Original Article

Effectiveness of Communication Board on Level of Satisfaction among Mechanically Ventilated Patients at Intensive Care Unit in a Tertiary Hospital

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Abstract

Introduction: Critical care nurses are crucial in managing critical patients, facing challenges with advanced technology, alarms, ventilators, and multiple laboratory investigations. They must effectively communicate and manage patients on mechanical ventilation (MV), a lifesaving intervention for those needing oxygenation and ventilation support to ensure patient satisfaction. **Materials and Methods:** The study employed a quasi-experimental design with 80 mechanically ventilated patients selected through purposive sampling. Data were collected using demographic and clinical pro forma and a predesigned four-point Likert satisfaction scale comprised 14 items. The intervention group utilized a communication board, while the conventional group received routine care. The aim was to evaluate satisfaction levels in both groups, followed by a posttest on the 5th day using the same instrument. **Results:** The pretest revealed mean satisfaction scores of 32.47 ± 6.48 and 33.95 ± 6.41 for the intervention and conventional groups, respectively, with a mean difference of 1.47, considered statistically nonsignificant (t_{78} = 1.023, P = 0.310). Conversely, posttest scores showed 37.85 ± 8.23 and 34.32 ± 6.18 for the intervention and conventional groups, respectively, with a mean difference of 3.53, indicating statistical significance (t_{78} = 2.164, P = 0.034). Hence, the communication board intervention significantly enhanced satisfaction scores among mechanically ventilated patients, underscoring its positive impact on nursing care in terms of patients' satisfaction. **Conclusion:** Effective communication is crucial in intensive care unit patient care, especially for those unable to speak due to MV. Utilizing communication boards significantly enhances patient satisfaction, highlighting the need for ongoing innovation in critical care nursing.

Keywords: *Communication board, critical care nursing, intensive care units, mechanical ventilation, nursing care, patient satisfaction*

Introduction

Critical care nurses are crucial in managing critical patients, facing challenges with advanced technology, alarms, ventilators, and multiple laboratory investigations. They must effectively communicate and manage patients on mechanical ventilation (MV), a lifesaving intervention for those needing oxygenation and ventilation support to ensure patient satisfaction.[1]

Effective communication is vital in patient-centered care, enhancing outcomes and safety.[2] It forms the foundation of the nurse–patient relationship, increasing patient satisfaction and trust in nurses, and is a fundamental human need in healthcare settings.[3,4] Communication challenges are a significant obstacle for mechanically ventilated patients, their families, and healthcare professionals in the intensive care unit (ICU).[5-8]

Among ICU patients, 40% need invasive MV via endotracheal tube or tracheostomy. Over 80% of critical care unit patients have moderate-to-severe communication problems during MV.[4,9] Only around 5% of messages communicated by MV patients are appropriately received and comprehended by healthcare personnel, indicating that understanding challenges exist in addition to the communication difficulties indicated by 50% of MV patients.[10,11]

According to a study, over 62% of mechanically ventilated patients report often feeling despair, helplessness, and anxiety while attempting to speak since they are unable to effectively express their requirements.[12] One of the most significant communication challenges between nurses and patients on MV is the lack of

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suitable communication methods. As a result, by finding and implementing suitable and effective communication approaches, these patients' anxiety levels may be greatly lowered.[13]

The presence of a mechanical ventilator can restrict communication between the patient and the nurse, with communication difficulties being the primary issues reported by patients in the ICU receiving MV support.[14] Therefore, the implementation of effective communication interventions, such as the use of a communication board, is essential in clinical practice to address challenges in patient satisfaction and support patient-centered care in the management of mechanically ventilated patients in the ICU.[15,16]

Materials and Methods

The study employed a quasi-experimental design with a quantitative approach. The research was carried out from July to December 2023 in the ICU at SGRD Hospital, Amritsar, Punjab. A total of 80 mechanically ventilated patients were selected through purposive sampling and equally randomized into two groups of 40 patients each, using a randomization table. The intervention group was provided with a communication board to help express their needs, emotions, and concerns while on MV. This board aimed to enhance communication between patients and healthcare providers, thereby improving patient satisfaction. In contrast, the conventional group followed routine ICU communication methods, relying on traditional nonverbal techniques such as gestures, head nodding, and lip reading.

Data were collected using a demographic, clinical pro forma and a predesigned four-point Likert satisfaction scale. The satisfaction scale rated patient responses from unsatisfied (1) to very satisfied (4) across 14 items, yielding a minimum score of 14 and a maximum of 56. The level of satisfaction was categorized into unsatisfied (14–27), neutral (28–41), satisfied (42–49), and very satisfied (50–56). The research instrument demonstrated a content validity index of 0.87, ensuring its appropriateness for the study, while its reliability, assessed through Cronbach's alpha, was measured at 0.78, indicating acceptable internal consistency.

