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An investigation into the mobilisation of critically ill patients in a tertiary hospital in South Africa

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Background. Mobilisation of critically ill patients in intensive care units (ICUs) is recognised for its potential to improve patient outcomes. There has been a paradigm shift toward incorporating mobilisation as standard practice in ICUs to mitigate complications associated with immobility. However, implementation remains inconsistent globally, and there is limited evidence regarding practice in South African (SA) ICUs. This study aimed to address this gap by examining mobilisation practices and barriers to mobilisation in a tertiary hospital setting in SA.

Objectives. To describe mobilisation practices and examine staff knowledge of, and barriers to, mobilisation in ICUs at a tertiary hospital in SA.

Methods. An observational cross-sectional study was conducted across four ICUs. Thirty patient folders were reviewed daily over five days to identify mobilisation opportunities. A self-designed review form incorporating safety criteria was used to assess the suitability of these opportunities. In addition, 26 nurses and 16 physiotherapists completed self-administered questionnaires assessing their knowledge of and perceived barriers to mobilisation.

Results. The study included 30 patients, with a mean (standard deviation (SD)) length of stay of 15 (15.56) days. Of 107 identified potential mobility events, 77 (72%) were deemed safe for mobilisation. In-bed activities were more common than out-of-bed activities. Staff demonstrated good knowledge of the benefits of mobilisation but scored lower on safety criteria. Key barriers identified by nurses and physiotherapists included staffing shortages (n=19; 73% and n=15; 94%, respectively), excessive sedation (n=18; 69% and n=8; 50%, respectively) and the need for physician orders to mobilise patients (n=15; 58% and n=2; 13%, respectively).

Conclusion. This study highlights conservative mobilisation practices and significant barriers to mobilisation in ICUs at a tertiary hospital. Targeted educational interventions and organisational changes are necessary to enhance mobilisation practices and improve patient outcomes.

Keywords. Early mobilisation, barriers, critical illness, knowledge, acute rehabilitation

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Contribution of study

This study contributes context-specific evidence on intensive care mobilisation practices in a South African tertiary hospital, addressing an important gap in the local literature. It also provides a foundation for implementation-focused research and service development by describing clinical practices alongside staff knowledge and perceived barriers.

The mobilisation of critically ill patients in intensive care units (ICUs) has attracted significant attention in recent years owing to its potential to improve patient outcomes.[1-4] ICU care has traditionally involved prolonged bed rest and sedation, often leading to adverse effects such as ICU-acquired weakness, prolonged mechanical ventilation and extended ICU and hospital stays.[5] ICU-acquired weakness, characterised by severe muscle weakness and functional impairment, affects 20 - 50% of critically ill patients and is associated with increased mortality and reduced quality of life after discharge.[6,7] Consequently, there has been a paradigm shift toward incorporating mobilisation as standard practice in ICUs to mitigate complications, such as delirium and muscle weakness, associated with immobility (NICE Clinical Guideline No. 103).[8]

Early mobilisation (EM) involves initiating physical activity, such as bed mobility, sitting, standing and walking, within the first few days of ICU admission.[9] Numerous studies have demonstrated that mobilisation is both safe and feasible, even in mechanically ventilated patients.[10-12] Mobilisation may reduce the incidence of ICU-acquired weakness, improve functional capacity, shorten the duration of mechanical ventilation and decrease ICU and hospital length of stay.[13-16] Despite these benefits, implementation in ICUs remains inconsistent globally, primarily owing to barriers such as staffing shortages, lack of mobilisation protocols, concerns about patient safety and insufficient knowledge and clinical skills.[17-20] Recent expert consensus from a Delphi study in South African (SA) and Zimbabwean public sector ICUs identified several

strategies to address these local challenges and standardise EM practices, including defining specific mobilisation activities, appointing clinical champions, creating dedicated physiotherapy posts and providing targeted staff training.[21]

Although the practice of mobilisation in SA ICUs is not well documented, conservative mobilisation practices have been demonstrated,[22] with limited evidence on ICU staff knowledge and attitudes toward mobilisation. This study aimed to describe mobilisation practices in ICUs at a tertiary hospital in SA, and to examine staff knowledge, as well as facilitators of and barriers to mobilisation. In this study, EM was defined as any mobility event occurring within the first 72 hours of ICU admission.[23-25]

Methods

An observational cross-sectional study was conducted from 16 to 20 July 2018 across four ICUs at Groote Schuur Hospital, a tertiary hospital in Cape Town: neurosurgical (6 beds), surgical (8 beds), medical (8 beds) and acute spinal (6 beds). A convenience sample was used. Patients aged ≥18 years admitted to these ICUs during the study period were eligible for folder review. Patients who had undergone cardiothoracic surgery were excluded owing to strict mobilisation protocols in these units.[26] Folders in the cardiothoracic ICU were also screened during data collection to identify any overflow of medical or surgical patients. Self-administered questionnaires were provided to consenting physiotherapy and nursing staff working in the units during the study period. Nursing and physiotherapy students and care workers were excluded.

