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RESEARCH ARTICLE

AN INTEGRATED REVIEW OF NURSES' KNOWLEDGE ON THERAPEUTIC & DIAGNOSTIC EQUIPMENT WITH A VIEW TO DEVELOP GUIDELINES"

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ABSTRACT

Background. In modern intensive care management of critical problems, there is need to intensify the efforts in the field of advanced technological education to make the staff nurses highly aware regarding the use of therapeutic equipments & to further widen their cognitive map so as to get fruitful results in the years to come.

Objectives.1) Determine the knowledge of staff nurses regarding the use of selected therapeutic & diagnostic equipments. 2) Find out the association between the knowledge of staff nurses regarding the use of selected therapeutic &diagnostic equipments with selected demographic variables.

Design. Non-experimental descriptive research design.

Methods. This study was carried out in a group of sixty registered staff nurses working at various clinical setting of selected hospital of Bhubaneswar. Samples were selected by Non-Probability Convenient Sampling technique. A structured Questionnaire was administered to collect both demographic data & data on the knowledge of Staff Nurses.

Results. Results revealed that 53% of the total sample has good knowledge on selected therapeutic/diagnostic equipments. The mean percentage score regarding the use of mechanical ventilator was 70.2%. , the use of AED was 72.6% & ECG was 70.5%. There was significant association between knowledge of staff nurses regarding the use of selected diagnostic &therapeutic equipment with age as the Chi-Square value was 7.61

Conclusions. After analysis & interpretation of data a guideline was developed & planned to implement in the hospital for the staff nurses regarding the use of the selected therapeutic &diagnostic equipments

Relevance to clinical practice.
Nursing a patient by using therapeutic equipment is a challenge for the nurses so there is a specific need of training to the health care team within the unit according to standardized management practices

INTRODUCTION

''Practice always depends on knowledge
Knowledge promotes competence & confidence''

In modern hospital care management of critical problems, most of the patients need the use of therapeutic & diagnostic equipment during their illness. The equipments are used as lifesaving intervention, So the nurses should have adequate knowledge regarding the use of those equipments as they are constantly in touch with the patient.

Sometimes nurses fail to adopt modern or recent nursing care for the patient by using therapeutic/diagnostic equipments due to the lack of knowledge and ignorance for learning therefore, the investigators is challenged to explore the knowledge level of staff nurses in relation to the use of therapeutic/diagnostic equipments with a view to develop a standard guidelines. According to Sclauzero P. (2011), a nurse may be the first health care professional to observe the electrocardiogram when the client is an acute distress. Valuable time may be saved if the nurse is able to recognize the presence of an abnormality. Knowledge of electrocardiogram interpretation & the disease process helps the nurse in understanding of disease pathophysiology there by allowing for better clients care. Researcher's own experience, discussion with experts and the influence of new models of defibrillator, made her to realize that there is a need to educate the staff nurses regarding defibrillator. Mrs. Teena George (2011) stated that Nowadays, use of defibrillation is an ordinary level of care for clients managed in critical care and on general care units. The clients who need emergency defibrillation is a challenge to the nurses providing care. Therefore the nurses must be familiar with the equipment, complications and nursing management. In modern intensive care management of critical problems, most of the patients need artificial ventilation during illness. With the availability of a variety of ventilators and increasing medical expertise, mechanical ventilation has become easier today although it is a lifesaving intervention, mechanical ventilation can also cause serious complications stated by Shubhashin S (2010). Catherine Joseph, et.al (2004): Through this study the overall care was moderately adequate below the score of 75 %

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patients on mechanical ventilators are totally dependent on nurses so nursing personnel have a major role to play in sustaining their lives.

There is need to intensify the efforts in the field of advanced technological education to make the staff nurses highly aware of care of patients on ventilator and to further widen their cognitive map so as to get fruitful results in the years to come. In service education can be provide periodically for staff working in I C U's in meeting selected needs of patients on mechanical ventilator. Letina kely (2001) conducted a study to characterize the role of intensive care nurse, in the management of mechanical ventilator. The result of the study shows that 67% received mechanical ventilation, Out of which death occurred in 12.5%.According to the above study, investigator concludes that critical care nurses have a high level of autonomy and responsibility in the management of mechanical ventilation and weaning.

This study is necessary As the technology grows, many advanced equipments are supplied to the hospital to manage the critical condition & to provide a standard care to the patients & the nurses are the important part of hospital who has continuously provide care to the patient with the use of life-saving equipments, therefore she should have adequate knowledge regarding the use of therapeutic/diagnostic equipment to become a skilled & competent health care provider. This study is framed to assess the knowledge of staff nurses regarding the use of therapeutic/diagnostic equipments as she is the only one who can save the life of people in emergency condition by proper using of these sophisticated equipments & by assessing the level of knowledge a standard guidelines will be developed in IMS & SUM Hospital to provide quality care to the patients.

