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Current Practice Types of Early Mobilization in the Intensive Care Units and Challenges Faced by Nurses Attempting to Translate It into Practice

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Abstract **Aims and objectives**: investigate Current practice types of early mobilization in the intensive care units and challenges faced by nurses attempting to translate it into practice. **Background:** Complications associated with inactivity for critically ill patients result in adverse outcomes. Implementation of protocols requires strategies that have proven to change the behavior of nurses. Whilst early progressive mobilization is known to be safe and useful for patients in an intensive care unit (ICU), challenges still exist to its implementation. **Method**: A prospective survey of ICU nurses was undertaken from six ICUs in two teaching hospitals in Egypt (Assuit University Hospitals and Al-Mansoura university hospital). A total of 90, nursing staff participated. The survey was designed to investigate the current nurses' practice type of early mobilization and challenges to its application. Challenges to early progressive mobilization were separated into five sections: patient-related, nurses-related, institutional-related, culture related and process related challenges. **Results**: Most reported practice types of mobilization were supine, lateral and semi-fowlers type. Patient-related challenges were generally perceived as having the greatest influence on the mobilization of ICU patients, followed closely by institutional-related challenges. The factors that were seen as preventing mobilization were most often hemodynamic instability, reduced level of consciousness, sedation, agitation, impending medical procedure, staff availability, and time constraints. **Conclusions**: ICU nursing staff perceived that challenges to the early progressive mobilization of ICU patients were multi-factorial and most frequently involved patients' medical condition and resource limitations.

Keywords: *surveys, early mobility, agitation, challenges*

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1. Introduction

Patients who need to stay in the intensive care unit may suffer from many different diseases, some requiring mechanical ventilation. The full comfort of the bed is a standard activity in the intensive care unit. Nurses and staff caring for patients may feel that it is better for the patient to rest because of his or her critical illness. However, rest in bed may also increase recovery time. Then patients with critical conditions begin to experience the effects of inactivity as well as their original disease. Immobility has shown negative effects throughout the whole body. Muscle deterioration begins after six hours of rest in bed and can cause a decrease in muscle strength by up to 40% in one week. This muscle weakness can contribute to the longer weaning process of the ventilator [1].

Nurses play an important role as a patient advocator [2,3] collaborator and nursing executives practice for patients connected to mechanical ventilation more than 24 h a day. The current nursing practice of patient mobilization is determined by the knowledge and attitude of nurses. Early mobilization is defined as any activities outside the scope of range of motions that initiated early after ICU acceptance and continues during the ICU period [4]. The onset of 'early' may differ from the first 24 hours to 7 days after admission [5,6].

Early mobilization includes active activities (such as sitting, standing and ambulation), as well as passive exercises (passive joint movements and cycling) [6,7]. The reported benefits of early mobilization include reduced ICU-acquired weakness, improved functional recovery within hospital, and improved walking distance at hospital discharge and reduced hospital length of stay [8].

Implementing an early and multidisciplinary Quality Improvement Program (QI) is difficult because it requires collaborative efforts from trained service providers with training, expertise and patient care responsibilities. Early mobilization of the ventilated patient may be a very

difficult task requiring many staff. The necessary medical equipment may also be a barrier to moving ICU patients. Although evidence supports inpatient mobilization and rehabilitation, it is often difficult to integrate these interventions into routine clinical practice [9]. For successful ICU application of early mobility, it is important to understand the barriers of its application and identify strategies to overcome these barriers [6,7].

1.1. Aims and Objectives of Study

This study aimed to identify the current practice types of early mobilization in the intensive care units and challenges faced by nurses attempting to translate it into practice.

1.2. Research Questions

What are the challenges faced by nurses attempting to translate early mobilization into practice in the ICU?

What are the current nurses' practice types of early mobilization in the intensive care units?

2. Design and Methods

2.1. Research Design

A prospective quantitative research (cross-sectional survey) of the critical care nurses was conducted between January 2018 and May 2018.

Study site: The present cross-sectional study consisted of a survey of professionals who deliver care at six ICUs in two teaching hospitals in Egypt (Assuit University Hospitals and Al-Mansoura university hospital).

