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Nurses' Knowledge and Perceived Barriers Regarding Early Mobilization of Patient Under Mechanical Ventilation In Teaching Hospitals

Soni K.C.[1], Nisha Sharma[2]
[1]*lecturer, School of Nursing, Chitwan Medical College, Tribhuvan University, Nepal*
[2]*Senior Staff Nurse, Chitwan Medical College Teaching Hospital, Nepal*
Corresponding Author: Soni K.C.,Lecturer, School of Nursing, Chitwan Medical College, Tribhuvan University, Nepal;

Abstract:
Background: *Early Mobilization (EM) in critical settings is defined as any activities beyond range of motion that is initiated within 48 hours of mechanical ventilation and continue during the ICU stay by the health care provider. Immobility during bed rest and the inflammatory response during critical illness is associated with the development of Intensive care unit Acquired Weakness (ICUAW). This study aimed to find out nurses' knowledge and perceived barriers regarding early mobilization of patient under mechanical ventilation.*
Materials and Methods: *Descriptive cross-sectional study was carried out among nurses working in two teaching hospitals of Chitwan. A total of 100 nurses were selected by using non probability consecutive sampling technique. Data were collected by using structured self- administered questionnaire. Data were analyzed in SPSS version 20 using descriptive statistics and inferential statistics.*
Results*: The findings of the study revealed that 63% of nurses were ≥ 22 years of age, 64% of the nurses had completed Proficiency Certificate Level in Nursing and only 37% had received in-service education regarding early mobilization of patient under mechanical ventilation. Regarding the level of knowledge 40% of the nurses had poor knowledge, 19% had fair knowledge and 41% had good knowledge regarding early mobilization of patient under mechanical ventilation. There was no statistical significance between knowledge and selected variables. Similarly, the most common barriers for not mobilizing patient under mechanical ventilation were inadequate nurse patient ratio (87%) and lack of mobility protocol (85%) in the ward.*
Conclusion*: Nearly half of the nurses still have poor level of knowledge regarding early mobilization of patient under mechanical ventilation. Hence there is an immense need to organize continuous in-service education for nurses to enhance their knowledge regarding early mobilization of patient under mechanical ventilation.*
Key Word: *Knowledge, Barriers, Nurses, Early mobilization*

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I. Introduction

Advances in critical care has resulted in improved Intensive Care Unit (ICU) mortality resulting in a growing number of ICU survivors. Despite the progression in the survival rate, ICU survivors are living with long term sequel of critical illness.[7] ICU survivors who have gone through prolong bed rest or immobility are living with impaired physical mobility and low quality of life.[9] Multiple studies have shown that immobility during bed rest and the inflammatory response during critical illness is associated with the development of Intensive Care Unit acquired weakness (ICUAW). ICUAW refers to the acute onset of diffuse, symmetric, generalized muscle weakness that develops after the onset of critical illness without other identifiable cause.[7,11] ICUAW has been reported to be as high as 57% depending on the ICU population studies.[11] ICUAW is associated with increase duration of mechanical ventilation and weaning, longer ICU and hospital stay and increase mortality, these physical impairment may last after years of discharge. So early mobilization is one of the safe and feasible method to improve functional outcome of patient.[7] EM helps to improve physiological wellness of ventilated patient, preserve muscle strength and mass, enhance insulin activity and glucose uptake and stimulate production of cytokines.[4,8,9] Despite the safety and feasibility of early mobilization, most ICU patient remain immobilized for longer period of time.[3]As there exists the fact that mobilizing critically ill patient is not without risk. However with all the consequences, EM in critical setting is novel and it increases the positive outcome for high-risk patients.[1]Translating available knowledge into clinical practice remains a serious problem because of numerous: patient level, institutional level and clinician level barriers. Since EM is believed to have multi-professionals cooperation from doctors, nurses, physiotherapists, occupational therapists &

respiratory therapists, huge cooperation from all these professionals are required to improve the overall post critical illness.[2,5]Among all those who provide care and are involved in acute rehabilitation, 97.7% of nurses are considered as a primary care provider and are responsible for mobilizing patient. Nurses play an important role in providing care to the patient for longer hour than any other health care personnel. As a patients advocator, collaborator and executives, they are available twenty four seven for the patients but still the ways to overcome the barriers and ways to make decisions regarding mobilization of patient are not well understood. Hence, nurses need to be knowledgeable, to communicate and advocate patient smartly.[6] Implementation of mobilization protocol could change the face of post critical illness life of patient worldwide. So, knowledge on early mobilization needs to be given to nurses and training regarding EM should be provided along with the implementation of mobilization protocol.[7,11]

