nurses regarding age 20 (66.6%) of nurses were <26 years old and 10 (33.33%) of the nurses were >26 years old. According to sex, majority of staff nurses 29 (96.6%) were females. According to Educational qualification 15 (50%) were B Se nurses 14 (46.6%) were GNM nurses and 1 (3.3%) were Post Basic B. Sc nurses. According to Area of clinical practice 12 (40%) of them were in special ward, 9 (30%) were working in critical care, 8 (26.7%) in medical ward and 1 (3.3%) were in surgical ward. According to present experience majority of them 24 (80%) were having experience of 2 - 3 years, 2 (6.67%) were having 4 - 5 years of experience and 4 (13.3%) were having experience of >5 years. According to previous experience in multi - specialty hospitals 21 (70%) had no previous experience in multi - specialty hospital and among those who are having 50 (16.6%) of them had experience of 1 - 3 years, 2 (6.67%) were having experience of <1 year and 2 (6.67%) were having experience of >5 years in multi - specialty hospital 12 (40%) had previous knowledge regarding medical device related pressure injury and 9 (30%) gained previous knowledge from books, 2 (6.67%) gained previous knowledge from supervisors, 1 (3.3%) gained previous knowledge from media.

5.1.1 Objective 1

The study finding revealed that knowledge regarding medical device related pressure injury, 9 (30%) the staff nurses had adequate knowledge, 9 (30%) had inadequate knowledge and majority of the staff nurses had moderately adequate knowledge. None of the staff nurses had excellent knowledge regarding medical device related pressure injury. So a planned teaching programme was conducted by the investigator for the staff nurses of St. Martin De Porres Hospital regarding medical device related pressure injury.

5.1.2 Objective 2

The study finding revealed that the calculated chi - square value is more than table value for the demographic variable previous experience in multi - specialty hospital at 0.05 level. Hence there is association between knowledge of staff nurses regarding Medical device related pressure injury and their selected demographic variables. Hence the formulated research hypothesis is accepted for this variable and null hypothesis is rejected.

The calculated chi - square value is less than table value for the other demographic variables at 0.05 level. Hence there is no association between knowledge of staff nurses regarding Medical device related pressure injury and their other selected demographic variables (Age, Sex, Area of clinical practice, Educational qualification, Present experience in clinical practice and previous knowledge). Hence the formulated research hypothesis is rejected and null hypothesis is accepted for these demographic variables.

5.2 Discussion

The findings of objective to assess knowledge of staff nurses regarding medical device related pressure injury which reveals that majority of the staff nurses had

moderately adequate knowledge regarding medical device related pressure injury. It can be supported by the following studies.

1. ISSM October 2017 conducted a prospective descriptive study to assess nursing staff perceptions of interventions to prevent medical device related pressure injury. Indicated nurses provide preventive interventions at a rate of at least 60%, 19.9% didn't think medical device can cause pressure ulcer. In the light of the fact medical device related pressure injury are not recognized, so comprehensive in service training program on medical device related pressure injury need to be organized in health care institution to inform nurses and enhance their awareness about prevention of medical device related pressure injury.

2. Münevver, Sonmez, Arzu Baha (2022) conducted a research to investigate the knowledge levels of nurses with regard to medical device - related pressure injuries and the factors affecting these. This descriptive and cross - sectional study was conducted with 355 nurses between December 15, 2020 and March 31, 2021. Data were collected using the Nurse Information Form and the Medical Device - Related Pressure Injuries Knowledge Questionnaire. Results The mean score of the nurses for the Medical Device - Related Pressure Injuries Knowledge Questionnaire was 22.11 ± 5.79 . The nurses obtained the highest score from the "Description" sub - dimension of the test, whereas the lowest scores pertained to the "Staging" sub - dimension. Only 23.1% of the nurses stated that they had general knowledge about medical device - related pressure injuries. A significant difference was determined between the mean scores that the nurses got from the Medical Device - Related Pressure Injuries Knowledge Questionnaire and their gender, work experience in the intensive care unit, frequency of encountering a medical device - related pressure injuries and their previous training on such injuries. In addition, a positive relationship was determined between the level of knowledge about medical device - related pressure injuries and age and seniority. It was concluded that the level of knowledge of nurses about medical device - related pressure injuries was insufficient. We therefore recommend that a regular training program be provided to nurses on medical device - related pressure injuries in order to reduce the incidence of these injuries and to provide a quality and safe care service to patients.

6. Conclusion

Medical device - related pressure injury primarily occurs on the ear from oxygen tubing and on the mouth from endotracheal tubes in patients in intensive care. Nurses are unaware of the implications of medical devices in contact with the skin, and patient medical records do not provide a useful source of information for pressure injury prevention. Peggy Kalowes 2013 developed an inter professional team to evaluate the effectiveness of skin bundle in MDRI prevention and result reveals that there was a reduction of MDRI from 0.6% to 0 in pediatrics and among adults from 0.28 to 0. Hence this prevention programme is effective to sustain a zero zone incidence of MDRI among adult and pediatrics.

Additional support, education, and monitoring of nurses at the local level is required to prevent the occurrence of medical device - related pressure injuries. Pressure injuries from medical devices are common and can cause significant morbidity in people of all ages. Pressure ulcers form in the shape of the device and are most commonly found after using oxygen delivery devices. It was discovered that using foam dressings helped to reduce the pressure on the device. Medical device - related pressure ulcers place a significant financial and clinical burden on today's health - care system. Fortunately, it is a fixed problem. To reduce the incidence of pressure ulcers, hospitals have a growing financial incentive to invest in prevention and risk mitigation strategies.

By implementing a multifaceted, evidence - based approach to the prevention and early detection of medical device - related pressure injury, hospitals can save money in the long run while also improving patient satisfaction. Medical device pressure injury is an ongoing clinical issue that warrants further investigation.

7. Future Scope

7.1.1 Nursing Practice

Nursing staff work in a variety of health care settings, from primary care to multispecialty hospitals, and play an important role in preventing medical device - related pressure injuries. As a result, nurses must have adequate knowledge of medical device - related pressure injuries and their prevention. There is also an urgent need to strengthen skills, develop newer competencies, and broaden their knowledge. So, measures such as using properly sized and secured medical devices, asking the patient if the device is irritating to them, applying prophylactic dressings to high - risk areas, and inspecting the patient's skin for any developing medical device - related pressure injury are critical for effective prevention of medical device - related pressure injuries.

7.1.2. Nursing Education

Because nurses play an important role in preventing medical device - related pressure injuries, the study also has implications for nursing education. Nurses' awareness, as well as their lack of knowledge about medical device - related pressure injury, increases the risk of such injury for patients. The head nurse must educate the subordinates about medical device - related pressure injuries.

7.1.3 Nursing Administration

Health care workers should receive formal training in the prevention and early detection of medical device - related pressure injuries. It is also necessary to establish a hospital - based monitoring system for medical device - related pressure injuries.

7.1.4 Nursing Research

One of the primary goals of nursing research is to add to the body of knowledge about nursing in order to broaden and expand its scope. It is only possible if nurses take the initiative to conduct further research. Knowledge of medical device - related pressure injury will assist nurses in developing effective strategies to address this issue, and more research involving nursing professionals is required.

7.2 Recommendation

- A study can be conducted to assess the knowledge of staff nurses regarding strategies and prevention of medical device related pressure injury
- A study can be conducted to assess knowledge of physicians regarding medical device related pressure injury
- A study can be conducted to identify difference between pressure ulcer and medical device related pressure injury.

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