- **Trauma ICU**: provide care for adult trauma patients, long-term ventilated patients, and spinal cord injury patients.
- **General ICU:** provide care for adult patients with different diagnosis rather than trauma as shock, acute pancreatitis, poisoning, heat stroke, respiratory failure.
- **Obstetric ICU**: provide care for preeclampsia and eclampsia women, women with HELP syndrome and women with post-partum hemorrhage.
- **Coronary ICU**: provide care for patients with the acute coronary syndrome and patients with heart failure
- **Post-operative intensive care unit:** provide care for post-operative patients
- **Respiratory intensive care unit:** provide care for patients with respiratory diseases.

2.2. The Focus Group

- Convenience sampling of 90 nurses working in intensive care units and meet the inclusion criteria were included in the study.

2.3. Inclusion Criteria

- Nurses who provided direct care to critically ill patients.
- Staff nurse who has been working in intensive care unit above 3 months.

2.4. Exclusion Criteria

- Student nurses who not responsible for direct care for critically ill patients.
- Staff nurse who is not at work during the data collection period and those on leave.
- Staff nurse who has not pass probation period.

2.5. Data Collection Tools and Methods

The study comprised three distinct phases, including (i) development of a questionnaire of challenges that limit the implementation of early mobility protocol ; (ii) pilot testing of the questionnaire; and (iii) implementation of the questionnaire.

2.6. Formation of the Questionnaire

The survey questionnaire was developed by the researchers for use in this study based on review of the related literatures [10,11]. The questionnaire was a self-reporting data collection tool where the participants provide their views about challenges that limit the implementation of early mobility protocol and current nurses' practice types of early mobilization. It was simple, not time-consuming to enable the researcher to obtain larger samples and assure that patients are not affected. This questionnaire consisted of three parts:

Part I: open ended questions about socio-demographic data.

Part II: closed ended questions about challenges (standard traffic light-system) was used to assist nurses in identifying and categorizing the challenges that prevent early mobility protocol implementation, where red indicated (strongly prevent the implementation) and need for caution as the risk of an adverse event, or consequences of an adverse event, was high, yellow indicated (may prevent the implementation) but mobilization is possible, but only after further consideration and/or further discussion among the ICU multidisciplinary team, and green indicated (don't prevent).

Part III: close-ended questions (yes and no type) about current nurses' practice types of early mobilization.

2.7. Piloting the Questionnaire

Once the approval of the ethical committee was received, the survey was further pilot tested. Pilot testing helps the researcher to identify confusing and irrelevant questions that may exist in the questionnaire. A group of 10 nurses (10 % of the sample size) was chosen for the pilot study.

2.8. The Final Questionnaire

The final questionnaire included a total of forty four questions that included three parts. The first part included six questions related to socio-demographic data (age, marital status, and department, level of experience, educational level and previous training). The second part included twenty eight closed questions about the challenges. (1) Patient's related challenges (13 questions), (2) Nurses related challenges (4 questions), (3) structurally

related challenges (4 questions), (4) culture related challenges (4 questions) and (5) process related challenges (3 questions). The third part included ten closed ended questions about current nurses' practice types of early mobilization.

2.9. Validity & Reliability

The researcher gives the questionnaire for seven experts (three in critical care nursing, two in critical care medicine, and two in nursing administration) to examine the questionnaire, and their recommendations were utilised to improve the quality of the questionnaire. Included test-retest reliability and internal validity was measured by the correlation coefficient (Cronbach alpha was 0.89)

2.10. Implementation of the Questionnaire

When the questionnaire was finished, it was copied according to the number of the participants. The researchers personally went to each ICU. After the purpose of the study was explained to the nurses, who agreed to participate in the study, the questionnaires were distributed, and the volunteers were asked to fill them out. The researchers waited near the participants in each ICU to explain any potential questions. The forms were collected immediately after this procedure.

2.11. Data Analysis

SPSS for Windows version 16.00 (SPSS Inc., Chicago, IL, USA) was used for statistical analysis. Descriptive statistics are presented by numbers (n), percentages (%) and as mean (standard deviation). Normality of data distribution was evaluated with the Kolmogorov–Smirnov test.

2.12. Ethical and Research Approvals

The research proposal was submitted for the approval of the study to the ethical committee of the faculty of nursing, Assiut University. Each ICU coordinator was informed about this study and gave their verbal support and written consent for the study. The nurses were informed in writing that participation in this study was voluntary and that nonparticipation would not affect their performance evaluation.

