

Research Article

Physiotherapy provision and practice: A EuropeAn Intensive CarE Unit (ICU) survey (PEAiCE) – A profile of ICU physiotherapy in Europe

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ABSTRACT

Background: Physiotherapy is an essential component of respiratory management and mobilisation/rehabilitation for patients in the Intensive Care Unit (ICU). However, the current practices across Europe related to organisational models, referral pathways, or clinical techniques are not well-defined.

Purpose: To examine physiotherapy provision and practice of respiratory management and mobilisation/rehabilitation for mechanically ventilated patients in European ICUs.

Methods: An online survey was developed, piloted and distributed in 11 languages via national coordinators, professional societies, and social media. The ICU physiotherapy leads, or in their absence, medical/nursing leaders from each ICU (one reply per ICU), completed the survey, which included information regarding ICU structure, physiotherapy provision, and current practice. Data were analysed descriptively.

Results: In total, 845 responses from 33 countries were included, with the largest representation from Spain (12%), the United Kingdom (11%), and France (11%). Most respondents were physiotherapists (88%) working in university hospitals (69%) and caring primarily for adult ICU patients (87%). Less than half (41%) of physiotherapists were dedicated to ICU, but 91% of them had received some ICU-specific training. Physiotherapy is initiated upon a referral in 52% of ICUs. It usually includes routine respiratory assessment (80%) and both respiratory management and mobilisation/rehabilitation for mechanically ventilated patients (85%). The most common techniques included endotracheal suctioning (55%) and manually assisted cough (51%), with less frequent use of mechanical insufflation-exsufflation (20%) and saline instillation (18%). Mobilisation/rehabilitation was widely practised, with 76% of respondents reporting patients sitting at the edge of the bed, 69% standing, and 71% walking during their ICU stay.

Conclusions: Physiotherapy is a well-integrated part in European ICUs with physiotherapists providing both respiratory management and mobilisation/rehabilitation techniques, although heterogeneity persists in organisation, referral pathways and the use of specific techniques.

Implications for Clinical Practice: These results inform the development of future training and workforce planning, ultimately improving interprofessional ICU care across Europe, particularly in underrepresented areas.

Background

Critically ill patients admitted to an Intensive Care Unit (ICU) often require mechanical ventilation and prolonged immobilisation, which may lead to respiratory complications and the development of ICU-acquired weakness [1–3]. Alongside nurses and other members of the multidisciplinary ICU team, physiotherapists play a central role in the prevention and treatment of these complications, including respiratory management and mobilisation/rehabilitation to support recovery [4–6]. The COVID-19 pandemic highlighted the important role of physiotherapists within the ICU, along with potential discrepancies and variations in physiotherapy provision and practice across European countries [7–13]. While countries with established and specialist physiotherapy provision in ICU and were able to increase demand for ICU care during the pandemic [10,12], other countries had little or no access to physiotherapy services in the ICU [14].

In Europe, physiotherapists are specialists in respiratory management and mobilisation/rehabilitation interventions that promote recovery and functional improvement in ICU patients [4–6,15,16]. There is a growing number of evidence-based clinical guidelines to support their role within the ICU and to aid decision-making and patient safety [17–21]. However, these international guidelines are often led by experts from English-speaking or Western European countries. As a result, wider adoption and implementation of these guidelines are challenging in countries with lower resources or different ICU settings [22,23]. Additionally, language can be a barrier to knowledge transfer and the sharing of expertise.

Previous national surveys in selected European countries have revealed significant variability in ICU physiotherapy practice, ranging from limited or no provision [14,24], inconsistent services [25–27], to those with well-established, dedicated teams [28]. Moreover, the last multi-country European survey of physiotherapy practice was completed over 20 years ago, with findings potentially biased due to its

focus on Western European countries, where ICU physiotherapy was already established [29]. Since then, physiotherapy practice might have evolved substantially due to recommendations for both early mobilisation as well as respiratory management by clinical practice guidelines [19,30,31]. An update is therefore urgently needed to provide a contemporary picture of physiotherapy practice across European ICUs to inform the development of targeted, evidence-based education programmes and the promotion of evidence-based physiotherapy practice. The aim of the current study is to examine physiotherapy provision and practice of respiratory management and mobilisation/rehabilitation for mechanically ventilated patients in European ICUs.

