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Effectiveness of Self-Instructional Module (SIM) on knowledge regarding care of patients with endotracheal intubation among staff nurses

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Cover Page Footnote

Heartfelt thanks to the study participants and the hospital authority.

Original Article

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Abstract

Introduction: Endotracheal intubation is a life-saving procedure. It is the most common procedure performed during life-threatening emergency conditions, most commonly in ICU patients. Nurses are the ones who handle these patients and also assist during this life-saving procedure. The researcher thus found it relevant to evaluate the efficiency of Self-Instructional Module on nurses regarding the care of patients with endotracheal intubation. **Objectives:** To evaluate the effectiveness of Self-Instructional Module on knowledge of nurses regarding the care of patients with endotracheal intubation by comparing mean pre-test and mean post-test knowledge scores; to determine the association between the level of pre-test knowledge scores of nurses with their selected socio-demographic variables. **Materials and methods:** A quantitative, pre-experimental one group pre-test post-test design was conducted among 60 nurses using a non-probability purposive sampling technique. A structured knowledge questionnaire was used to collect data from the participants. **Conclusion:** In the pre-test, 55% nurses had moderately adequate knowledge whereas in the post test 83.3% had adequate knowledge. The obtained 't' value was 28.86. Thus, this study concludes that the Self-Instructional Module was effective in enhancing the knowledge of staff nurses regarding care of patients with endotracheal intubation.

Key words: Endotracheal Intubation, Care, Self-Instructional Module, Knowledge, Nurses, pre-test-post-test design.

Introduction

The important part of the management of critically ill and injured patients is managing the airway. Endotracheal intubation is a procedure of passing a tube through the mouth or nose into the trachea. Endotracheal intubation is an emergency procedure which provides a patent airway during respiratory distress. It is indicated in various situations like respiratory failure, cardiorespiratory arrest, upper airway obstruction etc. According to a research study conducted over a span of four months around 114 patients were intubated. Out of these 114 intubations, 77 (67.5%) were males and 37 (32.5%) were females. This shows that endotracheal intubation is one of the most common and emergency life-saving procedure. Almost in every life-threatening situation, endotracheal intubation is required and nurses play a very important role in taking care of these patients (Pradip, 2012).

Endotracheal intubation is a simple, safe and nonsurgical technique that helps to maintain the goals of airway management. Endotracheal intubation is associated with complications, some of which are life-threatening. In a survey conducted among 1541 cases regarding complications of endotracheal intubation, 522 (34%) cases were noted with adverse respiratory events. Around 85% cases resulted in death or brain damage. This report showed that injury to lips, teeth,

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tongue, nose, pharynx, larynx, trachea and bronchi can also occur. In a review of 4460 claims, around 6% had airway injuries. Most frequent sites of injury were larynx (33%), pharynx (19%), and oesophagus (18%). The study concluded that nurses should be made aware regarding the serious and life-threatening complications, and they should prepare an effective strategy to prevent and manage these complications (Divatia & Bhowmic, 2005).

A prospective cross-sectional study was conducted on 55 patients in St. John's Medical College Hospital, Bengaluru to compare endotracheal tube cuff pressure in neutral and neck extension position. About 18% of the cases recorded ideal cuff pressure (22-32 cm H_2O) whereas in 76.4% it was high or very high. Almost 38.2% of the population had post-operative sore throat and hoarseness of voice at 15 minutes post-extubation. It persisted even after 24 hours following the procedure in 7.3% of the population. With head and neck extension, there could be a fall in intra cuff pressure. Hence, cuff pressure should be rechecked by the nurses with position change (Savithri et al., 2014).

A study conducted in Hinduja Hospital, Maharashtra to evaluate the rate of tube displacement on endotracheal intubated patients. The study showed that in a day, 0.6% of patients who were intubated had tube displacement. Out of 76 incidents, 54 patients suffered from endotracheal tube displacement. This study shows that endotracheal tube displacement is a very common complication and nurses need to be made aware of this complication to provide effective care to the patients (Kapadia et al., 2014).

Majjed and Shambhavi (2014) conducted a planned teaching programme to determine the knowledge and practice of nurses regarding endotracheal suctioning using structured knowledge questionnaire. Post-test result showed that all of the staff nurses (100%) gained knowledge. It concluded that education to the nurses will help them to prevent or to reduce the complication that can occur due to suctioning.

Nurses play an important role in endotracheal intubation as they assist during the procedure and also take care of those patients. The above studies provide information that endotracheal intubation involves various complications which can be life-threatening and irreversible. The nurses should have adequate knowledge regarding the care of patients with endotracheal intubation, by which complications can be reduced. the above information helped the researcher to undertake the study to evaluate the effectiveness of the Self-Instructional Module on knowledge of nurses regarding the care of patients with endotracheal intubation and it will help to enhance the knowledge of nurses.

Materials and Methods

The research approach and design adopted for the study were evaluative approach and one group pre-test post-test design respectively. The study was conducted among 60 nurses who were working in Emergency, Medical ICU, Surgical ICU and Critical Care Unit in selected hospitals. Nurses were selected by non-probability purposive sampling technique.