This study was approved by the Human Research Ethics Committee of the University of Cape Town (ref. no. 174/2018). Permission was obtained from the medical superintendent of Groote Schuur Hospital and the respective ICU managers prior to data collection. Informed consent was obtained from patients or their proxies for folder reviews, as well as from participating nurses and physiotherapists.

The primary outcome was to describe mobilisation practices in the ICUs. Patient folders were reviewed daily over five consecutive days (Monday to Friday) to identify potential and achieved mobilisation opportunities. Eight independent investigators covered the four ICUs, with two investigators per unit. To determine the suitability of mobilisation opportunities, a self-designed review form was used (Supplementary 1). The form was guided by a clinical algorithm developed by Hanekom *et al.*,[27] which categorises patients into three groups based on physiological stability. It also incorporated safety criteria, adapted from Hodgson *et al.*,[28] for active in-bed and out-of-bed mobilisation of mechanically ventilated, critically ill adults. The tool included specific safety criteria to determine whether a mobility event should occur. If all criteria were met, a mobility event was indicated, and the highest level of mobilisation achieved was documented. Mobility events were categorised as in-bed activities (e.g. passive movements, regular position changes) and out-of-bed activities (e.g. sitting on the edge of the bed, standing, ambulation). If safety criteria were not met, mobilisation was recorded as unsafe. EM events, defined as any mobility event occurring within the first three days of ICU admission, were also documented. The same criteria were applied to assess whether mobilisation opportunities should have resulted in mobility events and their level. Data on patient demographics, admission category, length of stay and ventilatory status were also collected.

Secondary outcomes included assessment of physiotherapists' and nurses' knowledge of mobilisation and perceived barriers to its implementation, using a self-administered questionnaire. Nursing staff and physiotherapists who were willing to participate and available during data collection were provided with a self-designed hard-copy questionnaire. The perceived barriers section was developed based on barriers identified in previous studies.[29-32]

Descriptive statistics were used to summarise mobilisation practices, knowledge scores and perceived barriers. Knowledge scores were expressed as percentages of correct responses and interpreted using a modified Bloom's cut-off: ≥80% (good), 60 - 79% (moderate) and <60% (poor), consistent with previous knowledge, attitude and practice (KAP) studies.[33,34] The Shapiro-Wilk test was used to assess normality of data distribution. Data were reported as frequencies, means and standard deviation (SD), or medians and interquartile ranges (IQR), as appropriate. As the study aimed to include all eligible patients, physiotherapists and nurses during the data collection period, no formal sample size calculation was performed. Data were analysed using the Statistical Package for Social Sciences (SPSS) version 25 (IBM Corp., USA).

Results

After excluding one folder for a patient aged <18 years, a total of 30 folders were reviewed during the data collection period, yielding 107 potential mobility events. Study participants comprised 26 nurses and 16 physiotherapists (Table 1). Of the nursing participants, 22 (85%) worked exclusively in the ICU. The mean (SD) years of working experience among the 24 nurses and 15 physiotherapists who responded to this question were 9.1 (7.8) and 12.6 (7.5) years, respectively.

Table 1. Participant demographical information

	Registered nurses (*n*=26) *n* (%)	Physiotherapists (*n*=16) *n* (%)
Years of experience		
1 - 5	11 (42)	3 (19)
6 - 10	5 (19)	5 (31)
11 - 15	5 (19)	2 (13)
16 - 20	0 (0)	2 (13)
≥21	3 (12)	3 (19)
Unanswered	2 (8)	1 (6)
Nursing qualification		
Registered/professional nurse	17 (65)	-
Staff nurse	5 (19)	-
Enrolled nurse	2 (8)	-
Auxiliary nurse	2 (8)	-

Table 2. Distribution of mobility events and sample characteristics across ICUs

	Total	
	n	%
Admission categories		
Medical	53	50
Surgical	5	5
Trauma	49	46
ICUs		
Medical	33	31
Acute spinal cord injury	28	26
Surgical	26	24
Neurosurgical	20	19
Ventilatory assistance		
Intubated and ventilated	63	59
None	44	41

ICUs = intensive care units.

Mobilisation practices

During the data collection period, 30 folders were reviewed across the four ICUs: 9 medical, 8 surgical, 7 neurosurgical and 6 acute spinal. From these folders, 107 mobilisation opportunities were identified (Table 2). The mean (SD) length of stay (LOS) at enrolment was 15 (15.6) days. The acute spinal ICU had the longest mean (SD) LOS (29.3 (18.7) days), followed by surgical (10.3 days) and medical (9.9 days), while the neurosurgical unit had the shortest mean LOS (8.4 days).

Of the 107 potential mobility events, 77 (72%) were classified as categories B and C ('safe to mobilise') based on the screening criteria. The highest level of mobilisation achieved overall was assisted ambulation.

The primary outcomes of all the recorded mobilisation practices are presented in Table 3. In categories B and C ('safe to mobilise'), in-bed activities – such as head-of-bed elevation (n=53; 69%), passive movements (n=41; 53%) and regular position changes (n=37; 48%) – were most common. Out-of-bed activities, including sitting on the edge of the bed (n=11; 14%) and standing (n=7; 9%), occurred less frequently. Only two events (3%) involved ambulation.