Methods*Design*

A cross-sectional, online survey design was developed with a secure survey software (JISC V.2) using the Checklist for Reporting of Survey Studies (CROSS) [32] ([Supplementary file 1](#)). Data collection was anonymous, with participation entirely voluntary.

Ethical approval

The research was granted ethical approval by Coventry University's Research Ethics Committee on 19th of December 2022 (code P136453). A study information sheet was included at the beginning of the survey, with participants completing an online consent form prior to commencing the survey.

Participants

The targeted population of this study were physiotherapists working in a European ICU. The aim was to obtain a single response per ICU, with

the survey completed by one ICU physiotherapist. Where no physiotherapist was identified within the ICU, another senior member of the ICU clinical team was asked to complete the survey. To reduce the risk of doubled answers from the same ICU, participants were informed at the beginning of the survey about the “one answer per ICU” requirement. Additionally, survey data were screened for potential duplicates to avoid potential doubled answers from the same ICU.

Steering committee

It was anticipated that participants in some countries would be difficult to reach due to no links to international networks or language barriers. To maximise access and coverage of these countries, an international steering committee was established via professional and social networks. Thirty-three clinicians or researcher representatives of multiple European regions were recruited. The steering group members evaluated the need for a translation of the survey and participated in translation if this was judged important. They were responsible for additional local ethical approval where required and for inviting ICUs within their countries or regions to participate in the survey.

Sampling and recruitment

We aimed to recruit a minimum of 250 ICUs from 38 European countries where physiotherapy is a recognised profession, as identified by membership of the World Physiotherapy database [33]. To maximise the recruitment of centres, various approaches were used to invite ICUs for participation. The specific dissemination strategy was guided by the national or local coordinators from the steering committee. Where possible, survey invitations were sent to physiotherapy or service leads through national databases. It was anticipated that some physiotherapists may not be linked to professional networks and therefore, social media platforms (e.g. X, Facebook, LinkedIn) [34] and snowballing sampling methods were also used [35], which particularly aimed to expand recruitment to marginalised European regions [36]. For countries and regions without any representation, the survey was shared through wider professional and international networks.

A link to the online survey was sent to participants, who were then given the opportunity to complete the survey in their preferred language. Data were collected anonymously, and no personal characteristics were collected. The participants had to answer all compulsory questions for the survey to be completed. Only the lead researcher (AL) had access to the online survey platform.

Survey development

A questionnaire was developed in English *a priori*, based on previously published national surveys of physiotherapy practice and expert consensus from the steering committee. The questionnaire was piloted in English by 5 steering group members from various European countries. Using feedback from the steering committee members who completed pilot testing of the survey, several questions were refined, and the structure and comprehension of the questions were revised. The questions were simplified and the numbers reduced to keep the survey completion time under 10 min. JISC formatting was adjusted to improve the end-user experience. The revised survey was examined by the steering committee to ensure readability and face validity prior to survey distribution.

Subsequently, the survey was translated into 10 European languages (French, German, Spanish, Portuguese, Polish, Italian, Finnish, Greek, Albanian, Ukrainian) using a standardised forward and backward method with at least two native speakers as per recommended international standards [37,38]. The translated surveys were piloted again in each language by up to 5 physiotherapists representing countries where that language was spoken (for example Austria, Germany and Switzerland for the German translation). All translations had to be approved by a lead researcher (SE) who checked backward translations.

Results from all pilots were fed back into the steering committee to guide the final online version of the survey (Supplementary file 2).

Survey items

The survey comprised closed single or multiple-choice questions to avoid the need for free-text translation. The customised logic was used to adapt questions’ flow to the respondents’ answers (for example, the practice-related questions were answered by physiotherapists only). The survey comprised 3 sections with 12 questions for all respondents and an additional 12 for physiotherapists only. Physiotherapy practice included questions about assessment, respiratory management (such as airway clearance, optimising lung volume or weaning from mechanical ventilation), and mobilisation/rehabilitation (defined as mobilisation, physical rehabilitation or exercise). See Table 1.

