GAVIN PUBLISHERS

Anesthsia and Medical Practice Journal

Pradhan C and Shrestha R. Anesth Med Pract J: AMPJ-115.
DOI: 10.29011/AMPJ-115. 100015

Case Report

Nurses' Knowledge Regarding Weaning Criteria of the Patients with Mechanical Ventilation in a Teaching Hospital, Chitwan

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Citation: Pradhan C, Shrestha R (2017) Nurses' Knowledge Regarding Weaning Criteria of the Patients with Mechanical Ventilation in a Teaching Hospital, Chitwan. Anesth Med Pract J: AMPJ-115. DOI: 10.29011/AMPJ-115. 100015

Received Date: 30 October, 2017; **Accepted Date:** 8 November, 2017; **Published Date:** 16 November, 2017

Abstract

Introduction/ Objective: Ventilator weaning is the process of gradually withdrawing artificial ventilation to the intubated patients for short or long time in critical care setting. Weaning patients from ventilator is complex and challenging task for nurses and knowing weaning criteria is most essential component for getting successful outcome for the patients with mechanical ventilation. Hence, this study was conducted to find out nurses' knowledge regarding weaning criteria of the patients with mechanical ventilation.

Methods: A descriptive cross-sectional study design was used with 57 nurses working in critical care unit of a teaching hospital, Bharatpur, Chitwan. The non-probability, enumerative sampling technique was used. Data was collected by using self-administered semi structured questionnaire during July, 2016. Association was analyzed using chi square.

Results: The level of knowledge regarding weaning criteria was 45.6% had adequate knowledge while 54.4% had inadequate knowledge. The significant influencing variables for weaning criteria were professional experience (p=<0.001), professional experience in critical care area (p=<0.001), clinical areas (p=0.002) and age (p=0.006) among nurses.

Conclusion: More than half of the respondents had inadequate knowledge regarding weaning criteria and professional experience as a whole and critical care area, clinical area and age are influencing variables for weaning criteria among nurses working in a teaching hospital Chitwan. Hence, it is strongly recommended for need of protocol, in-service education, effective supervision and reinforcement for improvement of knowledge on weaning criteria among nurses.

Keywords: Mechanical Ventilation; Nurse Knowledge; Weaning Criteria

Introduction

Ventilator weaning refers to the restoration of independent breathing in an individual dependent on mechanically assisted ventilation, which involves gradually exposing the individual to longer periods of partially supported or independent breathing [1]. Ninety percentage of the ICU patient need mechanical ventilation support globally. Intubation and mechanical ventilation are often lifesaving procedures for them [2]. About 6,469,674 patients need hospitalization in the six states of USA reported that 180,326 (2.8%) received invasive mechanical ventilation. Projecting to national estimates, there were 790,257 hospitalizations involving mechanical ventilation approximately 20% of patients who received mechanical ventilation did not receive intensive care [3].

Weaning patients from the ventilator is complex as the nurse needs to discontinue ventilation while providing continuous care, patient-focused, individualized weaning care plans and highlighting the expanding role of the ICU nurse [4]. Delays in weaning the patient from mechanical ventilation increase the number of complications and may lead to increased expenditure so the nurse must be well trained, should develop sound knowledge and practical skills in taking care of client with mechanical ventilator in order to develop them as effective potential and competent nurse practitioner [5]. About 90% of all ICU patients requiring mechanical ventilator support as a lifesaving measure. Approximately 30% of patients who require mechanical ventilation are not easily weaned [6].

Nurses must be knowledgeable about the function and limitations of ventilator modes, causes of respiratory distress and desynchrony with the ventilator, and appropriate management in order to provide high-quality patient-centred care [7].

Objectives

- To find-out nurses' knowledge regarding weaning criteria of the patients with mechanical ventilation.
- To identify the nurses' knowledge regarding weaning criteria of the patients with mechanical ventilation
- To find out the association between level of knowledge regarding weaning criteria of the patients with mechanical ventilation and selected variables.

