



KNOWLEDGE AND PRACTICE, REGARDING NURSING CARE OF PATIENTS ON MECHANICAL VENTILATOR

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KEYWORDS

Nursing Care Knowledge,
Nursing Care practice,
mechanical ventilator, ICU and
Staff Nurse.

ABSTRACT

A study was conducted to assess the knowledge and practice of staff nurses working in intensive care units regarding nursing care of patients on mechanical ventilator in selected hospitals of Rajasthan. The descriptive approach was adopted; purposive sampling was used to select a sample of 60 staff nurses working in ICU. The tool developed and used for data collection was structured knowledge questionnaire and an observational checklist. It was found that among 60 subjects, 73.67% had average knowledge and 67.97% had average practice score. There was significant association between the Knowledge and selected demographic variable such as age and educational qualifications and between practice and ICU working experience. There was no significant association between knowledge and some demographic variable as gender, clinical experience and between practice and remaining demographic variable as age, gender, educational qualification and clinical experience. There was positive correlation 0.49 between the level of Knowledge and Practice.

Introduction

The care of mechanically ventilated patient is at the core of nurse's clinical practice in the intensive care unit. In a wide variety of settings, nurses are increasingly likely to care for patients on mechanical ventilators.¹ The incidence of mechanical ventilator for adults grow from 284/1, 00,000 in 1996 to 340/10, 00,000 in 2002 the increase rate was 11% (1996 to 2002). The rapid increase in incidence occurs in younger age group as compare to elder patients. As the use of mechanical ventilator has been increased, the associated fatal complications also increased such as, hypotension, decrease cardiac output, pneumothorax, oxygen toxicity, gastric distension, infection, malnutrition, and ventilator associated pneumonia.

Mechanical ventilation is one of the most common interventions implemented in the intensive care unit. More than half of the patients in the ICU are ventilated the first 24 hours after ICU admission; comprised of individual who have acute respiratory failure to protect their airway. The lungs primary function is to add oxygen and to remove CO₂ from the blood passing through the lung's capillary bed.²

Mechanical ventilators assist the movement of gases (air) into and out of a patient's lungs, while minimizing the effort of breathing (Scholz et al, 2011). The nursing management of the mechanically ventilated patient is challenging on many levels: from the acquisition of highly technical skills; expert knowledge on invasive monitoring; and implementation of interventions to care for the patient. Each critically ill patient brings the clinical rationale for mechanical ventilation and additional complexities associated with their illness. It is recognized that the reason for mechanical ventilation and patient admission impacts on patient assessment and management.³

Mechanical ventilation is one of the most common interventions implemented in the intensive care unit. More than half of the patients in the ICU are ventilated the first 24 hours after ICU admission; comprised of individuals who have acute respiratory failure, compromised lung function, difficulty in breathing, or failure to protect their airway.⁴

Survival among mechanically ventilated patients depends not only on the factors present at the start of mechanical ventilation, but also on the development of complications and patient management in the intensive

care unit.⁵

Statement of the problem

A study to assess the knowledge and practice, regarding nursing care of patients on mechanical ventilator among staff nurses working in intensive care units of Mathura Das Mathure and Mahatma Gandhi Hospital at Jodhpur, Rajasthan.

Hypothesis

There is a significant association between demographic variable and knowledge and practice regarding nursing care of patient on mechanical ventilator among staff nurses working in ICU.

There is a correlation knowledge and practice regarding nursing care of patient on mechanical ventilator among staff nurses working in ICU.

Objectives of The Study

1. To assess the Knowledge of staff Nurses regarding Nursing care of patients on mechanical ventilator.
2. To assess the Practice of staff Nurses regarding Nursing care of patients on mechanical ventilator.
3. To determine the association between knowledge and selected demographical variables.
4. To determine the association between practice and selected demographical variables.
5. To determine the correlation between knowledge and practice of staff nurses regarding nursing care of patients on mechanical ventilator.