Data analysis

Data were exported from JISC to the statistical package IBM SPSS Statistics, version 28 (IBM Corp., Armonk, NY, USA). The data were screened for duplicate entries based on identical responses for the following variables: country, hospital level, type of ICU, age groups, number of beds, whether a physiotherapist is in the ICU, and the type of referral for the physiotherapist to the ICU. The identified duplicates were removed before the final analysis. Respondents’ characteristics were described as numbers and proportions. Frequency counts and percentages were used to describe categorical data for all respondents (by question) and by country. Physiotherapy practice was compared in the context of education level, training, experience, or type of hospital using the chi-square statistic.

Results

The survey was open for 5 months from the 19th of February to 21st of July 2024. Overall, 915 respondents completed the survey. After removing duplicates (n = 70), 845 responses from 33 different countries were included in the analysis (Fig. 1).

The survey was completed in 11 languages, with the majority of

Table 1
Survey structure.

	Title	Content	All	Physio only
Section 1	Structure of the ICU and hospital	Structure of the ICU and hospital, including data related to the country hospital type, ICU size, clinical speciality, and availability of physiotherapists in the ICU. (5 questions)	✓	
Section 2	The role of physiotherapy within the ICU	Initiation and provision of physiotherapy treatment: physiotherapists' dedication to ICU, referral pathways (7 questions)	✓	
	Physiotherapists' education and experience	Physiotherapy education, ICU experience, ICU-specific training (5 additional questions) Type of physiotherapy provided, specifically respiratory management, mobilisation/rehabilitation, or both.		✓
Section 3	Specific physiotherapy-related practice questions	Physiotherapy assessment, respiratory management, and mobilisation/rehabilitation (7 questions)		✓

