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Research Article

The Effectiveness of Communication Board on Ease of Communication and Anxiety among Patients on Mechanical Ventilator

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Abstract

Background: Patients with physical and sensory disabilities, such as deafness, blindness, and patient with endotracheal intubation and mechanical ventilation have been shown to face considerable barriers when communicating with health-care professionals.

Materials and Methods: The present study entitled effectiveness of communication board on communication pattern and level of anxiety. The research design adopted was pre-experimental non-equivalent, post-test only with control group design. A total number of 60 samples (30 samples for experimental group and 30 samples for control group) were selected using non-probability purposive sampling technique. The communication board was implemented as a strategy to communicate the needs of patients in the experimental group. The samples in control group were on routine treatment. About 2060 min after extubation, the post-test assessment of level of communication and anxiety was done using modified ease of communication scale and hospital anxiety and depression scale, respectively, in both experimental and control group. The data analysis was done using descriptive and inferential statistics.

Results: In post-test, patients on mechanical ventilator had 6.93 ± 1.43 mean level of anxiety in the experimental group and 14.7 ± 2.28 mean level of anxiety in the control group, so the mean difference is 7.77 and the calculated independent *t*-test value is 1.93 and it is statistically significant at $P < 0.05$ level.

Conclusion: Communication board can significantly improve the ease of communication pattern and level of anxiety among patients.

Keywords: Effectiveness, Communication Board, Communication Pattern, level of anxiety, mechanical ventilator.

Introduction

Communication is a process of sharing information through exchange of messages, thoughts by speech, visuals, signals, writing, or behavior. Human beings are always excited to meet new person, appear approachable to others and acquaintances, and are the kind of person who can just start chatting to a person on a working place. Being interactive is about making ourselves feel comfortable in our orbit.[1]

Mechanical ventilation is widely used to treat patients who are in critical condition. This treatment method is commonly applied for breathing difficulties. Patients receiving mechanical ventilation have reported communication difficulties as this number one communication problem while intubated.[2] Anxiety is general term for several disorders that cause nervousness, fear, apprehension, and worrying these disorders affect how we feel and behave, and they can manifest real physical symptoms. Mild anxiety is vague and unsetting, while severe anxiety can

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be extremely debilitating, having a serious impact on daily life. Consciousness while undergoing mechanical ventilation results in various experiences associated with breathlessness, fear, anxiety, helplessness, lack of control, and pain. Not being able to communicate either verbally or using assistive equipment is one of the worst experiences of these patients and leads to anger and hopelessness among them.

A study revealed that intubated patients from surgical ICU had unmet primary needs and communication difficulties. It identified the predictors of the primary needs from patient characteristics and communication difficulties. The result was that intubated patients were found to have communication difficulties. There was positive correlation between communication difficulties and general level of basic needs with r = 0. 53, $P < 0.01$ and there was also positive correlation found between the length of stay in ICU and the need for love and belonging with r = 0. 25, $P < 0.03$.[3]

Communication boards are both augmentative and alternative communication (AAC) devices. That means, these are used to supplement or replace spoken language as a means of communication.[4] Nurses and other health care practitioners are using non-verbal form of communication such as mouthing, gesticulating, nodding, and writing in communicating with the ventilated patients. Such non-verbal methods require excess energy and fatiguing and emotionally draining for these patients. The use of board as an intervention to enhance communication has been proposed by health care practitioners. A communication board is a board which is used for intubated patients consists of icons and pictures representing basic needs provide increased patient satisfaction, increased efficiency and speed of communicating, decreased frustration, and quicker expression of patient's needs.

A study reported that 40% intubated patients had interaction with nurses and they described the process of communication was extremely difficult communication problems caused by intubation and cognitive, sensory, or language deficits that distance the patient from care givers and loved ones.[5] The result of another study demonstrated that 73% of patient without communication board found that their communication process was inadequate. However, with the board 80% found, their communication was adequate. Of those who used the communication board, 80% were satisfied with the board, 20% moderately satisfied, and none reported unsatisfied. Nurse, however, reported 53% satisfaction, 30% moderately satisfied, and 17% unsatisfied.[6]