Review of Literature

Literature related to, knowledge and practice of staff nurses regarding nursing care of patients on mechanical ventilator and patient's needs during mechanical ventilation was reviewed.

Rose Maria, Davinder Kaur, Surinder Jaspal (2015) conducted a quasi-experimental study on Comparing Video Assisted Teaching (VAT) versus Self Instructional Module (SIM) regarding care of ventilated patients on knowledge and practices of staff nurses, analysis revealed VAT & SIM were equally effective in improving the knowledge as well as practices. However, upon comparison mean knowledge scores between the two groups were highly significant while mean practice scores were non-significant leading to conclusion that SIM was more

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effective in enhancing the knowledge and of staff nurses as compared to VAT, being a useful handy tool, in the clinical setting.⁶

Kushma Ghimire (2013) conducted a study to know the relationship between area and source of knowledge of staff nurses for patients on mechanical ventilation. According to the Results, out of 50 nurses, Seventy percent respondents had knowledge on Nursing care of patient on mechanical ventilation and 56% respondents had knowledge on complications of mechanical ventilation. Although few (20%) of the nurses had received educational program regarding care of patients on mechanical ventilation had scored good knowledge. It may be due to departmental exposure and previous experience of handling mechanically ventilated cases. So, the study concluded that educational program is not only the source of enhancing knowledge among staff nurses.

Cason CL, Tyner T, Saunders S, Broome L (2007) conducted a study on Nurses' implementation of guidelines for ventilator-associated pneumonia from the Centers for Disease Control and Prevention. The study was conducted to evaluate the extent to which nurses working in intensive care units implement best practices when managing adult patients receiving mechanical ventilation. Nurses attending education seminars in the United States completed a 29-item questionnaire about the type and frequency of care provided. Twelve hundred nurses completed the questionnaire. Most (82%) reported compliance with hand-washing guidelines, 75% reported wearing gloves, half reported elevating the head of the bed, a third reported performing subglottic suctioning, and half reported having an oral care protocol in their hospital. Nurses in hospitals with an oral care protocol reported better compliance with hand washing and maintaining head-of-bed elevation, were more likely to regularly provide oral care, and were more familiar with rates of ventilator-associated pneumonia and the organisms involved than were nurses working in hospitals without such protocols. The guidelines for the prevention of ventilator-associated pneumonia from the Centers for Disease Control and Prevention are not consistently or uniformly implemented. Significant reductions in rates of ventilator-associated pneumonia may be achieved by broader implementation of oral care protocols and using strategies and education programs.

Research Methodology

Research design: Descriptive study

Setting of the study: ICU's of Mahatma Gandhi and Mathura Das Mathure Hospital Jodhpur, Rajasthan.

Sample size and sampling technique: 60 staff nurses working in ICU selected by Simple purposive sampling technique.

Study tools:

Section I: - Socio Demographic Data of the subjects.

Part II: - Structured Knowledge questionnaire consisted of 35 knowledge items, designed to assess the level of knowledge regarding nursing care of patients on mechanical ventilator among staff nurses.

Score interpretation: The level of knowledge was categorized as

Poor knowledge: 0 – 17

Average knowledge: 18 – 27

Good knowledge: 28 – 35

Part III: - Observational Checklist consisted of 50 correct practices performed by staff nurses specifically in the area of oral care, eye care, ear care, skin care and communication to assess the level of practice regarding nursing care of patients on mechanical ventilator among staff nurses.

Score interpretation: The level of Practice was categorized as

Poor practice: 0 – 25

Average practice: 26 – 37

Good practice: 38 – 50

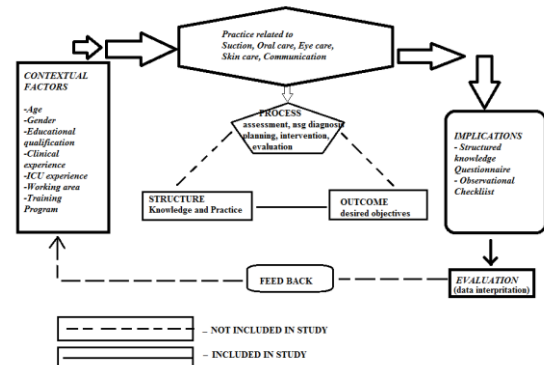
Plan for data analysis: A data analysis was planned on the basis of

objectives and hypothesis by descriptive & inferential statistics.