Materials and Methods

A hospital based cross sectional study was conducted among fifty-seven nurses' working at the Chitwan Medical College Teaching Hospital, Chitwan. Non-probability, enumerative sampling technique was used.

It was carried out at critical care units like Medicine Intensive Care Unit (MICU), Coronary Care Unit (CCU), and Surgery Intensive Care Unit (SICU)/Neuro Surgery Intensive Care Unit (NSICU). The study population was all the nurses working in critical care units of CMCTH who were Registered nurse, passed out PCL and Bachelor degree and who have > 6-month experience in critical areas. Semi structured, self- administered questionnaire was used to measure the knowledge of respondents.

Results

Socio-demographic Characteristics of Respondents

In regards to socio-demographic characteristics, out of 57 respondents, mean age was 22.79±2.17 and majority of the respondents were belongs to 20-24 years (77.2%), unmarried (77.2%), residing in urban (68.4%), hindu (98.2%), Brahmin/Chhetri (71.9%) professional qualification especially PCL nursing (61.4%),total professional experience ≤ 2years (78.9%),-working in Medical intensive care unit and Surgical intensive care unit/Neurosurgery intensive care unit (38.6%) ,professional experience in critical care area ≤ 2years (89.5%), annual income less than or equal to 1, 50,000 (NPR) was (50.9%), did not get chance to have training on Mechanical Ventilation (75.4%), and guidelines on weaning criteria of mechanical ventilator available in their ward (50.9%) (Table 1).

Variables	Frequency	Percentage
Age group (in years)		
20-24	44	77.2
25-29	13	22.8
Mean ±Standard Deviation=22.79 ±2.177		
Marital status		
Married	13	22.8
Unmarried	44	77.2
Place of residence		
Rural	18	31.6
Urban	39	68.4
Religion		
Hindu	56	98.2
Non hindu	1	1.8
Ethnicity		
Brahmin/Chhetri	41	71.9
Janajati/Dalit	16	28.1
Professional qualification		
PLC Nursing	35	61.4
Bachelor nursing	22	38.6
Total professional experience (in years)		
<2 years	45	78.9
>2years	12	21.1
Clinical area		
Medicine Intensive Care Unit	22	38.6
Surgery Intensive Care Unit/Neurosurgery Intensive Care Unit	22	38.6
Coronary care Unit	13	22.8
Professional experience in critical care area		
<2years	51	89.5
>2 years	6	10.5
Annual Income (in NPR)		
<1,50,000	29	50.9
>1,50,000	28	49.1
Training on Mechanical Ventilation		
Yes	14	24.6
No	43	75.4
Available guidelines on weaning criteria		
Yes	29	50.9
No	28	49.1

Table 1: Respondents' Socio-demographic Characteristics n=57.

Level of Knowledge regarding Weaning Criteria among Nurses

Nurses' had inadequate knowledge (54.4%) and adequate knowledge (45.6%) regarding weaning criteria (Table 2).

Level of knowledge	Number	Percentage
Inadequate (<19.61)	31	54.4
Adequate (>19.61)	26	45.6
Total	57	100
Mean ± SD (19.61 ± 4.86)		

Table 2: Respondents' Level of Knowledge Regarding Weaning Criteria of Mechanical Ventilation n=57

Association between Level of Knowledge regarding Weaning Criteria and Selected Variables

Similarly, (Table 3) showed that association between level of knowledge regarding weaning criteria and selected variables. There is association between level of knowledge regarding weaning criteria with age (p=0.006), professional experience (p=<0.001), clinical areas (p=0.002) and professional experience in critical area (p=<0.001).