Reed surveyed nurses and patient regarding methods used to communicate. Pre-intervention assessment reported 60% of mechanically ventilated patient extremely frustrated with their inability to communicate and 75% of nurses perceived their method and resource to be inadequate. Post-intervention compared to other communication aids and basic methods, and 58% of nurses reported the EZ board as the most beneficial method.[7] A true experimental study was conducted to assess the effectiveness of communication board in meeting patient's needs and to compare the level of satisfaction. In the experimental group, 192 (96%) of the subjects were able to meet their needs adequately after using the communication board as compared to 7 (3.5%) in control group. One hundred and fifty-five (77.5%) subjects of the experimental group showed maximal satisfaction with their ability to communicate needs as compared to only 2 (1%) in control group. One hundred and twenty-eight (64%) subjects of control group had minimal satisfaction with their ability to communicate their needs. The study concluded that the communication board was tested by the investigator and found appropriate for the 400 intubated CABG subjects.[8]

Communication devices are available for more complex cares. It is important for nurses to meet communication needs, identify appropriate alternative communication strategies. It is important for nurses to meet communication needs, which identify appropriate alternative communication strategies.

In most researches, patients experienced various problems in communication and anxiety due to mechanical ventilation. However, communication board places a vital role in reducing fear and anxiety and improved communication level. Research is done retrospectively with patients who survive critical illness. Under-recognition and disturbingly high levels of pain continue to be common among critically ill patients, many of who cannot communicate symptoms or request relief. Impairment in communication is a barrier to accurate assessment and optimum management of pain, delirium, and other signs and symptoms in the ICU. The extent to which non-surviving, critically ill patients are able to communicate, is challenging. Health-care providers are in the need to enhance effective communication of the mechanically ventilated patients to promote the communication. Health-care providers can facilitate the communication of mechanical ventilated patients by offering verbal reassurance and being present and available at bedside. Improving communication could be achieved using a communication board to standardize the approach of selecting various AAC methods.

Mechanically ventilated patients surveyed and said that a communication board would have helped them to better express their needs to hospital health care workers. The patients experienced that communication board helped both the speed and efficiency with which they communicated with their care giver. Hence, the investigator had an interest to assess the effectiveness of communication board on communication pattern and level of satisfaction.

However, there is lack of studies in this area especially in India. Hence, the investigator has undertaken this study to assess the effect of communication board on ease of communication and level of anxiety among mechanically intubated patients at Coimbatore.

Materials and Methods

Study design and setting

The research approach used for the present study was Quantitative Evaluative Approach and the research design adopted is pre-experimental non-equivalent, post-test only with control group design. The study was conducted in the ICUs of Kongunad Hospital and BRJ Multispecialty Hospital at Coimbatore. Kongunad Hospital is a 300 bedded multispecialty hospital with various specialties. BRJ Hospital is a 250 bedded multispecialty hospital and most importantly all these ICUs are well equipped with modernized emergency interventions. These ICUs had a capability to lodge more than 30 patients per day. In these, more than 50% of patients are mechanically ventilated. The target population for the present study was patients on mechanical ventilator. Non-probability purposive sampling technique was used to select the sample for the present study.

Sample size and sampling method

The sample size for the present study was 60, includes 30 samples for the experimental group and 30 samples for the control group. Non-probability purposive sampling technique was used to select the sample for the present study.

Data collection tool and technique

Modified ease of communication scale was used c to assess the level of communication. It includes self-structured 5-point observational rating scale which consisted of ten items relevant to patients level of communication such as how hard it was for the patients to communicate about their physical needs, thoughts, emotions, condition, pain relief, about the care, also to communicate with the visitors, or health team members. The total score ranged from 0 to 40, which includes no difficulty (0), mild difficulty (1–10), moderate difficulty (11–30), and severe difficulty (31–40). The hospital anxiety and depression scale were developed by Zigmond and Snaith (1983), which was used to assess the level of anxiety. It is a 4-point observational rating scale which consisted of seven questions for assessing patient's anxiety level. Total score ranged from 0 to 21. It includes normal (0–7), borderline abnormal (8–10), and abnormal (11–21). The reliability was established using inter rater method. The correlation coefficient found to be r = 0.8 indicated high reliability of tool to conduct this study.

Data management and analysis

The purpose of the study was explained to the participants and the verbal consent was obtained from the samples. Approximately 2–3 patients on mechanical ventilator were selected per day. A total number of 60 samples were selected using non-probability purposive sampling technique. Among them, 30 samples were allocated for the experimental group and 30 samples were allocated for the control group. The communication board was implemented as a strategy to communicate the needs of patients in the experimental group. The investigator has used the communication board whenever the patient rang the bell nearby him/her. The investigator has spent about 8 h daily to meet the needs of the patients. The samples in the control group were on routine treatment. About 20–60 min after extubation, the post-test assessment of level of communication and anxiety was done using modified ease of communication scale and hospital anxiety and depression scale respectively in both experimental and control group. Demographic data were collected using demographic pro forma.