Description of the tool

Data collection was performed using the structured knowledge questionnaire. The tool consisted of two parts.

Part I: included demographic variables such as age, gender, religion, educational qualification, area of work, years of experience and prior management of a patient with endotracheal intubation.

Part II: consisted of 36 items for assessment of knowledge, organised in three subsections related to endotracheal intubation's information, its indication, contraindications and complications and care of patients. Multiple-choice questions were used and a score of one was given for the right answer and zero for the wrong answer. The maximum score was 36. The scores were interpreted as, adequate knowledge (≥75%), moderately adequate knowledge (50-75%) and inadequate knowledge (below 50%).

Validity and Reliability: Content validity of the tool was ensured by 10 experts. Reliability of the tool was tested using split-half method and was found reliable ($r = 0.89$).

Data Collection Procedure and Analysis

Ethical clearance was obtained from the ethical committee of Adventist College of Nursing. Prior permission was obtained from concerned authorities

of the selected hospitals. The investigator ascertained the willingness and cooperation of the participants and informed consent was obtained. On the first day, a pretest was conducted by using structured knowledge questionnaire. A SIM (Self Instructional Module) on knowledge regarding the care of patients with endotracheal intubation was distributed to the participants. SIM included content regarding general information of endotracheal intubation, indications, contraindications and complications of endotracheal intubation and care of patients with endotracheal intubation. On the eighth day post-test was conducted.

Data analysis was done using both descriptive and inferential statistics on the basis of objective and hypothesis of the study. Socio-demographic data was analysed using frequencies and percentage distribution. The difference between the mean pre-test and post-test knowledge score was analysed by using paired 't' test at $p \leq .05$ level of significance.

Results

Table 1:
Distribution of study participants based on their socio-demographic profile

N=60

Demographic variables	Frequency(f)	Percentage(%)
Age		
21-26	28	46.7
27-32	26	43.3
33-38	06	10.0
Gender		
Male	11	18.3
Female	49	81.7
Religion		
Hindu	22	36.7
Muslim	02	03.3
Christian	36	60.0
Educational qualification	16	26.6
General nursing	34	56.7
BSc Nursing	10	16.7
Post BSc nursing		
Area of work		
Medical ICU	23	38.4
Surgical ICU	14	23.3
Critical Care	14	23.3
Emergency/ Casualty	09	15.0
Total years of experience	12	20.0
Less than 1 year	08	13.3
2 years	10	16.7
3 years	30	50.0
4 years and above		
Managed patient with endotracheal intubation	57	95.0
Yes	03	05.0
No		

Data in Table 1 show that 46.7% of the nurses belonged to age group of 21-26 years, most of them (81.7%) were female, 60.0% were Christians, 56.7% had completed BSc (N) degree, 38.4% were working in Medical ICU and 50% had more than four years of experience. Most of the nurses (95%) had managed patients with endotracheal intubation.

Distribution of pretest and posttest Knowledge of staff Nurses

In the pre-test majority of the nurses, 55% (33 out of 60) had moderate knowledge, 45% of the respondents had inadequate knowledge, 16.7% had moderately adequate knowledge and none had adequate knowledge regarding care of patients with endotracheal intubation. (Figure1). But in the post-test majority of the nurses 83.3%, (50 out of 60) had adequate knowledge and none had inadequate knowledge regarding the care of patients with endotracheal intubation after administration of Self-Instructional Module (Figure 2).

In the pre-test, the area wise mean pre-test knowledge scores of nurses regarding the care of patients with endotracheal intubation was assessed. The mean aspect wise knowledge of nurses was high (58.7 %) in the area of indications, contraindications, and complications of endotracheal intubation (Figure 3).

The mean post-test scores were high in all the areas such as general information (91.7%), its indication, contraindications and complications (90.6%) and care of patients with endotracheal intubation (88.0%) (Figure 4).

Effectiveness of Self-Instructional Module

The data in table 2 shows that the mean post-test knowledge scores of staff nurses were significantly higher than the pre-test knowledge scores. When a paired't' test was done, the obtained value 28.86 was found to be more than the table value (1.96 with 59 df) at 0.05 level of significance. Therefore, it is significant at $p = .05$.