Variables	Level of Knowledge	χ^2	p value
	Inadequate Adequate No. (%) No. (%)		
Age (In Years)			
20-24	29(50.87)	15(26.31)	7.477 0.006#
25-29	3(5.26)	10(17.54)	
Marital Status			
Married	5(8.77)	8(14.03)	2.138 0.144*
Unmarried	27(47.3)	17(29.82)	
Place of Residence			
Rural	13(22.80)	5(8.77)	2.763 0.096*
Urban	19(33.33)	20(35.08)	
Religion			
Hindu	31(54.38)	25(43.85)	0.795 0.373#
Non-Hindu	1(1.7)	-	
Ethnicity			
Brahmin/Chhetri	21(36.84)	20(35.08)	1.436 0.231*
Janajati/Dalit	11(19.29)	5(8.77)	
Professional Qualification			
PCL Nursing	23(71.9)	12(48)	3.376 0.066*
Bachelor in nursing	9(28.1)	13(52)	
Professional Experience (In years)			
<2	23(40.35)	6(10.52)	12.871 <0.001*
>2	9(15.78)	19(33.33)	
Clinical Area			
ICU	20(35.08)	24(96)	12.269 0.002#
CCU	12(21.05)	1(1.75)	
Professional Experience in Critical Area (In years)			
<2	27(47.36)	10(17.54)	12.314<0.001*
>2	5(8.77)	15(26.31)	
Training on Mechanical Ventilation			
Yes	7(12.28)	7(12.28)	0.284 0.594*
No	25(43.85)	18(31.57)	
Available Guideline on Weaning Criteria			
Yes	15(26.31)	14(24.56)	0.468 0.494*

Table 3: Association between Respondents' Level of Knowledge Regarding Weaning Criteria and Selected Variables.

Discussion

The present study aimed to find-out knowledge regarding weaning criteria among nurses working in a teaching hospital, Chitwan. The major findings were reported (i) more than half of the nurses had inadequate knowledge regarding weaning criteria (ii) Age, total professional experience, critical care unit experience and clinical area were significant influencing variables for knowledge regarding weaning criteria among nurses.

This might be due to majority of nurses were of age group 20-24 years. This finding is contradictory with another study finding conducted in Yenepoya Medical College Hospital, Deralakatte, Mangalore by Fathimath et al (2013) [8] revealed that age was not an influencing variable for level of knowledge on weaning criteria among nurse.

Regarding knowledge on ventilator weaning (54.4%) inadequate and (45.6%) adequate knowledge. The findings of this study were supported by a study conducted in Nelson Mandela Metropolitan University, Port Elizabeth, South Africa by Demingo (2011) reported that 92.5% of respondents obtained a knowledge score <50% whereas 7.5% of respondents obtained scores of ≥ 50% and an analytical, cross sectional survey was also done at South Africa, Johannesburg which stated that knowledge of ICU trained nurses was found lacking [9].

Regarding knowledge on definition of mechanical ventilation (87.7%), definition on ventilator weaning (71.9%). The findings were supported by a hospital based descriptive study done

in B.P. Koirala Institute of Health Science by Mehta RS & BK Bhattarai (2012) stated that knowledge regarding definition of mechanical ventilation (100%), definition on ventilator weaning (82.9%) [10].

The findings of the study revealed that there is significant association between knowledge regarding weaning criteria and critical area (p=0.002). This finding was contradictory with another study conducted in Yenepoya Medical College Hospital, Deralakatte, Mangalore by Fathimath et al. (2013) reported that critical area is not significant of level of knowledge on weaning criteria [11].

Conclusion

It is concluded that more than half of the nurses' knowledge regarding weaning criteria of the patient with mechanical ventilation was inadequate. And age, total professional experience, critical care unit experience and clinical area were significant influencing variables for knowledge regarding weaning criteria among nurses.

Acknowledgements

I would like to express a profound sense of gratitude and thanks to my respected teachers, Dr. Rosy Shrestha for their continuous valuable guidance and support throughout the period of this study. We would like to thanks to Chitwan Medical College and all the critical care nurses working at Chitwan Medical College, Bharatpur, Chitwan for their willingly giving their time and information for this study.

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