Table 1 shows the frequency and percentage distribution of samples in the experimental and control group. In the experimental group, about one-third of samples 10 (33%) were between 61 and 70 years of age and in the control group, the similar number of samples 9 (30%) were between the age group of 41 and 50 years. According to the gender of subjects in the experimental group, 16 (53%) were male and 14 (47%) were female. In the control group, 15 (50%) were male and 15 (50%) are female. In the experimental group, an equal number of 8 (26%) samples had secondary education and were illiterate; however, similar number 7 (24%) of the samples had either primary education or graduate. In the control group, about one-third 10 (33.33%) of the samples had secondary education, whereas about 8 (26.66%) of the samples had primary education, only about 7 (24%) of the samples were graduates; however, 5 (16%) of the samples were illiterate. In the experimental group, the majority 21 (70%) of the samples were unemployed. The highest percentage 19 (63.3 %) of samples were married in the experimental group and in the control group 22 (73.3%).

In the control group, the majority of 20 (66.66%) of the samples were employed. In the experimental group, similarly, half of the samples were 15 (50%) were living in rural and urban areas, but in the control group, the majority 17 (56.66%) of the samples were from rural areas. In the experimental group, more than half 16 (53%) of the samples were ventilated for 24 h, whereas 11 (37%) of the samples were ventilated for 48 h, the least percentage 3 (10%) of the samples were ventilated for 72 h; however, none 0 (0%) of the samples were found more than 72 h of ventilation. In the control group, about 13 (43.3%) of the samples were ventilated for 48 h, whereas 12(40%) of the samples were ventilated for 24 h, the least percentage 5 (16.7%) of the samples were ventilated for 72 h; however, none 0 (0%) of the samples were ventilated for more than 72 h.

In the experimental group, majority 25 (83%) of the samples were not experienced ventilator support previously, the least percentage 5(17%) of the samples had previous ventilator experience. In the control group almost all the samples, 28 (93.3%) were not having previous ventilator experience, whereas only 2 (6.6%) of the samples were exposed to ventilator support previously. In the experimental group, about half 50% of the samples were stayed in ICU for 2 days, whereas similar number 6 (20%) of the samples were stayed in ICU for 3 days and 4 days. In the control group, majority 11 (36.6%) of the samples were stayed in ICU for 3 days, similar number 8 (26.6%) of the samples were stayed in ICU

Table 1: Frequency and percentage distribution of samples according to their demographic variables. *n*=60

Demographic variables	Experimental group		Control group	
	Frequency (f)	Percentage	Frequency (f)	Percentage
Age in years				
20–30	4	13.33	5	16
31–40	3	10	0	0
41–50	8	26.66	9	30
51–60	5	16.66	7	24
61–70	10	33.33	9	30
Sex				
Male	16	53	15	50
Female	14	47	15	50
Educational status				
Illiterate	8	26	5	16
Primary education	7	24	8	26.66
Secondary education	8	26	10	33.33
Graduate	7	24	7	24
Occupational status				
Employed	9	30	20	66.66
Unemployed	21	70	10	33.33
Marital status				
Married	19	63.3	22	73.3
Unmarried	11	36.7	8	26.6
Widow/widower	0	0	0	0
Divorced	0	0	0	0
Area of living				
Urban	15	50	13	43.3
Rural	15	50	17	56.6
Duration of mechanical ventilation (h)				
24	16	53	12	40
48	11	37	13	43.3
72	3	10	5	16.6
>72	0	0	0	0
Previous history of ventilator				
Yes	5	17	2	6.6
No	25	83	28	93.3
Length of stay in ICU (days)				
2	15	50	8	26.6
3	6	20	11	36.6
4	6	20	8	26.6
5	3	10	3	10
Disease condition				
CAD	4	13.33	9	30
COPD	6	20	10	33.3
RTA	10	33.33	5	16.6
Surgery	5	16.66	4	13.3
Others	5	16.66	2	6.6

for 2 days and 4 days. In the experimental group, about one-third 10 (33.33%) of the samples were admitted for RTA. In the control group, one-third 10 (33.3%) of the samples were having COPD.