3. Results

By looking more closely to Table 1, it can be seen that the mean and SD of age of working nurses in all ICUs was 27.77± 5.9. The number of nurses working in trauma unit was equal to the number of nurses working in the coronary unit 20 (22.2%). Moreover, 62.6 % of nurses were bachelor degree. Furthermore, 38.9 % of nurses had work experience ranged from (3 months -2 years). Over the previous findings, all nurses mentioned that they didn't receive any previous training about early mobilization.

The obvious view from Table 2 that all nurses mentioned most patients' challenges as severity of diseases, pain, palliative care; hemodynamics or respiratory instability and deep sedation or paralysis strongly prevent the implementation of early mobility protocol. In the other hand, few number of nurses (24(26.7%) & 25(27.8%)) respectively mentioned that patient's refusal and patients' fatigue don't prevent the implementation of the protocol.

The view of Table 3 is greatly different, because the opinions' of nurses divided equally between may prevent and don't prevent regarding to nurses' related challenges to implement early mobility protocol. Furthermore, the highest percentages of nurses mentioned that limited staff, time constrain and lack of early mobility program/protocol strongly prevent implementation of early mobility (67.8%, & 68.9%) respectively. Despite, 64.4% of nurses reported that the factor of limited equipment doesn't prevent the implementation.

It is clear from Table 4 that most of nurses reported that culture related challenges to implement early mobility protocol as lack of early mobility culture, early mobility not priority, lack of support and lack of staff knowledge about benefits of early mobility can prevent the implementation of this protocol with percentages of (45.6%, 58.9%, 56.7% and 64.4%) respectively. In addition to the highest percentage of nurses reported that all process-related challenges can prevent the implementation of the early mobility protocol except few numbers of nurses 2 (2.2%) mentioned that unclear order or role don't prevent.

Regarding to current nurses' practice types of early mobilization, supine position was the most common type (91.1%). Further down the list, lateral was (85.55%), followed by semi-fowlers (48.8%). In the one hand, all nurses reported that cycle grometer, rotation and reflection, walking, and prone were not performed at all (Figure 1).

Table 1. Distribution of Socio-demographic characteristics of studied nurses (No: 90)

items	frequency	Percent (%)
Age(mean and SD)	27.77± 5.9	
ICU		
Trauma intensive care unit.	20	22.2
General intensive care unit.	17	18.9
Coronary ICU	20	22.2
Obstetric ICU	9	10
Post-operative ICU	16	17.8
Respiratory ICU	8	8.9
Education		
1) Bachelor degree	56	62.2
2) Postgraduate-master degree	30	33.3
3) Postgraduate-doctoral degree	4	4.4
4) Other	0	0
Level of experience		
1) 3 months –2	35	38.9
2) >2–5	26	28.9
3) >5–10	10	11.1
4) >10	19	21.1
Marital status		
Yes	62	68.9
no	28	31.1
Previous training		
Yes	0	0
no	90	100%

Table 2. Frequencies and distributions of patients related challenges toward the delivery of early mobility protocol

items	▲	⬢	●
Patient's related challenges toward the delivery of early mobility protocol			
High severity of illness, patients "too sick" or "too well	0	90(100%)	0
Hemodynamic instability, arrhythmias	0	90(100%)	0
Respiratory instability/ distress, ventilator asynchrony	0	90(100%)	0
Pain	0	90(100%)	0
Poor nutritional status and obesity	55(61.1%)	35(38.9%)	0
Baseline or new immobility/weakness	55(61.1%)	35(38.9%)	0
Deep sedation and/or paralysis	0	90(100%)	0
Delirium, agitation	50(54.9%)	40(44%)	0
Patient refusal, lack of motivation, anxiety	0	66(73.3%)	24(26.7%)
Fatigue, need for rest, sleepiness	65(72.2%)	0	25(27.8%)
Palliative care	0	90(100)	0
Connection with haemo-dynamic monitoring equipment	44(48.9%)	46(51.1%)	0
Connection with IV lines or drains	57(36.7%)	33(63.3%)	0