In category A ('unconscious/physiologically unstable'), 15 (50%) mobilisation opportunities were deemed unsafe or contraindicated. Of the remaining 15 (50%) opportunities, which qualified for in-bed mobilisation, no specific level of mobility was performed.

Table 3. Summary of all mobilisation opportunities per category

	Category A: Unconscious/ physiologically unstable		Category B: Awake/ physiologically stable		Category C: Deconditioned		Total	
	n	%	*n*	%	*n*	%	*n*	%
Mobilisation opportunities	30	28	29	27	48	45	107	100
Appropriate level of mobilisation achieved per category	15	50	10	34	21	44	46	43
Appropriate mobilisation level not achieved	15	50	19	70	27	56	61	57
Mobilisation levels achieved								
Out-of-bed activities								
Lying down to sitting up	0	0	5	17	6	13	11	14
Sitting to standing	0	0	4	14	3	6	7	9
Standing-to-chair transfer	0	0	4	14	2	4	6	8
Assisted ambulation	0	0	2	7	0	0	2	3
Independent ambulation	0	0	0	0	0	0	0	0
Stair climbing	0	0	0	0	0	0	0	0
In-bed activities								
Head-of-bed elevation	0	0	19	66	34	71	53	69
Regular position changes	0	0	17	59	20	42	37	48
Passive movements	0	0	11	38	30	63	41	53
Stretching	0	0	4	14	10	21	14	18
In-bed strengthening	0	0	4	14	16	33	20	26

Table 4. Early mobilisation opportunities

	Category A: Unconscious/ physiologically unstable		Category B: Awake/ physiologically stable	
	n	%	*n*	%
Mobilisation opportunities	12	38	20	63
Appropriate level of mobilisation achieved per category	8	67	5	25
Appropriate mobilisation level not achieved	4	33	15	75
Mobilisation levels achieved				
Out-of-bed activities				
Lying down to sitting up	0	0	2	10
Sitting to standing	0	0	2	10
Standing-to-chair transfer	0	0	2	10
Assisted ambulation	0	0	0	0
Independent ambulation	0	0	0	0
Stair climbing	0	0	0	0
In-bed activities				
Head-of-bed elevation	0	0	14	70
Regular position changes	0	0	13	65
Passive movements	0	0	8	40
Stretching	0	0	2	10
In-bed strengthening	0	0	2	10

Of the 32 EM opportunities (Table 4), 20 (63%) were classified as category B and therefore deemed safe to mobilise. For out-of-bed EM events, the highest level achieved (*n*=2; 10%) was standing-to-chair transfers. For in-bed activities, head-of-bed elevation (*n*=14; 70%), position changes (*n*=13; 65%) and passive exercises (*n*=8; 40%) were most frequently performed. Stretching, strengthening and out-of-bed activities (e.g. sitting and standing) were each recorded only twice. Although eight (67%) category A opportunities were deemed unsafe or contraindicated for mobilisation, four (33%) patients in this category were identified as eligible for basic in-bed mobilisation; however, no mobilisation interventions were implemented.

Results relating to nurses' (*n*=26) and physiotherapists' (*n*=16) knowledge of mobilisation indicated that both groups were knowledgeable, with mean total correct knowledge scores of 71% (*n*=351/494) and 83% (*n*=251/304), respectively (Table 5). Both groups scored lower in the safety knowledge domain (58% and 70%, respectively), and nurses scored lowest (54%) in the timing of mobilisation domain.

The main reported barrier to implementing mobilisation among both nurses and physiotherapists was a lack of staff (*n*=19; 73% and *n*=15; 94%, respectively). Among nurses, excessive patient sedation (*n*=18; 69%) and the requirement for physician orders to mobilise (*n*=15; 58%) were also prominent barriers. Physiotherapists reported patients being too unwell to mobilise (*n*=13; 81%) and lack of equipment (*n*=12; 75%) as major barriers (Table 6).

Discussion

This study aimed to describe ICU mobilisation practices, as well as staff knowledge of and perceived barriers to mobilisation in a tertiary hospital setting. The primary findings highlight conservative mobilisation practices, gaps in safety-related knowledge and modifiable barriers to implementation.

Mobilisation practices and knowledge

This study found that, although numerous safe mobilisation opportunities were identified, in-bed activities (e.g. head-of-bed elevation, passive exercises and position changes) were performed more frequently than out-of-bed activities (e.g. sitting, standing and walking). In category A ('unconscious/physiologically unstable'), many mobilisation opportunities were deemed unsafe or contraindicated, as expected given patients' clinical instability. However, the absence of mobilisation despite the presence of safe in-bed mobilisation opportunities suggests a cautious or risk-averse approach among clinicians.

