

## RESEARCH REPORT

# BARRIERS TO EARLY MOBILIZATION IN CRITICAL CARE SETTINGS - A PERCEPTION BASED SURVEY AMONG PHYSICAL THERAPIST

### ABSTRACT

#### BACKGROUND AND AIM

Early mobilization practices in critical care settings are safe, efficacious and evidently proven treatment to reduce morbidity as well as mortality. Inactivity adversely affects pulmonary and cardiovascular systems. Despite of widely available evidences, barriers to early mobilization still exist in critical care settings. Hence the present study aims to identify the barriers related to early mobilization perceived by physiotherapist in critical care settings.

#### METHOD

A cross-sectional survey among 99 physiotherapists working in a critical care setting of different tertiary care hospitals of Karachi, Pakistan was conducted in which a self-administered questionnaire related to perceived barriers for early mobilization was introduced.

#### RESULTS

The descriptive statistics revealed that 87% of physician requisition is required for mobilization, 74% response rate was received by PT for unawareness to identify the suitable patient for early mobilization, and 68% showed lack of staffing resources. 56% response rate was received regarding requirement of adequate training to facilitate early mobilization. Moreover, lack of decision making and safety concerns were 68% respectively.

#### CONCLUSION

Perceptions received by physical therapist reveals that the barriers identified should be considered important in the tertiary care hospitals as mobilization is found to be potentially beneficial in improving patients' functional outcomes. It is recommended to conduct further studies in future that can evaluate the role of knowledge transformation in modifying these barriers.

#### KEYWORDS

Early mobilization, patients, Intensive care, Ambulation, Physical therapy Barriers, Perception, Critical care, Consequences of Bed-Rest, Mechanical ventilation

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## INTRODUCTION

It was the first time, in World War II, when early ambulation of hospitalized soldiers was introduced as an effort to accelerate their recovery and quick return to battlefields. In 1944, a number of conferences were held for the first time in history, on the issue of Bed Rest. Moreover, leading international journals published their editorial highlighting the complications of bed-rest and revealing the benefits of early mobilization. Consequently, the intensive care units were established, years later. An illustrated report was published by University of Colorado in 1972 that focused on benefits of early mobilization in mechanically ventilated patients. It has clearly demonstrated the increased general strength and well-being of the patients as a result of physical activity<sup>1</sup>.

There are multifactorial causes of neuromuscular weakness. Overwhelmingly, the critical illness polyneuropathy and myopathy are well-known etiologies<sup>1</sup>. Moreover, inflammatory conditions like sepsis may be the cause of muscular dysfunction. Bed-rest is counted as another important etiology as various experimental studies claim 4% to 5% decline in muscular strength per week as well as reduction in bone mineral density and muscle mass<sup>2</sup>.

Early mobilization has direct impact in modifying the deleterious effects of bed rest by targeting muscle fiber, inflammatory markers and metabolism, both structurally and functionally<sup>3</sup>. Muscle activity plays a crucial role as an anti-inflammatory agent in inflammation mediated diseases by producing myokines<sup>4</sup>.

Adding to this, experiments proved that insulin resistance and microvascular-dysfunction developed in healthy individuals just after 5 days of bed rest. Musculoskeletal is not the only system that is affected due to immobility. Instead, cardiopulmonary system is also badly affected by bed-rest resulting in tachycardia, orthostatic hypotension, decrease in stroke volume, cardiac output and VO<sub>2</sub> max. Moreover, prolonged recovery duration is required in these individuals to restore their baseline status after the termination of bed-rest.<sup>1</sup>

Another study was aimed to investigate the feasibility of body weight supported treadmill training in critical patients in intensive care setting. A treadmill was customized to be used in medical and surgical ICU which was body weight supported. The feasibility of treadmill training was estimated through eligibility, number of successful attempts of BWSTT, required man power, complication, number of patients that were unable to walk without BWSTT, level of satisfaction and anxiety during intervention. The study further reported that among 20 patients there was no unfavorable event occurred throughout 54 sessions in which all of the medical supportive

equipment was kept connected. 74% patients were unable to ambulate without BWSTT<sup>5</sup>.

This study supported the use of BWSTT as it seems to be safe and facilitate the initiation of early ambulation in critically ill patients with severe muscle weakness<sup>5</sup>.