Table 3. Frequencies and distributions of nurses' and structural related challenges toward the delivery of early mobility protocol

items	▲	⬢	●
Nurses' related challenges toward the delivery of early mobility protocol			
forgetfulness	44(48.9%)	6(6.7%)	40(44.4%)
Laziness	37(41.1%)	13(14.4%)	40(44.4%)
Noncompliance and incompetence of the staff	41(45.6%)	17(18.9%)	32(35.6%)
Lack of initiation	45(50%)	20(22.2%)	25(27.8%)
Structural related challenges toward the delivery of early mobility protocol			
Inadequate staff training	64(71.1%)	26(28.9%)	0
Lack of early mobility program/protocol	29(32.2%)	61(67.8%)	0
Limited equipment	27(30%)	4(4.4%)	58(64.4%)
Limited staff, time constrain	28(31.1%)	62(68.9%)	0

Table 4. Frequencies and distributions of culture and process related challenges toward the delivery of early mobility protocol

items	▲	⬢	●
Culture related challenges toward the delivery of early mobility protocol			
Lack of early mobility culture	41(45.6%)	16(17.8%)	33(36.7%)
Early mobility not priority	53(58.9%)	36(40%)	1(1.1%)
Lack of support	51(56.7%)	34(37.8%)	5(5.6%)
Lack of staff knowledge about benefits of early mobility	58(64.4%)	32(35.6%)	0
Process related challenges toward the delivery of early mobility protocol			
Lack of planning and coordination	71(78.9%)	19(21.1%)	0
Unclear order or role	45(50%)	43(47.8%)	2(2.2%)
Missing daily screening	56(62.2%)	34(37.8%)	0

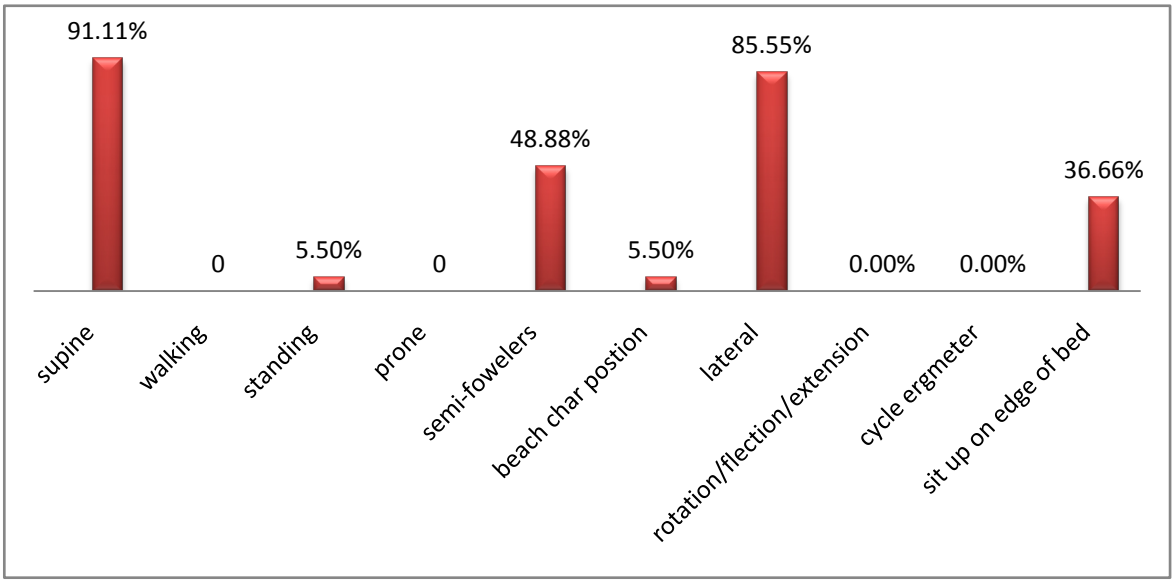

Figure 1. Current nurses' practice types of early mobilization

4. Discussion

New evidence in clinical practice may be particularly challenging when: 1) complex changes are needed to the clinical routine; 2) there is a change in care organization; and 3) interdisciplinary team collaboration is required [12].

Early mobilization is more dependent on the staff environment than on the staff themselves. Therefore, the availability of modern equipment and a good working environment are also important factors. Although the work environment can be improved with the availability of modern equipment, such as an adjustable ICU bed designed to facilitate early movement, participants assess the additional costs as an important barrier to implementation. In previous studies, many barriers to early mobilization appear to be associated with patience, such as pain, severity of disease, or intensive care equipment (eg mechanical ventilation) [6].