Table 2 reveals that in the experimental group during post-test assessment, majority 22 (73.33%) of the samples had mild difficulty in communication, whereas about 8 (26.67%) of the samples had moderate difficulty in communication; however, none 0 (0%) of the samples had either no difficulty or severe difficulty in communication. In the control group, majority 25 (83.3%) of the samples had severe difficulty in communication, whereas about 5 (16.67%) of the samples had moderate difficulty in communication; however, none 0 (0%) of the samples had either no difficulty or mild difficulty in communication.

Table 2: Frequency and percentage distribution of samples based on post-test level of ease of communication and level of anxiety on mechanical ventilator in the experimental and control group. *n*=60

Components	Experimental group		Control group	
	Post-test		Post-test	
	N	%	*N*	%
Ease of communication				
No difficulty	0	0	0	0
Mild difficulty	22	73.33	0	0
Moderate difficulty	8	26.67	5	16.67
Severe difficulty	0	0	25	83.33
Level of anxiety				
Normal	26	86.66	0	0
Border line abnormal	4	13.33	1	3.33
Abnormal	0	0	29	96.67

In the experimental group during post-test, highest percentage 26 (86.66%) of the samples had no anxiety, whereas about 4 (13.33%) of the samples had border line abnormal level of anxiety and none 0% of the samples had abnormal level of anxiety. In the control group during post-test, highest percentage 29 (96.67%) of the samples had abnormal level of anxiety, whereas only 1 (3.33%) of the samples had border line abnormal level of anxiety and none 0% of the samples had no anxiety.

In post-test, patients on mechanical ventilator had 11.6 ± 2.02 mean ease of communication in the experimental group and 31.7 ± 4.24 mean ease of communication score in the control group, so the mean difference 20%, the calculated independent "t"-test value is 3.381, and it is statistically highly significant at $P < 0.01$ level.

In post-test, patients on mechanical ventilator had 6.93 ± 1.43 mean level of anxiety in the experimental group and 14.7 ± 2.28 mean level of anxiety in the control group, so the mean difference is 7.77, the calculated independent "t"-test value is 1.93, and it is statistically significant at $P < 0.05$ level.

Table 3 shows that in post-test, patients on mechanical ventilator had 11.6 ± 2.02 mean ease of communication in the experimental group and 31.7 ± 4.24 mean ease of communication score in the control group, so the mean difference 20%, the calculated independent "*t*"-test value is 3.381, and it is statistically highly significant at $P < 0.01$ level.

In post-test, patients on mechanical ventilator had 6.93 ± 1.43 mean level of anxiety in the experimental group and 14.7 ± 2.28 mean level of anxiety in the control group, so the mean difference is 7.77, the calculated independent "t"-test value is 1.93, and it is statistically significant at $P < 0.05$ level

Above Table 4 displays that the calculated Karl Pearson's correlation coefficient value (r = 0.6) of ease of communication and level of anxiety shows moderate positive correlation between ease of communication and level of anxiety.

It reveals that in the experimental group, there was no association found between the post-test level of communication and demographic variables such as age, sex, education, occupational status, marital status, area of living, duration of mechanical ventilator, previous history of ventilator, length of stay in ICU, and disease condition.

Table 5 reveals that in the experimental group, there was no association found between the post-test level of communication and demographic variables such as age, sex, education, occupational status, marital status, area of living, duration of mechanical ventilator, previous history of ventilator, length of stay in ICU, and disease condition.

In the experimental group, there was a significant association found between the post-test level of anxiety and demographic variable such as marital status ($\chi^2 = 9.17$). All the other variables such as age, sex, educational status, occupational status, area of living, duration of mechanical ventilator, previous history in ICU, length of stay in ICU, and disease condition, were not associated.