These findings are consistent with local,[22] African[35] and international literature,[36-39] demonstrating predominantly conservative mobilisation practices. The predominance of in-bed activities suggests the presence of barriers limiting the implementation of more active forms of mobilisation in this cohort. This aligns with previous literature indicating that, while mobilisation is widely recognised as beneficial, its implementation remains constrained by various factors.[38]

Based on the modified Bloom's cut-off classification described in the methods, participants demonstrated moderate to good knowledge of mobilisation, with physiotherapists generally scoring higher than nurses. This difference between professional groups is consistent with findings reported by Dagnachew *et al*.[18] Good knowledge was observed regarding the definition and benefits of mobilisation, indicating that healthcare professionals in this study were well informed about its core concepts and advantages in the ICU setting.

Notably, both groups scored lower in the safety knowledge domain, which may explain the conservative mobilisation practices documented, as safety knowledge influences both the implementation of mobilisation protocols and staff confidence in mobilising critically ill patients. These findings suggest a need for targeted educational interventions to

Table 5. Physiotherapists' and nurses' knowledge regarding mobilisation

Knowledge sections	Nurses: questions correct: *n* (%)	Physiotherapists: questions correct: *n* (%)
Mean overall/total score	13.5/19 (71)	15.7/19 (83)
Definitions of mobilisation	91/104 (88)	64/64 (100)
0 correct	0 (0)	0 (0)
1 correct	0 (0)	0 (0)
2 correct	2 (8)	0 (0)
3 correct	9 (35)	0 (0)
4 correct	15 (58)	16 (100)
Timing of mobilisation	42/78 (54)	35/48 (73)
0 correct	4 (15)	0 (0)
1 correct	5 (19)	2 (13)
2 correct	14 (54)	9 (56)
3 correct	3 (12)	5 (31)
Safety of mobilisation activities	120/208 (58)	89/128 (70)
0 correct	1 (4)	0 (0)
1 correct	0 (0)	0 (0)
2 correct	1 (4)	0 (0)
3 correct	1 (4)	1 (6)
4 correct	9 (35)	2 (13)
5 correct	6 (23)	4 (25)
6 correct	7 (27)	6 (38)
7 correct	1 (4)	2 (13)
8 correct	0 (0)	1 (6)
Benefits of mobilisation	98/104 (94)	63/64 (98)
0 correct	0 (0)	0 (0)
1 correct	0 (0)	0 (0)
2 correct	2 (8)	0 (0)
3 correct	2 (8)	1 (6)
4 correct	22 (87)	15 (98)

Table 6. Barriers relating to mobilisation

Barriers	Nurses *n* (%)	Physiotherapists *n* (%)
Lack of staff	19 (73)	15 (94)
Excessive sedation	18 (69)	8 (50)
Requiring doctors' orders to mobilise	15 (58)	2 (13)
Patients too unwell to participate in mobilisation	14 (54)	13 (81)
Poor communication within the medical team	11 (42)	8 (50)
Presence of ventilators	10 (38)	1 (6)
Lack of equipment	10 (38)	12 (75)
Concern regarding the safety of mobilisation	10 (38)	2 (13)
Time constraints	8 (31)	8 (50)
Concern for disrupting attachments	7 (27)	4 (25)
Lack of personal experience	7 (27)	3 (19)
There is no one promoting early mobilisation	6 (23)	2 (13)
Shortage of practical evidence to assist with patient mobilisation	6 (23)	0 (0)
Lack in training of nursing and physiotherapy staff with regards to safety and use of available resources	5 (19)	5 (31)
Mobilisation of patients will result in increased workload	4 (15)	4 (25)

improve understanding of safety criteria and protocols for mobilisation in the ICU setting.

Previous studies have emphasised that adequate training and education of ICU staff are essential for improving knowledge and supporting the uptake of mobilisation practices.[18,40] Addressing gaps in safety knowledge may enhance both competence and confidence in safely mobilising critically ill patients. In addition, adherence to standardised mobilisation guidelines may further support implementation, as these have been shown to improve clinical practice and patient outcomes in similar settings.[41]

Barriers to early mobilisation

This study identified several barriers to mobilisation, with lack of staff, excessive patient sedation, the need for doctors' orders, patients being too unwell to mobilise and lack of equipment most commonly reported. These barriers can broadly be grouped into organisational, individual and patient-related categories.[42]

Organisational barriers

Organisational barriers often arise from systemic constraints within healthcare settings. Consistent with this study, staffing shortages and high patient-to-nurse ratios have been cited as significant obstacles to mobilisation, limiting the availability of personnel to assist with these activities.[43-47] Interestingly, although lack of staff was cited as a main barrier, increased perceived workload was not. This finding warrants further investigation, as it may suggest that healthcare professionals are willing to incorporate mobilisation into routine practice once other organisational barriers are addressed.

