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A Study to Assess the Effectiveness of a Self-Instructional Module on Knowledge Regarding the Use of a Communication Board in Communicating with Patients on Mechanical Ventilation Among Staff Nurses Working in a Selected Hospital at Bangalore

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Abstract

Background: A communication board is used in intensive care units (ICUs) to communicate with patients on mechanical ventilation. It facilitates transfer of messages between patients and staff nurses. This study attempted to assess the effectiveness of a self-instructional module (SIM) on knowledge of staff nurses regarding the use of a communication board for communicating with patients on mechanical ventilation at a selected hospital in Bangalore.

Objective: To assess the effectiveness of a self-instructional module on knowledge regarding the use of a communication board among staff nurses working at a selected hospital in Bangalore.

Methods: A pre-experimental study included 30 staff nurses working at a selected hospital in Bengaluru. Demographic details of all the staff nurses were collected. A structured knowledge questionnaire was used for collecting baseline data from the staff nurses on their knowledge about the communication board for communicating with patients on mechanical ventilation. The intervention was given with the aid of a SIM. The results were described using descriptive and inferential statistics.

Results: The pre-test results showed that 12 (40%) respondents had inadequate levels of knowledge, 18 (60%) demonstrated moderate levels of knowledge and none of them had adequate knowledge. In the post-test, 25 (83.3%) had adequate levels of knowledge, 5 (16.7%) had moderate levels of knowledge and none of the staff nurses had inadequate knowledge. The mean pre-test knowledge score percentage was 57.0%. The mean post-test knowledge score percentage was 83.0%. The mean post-test knowledge score percentage was higher than the pre-test knowledge score percentage, thus implying that the self-instructional module increased the knowledge of staff nurses.

Conclusion: The study showed that the self-instructional module was effective in increasing the knowledge. Significant association of pre-test knowledge scores with selected demographic variables was noted.

Keywords: Self-instructional module, Knowledge, Communication board, Patients on mechanical ventilation, Staff nurses

Introduction

Communication is a process by which information is exchanged between individuals through a common system of symbols, signs, or behaviors.[1,2] Communication is a vital component in addressing the needs of intensive care unit patients, who often have impaired communication abilities due to their compromised status.[3,4,5,6] A communication board is an apparatus that aids in self-expression for those with low language proficiency by displaying pictures, symbols, or illustrations. To interact with other users, the user can make gestures, point to, or blink at images.[7]

Communication boards can be a vital resource for individuals with disabilities, including those recovering from strokes, surgery-related disabilities, patients on intubation, patients on a mechanical ventilator, chronic obstructive pulmonary disease (COPD) patients, postoperative patients, accident patients and patients with chronic impairment of one or more organ systems.[5]

Communication boards can also help develop better language skills, more autonomy, and positive social interactions.[8] A communication board does not have to be a board at all. A communication board can take various forms, such as a piece of paper with symbols, a series of fabric pockets holding interchangeable note cards, or a notebook or file folder containing magazine photographs. It serves as a valuable tool to facilitate communication for individuals with language limitations.[9]

Each individual is unique. The essence of nursing is to provide individualized and holistic care to the patients based on their felt needs. Admission of patients in the critical care unit imposes unavoidable separation from the family. It affects the patient both physically and psychologically. When the patients are unable to communicate verbally, it further adds to the patient's agony and poses challenges to providing effective and quality care.[10,11]

Patients on mechanical ventilation cannot express their feelings and needs verbally due to the endotracheal tube passing through their vocal cords, rendering speech impossible and increasing their frustration and anxiety. As a result, the caregiver is forced to interpret the patients' non-verbal communication such as mouthing, gesticulating, nodding, and writing - which can be difficult for the critically ill patient. Nearly 40% of all seriously ill patients who die in hospitals spend their last days and hours in medical intensive care receiving mechanical ventilation. Many patients die in pain without the ability to fully express their needs, wishes about end-of-life care, or final messages to loved ones and the intubated patients, those who are the most severely ill experience greatest anger due to their inability to speak.[12,13]

Materials and Methods

A quantitative and evaluative approach with pre-experimental research design and one group pre-test post-test was used in present the study to evaluate the effectiveness of a self-instructional module on knowledge of staff nurses regarding the use of a communication board for communicating with patients on mechanical ventilation at a selected hospital in Bangalore, Karnataka. A purposive sampling technique was used to select a sample of 30, and a structured knowledge questionnaire was used to collect the data from the participants. The questionnaire consisted of Section A which included socio-demographic variables, and Section-B which included a structured knowledge questionnaire. This was tested for reliability using Spearman-Brown prophecy formula and a reliability of r=0.83 was established. The data were collected after obtaining institutional ethical clearance and formal permission from the hospital authorities. Following this, a pre-test was conducted to assess the knowledge among staff nurses, and a self-instructional module was administered. Post-test was conducted after seven days using the same knowledge questionnaire to evaluate the effectiveness of the self–instructional module (SIM).