Patients' admission to neurological ICUs makes them prone to multiple cognitive and physical disabilities and impairments, as well as high risk of mortality. Moreover, at several occasions certain clinical decisions are made despite their unpredictable outcomes. Patients presenting with neurological conditions like Cerebrovascular Accident (CVA) and traumatic brain injury are restricted from mobility due to their illness. Furthermore, certain barriers like invasive line, monitoring devices and initial bed rest due to therapeutic restriction, are unavoidable. Consequently, the effects of immobility are detrimental. Diseases like Acute Respiratory Distress Syndrome prolong the length of stay in ICU which results in critical illness myopathies. Even at discharge patient has poor functional status. Poor outcomes of hospital stay including prolonged intubation, recurrent chest infections, delayed recovery and even, death, are associated with intensive care acquired weakness. The quality of life and functional status are severely compromised due to prolong ICU stay<sup>6</sup>.

A randomized control trial was conducted recruiting 150 patients with an ICU stay of 5 days or more. These patients had no neurological insult and were randomized to receive usual care or intervention. The patients in intervention group received intensive exercises in all levels of care including ICU, wards and OPDs. Participant were assessed using Six-minute Walk Test (6MWT), Timed Up and Go Test and the Physical Function in ICU Test on recruitment, ICU-admission, hospital discharge and at the intervals of 3, 6, and 12 months. The Short Form 36 Health Survey, version 2 (SF-36v2) and Assessment of Quality of Life (AQoL) Instruments were used for assessing Patient outcomes. There were no intra-group differences in hospital data and demographic details, which includes acuity and length of stay (LOS) (Acute Physiology and Chronic Health Evaluation II score: 21 vs. 19; hospital LOS: 20 vs. 24 days). Primary outcomes of 6MWT revealed no significant differences at the 12th month of hospital discharge. However, exploratory analyses demonstrated the rate of change over time and mean inter-group differences in 6MWT were greater in the intervention group comparing to initial assessment<sup>7</sup>.

A prospective study with duration of four weeks was conducted on 106 patients, admitted in ICU. The variables focused in this study were total patients enrolled, frequency and type of mobilization, and the reasons for keeping the patient immobile. The result showed that there are many potential barriers

which are avoidable like vascular access device in femoral region, timings of different procedures and agitation or reduced level of consciousness. It was concluded that intervention to enhance mobilization in ICU are careful management of procedures-schedule, site of catheter insertion and sedation protocol development<sup>8</sup>.

A cross sectional survey research was conducted among the ICU physicians and physiotherapist in Canada. It was a perception based postal survey which was self-administered. The results of the study revealed the importance of early mobilization in the perception of participants and identified various notable barriers related to medical institutions, health care providers and patients. Furthermore, it notified significant gaps in the knowledge and skills of health care providers to handle complexities that might occur during the early mobilization, particularly, with patients receiving mechanical ventilator support, high and unplanned doses of sedative medications resulting in poor patient-cooperation, limited or over occupied staffing, unavailability of desired supporting equipment and lack of well-defined protocols<sup>9</sup>.

Similarly, a bi-national, multi-center, prospective cohort study conducted in 12 ICUs in Australia and New Zealand. Patients enrolled were likely be on ventilatory support for more than 48 hours and expected to be functionally independent previously. The outcome measures were assessed are as follow: mobilization during invasive ventilation, depth of sedation using the Richmond Agitation and Sedation Scale (RASS), co-interventions, days on mechanical ventilator, ICU-acquired weakness (ICUAW) at discharge from ICU, status at day 90, and 6-month functional recovery including return to work. Muscle strength using MRC scale was assessed in 94 out of 156 ICU survivors. MRC score is high in 48% patients with ICU acquired weakness who were mobilized while mechanically ventilated. Despite of these drastic results early mobilization was uncommon due to numbers of barriers; more than 50% of patients discharged from the ICU had developed ICU-acquired weakness<sup>10</sup>.

Conclusively, the significance of early mobilization has been clearly established under provided evidences. Therefore, the present study aimed to investigate and identify the possible barriers to the early mobilization in critical care setting of tertiary care hospitals of Karachi in accordance with the perceptions of physical therapy professionals.

## METHODOLOGY

### Research Design

The aims of study were achieved through descriptive analysis. The study was investigative and discussed the opinions and perceptions of participants among the study group. Therefore, it was

primarily a survey based study.

### Sampling Technique

Random sampling was used thus the participants were selected randomly from tertiary care hospitals.

### Sample Size

The sample size was 100.

### Inclusion Criteria

- Physiotherapist from tertiary care hospitals having different types of intensive care units
- Physiotherapists who are working as inpatient therapist.

### Exclusion Criteria

- Physiotherapist working in outpatient
- Physiotherapist working as home based therapist
- Physiotherapist working in small hospitals having general services and no Intensive care units

### Study Duration

The study duration was 6 months

### Procedures

The survey study was conducted in Karachi Pakistan with participants from tertiary care hospitals. 100 participants were selected randomly and questionnaire was introduced. The questionnaire was consisted of three sections that had closed ended questions regarding perceived barriers in mobilizing critically ill adults at institutional level, health care provider level and patient level. All data was analyzed at SPSS version 20.