Ethical considerations

The investigation was granted ethical approval by the Institute Ethics Committee at SGRD University of Health Sciences, Amritsar, Punjab, India, with the reference number SGRDU//23-143 on May 5, 2023. Formal permission for data collection was subsequently obtained from the relevant authorities. Participants were informed that there were no risks associated with their involvement in the research. Data collection commenced once the participants had completed and signed the informed consent forms.

Sample size

In this study, we determined the sample size using a formula integrating power, effect size, and the desired level of statistical significance, utilizing data from a pilot study. With mean values of 35.50 ± 5.541 for the experimental group and 32.10 ± 4.854 for the conventional group, we calculated a required sample size of 74 under the conditions of an α level set at 0.05 and a power $(1-\beta)$ of 0.80. Therefore, the researcher involved 80 samples in total, allocating 40 to each group for analysis.

$$n = \frac{\left(Z_{1-\frac{\alpha}{2}} + Z_{\beta}\right)^2 \left(\sigma_1 + \sigma_2\right)^2}{\left(\mu_1 - \mu_2\right)^2}$$

Eligibility criteria

Patients who were mechanically ventilated and able to understand Hindi, Punjabi, or English. Participants with conditions such as sedation, muscle relaxant, disorientation, or any cognitive impairment related to disease condition were excluded from the study.

Data collection procedure

After obtaining ethical approval and informed consent, the researchers explained the study's aims, objectives and data collection procedures to the participants. A previsit to the study settings was conducted to seek authorization from the charge nurse and to establish an appropriate data collection schedule. A pretest was then administered to participants in both the intervention and conventional groups. In the intervention group, a communication board was used to facilitate interaction, while the conventional group followed routine care with traditional communication methods. The aim was to assess satisfaction levels in both groups, and on the 5th day, a posttest using the same research instrument was administered to evaluate the outcomes.

Statistical analysis

Data analysis was conducted using the IBM SPSS software (IBM Corp., IBM SPSS Statistics, Version 27.0, Armonk, NY, USA: IBM Corp; 2020). Descriptive statistics included frequency, percentage, and mean. For inferential statistics, a Chi-square test was applied to assess homogeneity. The independent *t*-test was used to compare satisfaction scores between groups. In addition, the independent *t*-test and ANOVA were conducted to examine the association between satisfaction scores and selected variables. $P < 0.05$ was considered statistically significant.

Results

The result reveals a diverse age distribution in both groups, with 40% of patients in each group being over 60 years old. The mean age was similar across the groups at approximately 54 years. Regarding gender distribution, the intervention group had a slightly higher percentage of

females (55%) compared to the conventional group (45%). In terms of educational status, a significant portion of participants had up to a 10th-grade education (40% in the intervention group and 30% in the conventional group). A notable difference was observed in the informal education category, where 47.5% of the conventional group had informal education compared to 30% in the intervention group. The occupational status revealed that a larger proportion of the intervention group was nonworking (70%) compared to the conventional group (57.5%).

Family income levels varied, with the intervention group having a higher mean monthly income (Rs. 34,250 ± 15,861.17) than the conventional group (Rs. 29,850 ± 12,311.24). The distribution of family income categories showed a higher percentage of the conventional group earning Rs. 20,000 or less per month. Most participants in both groups were from nuclear families, with a slightly higher percentage in the intervention group (85% vs. 80% in the conventional group). Habitat analysis showed a higher proportion of urban dwellers in the intervention group (60%) compared to the conventional group (45%). Dietary habits revealed that 75% of the intervention group were nonvegetarians, in contrast to 55% in the conventional group, indicating a preference for nonvegetarian diets among the intervention participants.

The Chi-square test ($P > 0.05$) indicated no significant variable differences, maintaining homogeneity across the groups.

The clinical profile showed that the diagnoses among the patients varied, with chronic kidney disease affecting 10% of the intervention group and 15% of the conventional group. Chronic liver disease was more prevalent in the intervention group (17.5%) compared to the conventional group (10%). Congestive heart failure was observed in 15% of the intervention group and 17.5% of the conventional group. Sepsis, head injury, and acute respiratory distress syndrome were other notable diagnoses, showing a varied distribution between the two groups. The average length of stay was slightly longer in the intervention group (7.75 ± 2.64 days) compared to the conventional group (7.18 ± 2.95 days). Regarding the duration of MV, the average duration of MV was 7.63 ± 2.86 days for the intervention group and 7.45 ± 2.88 days for the conventional group. Both groups showed homogeneity, as the Chi-square test revealed no significant differences in clinical variables between the groups ($P > 0.05$).