II. Material And Methods

Descriptive cross-sectional research design was carried out on nurses' of Chitwan Medical College Teaching Hospital (CMCTH) and College of Medical Sciences, (COMSTH) Bharatpur-5, Chitwan from 2/6/2019 - 15/6/2019.

A total of 300 subjects were included in this study.

Study Design: Descriptive cross-sectional study

Study Location: These teaching hospitals are situated in Bharatpur-10, Chitwan, Bagmati Province, Nepal. Both have well equipped outpatient and inpatient departments including critical units.

Study Duration: 2nd June 2019 to 15th June 2019

Sample Size: 100 Nurses

Sample size Calculation:

According to Yamne (1967) for finite population. where the possible error is 5%.

Working formula

$(n) = N/(1+Ne^2)$

Where,

N= total nurses

n= sample size

e = possible error

Now,

Total nurses'(N) = 130

Allowable error (e) = 5% (0.05)

Sample size(n) = $N/(1+Ne^2)$ (Yamne, 1967)

$=130/ (1+130\times(0.05)^2) =98.11$

$=99 \approx 100$

Thus, the required sample size is 100.

Inclusion criteria:

1. Nurses who had completed Proficiency Certificate Level and Bachelor in Nursing from recognized institution.
2. Nurses who had at least 3 months of job experience in critical unit

Exclusion criteria:

1. Nurses who doesn't give consent to fill the questionnaire

Procedure Methodology

Self- administered structured questionnaire was developed after extensive literature review. The instrument was divided into three parts. Part I is related to socio demographic variable, Part II is related to nurses' knowledge regarding early mobilization of patient under mechanical ventilation and Part III is related to barriers of early mobilization of patient under mechanical ventilation.

Data was collected by researcher herself during the period of 2019/6/2 to 2019/6/15. Data was collected from the nurses of critical care unit. Self- administered question was distributed to each respondent one at a time. The questionnaire was collected immediately by the researcher herself after the completion. Data was collected in morning and evening shift. 10-15 minutes of time was given to fill the form. Data was collected from 9-10 nurses per day.

Statistical analysis

All the collected data were checked, reviewed and organized for accuracy, completeness. Data were coded and entered. The collected data were analyzed in Statistical Package for Social Sciences (SPSS) version

20. Data analysis was done using descriptive statistics (frequency, percentage, median, mean) for description of Socio demographic, professional qualification, knowledge on early mobilization and inferential statistics (Chi-square) was used to measure the association between knowledge and selected variables.

III. Results

TABLE 1
Respondents' Socio-demographic and Professional Characteristics

n=100

Variables	Percentage
Age group (in completed years)	
<22	37
≥22	63
(Median=22;IQR=Q3-Q1=24-21;min=19,max=29)	
Marital status	
Married	
Unmarried	22
	78
Ethinicity	
Brahmin	
Chhetri	51
Janajati	24
Dalit	21
Others (Thakuri)	1
	3
Professional qualification	
Proficiency Certificate Level Nursing	64
Bachelor Nursing	36
Professional designation	
Senior staff nurse	22
Staff nurse	78
Total professional experience (in years)	
< 1 year	40
≥ 1 year	60
Median= 1, IQR=(Q3-Q1)= (1.91-0.5) min=.33,max=5.00	
Present working unit	
Medical ICU	34
Surgery ICU	36
Neuro ICU	8
Gastro ICU	12
CCU	15
Post operative ICU	5
Professional experience in critical area (in years)	
<1 year	36
≥ 1 years	64
Median=1,IQR=(Q3-Q1)=(1.91-0.5),min=0.33,max=4.5	
In-service regarding early mobilization of patient under mechanical ventilation	
Yes	
No	37
	63
Guidelines for early mobilization of patient under mechanical ventilation	
Yes	
No	49
	51