### Data Analysis

The data, collected through questionnaires were assigned numbers and recorded on Microsoft Excel Database. All data was analyzed on SPSS 20.

### Ethical Consideration

Ethical approval has been taken from the institutional review board of the concerned hospital settings before conducting the research. Moreover, an informed consent was given to the participants before completing the questionnaire.

## RESULTS

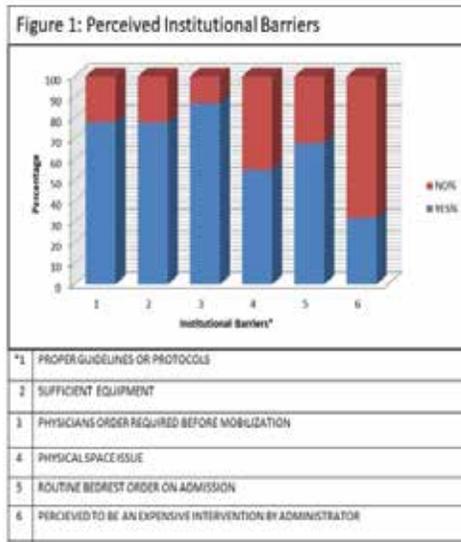
### Response rate and respondents:

99 respondents were responded to the survey questionnaire of the research conducted within tertiary care hospitals of Karachi.

### Perceived institutional barriers to early mobilization:

Overall respondents perceived that with respect to institutional barriers, the most common barriers to early mobilization are physician order required for early mobilization (87%), need of proper guidelines and protocols (78%), insufficient equipment for mobilization (78%) and routine bed rest order in

admission notes (68%).The least common institutional barrier observed is that administrator perceived to be an expensive intervention (32%), as represented in Fig.1 below.



**Perceived health care provider related barriers to early mobilization:**

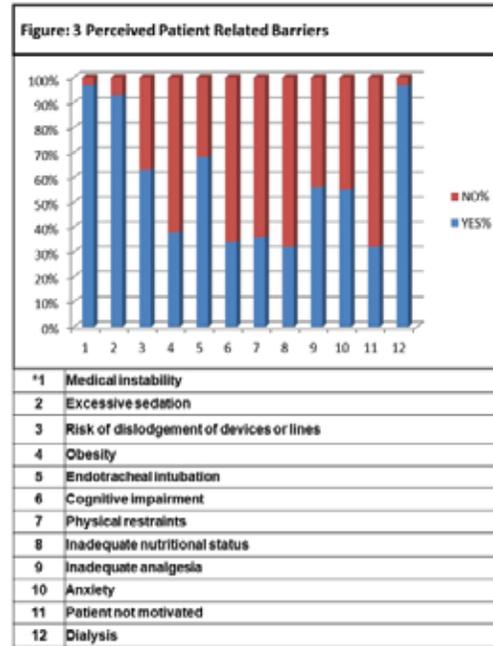
Overall respondents perceived that with respect to health care provider related barriers; the most common perceived barriers are inability to recognize suitable patients for mobilization (74%), lack of decision making authority (68%) and safety concerns (68%).Furthermore, lack of adequate training that is needed to facilitate early mobilization is identified as significant barrier (56%). The least common perceived health care provider related barrier is lack of coordination to facilitate mobilization (53%), as demonstrated in fig.2.



**Perceived patient related barriers to early mobilization:**

Overall response rate by respondents to perceive patient related barriers to early mobilization recommended that most common barriers are medical

instability (97%), patient on dialysis (97%), excessive sedation (93%) endotracheal tube (68%), poor nutritional status (68%) and patient not motivated (68%).The least common patient related mobilization observed is inadequate nutritional status of patient (32%), as shown in figure.3.



**DISCUSSION**

Majority of our participants though consider importance of early mobilization of critically ill patients but stated number of barriers at the levels of institution, healthcare provider and patients.

This type of study was not conducted yet in Pakistan, even though we have high level tertiary care hospitals in high numbers especially in all big cities of Pakistan. However, identification of barriers to early mobilization is the objective of recent international researches that identified multiple important domains to facilitate early mobilization and rehabilitation of mechanically ventilated patients<sup>11</sup>.