In the intervention group, 27.5% were unsatisfied, 52.5% neutral, and 20.0% satisfied. In comparison, in the conventional group, 20.0% were unsatisfied, 60.0% neutral, and 20.0% satisfied. This indicates a higher level of dissatisfaction in the intervention group and a greater tendency toward neutrality in the conventional group [Figure 1].

In the intervention group, 17.5% were unsatisfied, 30.0% neutral, 40.0% satisfied, and 12.5% very satisfied. In contrast, in the conventional group, 12.5% were unsatisfied, 67.5% neutral, and 20.0% satisfied, with none very satisfied. This reflects a significant improvement in the proportion of satisfaction levels within the intervention group [Figure 2].

The pretest mean satisfaction score was 32.47 ± 6.48 for the intervention group and 33.95 ± 6.41 for the conventional group, with a mean difference of 1.47. An independent "*t*-test" was applied, indicating a difference that is not statistically significant at the baseline ($t_{78} = 1.023$, $P = 0.310$) [Table 1].

In contrast, the posttest results demonstrate a mean satisfaction score of 37.85 ± 8.23 for the intervention group and 34.32 ± 6.18 for the conventional group. The mean difference between the groups postintervention increased to 3.53. The results indicate a statistically significant difference at the 0.05 level in the posttest ($t_{78} = 2.164$, $P = 0.034$). Hence, the intervention, involving the use of a communication board, effectively improved satisfaction scores among mechanically ventilated patients in the intervention group compared to the conventional group [Table 1]. These results highlight the positive impact of enhancing communication capabilities on patient satisfaction, emphasizing the role of the communication board in improving the quality of care for mechanically ventilated patients.

The results indicate that there were no significant associations between the pretest satisfaction levels among mechanically ventilated patients in the intervention group and factors such as age ($P = 0.722$), gender ($P = 0.680$), educational status ($P = 0.806$), diagnosis ($P = 0.660$), length of ICU stay ($P = 0.182$), and duration of mechanical ventilation ($P = 0.992$) at the 0.05 significance level.

The results also indicate no significant associations between pretest satisfaction levels among mechanically ventilated patients in the conventional group and factors such as age ($P = 0.407$), gender ($P = 0.170$), educational status ($P = 0.948$), diagnosis ($P = 0.140$), length of ICU stay ($P = 0.880$), and duration of mechanical ventilation ($P = 0.452$) at the 0.05 significance level.

Table 1: Effectiveness of the communication board regarding satisfaction score among mechanically ventilated patients (*n*=80)

Measurement	Intervention, mean±SD	Conventional, mean±SD	MD	*t*	df	*P*
Pretest	32.47±6.48	33.95±6.41	1.47	1.023	78	0.310
Posttest	37.85±8.23	34.32±6.18	3.52	2.164	78	0.034

SD: Standard deviation; MD: Mean difference; df: Degree of freedom

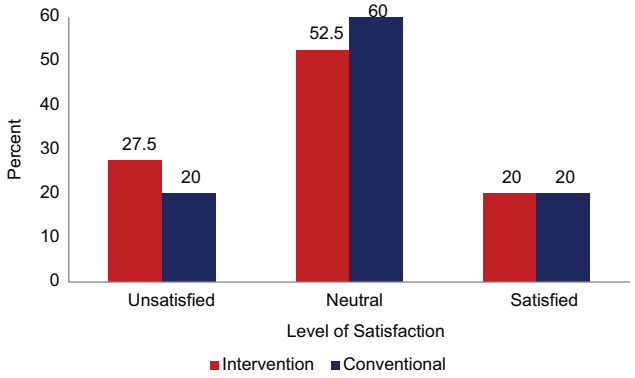

Figure 1: Pretest level of satisfaction among mechanically ventilated patients

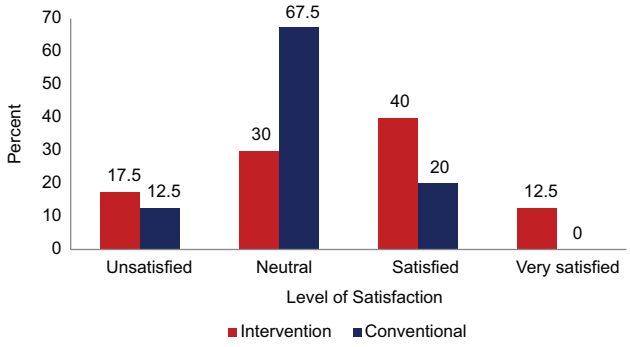

Figure 2: Posttest level of satisfaction among mechanically ventilated patients

Discussion

Our study's findings suggest the positive impact of communication board interventions on patient satisfaction among those undergoing MV. A smaller percentage of patients in the intervention group (17.5%) were dissatisfied postintervention, compared to 12.5% in the conventional group. The intervention group saw a significant reduction in neutrality, dropping from 67.5% to 30%, alongside an increase in satisfaction rates, with 40% of patients satisfied, including 12.5% who were very satisfied, doubling the satisfaction rate of the conventional group (20%). This emphasizes the effectiveness of communication boards in improving patient satisfaction.