MATERIALS & METHODS

Design

A Survey research approach is used for this study as it is considered as suitable one to assess the knowledge of staff nurses regarding the use of therapeutic/diagnostic equipments. "A survey is a research design which is used to collect information from different subjects within a given population having same characteristics of interest."

(Suresh K. Sharma, 2011). Keeping in view the objective of the study, the research design for the present study was Non-experimental descriptive research design,

Hypothesis

***$H_1$1*-**There will be significant association between the knowledge of staff nurses regarding the use of selected therapeutic/diagnostic equipments with Age.

$H_0$1-There will be no significant association between the knowledge of staff nurses regarding the use of selected therapeutic/diagnostic equipments with Age.

***$H_1$2*-**There will be significant association between the knowledge of staff nurses regarding the use of selected therapeutic/diagnostic equipments with Gender.
***$H_0$2*-** There will be no significant association between the knowledge of staff nurses regarding the use of selected therapeutic/diagnostic equipments with Gender.

***$H_1$3*-**There will be significant association between the knowledge of staff nurses regarding the use of selected therapeutic/diagnostic equipments with Work Experience.
$H_0$3- There will be no significant association between the knowledge of staff nurses regarding the use of selected therapeutic/diagnostic equipments with work experience.

***$H_1$4*-**There will be significant association between the knowledge of staff nurses regarding the use of selected therapeutic/diagnostic equipments with Qualification.
$H_0$4- There will be no significant association between the knowledge of staff nurses regarding the use of selected therapeutic/diagnostic equipments with Qualification.

Sample & setting

For the present study Non-Probability convenience sampling is used to collect the data. Convenience sampling is a Non-probability sampling technique where subjects are selected because of their convenient accessibility & proximity to the researcher. Basing upon the survey system packages the confidence interval is 4 & confidence level was 95% & population size was 150, in which calculated sample size was 120. A total of 120 registered Nurses who were present during study & who satisfied the inclusion criteria were taken as the sample. The study was conducted on Staff Nurses working in IMS & SUM Hospital Bhubaneswar, which was multispecialty teaching hospital having 750 beds.

Description of tool

Self structured questionnaire was prepared to collect demographic data & to assess the knowledge of Staff Nurses regarding the use of Mechanical Ventilator, Automated External Defibrillator & ECG Machine which was based on 1) Related review of literature received from books, journals, published & unpublished research studies.2) Consultant & guidance from various subjects, experts & in related fields were taken.3) Past experience of the investigator.4) Preparation of blue print. 5) Formal & non-formal discussion with peer groups. 6) Consultation with statistician for data analysis. The content validity of the tool was established as per the expert suggestions & corrections were made. The suggestions were considered & tool was reframed accordingly. Reliability was tested for internal consistency by using Chronbach reliability formula. The reliability value for questionnaire related to knowledge of staff nurses regarding the use of Mechanical Ventilator was 0.71**.**The reliability value for questionnaire related to knowledge of staff nurses regarding the use of AED was o.71**.**The reliability value for questionnaire related to knowledge of staff nurses regarding the use of ECG Machine was 0.70**.**

Ethical consideration & data collection procedures

Data collection was carried out after obtaining formal approval from university ethical committee & hospital ethical committee. Participants were selected from the hospital based on the criteria of inclusion. The investigator first introduced herself to the respondents & explained the purpose of gathering the information. Informed consent from the samples was obtained after explanation of objectives of the study. They were assured that their responses would be kept confidential & used only for research purpose. The technique used for data collection was administration of the self structured questionnaire for demographic data & to assess the knowledge

of staff Nurses regarding the use of selected therapeutic/diagnostic equipments, then collected after few days.

RESULTS

Characteristics of the study groups

After conducting the study, it was observed that out of 120samples ,60% of the sample were in the group of 21-30 years & 40% of sample were in the group of >30 years. With regards to gender , 30% of the sample were male & 70% of the sample were female. With regards to marital status, 42% of the sample were married & 58% of the sample were unmarried. With regards to work experience, work experience depicts that 60% of the sample were having the work experience of 0-5years, 40%of sample were having the work experience of >5years .With regards to to qualification depicts that 28% of the sample were completed GNM.28%of sample were completed B.Sc(N),22% were completed P.B.Sc(N)& 22% of sample were completed M.Sc(N). With regards to educational programme 30% of the sample attended seminar.24%of sample attended workshop,23% of the sample attended workshop,23% of the sample attended In-Service education & 23% of sample attended staff-development programme. With regards to exposer to mass media 30% of the sample expose to television, radio,internet,37% of the sample exposer library, books news,& 33% of sample exposer to all.