Lack of equipment required for safe mobilisation has also been identified as a barrier.[20,38] In addition, the requirement for explicit doctors' orders before initiating mobilisation may delay implementation.[48-50]

Addressing these organisational barriers may be facilitated by the introduction of standardised mobilisation protocols, which may support more timely and consistent mobilisation practices.[51,52]

Patient-related barriers

Patient-related barriers include factors intrinsic to patients' clinical status. Excessive sedation, often used to ensure comfort and safety, and haemodynamic instability may limit active mobilisation and patient participation.[45,53-55] These factors may be mitigated through optimised sedation protocols, delirium prevention strategies and effective pain control, as outlined in the ABCDEF ICU liberation bundle.[56]
Furthermore, the implementation of standardised safety criteria for mobilisation may assist clinicians in determining when and how to mobilise patients safely, even in the presence of physiological instability.[27,28] Regular reassessment of patient readiness for mobilisation and a stepwise progression of activity may also help to overcome some of these barriers.

Individual barriers

Individual barriers relate to healthcare providers' knowledge, attitudes and skills, all of which influence the implementation of mobilisation practices.[32,57] These barriers were not highly ranked in this study, and participants demonstrated good knowledge of basic mobilisation principles. However, as noted, gaps in safety-related knowledge were evident among ICU staff. These gaps may be addressed through targeted education and training programmes aimed at improving staff confidence and competence,[21,45,52] alongside the implementation of standardised protocols and guidelines, the appointment of mobility champions and the promotion of a multidisciplinary team approach.[21,58]

Most of the barriers identified in this study are modifiable, including staffing levels, sedation practices and the requirement for doctors' orders. These may be addressed through co-ordinated care and targeted interventions, such as sedation and mobilisation protocols, which may reduce reliance on doctors' mobilisation orders. Mobilisation protocols have been shown to improve mobilisation rates in ICUs and have been recommended as a local strategy to address barriers to mobilisation.[21,51,59]

Although staffing levels are theoretically modifiable, this may be challenging in resource-constraint settings. However, standardised mobilisation protocols have been shown to be effective without increased staffing levels.[46] By contrast, non-modifiable barriers, such as haemodynamic instability and severe illness, may limit the ability to safely mobilise some patients. Adequate knowledge of safety criteria is therefore essential to determine whether mobilisation is both safe and feasible.

Limitations

This study was conducted in a single tertiary hospital with a small sample, which limits the generalisability of the findings. The short data collection period and consequent small sample size should be considered when interpreting the results. It is possible that some mobility events were missed during data collection owing to factors such as patient acuity and bed

occupancy. Efforts were made to mitigate this by adopting a 'real-world' observational approach that considered all mobilisation events, not only EM. The questionnaire design may have limited the depth of assessment of knowledge and barriers, and it lacked formal content validation. However, despite these limitations, relevant knowledge gaps were identified that may inform strategies to improve mobilisation practices. Perceptions of facilitators to mobilisation were not explored. Future studies incorporating focus groups or individual interviews may provide a more in-depth understanding of knowledge, attitudes and behaviours toward mobilisation.

Finally, the cross-sectional design reflects practices at a single point in time and may not capture variation in mobilisation practices over longer periods.

Clinical implications

The identification of conservative mobilisation practices and significant barriers highlights the need for targeted interventions. Strengthening interprofessional collaboration and implementing standardised mobilisation protocols may facilitate more consistent practice. In addition, enhancing education and training of ICU staff – particularly in relation to safety – may improve confidence and competence in mobilising critically ill patients, with potential benefits for patient outcomes.

Conclusion

This study provides valuable insight into current mobilisation practices, staff knowledge and barriers to mobilisation in ICUs at a tertiary hospital in SA. Despite the recognised benefits of EM, its implementation remains conservative. Future research should focus on developing and testing targeted interventions to address these barriers and support wider adoption of mobilisation practices. These may include staff development, strengthened interprofessional collaboration and the implementation of standardised protocols.

Addressing these challenges is essential to improve patient outcomes and advance the standard of care in ICU settings.

Data availability statement. The data used for this study are available from the first author upon request.