A supporting study reported a 90% satisfaction rate in their intervention group compared to 30% in the conventional group.[17] Another study found that 77.8% of patients in the intervention group benefited from illustrated communication materials, while patients in the conventional group faced communication challenges.[11]

Despite these positive results, gaps in nurse–patient communication remain, with only 4% of nurses successfully communicating with intubated patients.[18] Other research highlight the importance of patient-centered communication for better healthcare outcomes.[19,20] Promoting the use of communication aids like picture boards to address the frustration of ventilated patients.[21] Furthermore, the use of digital devices has proven effective in bridging communication gaps in ICU settings.[22]

Coelho *et al*.[23] and Ten Hoorn *et al*.[8] emphasize incorporating alternative communication strategies in ICU care, though challenges like time consumption persist. Finally, Carruthers *et al*.[4] and Nilsen *et al*.[24] provide further support for augmentative and alternative communication strategies, reinforcing their value despite variability in study quality and consensus. Scheunemann *et al*.[25] and Ariffina *et al*.[26] emphasized the importance of structured communication interventions and the critical role of nurses in supporting voiceless ICU patients. Fatkal[27] highlighted the effectiveness of communication boards in overcoming communication barriers for ventilated ICU patients, noting significant improvements postintervention.

Our study reveals that communication boards significantly enhance patient satisfaction among mechanically ventilated patients. In the pretest, no significant difference was observed between the intervention and conventional groups. However, posttest analysis demonstrated a statistically significant increase in satisfaction scores in the intervention group, underscoring the effectiveness of communication boards.

Supporting research indicates that patient satisfaction increases and communication of needs improves following the intervention.[28] Another study emphasizes the role of structured communication tools in improving family satisfaction and aligning expectations between physicians and relatives, reinforcing their importance in critical care.[29]

On the other hand, Guttormson *et al*.[10] associated ineffective communication with feelings of helplessness and dissatisfaction, underscoring the need for better communication strategies. Similarly, Rathi and Baskaran[30] and Bhardwaj and George[31] affirmed the positive impact of communication boards on patient satisfaction.

However, some studies, like those by Chakraborty *et al*.[32] and Rodriguez *et al*.,[33] question the overall effectiveness of visual communication aids, citing varied results. Despite these dissenting views, the consensus largely supports integrating communication boards into patient care, as shown by Kartlarının,[34] Erfan *et al*.,[35] and Kaur *et al*.[36]

Our investigation found no significant association between pretest satisfaction levels and demographic or clinical factors in both the intervention and conventional groups. Similarly, Bhardwaj and George[31] found no statistical association between satisfaction and sociodemographic or clinical characteristics in mechanically ventilated patients, which aligns with our findings. However, Chakraborty *et al*.[32] reported an exception where patient satisfaction was linked to the duration of compromised communication, although they also found no association with age or gender.

Strengths of the study

Adopting a quasi-experimental study design with a quantitative approach enhances the rigor of the research. The controlled comparison between the intervention (communication boards) and conventional groups provides clear insights into the effectiveness of the intervention. Random allocation minimizes selection bias, further strengthening the validity of the findings and their applicability to similar ICU settings.

Limitations

The study's limitations, particularly the potential lack of generalizability of the results due to the single tertiary hospital setting, are important to consider. The findings might not be applicable to all ICU settings or patient populations with different conditions. To improve the generalizability of these results, further research with a larger, more diverse sample and a randomized controlled trial design is recommended across broader healthcare settings.

Conclusion

Effective communication is vital in patient care, especially in ICU settings where patients often cannot speak due to MV. This study strongly supports using communication boards to improve patient satisfaction, significantly fostering a more patient-centered approach. The findings highlight the challenges nursing staff face in establishing clear communication with ventilated patients, emphasizing the need for ongoing innovation in communication tools. These insights encourage adopting more compelling, empathetic communication strategies in critical care, ultimately enhancing patient satisfaction and improving care quality.

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Conflicts of interest

There are no conflicts of interest.

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