Table 3: Mean, standard deviation and independent t-test value on post-test level of ease of communication and level of anxiety among samples on mechanical ventilation in the experimental and control group. n=60

Components	Group	Post-test		*t*-test value
		Mean	SD	
Ease of communication	Experimental group	11.6	2.02	**3.381
	Control group	31.7	4.24	
Level of anxiety	Experimental group	6.93	1.43	*1.93
	Control Group	14.7	2.28	

Table value 2.75 Df=58 **Highly significant $P<0.01$. Table value 1.697 Df=58 *Significant $P<0.05$

Table 4: Karl Pearson's correlation coefficient value on ease of communication and level of anxiety among mechanically ventilated patients. *n*=60

Variables	Experimental group		Control group		Karl Pearson's correlation and co -efficient value
	Mean	SD	Mean	SD	
Ease of communication	11.6	2.023	31.7	4.24	0.6
Level of anxiety	6.93	1.43	14.7	2.28	

Table 5: Association between the post-test level of ease of communication among samples and their selected demographic variables in the experimental group. n=30

Demographic variables	Df	Table value	Ease of communication	Level of anxiety
			Chi-square value	Chi-square value
Age	4	9.48	7.75	1.87
Sex	1	3.84	0.27	1.48
Educational status	3	7.81	3.47	1.10
Occupational status	1	3.84	0.77	0.05
Marital Status	1	3.84	0.61	**9.17
Area Of living	1	3.84	1.07	2.07
Duration of mechanical ventilator	2	5.99	1.03	2.02
Previous History of ventilator	1	3.84	1.33	0.23
Length of stay in ICU	3	7.81	1.42	2.61
Disease condition	4	9.48	4.04	3.81

In the experimental group, there was a significant association found between the post-test level of anxiety and demographic variable such as marital status ($\chi^2 = 9.17$). All the other variables such as age, sex, educational status, occupational status, area of living, duration of mechanical ventilator, previous history in ICU, length of stay in ICU, and disease condition, were not associated.

Discussion

The study was done to evaluate the effectiveness of communication board on ease of communication and level of anxiety among patients on mechanical ventilator. In the present study, the experimental group samples, majority of

them 22 (73.33%) had mild difficulty in communication, whereas about 8 (26.67%) of the samples had moderate difficulty in communication. According to level of anxiety in the experimental group during post-test, highest percentage 26 (86.66%) of the samples had no anxiety, whereas about 4 (13.33%) of the samples had border line abnormal level of anxiety and none 0% of the samples had abnormal level of anxiety. The finding was similar and consistent with another study, where in the experimental group, 192 (96%) of the subjects were able to meet their needs adequately after using the communication board as compared to 7 (3.5%) in control group. One hundred and fifty-five (77.5%) subjects of the experimental group showed maximal satisfaction with their ability to communicate needs as compared to only 2 (1%) in the control group. One hundred and twenty-eight (64%) subjects of the control group had minimal satisfaction with their ability to communicate their needs. The study concluded that the communication board was tested by the investigator and found appropriate.[8]

The finding of the present study reveals that the post-test, patients on mechanical ventilator had 11.6 ± 2.02 mean ease of communication in the experimental group and 31.7 ± 4.24 mean ease of communication score in the control group, so the mean difference 20%, the calculated independent "t"-test value is 3.381, and it is statistically highly significant at $P < 0.01$ level. In post-test, patients on mechanical ventilator had 6.93 ± 1.43 mean level of anxiety in the experimental group and 14.7 ± 2.28 mean level of anxiety in the control group, so the mean difference is 7.77, the calculated independent "t"-test value is 1.93, and it is statistically significant at $P < 0.05$ level. The finding of the present study is been supported by the study done by.The mean communication score in the experimental group was 5.73 ± 1.48; in the control group, it was 14.8 ± 2.73, which showed a significant difference between them $P \geq 0.001$. The mean anxiety score in the experimental and control group were 16.93 ± 2.49 and 18.06 ± 1.83, respectively, with $P \geq 0.24$ which decreased significantly after the intervention ($P \geq 0.003$).[9]

In the present study in post-test, patients on mechanical ventilator had 11.6 ± 2.02 mean ease of communication in the experimental group and 31.7 ± 4.24 mean ease of communication score in control group, so the mean difference 20%, the calculated independent "t"-test value is 3.381, and it is statistically highly significant at $P < 0.01$ level. The finding was similar to the study done by Kalyani Fatkal, where the result t = 23.81 which was statistically significant at $P < 0.5$.[10] Thus, the research revealed that communication board was effective in improving the level of satisfaction of the communication pattern.

Conclusion

The communication board was effective in reducing the difficulty of communication among patients on mechanical ventilator. There was a strong positive correlation between ease of communication and level of anxiety. In the experimental group, there was a significant association found between the post-test level of anxiety and demographic variables such as marital status ($\chi^2 = 9.17$).

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Conflicts of Interest

We declare that we have no conflicts of interest.

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