Table 1 represents the socio-demographic and professional related characteristics of respondents which shows that 63% of respondents were of age ≥ 22 years and 78% of respondents were unmarried. In regards to professional qualification, 64% of respondents had completed PCL Nursing. Similarly 78% of nurses were staff nurse, 36% of respondents have total work experience less than one year. More than half (60%) of the respondents had worked more than or equal to 1 year in the present unit. Concerning guidelines regarding early mobilization of patient under mechanical ventilation 51% of respondents revealed that there was no any guidelines in the working unit. Likewise, 63% of respondents also highlighted that they have not received any in-service education regarding early mobilization of patient under mechanical ventilation.

TABLE 2
Respondents' Knowledge regarding General Information on Early Mobilization of Patient under Mechanical Ventilation

n=100

Statements	Correct Response %
Early mobilization is any activity beyond ROM that is initiated within 48hours of mechanical ventilation	52
Early mobilization is performed by physiotherapists, Doctors, Nurses	49
Most important benefit of early mobilization of patient under mechanical ventilation is decrease in ventilator days	26
Frequency of change in position should be done every two hourly	47
PROM exercise should be performed TID in patient under mechanical ventilation	33
Patient can be mobilized out of bed if PEEP ≤10	18
Most common complication faced due to delayed mobilization is ICU acquired weakness	21
Patient under mechanical ventilation can ultimately walk	7
Most common adverse medical consequences of early mobilization of patient under mechanical ventilation is desaturation	42
Ongoing mobilization session should be terminated if heart beat <40, >130 beats	49
Reassessment of patient for mobilization should be done after 12 hours if the patient does not fulfill the mobilization criteria at present	21

Table 2 represents the general information regarding early mobilization of patient under mechanical ventilation where 52% of respondents correctly answered that early mobilization is any activity beyond ROM that is performed within 48 hours of mechanical ventilation. Forty nine of the respondents were aware that early mobilization is performed by physiotherapists, doctors and nurses and the same percentage (49%) of the respondents knew that ongoing mobilization session should be terminated if the heart beat is < 40 or > 130 beats/min. Only 7% were able to answer correctly that patient under mechanical ventilation can ultimately walk.

TABLE 3
Respondents' Knowledge regarding the Criteria's for Early Mobilization of Patient under Mechanical Ventilation

n=100

Statements	Correct Response %
Recommended Fio_2 for initiating mobilization of patient under mechanical ventilation is ≤ 0.60	37
Recommended PEEP for initiating mobilization of patient under mechanical ventilation is ≤ 10	75
Minimum criteria for early mobilization of patient under mechanical ventilation is no active cardiac ischemia and no dysrhythmia requiring new antiarrhythmic agent within 12-24 hours	35
Important measure to be considered for initiating early mobilization of patient under mechanical ventilation is no new or increase of any vasopressin within 2 hours	37
Oxygen saturation for initiating mobilization of patient under mechanical ventilation is > 90%	32
Duration of sedation vacation should be 2 hours before initiating mobilization	47
Maximum RAAS score for early mobilization of patient under mechanical ventilation should be +2	48

Table 3 represents that three fourth (75%) of the respondents answered correctly that the recommended PEEP for initiating mobilization is ≤10. Forty eight percent of respondents were correct that the maximum RAAS score should be +2 for early mobilization of patient under mechanical ventilation. Less than half (32%) respondents answered correctly that the oxygen saturation should be >90 before initiating mobilization.

TABLE 4
Respondents' Level of Knowledge regarding Early Mobilization of Patient under Mechanical Ventilation

Level of Knowledge	Frequency	Percentage
Poor Knowledge (<50% of total score)	40	40
Fair Knowledge (50%-<75% of total score)	19	19
Good knowledge (≥ 75% of total score)	41	41
Total	100	100

$\bar{X} \pm \delta$ *=7.11±2.127, min=2; max=13*

Table 4 shows that out of 100 respondents, 40% of the respondents had poor knowledge, 19% had fair knowledge and 41% had good knowledge regarding early mobilization of patient under mechanical ventilation.