Frequency & percentage distribution of staff nurses according to knowledge score-

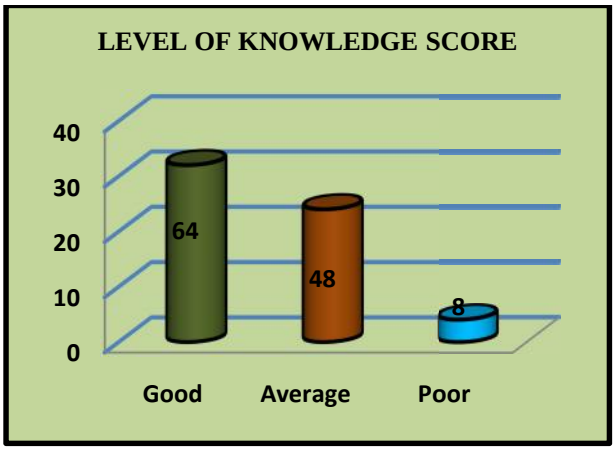

Figure -1(Distribution of staff nurses according to knowledge score.)

Fig -1 Show that 53% of the total sample has good knowledge on Selected therapeutic/diagnostic equipments, 40% of the sample has average knowledge & 7% of sample has poor knowledge.

Mean, standard deviation & mean percentage of knowledge score of staff nurses regarding the use of selected therapeutic/diagnostic equipments

Table-1 Shows that the mean percentage score of knowledge of staff nurses regarding the use of mechanical ventilator was 70.2% & the SD was 2.5. The mean percentage score of knowledge of staff nurses regarding the use of AED was 72.6% & the SD was 2.4 & the mean percentage of knowledge score on ECG Machine was 70.5% & SD was 2.7.

Table 1(Mean, standard deviation& mean percentage of knowledge scorer)

SL. NO	KNOWLEDGE SCORE	NO.OF ITEMS	NO.OF SAMPLE	MEAN	SD	MEAN%
1.	Knowledge scores on mechanical ventilator	14	120	9.8	2.5	70.2%
2.	Knowledge scores on defibrillator	14	120	8.7	2.4	72.6%
3.	Knowledge scores on ECG machine	12	120	9.9	2.7	70.5%

Ranking the knowledge level of staff nurses regarding the use of selected therapeutic /diagnostic equipments

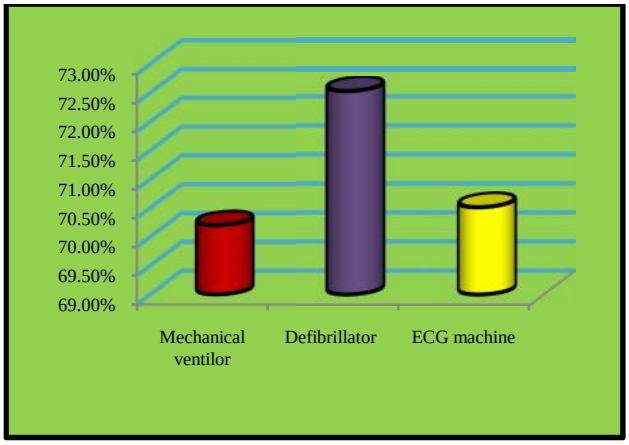

Figure-2 (Ranking the knowledge level of staff nurses)

Fig-2, Shows that the rank order of the knowledge score of staff nurses regarding the use of defibrillator(AED) is high i.e 72.5% (1^{st}),knowledge score on ECG Machine is 70.5%(2^{nd}) & knowledge score on Mechanical Ventilator is 70.2%(3^{rd}).

Association between the knowledge of staff nurses regarding the use of selected therapeutic/diagnostic equipments with selected demographic variables.

Table-2(Association between the knowledge of staff nurses)

Sl. no	Socio-demographic variables	Chi-square value	Degree of freedom	Tabulated value P=0.05	Inference
1	Age	7.61	1	3.84	significant
2	Gender	0.05	1	3.84	Not significant
3	Work experience	7.61	1	3.84	significant
4	Qualification	.27	3	7.82	Not significant

The analysis shows that there was significant association between knowledge of staff nurses regarding the use of selected diagnostic/therapeutic equipment with age as the Chi-Square value was 7.61 which is more than the tabulated value. So that the $H_1$1 was accepted & $H_0$1 was rejected , also significant association between knowledge of staff nurses with work experience as the Chi-Square value was 7.61 which is more than the tabulated value. So that the $H_1$3 was accepted & $H_0$3 was rejected. But There was not significant association between knowledge with other demographic variables such as Gender & Qualification as the Chi-square value were 0.05 & .27 respectively which is less than the tabulated value. So the $H_0$2 & $H_0$4 were accepted & $H_1$2 & $H_1$4 were rejected.