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1. Alaparthi GK, Gatty A, Samuel SR, Amaravadi SK. Effectiveness, safety, and barriers to early mobilization in the intensive care unit. Crit Care Res Pract 2020;2020(1):7840743. https://doi.org/10.1155/2020/7840743
2. Monsees J, Moore Z, Patton D, et al. A systematic review of the effect of early mobilisation on length of stay for adults in the intensive care unit. Nurs Crit Care 2023;28(4):499-509. https://doi.org/10.1111/nicc.12785
3. Zang K, Chen B, Wang M, et al. The effect of early mobilization in critically ill patients: A meta-analysis. Nurs Crit Care 2020;25(6):360-367. https://doi.org/10.1111/nicc.12455
4. Singam A. Mobilizing progress: A comprehensive review of the efficacy of early mobilization therapy in the intensive care unit. Cureus 2024;16(4):e57595. https://doi.org/10.7759/cureus.57595
5. Vanhorebeek I, Latronico N, Van den Berghe G. ICU-acquired weakness. Intensive Care Med 2020;46(4):637-653. https://doi.org/10.1007/s00134-020-05944-4
6. Meyer-Frießem CH, Malewicz NM, Rath S, et al. Incidence, time course and influence on quality of life of intensive care unit-acquired weakness symptoms in long-term intensive care survivors. J Intensive Care Med 2021;36(11):1313-1322. https://doi.org/10.1177/0885066620949178
7. Panahi A, Malekmohammad M, Soleymani F, Hashemian SM. The prevalence and outcome of intensive care unit acquired weakness (ICUAW). Tanaffos 2020;19(3):250-255. https://pubmed.ncbi.nlm.nih.gov/33815546/
8. Devlin JW, Skrobik Y, Gelinas C, et al. Clinical practice guidelines for the prevention and management of pain, agitation/sedation, delirium, immobility, and sleep disruption in adult patients in the ICU. Crit Care Med 2018;46(9):e825-e873. https://doi.org/10.1097/CCM.0000000000003299
9. Clarissa C, Salisbury L, Rodgers S, Kean S. Early mobilisation in mechanically ventilated patients: A systematic integrative review of definitions and activities. J Intensive Care 2019;7:3. https://doi.org/10.1186/s40560-018-0355-z
10. Nydahl P, Sricharoenchai T, Chandra S, et al. Safety of patient mobilization and rehabilitation in the intensive care unit: Systematic review with meta-analysis. Ann Am Thorac Soc 2017;14(5):766-777. https://doi.org/10.1513/AnnalsATS.201611-843SR
11. da Cunha Ferreira D, Marcolino MAZ, Macagnan FE, Plentz RDM, Kessler A. Safety and potential benefits of physical therapy in adult patients on extracorporeal membrane oxygenation support: A systematic review. Rev Bras Ter Intensiva 2019;31(2):227-239. https://doi.org/10.5935/0103-507X.20190017
12. Bahouth MN, Power MC, Zink EK, et al. Safety and feasibility of a neuroscience critical care program to mobilize patients with primary intracerebral hemorrhage. Arch Phys Med Rehabil 2018;99(6):1220-1225. https://doi.org/10.1016/j.apmr.2018.01.034
13. Zhang L, Hu W, Cai Z, et al. Early mobilization of critically ill patients in the intensive care unit: A systematic review and meta-analysis. PLoS ONE 2019;14(10):e0223185. https://doi.org/10.1371/journal.pone.0223185
14. Wang J, Ren D, Liu Y, Wang Y, Zhang B, Xiao Q. Effects of early mobilization on the prognosis of critically ill patients: A systematic review and meta-analysis. Int J Nurs Stud 2020;110:103708. https://doi.org/10.1016/j.ijnurstu.2020.103708
15. Tipping CJ, Harrold M, Holland A, Romero L, Nisbet T, Hodgson CL. The effects of active mobilization and rehabilitation in ICU on mortality and function: A systematic review. Intensive Care Med 2017;43(2):171-183. https://doi.org/10.1007/s00134-016-4612-0
16. Anekwe DE, Biswas S, Bussières A, Spahija J. Early rehabilitation reduces the likelihood of developing intensive care unit-acquired weakness: A systematic review and meta-analysis. Physiother 2020;107:1-10. https://doi.org/10.1016/j.physio.2019.12.004
17. Zhang H, Liu H, Li Z, et al. Early mobilization implementation for critical ill patients: A cross-sectional multi-center survey about knowledge, attitudes, and perceptions of critical care nurses. Int J Nurs Sci 2022;9(1):49-55. http://doi.org/10.1016/j.ijnss.2021.10.001
18. Dagnachew TK, Berhe YW, Mustofa SY, Chekol WB. Clinicians' knowledge and attitude towards early mobilization in intensive care units in Ethiopian tertiary hospitals: A multi-centre study. SAGE Open Med 2023;11:20503121231172348. https://doi.org/10.1177/20503121231172348
19. Parry SM, Nydahl P, Needham DM. Implementing early physical rehabilitation and mobilisation in the ICU: Institutional, clinician, and patient considerations. Intensive Care Med 2018;44(4):470-473. https://doi.org/10.1007/s00134-017-4908-8