TABLE 5
Respondents' Perceived Barriers Regarding Early Mobilization of Patient under Mechanical Ventilation
n=100

Variables	Percentage
Patient related barriers	
Hemodynamic instability of patient	80
Sedated patient	74
Dislodgement of devices	69
Obese patient	44
High severity of illness	69
Poly trauma	59
Nurses related variables	
Lack of self directed learning	75
Inadequate training regarding early mobilization	82
Lack of skill	73
Novice staff	73
Inablility to screen the eligibility	60
Lack of team work	62
Early mobilization is not a prioriy	51
Risk of self injury	46
Fear of harm/ injury to patient	68
Excess work	62
Institutional related variables	
Lack of mobilization protocol	85
Lack of routine mobility Practice	64
In appropriate nurse patient ratio	87
Lack of tilt table	66
Lack of special mobility chair	68
Lack of portable ventilator	66
Lack of portable monitor	71
Lack of portable syringe pump and infusion pump	68
Need for doctors order	69
High cost	44
Lack of motivation from senior	58

Table 5 represents all the possible perceived barriers that hinders early mobilization of patient under mechanical ventilation. In regards to patient related barrier 80% of respondents perceived hemodynamic instability of patient as one of the reason for not mobilizing the patient. Similarly, 44% of the respondents perceived obese patient as a barrier for early mobilizing patient under mechanical ventilation. Likewise in regards to nurses related barriers, 82% of nurses believed that inadequate training is what had hindered mobilizing patient and 46% respondents answered that risk of self injury is the reason for not mobilizing patient. Similarly in regards to institutional barriers, 87% and 85% of respondents believed that lack of appropriate nurse patient ratio and lack of mobility protocol was the main reason for not mobilizing patient under mechanical ventilation whereas only 44% perceived high cost as barrier.

IV. Discussion

Mobilizing mechanically ventilated patient has gained special attention in today's era as the survivors of critical illness has an increasing trend. Delayed mobilization or lack of mobilization causes greater morbidity and mortality in the post illness phase, so the early mobilization of patient under mechanical ventilation plays a significant role in improving the post critical illness outcome.

The findings of the study revealed that 40% of the respondents had poor knowledge regarding early mobilization of patient under mechanical ventilation. This finding is supported by Koo, Choong, Cook et al. (2016)[5] that revealed that 59.8% of had insufficient knowledge or skills to mobilize patient receiving mechanical ventilation. Similarly this finding is in contrast with the findings of Jolley et al. (2014)[4] which concluded that most clinicians (nurses, physical therapist and physician) are knowledgeable regarding potential benefits of early mobilization. The reason for poor knowledge in the study setting might be due to lack of mobility protocol (85%), inadequate training on early mobilization of patient under mechanical ventilation (82%) and inability to screen the eligibility (60%).

Concerning the perceived barriers of early mobilization, the findings in this study revealed that majority (87%) of the respondents perceived inappropriate nurse patient ratio as the barrier whereas the study conducted by Leong (2017)[6] revealed that nurse patient ratio was not a problem as majority (89%) of nurse patient ratio were 1:1.

The findings of the study also revealed that 46% of the respondents perceived risk of self injury as a barrier for early mobilization , which is in contrast with the findings of Jolley et al., (2014)[4] which revealed that about 71% of respondents took self injury as a barrier.

The study also revealed that 62% of the respondents perceived excess work as barrier which is also supported by the findings of Jolley et al. (2014)[4] that showed 65% of respondents perceived excess work as one of the barriers for delayed mobilization

V. Conclusion

Based on the findings of the study, it is concluded that less than half of the nurses still have poor level of knowledge regarding early mobilization of patient under mechanical ventilation. A number of barriers towards early mobilization are identified such as in appropriate nurse patient ratio, lack of mobilization protocol, inadequate training regarding early mobilization. This finding suggest the need to upgrade nurses' knowledge and reduce barriers to enhance the mobilization practice and hence reduce the post critical ill.

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