Validity, Reliability & acceptability of guidelines regarding the use of selected therapeutic/diagnostic equipments

The content validated of the Guidelines regarding the use of selected therapeutic /diagnostic equipments were validated by giving it to different experts in concerned field & also it was modified as per expert's suggestions. The reliability of the proposed guidelines was tested for internal consistency, which was 0.82 & it was found to be highly reliable.

Acceptability of staff nurses on proposed guidelines by the researcher denotes that 98% of staffs were accepted with the item "I find that material give information which I wanted to learn". 97% of staffs were accepted with "I find that different aspects which are included in the guidelines are of practical use." 100% of staff feel satisfied after reading the proposed guidelines & also with "I find that guideline can be used without anybody's help"

DISCUSSION

The present study revealed that the mean percentage score of knowledge of staff nurses regarding the use of mechanical ventilator is 70.2% & the SD is 2.5. A similar study was conducted by SINI V.J in Chennai, The result showed that 72.5% of staff nurses had adequate knowledge, 25% had moderate knowledge and only 2.55 had inadequate knowledge regarding nursing care of patient on mechanical ventilation. The present study revealed that the mean percentage of knowledge score regarding the use of ECG Machine was 70.5% & SD was 2.7. A similar study was conducted by S.Sathiya Rani among B.SC (N) student in Raichur found that the mean percentage is 32.17 %& SD was 4.37. Donowitz (1992) ,conducted a descriptive study to assess the knowledge & skills on ECG among Medical student found that the mean score was 69.73 in knowledge & 65.83 in skills. The present study revealed that the mean percentage score of knowledge of staff nurses regarding the use of AED was 72.6% & the SD was 2.4 . Luis Venyin (2010) conducted a similar study among staff Nurses, he found that the knowledge score among graduate Nurses was more than the GNM Nurses. In this study it was revealed that, the knowledge score of staff nurses regarding the use of defibrillator(AED) is high i.e 72.5% (1st),knowledge score on ECG Machine is 70.5%(2nd) & knowledge score on Mechanical Ventilator is 70.2%(3rd).F.Bloos(2009),conducted another study , he stated that to provide quality & competent care, the nurses should possess knowledge & adequate skills. This can be achieved by incorporating the existing knowledge & skill with self-directed learning programme. This study revealed that 53% of the total sample has good knowledge on Selected therapeutic/diagnostic equipments ,40% of the sample has average knowledge & 7% of sample has poor knowledge. Lucy Kinnear in his study found that 72.5% of staff nurses had adequate knowledge,25% had moderate knowledge & 2.55% had inadequate knowledge regarding the use of some medical equipments. The present study revealed that there was significant association between knowledge score of staff Nurses regarding the use of selected therapeutics/diagnostic equipments with selected demographic variables such as Age & Work experience .Subhasini.S conducted a study in selected Hospital of Mangalore stated that there was significant association between knowledge of staff nurses regarding the care of patient under mechanical ventilator with work experience .Beveridge M.(2001) stated that significant association was found between knowledge score on ECG with age & experience in specialty . The limitations of the study were , Study was limited to IMS & SUM Hospital, Bhubaneswar., sample size of 120 only , to registered nurses & research design for the present study was Non-experimental descriptive research design

CONCLUSION

In this study it was revealed that there was significant association between the knowledge of staff Nurse regarding the use of therapeutic/diagnostic equipment with selected demographic variables such as Age & Work Experience & there was no significant association between knowledge with Gender & Qualification. The investigator noted that there was a need to have adequate technical and scientific knowledge among Staff Nurses regarding the use of therapeutic/diagnostic equipments in the clinical settings. So that basing upon the results of the study the investigator developed standard guidelines regarding the use of Mechanical Ventilator, Defibrillator (AED) & ECG Machine which should be helpful for the staff nurses in their clinical practice. Basing on the findings of the study, the investigator proposes the following recommendations for future research. The study can be replicated on large samples in different setting to have a wider generalization of findings..A study can be conducted using using other strategies information booklet, self instructional module, manual etc. An experimental study can be carried out to evaluate the effectiveness of standard guideline

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