Conceptual frame work

In the current study King's conceptual frame work and theory of goal attainment was applied to investigate the phenomena of knowledge and practice of staff nurses. In the present study, the investigator used this model up to the second step to assess the knowledge and practice of staff nurses regarding the Nursing care of patient on mechanical ventilator.

Fig no. 1 Imogene King's Goal attainment model



Results

Out of 60 staff Nurses, 53.3% had average, 46.7% had good and 0% had poor level of knowledge. In the area of practice 53.3% had average, 33.3% had good & remaining 13.3% had poor level of practice. The overall mean percentage of the Knowledge score was 73.67% with 25.78 ± 7.75 and practice score was 67.97% with 33.98 ± 8.98 as mean and SD of the total score. There was a significant association between the Knowledge and Practice and selected demographic variable as age and educational qualifications and between practice and ICU experience at $P > 0.05$ level of significance. A positive correlation found between the level of Knowledge and Practice. Karl Pearson's correlation coefficient test was done the mean k score was 25.78 with the SD of 7.75 and the practice mean score was 33.98 with the SD of 8.98. The value of correlation coefficient $r = 0.49$ showed a positive correlation between Knowledge and Practice.

Table 1: Distribution of staff nurses working in ICU's by their socio-demographic characteristics (N=60)

| S. no. | Demographic characteristics | Category | Frequency | Percentage (%) |
|--------|----------------------------------|--|---------------------------|--|
| 1. | Age | 25 and below 26 – 30 31 – 35 36 and above | 16 24 7 13 | 26.67 40.00 11.67 21.67 |
| 2. | Gender | Male Female | 30 30 | 50 50 |
| 3. | Educational qualification | Bsc. Nursing P.B.BSc Nsg G.N.M | 2 6 52 | 3.33 10 86.67 |
| 4. | Total Clinical experience (yrs.) | 0.5 to 4 4+ to 8 8+ to 12 >12 | 30 15 4 11 | 50 25 6.67 18.33 |
| 5. | ICU Working experience (yrs.) | 0.5 to 2 2+ to 4 4+ to 6 >6 | 20 21 11 8 | 33.33 35 18.33 13.33 |
| 6. | Present working area | CCU CTICU ICU MICU SICU | 9 11 19 10 11 | 15 18.33 31.67 16.67 18.33 |

the educational qualification of G.N.M. 30 (50%) subjects were under the 6 months to 4 years category of the total clinical experience and 20 (30%) were having 6 months to 2 years of ICU experience. Out of 60

Table 1 shows that majority of staff nurses i.e. 24 (40%) belonged to age group 26 – 30 years. Out of 60 staff nurses 30 (50%) were females and 30 (50%) were male. Majority of the subjects i.e. 52 (86.67%) were having

subjects nobody had attended any training program related to nursing care of mechanically ventilated patient.

Table – 2 Frequency and percentage distribution of level of Knowledge of the staff nurses regarding Nursing care of a patient on mechanical ventilator. (N = 60)

| Knowledge | Range of scores | Frequency | Percentage |
|-----------|-----------------|-----------|------------|
| Poor | 0 - 17 | 0 | 0.0% |
| Average | 18 - 27 | 32 | 53.3% |
| Good | 28 - 35 | 28 | 46.7% |

Table-2 shows that out of 60 staff nurses 32 (53.3%) had average knowledge, and 28 (46.7%) had good level of knowledge and 0% of staff nurses had poor level of knowledge regarding Nursing care of patient on mechanical ventilator.