Results

Table 1 depicts the data regarding socio-demographic variables. The majority of staff nurses 66.6% (20) were between 31-40 years of age, 60% (18) were females, 70% (21) had GNM qualification, 56.7% had 11-15 years of experience working in ICU's, 50% (15) acquired their knowledge from their experience working in ICUs, 56.7% (17) and 53.4% (16) of the participants' fathers and mothers, respectively had primary education, 83.3% (25) belonged to Hindu religion, and 53.3% (16) of the staff nurses reported a family income of Rs. 21,000 – 30,000 per month.

Table 1: Socio-demographic characteristics of staff nurses (N=30)

S. No	Characteristics	Category	Respondents	
			Frequency	%
1.	Age group (years)	22-30	5	16.7
		31-40	20	66.6
		41-50	5	16.7
2.	Sex	Male	12	40.0
		Female	18	60.0
3.	Qualification	B.Sc.	7	23.3
		M.Sc.	2	6.7
		GNM	21	70.0
4.	Clinical Experience (years)	1-5	3	10.0
		6-10	3	10.0
		11-15	17	56.7
		>15	7	23.3
5.	Source of Knowledge	Experience in ICU	15	50.0
		Friends/ Colleagues	10	33.3
		Journal, Seminar, Webinars, and Internet	2	6.7
		Others	3	10.0
6.	Education of Father	Primary education	17	56.7
		Secondary education	6	20.0
		Graduate	5	16.7
		Postgraduate	2	6.6
7.	Education of Mother	Primary education	16	53.4
		Secondary education	10	33.3
		Graduate	4	13.3
5.	Religion	Hindu	25	83.3
		Christianity	5	16.7
5.	Economic status per month	Rs. 11,000-20,000	5	16.7
		Rs. 21,000-30,000	16	53.3
		>Rs. 31,000	9	30.0

Table 2 shows that during pre-test, 12 (40%) staff nurses demonstrated inadequate knowledge, while 18 (60%) staff nurses showed moderate knowledge. Whereas in the post-test, 25 (83.3%) showed adequate knowledge, 5 (16.7%) demonstrated moderate knowledge (Table 2) (Figure 1).

Table 2: Findings related to pre-test and post-test levels of knowledge (n=30)

Level of Knowledge	Category	Pre-test		Post-test	
		Frequency	%	Frequency	%
Inadequate	≤ 50% score	12	40.0%	0	0.0%
Moderate	51-75% score	18	60.0%	5	16.7%
Adequate	> 75% score	0	0.0%	25	83.3%

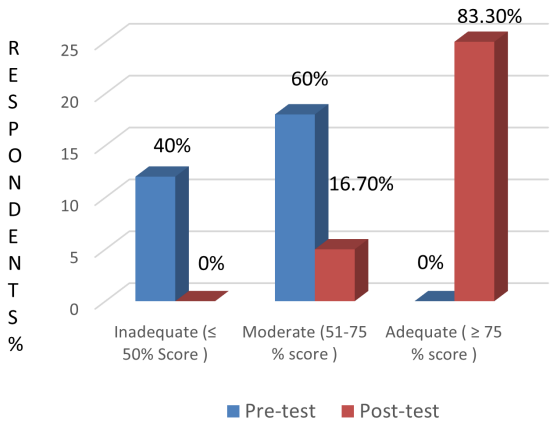

Figure 1: Comparison of pre-test and post-test knowledge levels

Table 3: Findings related to evaluating the effectiveness of a self-instructional module on the use of communication boards for communicating with patients on mechanical ventilation among staff nurses (n=30)

Aspects	Max. Score	Knowledge Scores				Paired 't' Test
		Mean	SD	Mean (%)	SD (%)	
Pre-test	30	17.10	3.33	57.0	11.1	14.10*
Post-test	30	24.90	1.94	83.0	6.5	
Enhancement	30	7.80	3.02	26.0	10.1	

* Significant at 0.05 level, t (0.05, 29df) = 2.045

Table 3 shows that the respondents' mean percentage of knowledge scores regarding the use of a communication board to communicate with patients on mechanical

ventilation was 57% in the pre-test and it increased to 83% in the post-test, reflecting an enhancement of 26%. To determine the effectiveness of the SIM, paired "t" test was used to compute the "t" value, and the calculated paired "t" test value (t=14.10*) was greater than the table value at 0.05 level of significance, indicating a significant difference between pre-test and post-test knowledge scores of respondents. The study concluded that the self-instructional module effectively enhanced the knowledge of staff nurses about using communication boards to interact with patients on mechanical ventilation. (Figure 2).