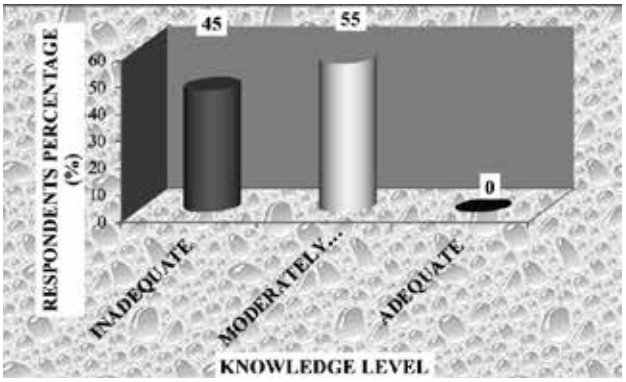

Figure 1: Distribution of overall pre-test knowledge scores of staff nurses

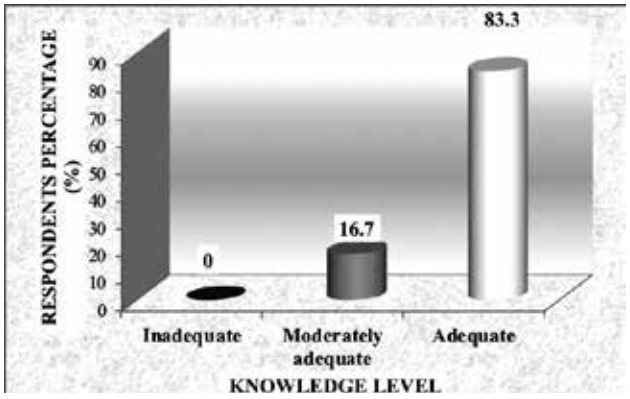

Figure 2: Overall post-test knowledge scores of staff nurses

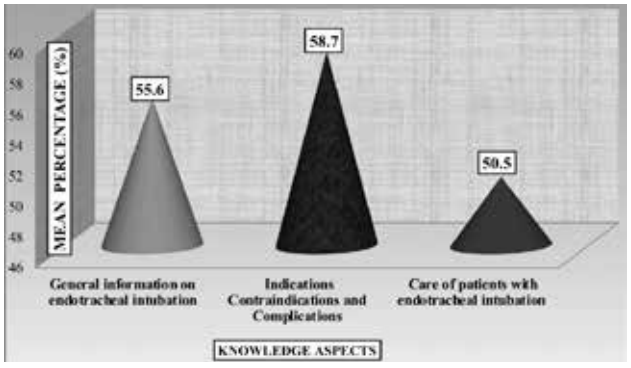

Figure 3: Area wise mean pre-test knowledge scores of staff nurses

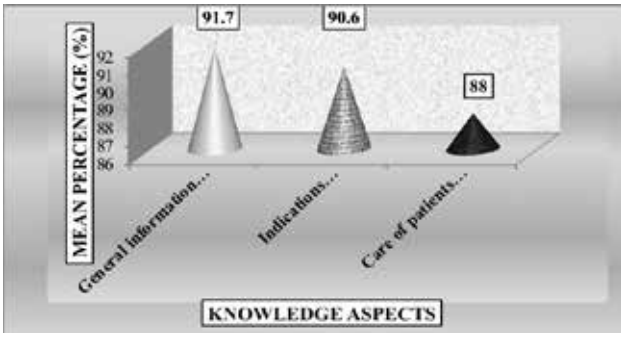

Figure 4: Area wise mean post-test knowledge scores of staff nurses

Table 2:
Comparison of Overall Mean Pre-test and Post-test Knowledge Scores of Nurses Regarding Care of Patients with Endotracheal Intubation

N=60

Aspects	Max score	Respondents knowledge				Paired 't' test
		Mean	SD	Mean (%)	SD (%)	
Pre test	36	19.40	3.5	53.9	9.6	
Post test	36	32.13	2.7	89.3	7.4	**28.86***
Enhancement	36	12.73	3.4	35.4	9.5	

Association between pretest knowledge and selected socio-demographic variables

To determine the association between the level of knowledge and selected demographic variables Chi square test was used. Results revealed that there was a significant association found between pretest level of knowledge with age (χ^2 =6.65), gender (χ^2 value =4.18), educational qualification (χ^2 value =6.99) and area of work (χ^2 value =10.03). But no association was found with regard to religion, total years of experience and prior management of patients with endotracheal intubation.

Discussion

The findings of the present study revealed that after administration of Self-Instructional Module the post-test mean knowledge score (32.13) was improved from the pretest mean knowledge score (19.40) with mean difference of 12.73. The obtained 't' value (28.86) was found to be significant at p< .05 level. Chi square test was used to identify the association of knowledge with selected socio-demographic variables. Results revealed that there was a significant association between pre-test level of knowledge with age (χ^2 =6.65), gender (χ^2 value =4.18), educational qualification (χ^2 value =6.99) and area of work (χ^2 value =10.03). But no association was found with regard to religion, total years of experience and prior management of patients with endotracheal intubation.

The study by Majjed and Shambahvi (2014) also supports the present study which shows 100% knowledge in the post-test regarding endotracheal suctioning. Another study conducted by Gogoi showed that the staff nurses mean post-test knowledge score (23.70) was higher than the mean pre-test knowledge score (17.25). Nurses play a key role in preventing the complications associated with endotracheal intubation.

As the study shows, knowledge about various life-threatening complications and their care will help the nurses.

Conclusion

The results of the study showed that nurses had moderately adequate knowledge regarding the care of patients with endotracheal intubation during the pre-test. The study also proved that Self Instructional Module is an effective teaching strategy in improving their knowledge regarding the care of patients with endotracheal intubation. Nurses need to update their knowledge through regular in-service education to manage the patients with endotracheal intubation. Nurses play a key role in providing holistic care for intubated patients in order to prevent complications associated with it. Prevention of intubation related complication can be achieved by nurses through improved knowledge, assessment and clinical decision-making skills.

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