20. Tadyanemhandu C, van Aswegen H, Ntsiea V. Barriers and facilitators to implementation of early mobilisation of critically ill patients in Zimbabwean and South African public sector hospitals: A qualitative study. Disabil Rehabil 2021;44(22):6699-6709. https://doi.org/10.1080/09638288.2021.1970827
21. Tadyanemhandu C, Ntsiea V, van Aswegen H. Implementation strategies to overcome barriers to early mobilisation practices in Zimbabwean and South African public sector ICUs: A Delphi study. South Afr J Crit Care 2024;40(3):e1692. https://doi.org/10.7196/SAJCC.2024.v40i3.1692
22. Tadyanemhandu C, van Aswegen H, Ntsiea V. Organizational structures and early mobilization practices in South African public sector intensive care units – A cross-sectional study. J Eval Clin Pract 2021;27(1):42-52. https://doi.org/10.1111/jep.13378
23. Ding N, Zhang Z, Zhang C, et al. What is the optimum time for initiation of early mobilization in mechanically ventilated patients? A network meta-analysis. PLoS ONE 2019;14(10):e0223151. https://doi.org/10.1371/journal.pone.0223151
24. Daum N, Drewniok N, Bald A, et al. Early mobilisation within 72 hours after admission of critically ill patients in the intensive care unit: A systematic review with network meta-analysis. Intensive Crit Care Nurs 2024;80:103573. https://doi.org/10.1016/j.iccn.2023.103573
25. Bein T, Bischoff M, Brückner U, et al. S2e guideline: Positioning and early mobilisation in prophylaxis or therapy of pulmonary disorders. Anaesthesist 2015;64(Suppl 1):S1-S26. https://doi.org/10.1007/s00101-015-0071-1
26. Santos PMR, Ricci NA, Suster EAB, Paisani DM, Chiavegato LD. Effects of early mobilisation in patients after cardiac surgery: A systematic review. Physiother 2017;103(1):1-12. https://doi.org/10.1016/j.physio.2016.08.003
27. Hanekom S, Gosselink R, Dean E, et al. The development of a clinical management algorithm for early physical activity and mobilization of critically ill patients: Synthesis of evidence and expert opinion and its translation into practice. Clin Rehab 2011;25(9):771-787. https://doi.org/10.1177/0269215510397677
28. Hodgson CL, Stiller K, Needham DM, et al. Expert consensus and recommendations on safety criteria for active mobilization of mechanically ventilated critically ill adults. Crit Care 2014;18(6):658. https://doi.org/10.1186/s13054-014-0658-y
29. Leditschke IA, Green M, Irvine J, Bissett B, Mitchell IA. What are the barriers to mobilizing intensive care patients? Cardiopulm Phys Ther J 2012;23(1):26-29. https://pmc.ncbi.nlm.nih.gov/articles/PMC3286497/
30. Koo KKY, Choong K, Cook DJ, et al. Early mobilization of critically ill adults: A survey of knowledge, perceptions and practices of Canadian physicians and physiotherapists. CMAJ Open 2016;4(3):e448-e454. https://doi.org/10.9778/cmajo.20160021
31. Parry SM, Remedios L, Denehy L, et al. What factors affect implementation of early rehabilitation into intensive care unit practice? A qualitative study with clinicians. J Crit Care 2017;38:137-143. https://doi.org/10.1016/j.jcrc.2016.11.005
32. Anekwe DE, Koo KKY, de Marchie M, Goldberg P, Jayaraman D, Spahija J. Interprofessional survey of perceived barriers and facilitators to early mobilization of critically ill patients in Montreal, Canada. J Intensive Care Med 2019;34(3):218-226. https://doi.org/10.1177/0885066617696846
33. Olum R, Chekwech G, Wekha G, Nassozi DR, Bongomin F. Coronavirus disease-2019: Knowledge, attitude, and practices of health care workers at Makerere University Teaching Hospitals, Uganda. Front Public Health 2020;8:181. https://doi.org/10.3389/fpubh.2020.00181
34. Ashebir W, Yimer B, Alle A, Teshome M, Teka Y, Wolde A. Knowledge, attitude, practice, and factors associated with prevention practice towards COVID-19 among healthcare providers in Amhara region, northern Ethiopia: A multicenter cross-sectional study. PLoS Glob Pub Health 2022;2(4):e0000171. https://doi.org/10.1371/journal.pgph.0000171
35. Tadyanemhandu C, van Aswegen H, Ntsiea V. Early mobilisation practices of patients in intensive care units in Zimbabwean government hospitals – A cross-sectional study. South Afr J Crit Care 2018;34(1):46-51. https://pmc.ncbi.nlm.nih.gov/articles/PMC9256537/
36. Jolley SE, Moss M, Needham DM, et al. Point prevalence study of mobilization practices for acute respiratory failure patients in the United States. Crit Care Med 2017;45(2):205-215. https://doi.org/10.1097/CCM.0000000000002058
37. Timenetsky KT, Neto AS, Assunção MSC, Taniguchi L, Eid RAC, Corrêa TD. Mobilization practices in the ICU: A nationwide 1-day point-prevalence study in Brazil. PloS ONE 2020;15(4):e0230971. https://doi.org/10.1371/journal.pone.0230971