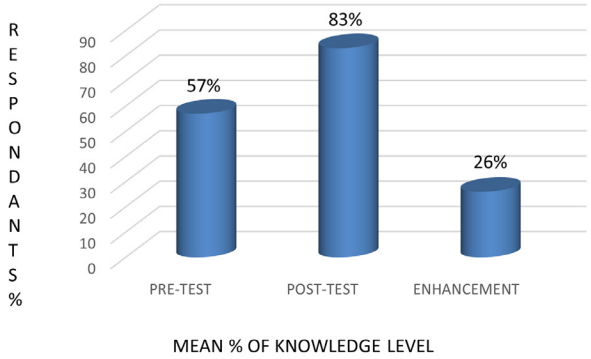

Figure 2: Comparison of mean pre-test, post-test, and enhancement of knowledge levels

Chi-square test was calculated to determine the association between the pre-test knowledge levels of staff nurses and their selected demographic variables regarding the use of a communication board for communicating with patients on mechanical ventilation. A significant association (P <0.05) was found between the pre-test scores and demographic variables like age group (years), qualification, clinical experience (years), and religion. There was no significant association (P <0.05) found between the pre-test knowledge scores and other demographic variables such as gender, source of knowledge, education of father, education of mother, and economic status.

Discussion

The primary aim of the study was to assess the impact of the use of a communication board for communicating with patients on mechanical ventilation. The data were collected from 30 staff nurses working at a selected hospital using a structured knowledge questionnaire. The paired "t" test value was 14.10 reflecting an effective improvement in the knowledge.

A similar study was conducted by Binju Raju *et al.,* (2018) to assess the effectiveness of a self-instructional module on the knowledge of ICU staff nurses regarding the use of a communication board for communicating with patients on mechanical ventilation at selected hospitals in Udaipur city, Rajasthan.[14] After the pre-test, a self-instructional module was administered, following which a post-test was conducted. The data obtained were analyzed using differential and inferential statistics. The mean post-test knowledge score was 26.71 (89.03 percent) which was higher than the mean pre-test knowledge score (17.91; 59.70 percent). The enhancement in the knowledge levels of the respondents was 8.8, indicating a gain in the knowledge.[14]

Nandaprakash *et al.,* (2019) conducted a study in Mysore for improving the knowledge and skills of collecting and integrating evidence into practice. The post-test mean value of the experimental group was 11.3 (56.50%), which was higher than the pre-test mean value 5.97 (29.85%). The mean difference value was 5.33 and the obtained t' test value was 15.0. The obtained value was highly significant at P <0.05 level. The mean post-test value of the control group (5.97; 29.85%) was higher than the pre-test mean value (5.95; 29.75%). The mean difference value was 0.02 and the obtained t-test value was 0.61, which was not significant at P <0.05 level; therefore, the null hypothesis was rejected. The obtained post-test mean value in the experimental group (11.3) was higher than the post-test mean value in the control group (5.97). The mean difference value was 5.33 and the obtained t-test value was 9.07, which was not significant at P <0.05 level and therefore the null hypothesis was rejected. Interpretation and conclusion indicated the effectiveness of the self-instructional module in improving the knowledge regarding evidence-based nursing practice.[15]

SR Hosseini *et al.,* conducted a study titled, 'The effect of communication board on patients' anxiety in conscious patients under mechanical ventilation' at Sigmund Hospital in Tamil Nadu. In this quasi-experimental study, 30 conscious patients under mechanical ventilation, hospitalized in the intensive care unit were enrolled, and were randomly assigned to intervention and control groups. Statistical results showed that anxiety decreased in both the groups over time, but the decrease was significant in the intervention group than in the control group (P=0/000). It was concluded that the use of a communication board in conscious patients on mechanical ventilation can reduce anxiety.[10]

Conclusion

The study findings demonstrated that the self-instructional module effectively enhanced the knowledge of staff nurses regarding the use of a communication board for interacting with mechanically ventilated patients.

In conclusion, the self-instructional module proved to be an effective tool in improving staff nurses' understanding of communication board usage for patients on mechanical ventilation.

For broader generalization, a replication of this study with a larger sample size and wider geographic coverage is recommended. Additionally, a comparative study can be conducted to evaluate the effectiveness of self-instructional modules versus video-assisted teaching programs. Further research can also assess staff nurses' knowledge of communication board usage in clinical settings.

Conflicts of Interests

Nil

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