It was observed that the early mobilization did not seem to be of importance although being a health care provider, everyone aware about the complications of bedridden status if kept without reason. International researches suggest that early mobilization should start as soon as the patient's cardiopulmonary condition becomes stable. Early mobilization is considered as an integral aspect of multidisciplinary focus in ICU routine practices. It begins as soon as physiological stability is attained by the patient that though varies throughout published studies but usually includes cardiovascular, respiratory and neurological status<sup>12</sup>. Moreover, some clinicians consider endotracheal tube (ETT), vascular access devices, or other equipment as the limitation to the feasible mobilization<sup>13</sup>. Conversely, 5 patients with ETT were reported to have participated in 593 activities by a prospective cohort study,

which ranged from sitting on the bed side up to complete ambulation<sup>14</sup>.

Similarly, there were no accidental extubation reported, despite the fact that all events involved ambulation. However, only a single incident of feeding tube dislodgment had occurred out of total 1449 events of physical activity. Furthermore, the same protocol was applied to a sample of 145 intubated patients and no incident of accidental equipment dislodgment was reported. Therefore, early mobilization is supported to be feasible in ICU by these aforementioned studies<sup>15</sup>.

With respect to the institutional level barriers, the need of physicians' order prior to mobilization was identified as the most observable barrier by the physiotherapists working in tertiary care hospitals of Karachi as they are considered secondary contact and need referral orders from the physicians. Physiotherapist were though trained and educated, yet they are unable to initiate early mobilization without the physicians' consent. This concludes that further education in order to overcome the gaps in knowledge as well as technical skills is significant for emergency medicine facilitators in intensive cares.

Others less rated barriers but important ones are need of proper guidelines and protocols and sufficient equipment for mobilization<sup>16</sup>. Another study prompts to develop proper guidelines by which patients' safety during early mobilization in ICUs of tertiary care hospitals will be promoted<sup>17</sup>.

A well-equipped healthcare team including members of varied disciplines and all necessary supporting equipment such as portable ventilators, oximeter, bag-valve-mask with supplemental oxygen, suction devices and wheel chairs is essential to deliver safe physiotherapy treatment<sup>18</sup>.

The need of proper equipment should be considered the most important factor for safety mobilization<sup>19</sup>. Therefore, unavailability of required equipment is also discussed as a significant barrier to mobilization of critical patient<sup>20</sup>. Provision of proper equipment by administration of hospital should be the main priority in hospitals.

Routine bed rest orders on admission paper are another barrier which should be reevaluated after patient becomes stable medically<sup>21</sup>.

Recent prominent studies highlighting improvements in functional outcomes and cost savings in prospective studies of early mobilization for critically ill patients have focused the awareness of ICU acquired weakness<sup>1, 22</sup>. Our survey demonstrates strong enthusiasm for early mobilization, particularly among physiotherapists and where mobility champions exist. Mobility can also be limited by safety concerns, delays in the recognition of suitable patients, low prioritization for this aspect of care,

poor inter-disciplinary communication and coordination<sup>23</sup>.

Similar to other surveys, we found that excessive sedation medical instability were important patient related barriers to early mobilization<sup>24</sup>. Sedation breaks should be given to the patient to access the patient conscious status through GCS scoring and evaluate the patient for mobilization if medical condition allowed.

Another important barrier is the dialysis<sup>25</sup>. The mutual understanding and communication between the ICU staffs is necessary so that the patient can be mobilizing during the period of off dialysis<sup>25</sup>. In Previous study, the different barriers for mobilization were identified by physical therapists and nurses; hemodynamic instability and renal replacement therapy were barriers rated higher by nurses, whereas neurologic impairment was rated higher by physical therapists<sup>13</sup>.

Endotracheal tube is another major barrier which is identified but we can handle this barrier and through the good coordination and provision of champions in rehabilitation the mobilization of patient with ETT can be made possible<sup>26, 27</sup>.

An observational study was conducted, targeting the perceptions of physical therapist and nurses, regarding mobilization in intensive care units and barriers related to it. The study enrolled 63 critically ill patients, which were mobilized by both physiotherapist and nurses. The opinions of physical therapist and nurses appeared to be different in identifying the severity of the barriers that hurdle early mobilization of critically ill patients. Physiotherapists regarded neurological impairment as the higher barrier while the nurses identified renal impairment and hemodynamic instability as the major limitation for early mobilization<sup>28</sup>. The result outcomes demonstrated that the physical therapists are more involved in the mobilization and rehabilitation of their critically ill patients. Therefore, the role of physical therapist in the rehabilitation and mobilization of critical patient is integral<sup>13</sup>.

Our research suggests that there are many barriers identified at institutional level, health care provider and patient related barriers. However, a great number of these identified barriers can be modified and manipulated through different techniques suggested earlier. Consequently, it implies that the need of further studies still persist in order to investigate these barriers more specifically, in the future. Moreover, future researches should focus on the development of strategies and protocols that ensure safe early mobilization despite these potential barriers, especially in Pakistani context.

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