All nurses in this study reported that they didn't receive any patient early mobilization training which was consistent with reported results by [13].

The most important mentioned patients' related challenges in this study which strongly inhibit application for early mobilization as reported by nurses were severity of disease, pain, palliative care, blood dynamics or respiratory instability, presence of tracheal tube and deep anesthesia or paralysis. This view could be explained by the fear of nurses from increasing the risk of injury to the patient if they began early to mobilize patients. These results were consistent with previous surveys of ICU staff [14,15,16,17]where barriers to mobilization were considered. [18] and colleges tried to compare between Australian and Scottish ICUs regarding early mobilization. Physiological instability and ETT were often declared obstacles; however, sedation was the most common barrier to mobilization in the Australian and Scottish cohorts.

In concern of nurses related challenges in this current study, half of the nurses said that forgetfulness, laziness, noncompliance and inefficiency of the staff and lack of initiation don't prevent the early mobility of acutely ill. These results could be analyzed as the nurses who believe that these factors do not preclude the application of early mobility, because it is a simple procedure and they are experienced enough as ICU nurses to implement it. This view was not supported by [13] and [11] who stated that early mobilization is a complex intervention that requires careful assessment and supervision of patients, as well as cooperation and training of a multidisciplinary team.

The most frequently identified structural challenges that severely inhibit early mobility application in this study were limited staffing, limited time, and the absence of an early mobility program / protocol. Lack of time during the working day was a major barrier that could be explained by a large number of patients, and thus more than one patient per nurse. These results were supported by [9,19].

Most nurses reported that the factor of limited equipment doesn't prevent the implementation. This may be due to the availability of most equipment needed, or they thought that it may be applied by a simple way without need for more equipment as turning or walking, sitting and standing. This view was not in line with [13] who mentioned that insufficient equipment was a significant challenge for his participants to implement early mobility protocol.

With regard to culture-related challenges for the implementation of the early mobility protocol, most nurses reported that lack of early mobility culture, early mobility not priority, lack of support and lack of staff knowledge about benefits of early mobility could prevent the implementation of this protocol. The lack of priority and awareness from staff regarding benefits of early mobility was identified as a consequence of the fact that the majority of them have not received any prior training on early mobility. This lack of knowledge may also be due to the absence of pre-employment guidance programs. These results were similar to the results of the recent Canadian survey of physicians and physiotherapists on acute rehabilitation in the ICU showed that insufficient awareness of health care provider, skills set, safety concerns, and delays in re-identifying of appropriate patients were important barriers [14]. Koo et al., [13] also noted that more than half of respondents believed that early mobilization in the ICU was generally supported but not seen as a priority in care. In addition to, the highest percentage of nurses reported that all challenges associated with the process as lack of planning and the missing daily screen could prevent the implementation of the early mobility protocol except for a few number of nurses mentioned that unclear order or role does not prevent the early mobility application. This confirm the result of [11,13].

A recent study conducted by [11] identified 28 unique barriers to early mobilization, and more than 70strategies to overcome these barriers. The researchers suggested that it was important to make early mobility, use a multi-professional approach to implementation, and change the ICU culture. Implementation strategies can be directed towards addressing contextual factors such as organizational structure (location, size, specialization, inactive resources), and other relevant factors (leadership, culture, climate, social relations, power balance, and attitudes to risk taking) to increase the likelihood of intervention absorption [20,21,22].

The types of mobilization which were exercised in critical care units were supine, fowler/semi fowler, lateral, sit up on bed/edge of bed, transfer to bed or chair, beach chair position, , transfer to (chair/bed) and walking. All of these types were divided into in bed mobilization and out bed mobilization. Regarding to current nurses' practice types of early mobilization in this study were supine position was the most common type, further down the list, lateral, followed by semi-fowlers. At the bottom of the list, cycle grometer, rotation and reflection, walking, and prone were not performed at all which have been supported from previous study [5,23].

5. Conclusion and Implication for Practice

Nurses must be trained to determine the patient classification and readiness for early mobilization to enhance patient collaboration with physician and physical therapist. It is important to determine the practice pattern

of mobilization and needs in various disciplines of the ICU. This will establish a better basis for protocols and the development of guideline for practice. This survey also highlighted the health care organizations to see the important of commitment and strengthening doctors, nurses, and physical therapist to follow the practices of protocol and guideline accordingly.

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