38. Wang J, Shi C, Xiao Q, Jia Y. ICU nurses' practice and intention to implement early mobilization: A multi-centre cross-sectional survey. Nurs Crit Care 2024;29(5):1067-1077. https://doi.org/10.1111/nicc.13100
39. Liu H, Tian Y, Jiang B, Song Y, Du A, Ji S. Early mobilisation practice in intensive care units: A large-scale cross-sectional survey in China. Nurs Crit Care 2023;28(4):510-518. https://doi.org/10.1111/nicc.12896
40. Chohan S, Ash S, Senior L. A team approach to the introduction of safe early mobilisation in an adult critical care unit. BMJ Open Qual 2018;7(4):e000339. https://doi.org/10.1136/bmjoq-2018-000339
41. Hanekom S, Louw QA, Coetzee AR. Implementation of a protocol facilitates evidence-based physiotherapy practice in intensive care units. Physiother 2013;99(2):139-145. https://doi.org/10.1016/j.physio.2012.05.005
42. Popoola M, Dingle M, MacLaren J, Dyson J. What are the barriers to nurses mobilising adult patients in intensive care units? An integrative review. Aust Crit Care 2022;35(5):595-603. https://doi.org/10.1016/j.aucc.2021.09.002
43. Boehm LM, Lauderdale J, Garrett AN, Piras SE. A multisite study of multidisciplinary ICU team member beliefs toward early mobility. Heart Lung 2021;50(1):214-219. https://doi.org/10.1016/j.hrtlng.2020.09.021
44. Bennion J, Manning C, Mansell SK, Garrett R, Martin D. The barriers to and facilitators of implementing early mobilisation for patients with delirium on intensive care units: A systematic review. J Intensive Care Soc 2024;25(2):210-222. https://doi.org/10.1177/17511437231216610
45. Babazadeh M, Jahani S, Poursangbor T, Cheraghian B. Perceived barriers to early mobilization of intensive care unit patients by nurses in hospitals affiliated to Jundishapur University of Medical Sciences of Ahvaz in 2019. J Med Life 2021;14(1):100-104. https://doi.org/10.25122/jml-2019-0135
46. Ling XW, Lim YH, Ong HK, et al. Mobilising intensive care patients early. Proc Singap Healthc 2020;30(3):193-199. https://doi.org/10.1177/2010105820963292
47. Kim C, Kim S, Yang J, Choi M. Nurses' perceived barriers and educational needs for early mobilisation of critical ill patients. Aust Crit Care 2019;32(6):451-457. https://doi.org/10.1016/j.aucc.2018.11.065
48. Brock C, Marzano V, Green M, et al. Defining new barriers to mobilisation in a highly active intensive care unit – Have we found the ceiling? An observational study. Heart Lung 2018;47(4):380-385. https://doi.org/10.1016/j.hrtlng.2018.04.004
49. Akhtar P, Deshmukh P. Knowledge, attitudes, and perceived barriers of healthcare providers toward early mobilization of adult critically ill patients in intensive care unit. Indian J Crit Care Med 2021;25:512-518. https://doi.org/10.5005/jp-journals-10071-23835
50. Sakuramoto H, Nakamura K, Ouchi A, et al. Current practice and barriers to the implementation of mobilization in ICUs in Japan: A multicenter prospective cohort study. J Clin Med 2023;12(12):3955. https://doi.org/10.3390/jcm12123955
51. Nydahl P, Gunther U, Diers A, et al. PROtocol-based MObilizaTION on intensive care units: Stepped-wedge, cluster-randomized pilot study (Pro-Motion). Nurs Crit Care 2020;25(6):368-375. https://doi.org/10.1111/nicc.12438
52. Hodgson CL, Schaller SJ, Nydahl P, Timenetsky KT, Needham DM. Ten strategies to optimize early mobilization and rehabilitation in intensive care. Crit Care 2021;25(1):324. https://doi.org/10.1186/s13054-021-03741-z
53. Lin F, Phelan S, Chaboyer W, Mitchell M. Early mobilisation of ventilated patients in the intensive care unit: A survey of critical care clinicians in an Australian tertiary hospital. Aust Crit Care 2020;33(2):130-136. https://doi.org/10.1016/j.aucc.2019.02.002
54. Watanabe S, Hirasawa J, Naito Y, et al. Association between the early mobilization of mechanically ventilated patients and independence in activities of daily living at hospital discharge. Sci Rep 2023;13(1):4265. https://doi.org/10.1038/s41598-023-31459-1
55. Fontela PC, Forgiarini LA Jr, Friedman G. Clinical attitudes and perceived barriers to early mobilization of critically ill patients in adult intensive care units. Rev Brasil Ter Intensiva 2018;30(2):187-194. https://doi.org/10.5935/0103-507X.20180037
56. Sosnowski K, Lin F, Chaboyer W, Ranse K, Heffernan A, Mitchell M. The effect of the ABCDE/ABCDEF bundle on delirium, functional outcomes, and quality of life in critically ill patients: A systematic review and meta-analysis. Int J Nurs Stud 2023;138:104410. https://doi.org/10.1016/j.ijnurstu.2022.104410
57. Dubb R, Nydahl P, Hermes C, et al. Barriers and strategies for early mobilization of patients in intensive care units. Ann Am Thorac Soc 2016;13(5):724-730. https://doi.org/10.1513/AnnalsATS.201509-586CME
58. Mukpradab S, Mitchell M, Marshall AP. An interprofessional team approach to early mobilisation of critically ill adults: An integrative review. Int J Nurs Stud 2022;129:104210. https://doi.org/10.1016/j.ijnurstu.2022.104210
59. Sosnowski K, Mitchell ML, White H, et al. A feasibility study of a randomised controlled trial to examine the impact of the ABCDE bundle on quality of life in ICU survivors. Pilot Feasibility Stud 2018;4(1):32. https://doi.org/10.1186/s40814-017-0224-x

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