Table 3 Frequency and percentage distribution of the staff nurses practice score regarding Nursing care of patient on mechanical ventilator. (N = 60)

| Level of practice | Range of scores | Frequency | Percentage |
|-------------------|-----------------|-----------|------------|
| Poor | 0 – 25 | 8 | 13.3% |
| Average | 26 – 37 | 32 | 53.3% |
| Good | 38 – 50 | 20 | 33.3% |

Table no.3 indicates that majority of staff nurses 32 (53.3%) had average level of practice, 20 (33.3%) had good level of practice whereas 13.3% showed poor level of practice.

Table-4: Association between the knowledge score and selected demographic variables

| S. no. | Demographic variables | Poor F % | Average F % | Good F % | Chi-square | t value | P value | df | Inferences |
|--------|----------------------------------|-------------|----------------|-------------|------------|---------|---------|----|------------|
| 1. | Age | | | | | | | | |
| | 25 and below | 0 | 8 | 8 | 13.16 | 7.81 | 0.001 | 3 | S |
| | 26 – 30 | 0 | 14 | 16 | | | | | |
| | 31 – 35 | 0 | 6 | 3 | | | | | |
| | 36 and above | 0 | 10 | 11 | | | | | |
| 2. | Gender | | | | | | | | |
| | Female | 0 | 25 | 25 | 0.267 | 3.84 | .05 | 1 | NS |
| | Male | 0 | 28 | 21 | | | | | |
| 3. | Educational qualification | | | | | | | | |
| | Bsc. Nursing | 0 | 0 | 2 | 6.34 | 5.99 | .05 | 2 | S |
| | P.B.BSc Nsg | 0 | 1 | 5 | | | | | |
| | G.N.M | 0 | 3 | 35 | | | | | |
| 4. | Total Clinical experience (yrs.) | | | | | | | | |
| | 0.5 to 4 | 0 | 1 | 1 | 1.97 | 7.815 | 0.005 | 3 | NS |
| | 4+ to 8 | 0 | 9 | 6 | | | | | |
| | 8+ to 12 | 0 | 1 | 3 | | | | | |
| | >12 | 0 | 5 | 6 | | | | | |
| 5. | ICU Working experience (yrs.) | | | | | | | | |
| | 0.5 to 2 | 0 | 1 | 8 | 2.660 | 7.815 | 0.005 | 3 | NS |
| | 2+ to 4 | 0 | 1 | 8 | | | | | |
| | 4+ to 6 | 0 | 5 | 6 | | | | | |
| | >6 | 0 | 2 | 6 | | | | | |
| 6. | Present working area | | | | | | | | |
| | CCU | 0 | 3 | 6 | 3.37 | 9.48 | 0.005 | 4 | NS |
| | CTICU | 0 | 7 | 4 | | | | | |

| | | | | | | | | | | | |
|------|---|---|---|-----|---|-----|--|--|--|--|--|
| ICU | 0 | 0 | 1 | 18. | 8 | 13. | | | | | |
| MICU | 0 | 0 | 6 | 10 | 4 | 6.7 | | | | | |
| SICU | 0 | 0 | 5 | 8.3 | 6 | 10 | | | | | |

Table-4 depicts association between the knowledge level and some selected variable as age and educational qualification of the staff nurses were found to be significant at the level of $p < 0.05$ except the variable i.e. gender, clinical experience, ICU experience and present working area of the staff nurses were not statistically significant.

Table-5 Association between the practice score and selected demographic variables

| S. no | Demographic variables | Poor F % | Average F % | Good F % | Chi-square | t value | P value | df | Inferences |
|-------|----------------------------------|-------------|----------------|-------------|------------|---------|---------|----|------------|
| 1. | Age | | | | | | | | |
| | 25 and below | 3 | 1 | 1 | 13.98* | 12.59* | 0.043 | 6 | S |
| | 26 – 30 | 5 | 8 | 1 | | | | | |
| | 31 – 35 | 0 | 5 | 2 | | | | | |
| | 36 and above | 0 | 7 | 6 | | | | | |
| 2. | Gender | | | | | | | | |
| | Female | 0 | 1 | 1 | 0.267* | 3.84* | 0.604 | 1 | NS |
| | Male | 0 | 1 | 1 | | | | | |
| 3. | Educational qualification | | | | | | | | |
| | Bsc. Nursing | 0 | 0 | 2 | 18.46 | 9.49 | .05 | 4 | S |
| | P.B.BSc Nsg | 0 | 0 | 6 | | | | | |
| | G.N.M | 8 | 3 | 1 | | | | | |
| 4. | Total Clinical experience (yrs.) | | | | | | | | |
| | 0.5 to 4 | 8 | 1 | 8 | 11.93* | 12.59* | 0.063 | 6 | NS |
| | 4+ to 8 | 0 | 1 | 4 | | | | | |
| | 8+ to 12 | 0 | 2 | 2 | | | | | |
| | >12 | 0 | 5 | 6 | | | | | |
| 5. | ICU Working experience (yrs.) | | | | | | | | |
| | 0.5 to 2 | 7 | 1 | 2 | 17.11* | 12.59* | 0.008 | 6 | S |
| | 2+ to 4 | 1 | 1 | 8 | | | | | |
| | 4+ to 6 | 0 | 6 | 5 | | | | | |
| | >6 | 0 | 3 | 5 | | | | | |
| 6. | Present working area | | | | | | | | |
| | CCU | 1 | 4 | 4 | 1.58* | 15.51* | 0.991 | 8 | NS |
| | CTICU | 2 | 6 | 3 | | | | | |
| | ICU | 2 | 1 | 6 | | | | | |
| | MICU | 1 | 5 | 4 | | | | | |
| | SICU | 1 | 6 | 3 | | | | | |

* $P < 0.05$ N.S. – Not significant S. – Significant

Table – 5 depicts the association between the practice level and some selected variable as age, qualification and ICU experience of the staff nurses were found to be significant at the level of $p < 0.05$ except the variable i.e. gender, clinical experience, and present working area of the staff nurses were not statistically significant.

Table – 6 Correlation between the level of knowledge and practice of staff nurses regarding nursing care of patient on mechanical ventilator.

| Covariant | Mean score | SD | Mean % | P value (r) |
|-----------------|------------|------|--------|---------------|
| Knowledge score | 25.78 | 7.75 | 73.67% | 0.4920 |
| Practice score | 33.98 | 8.98 | 67.97% | |

Table no. 6 shows a positive correlation between knowledge and practice at $r = 0.4$

Testing Hypothesis

It was revealed that there was some demographic variable such as age and educational qualification which was significant with the knowledge and practice but others were not so H1 and H2 was not accepted but there was a positive correlation between knowledge and practice so H3 was accepted.

Conclusion

The findings revealed that staff nurses had average knowledge and practice regarding care of patient on mechanical ventilator and there was

significant association between the level of knowledge and only two demographic variables such as age and educational qualification whereas there was significant association between the level of Practice and selected demographic variables such as age, educational qualification, and ICU working experience. The study showed that there was a positive correlation in the level of knowledge and practice.

Recommendations

The present study can be replicated on a larger sample, thereby findings can be generalized.

A similar study can be designed to explore knowledge, attitude and practice of staff nurses regarding Nursing care of patient on mechanical ventilator

A detailed comparative study can be undertaken between Government and private hospital staff nurses working in ICU to compare their knowledge, practices as well as their attitude regarding Nursing care of a

patient on mechanical ventilator.

Experimental study can be conducted with structured teaching program to test its effectiveness in improving the knowledge and practice of staff nurses.

A workshop, seminar or training program can be organized for staff nurses regarding Nursing care of mechanically ventilated patient to enhance their level of knowledge and practice.

Long term follow-up studies can be undertaken to find the relationship between knowledge, practice and outcome of patient's mortality rate in ICU.

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Endnotes

¹ Christine N. Caring for the mechanically ventilated patient: part one. Nurs Stand. 2006;20(17):55-64; quiz 66.

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