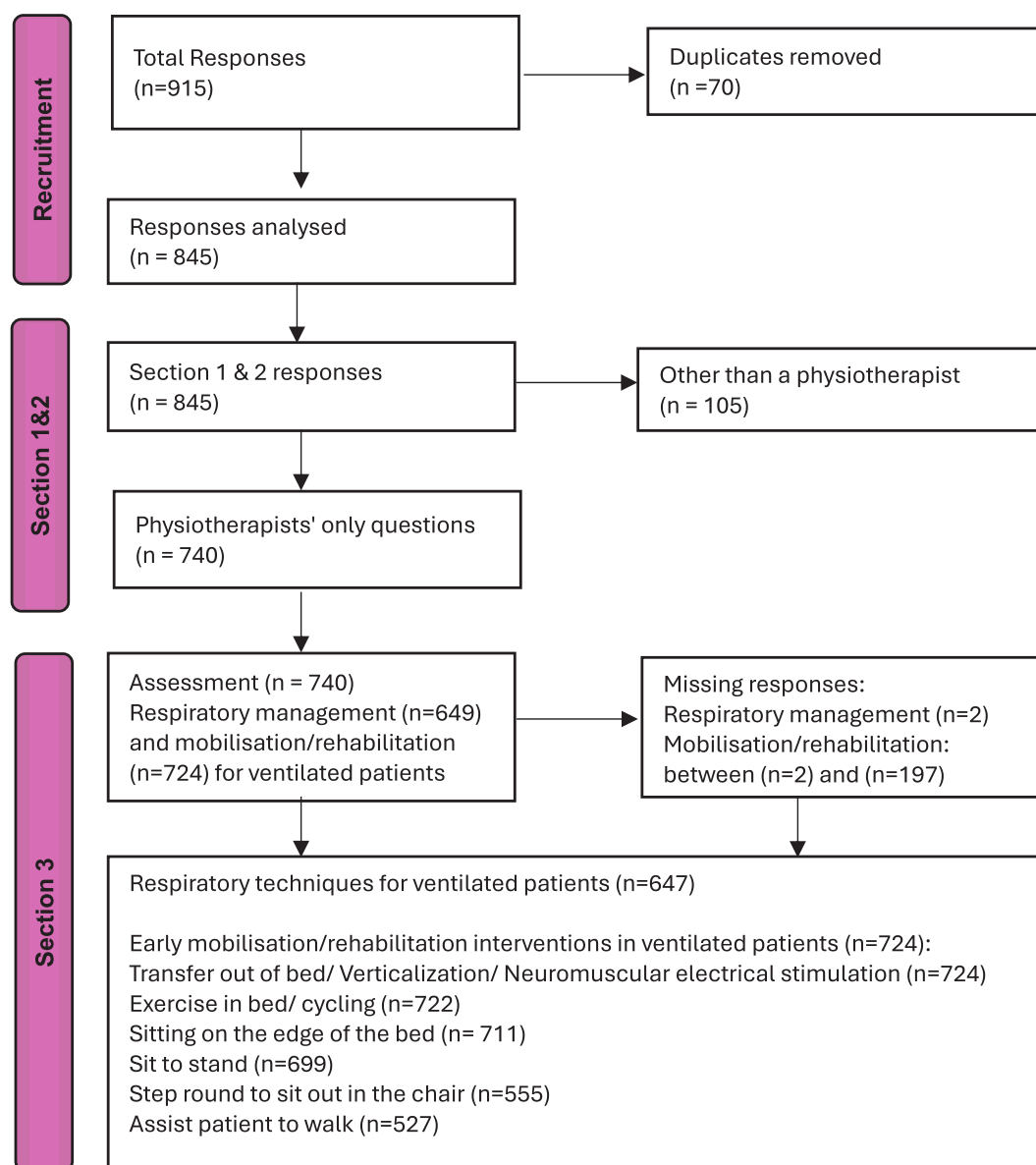


Fig. 1. Flowchart of responses for each section of the survey and physiotherapy practice for ventilated patients.

responses in English (n = 302, 36%), German (n = 135, 16%) and French (n = 116, 14%) (Fig. 2, [Supplementary file 3](#)). Countries with the most responses were Spain (n = 98, 12%), the United Kingdom (n = 95, 11%) and France (n = 89, 11%) (See Fig. 2), although this may not reflect the proportion of responses received per ICU from each country. For example, in Iceland whilst only 3 responses were received this was estimated to represent a 100% response rate for the number of ICUs within the country, whilst 8 responses from Albania represented 80% response rate and 44 from Switzerland indicated 54%. However, due to a lack of available or consistent ICU reporting across a number of European countries, we were, therefore, unable to consider proportional representation when interpreting these results ([Supplementary file 3](#)). Most respondents were physiotherapists (n = 740, 88%) working in university hospitals (n = 583, 69%) with adult patients (n = 731, 86.5%). [Table 2](#) shows details on characteristics.

Physiotherapy provision

A total of 346 (41%) respondents reported dedicated physiotherapists within ICU, 389 (46%) shared physiotherapists between ICU and

other wards, and 74 (9%) answered that physiotherapists only treated patients on an ad-hoc basis. Respondents from Belgium and France reported the highest proportion of physiotherapists dedicated to work in ICU only (77% and 66%, respectively). Over half (n = 437, 51.7%) of all respondents reported that a referral by a medical doctor was required to initiate physiotherapy, with 71 (8.5%) needing a specific referral, which also indicated the prescribed treatment.

Experience and training

Of all physiotherapist respondents (n = 740), 53% had a physiotherapy diploma (n = 187) or Bachelor's degree (n = 209), 40% completed a Master's degree (n = 293) and 4% a Doctorate degree (n = 26). Less than half of physiotherapists (n = 335, 45%) had been working in the ICU for 10 years or more, with 39% (n = 289) reporting less than 5 years of experience in the ICU. The majority of respondents (n = 672, 91%) indicated that they had received some form of ICU-specific training, including 20% of physiotherapists (n = 146) from 15 countries with cardio-respiratory or ICU-specific degrees, 39% (n = 288) had never attended an ICU-specific conferences ([Supplementary file 3](#)).

PEAiCE Survey responses

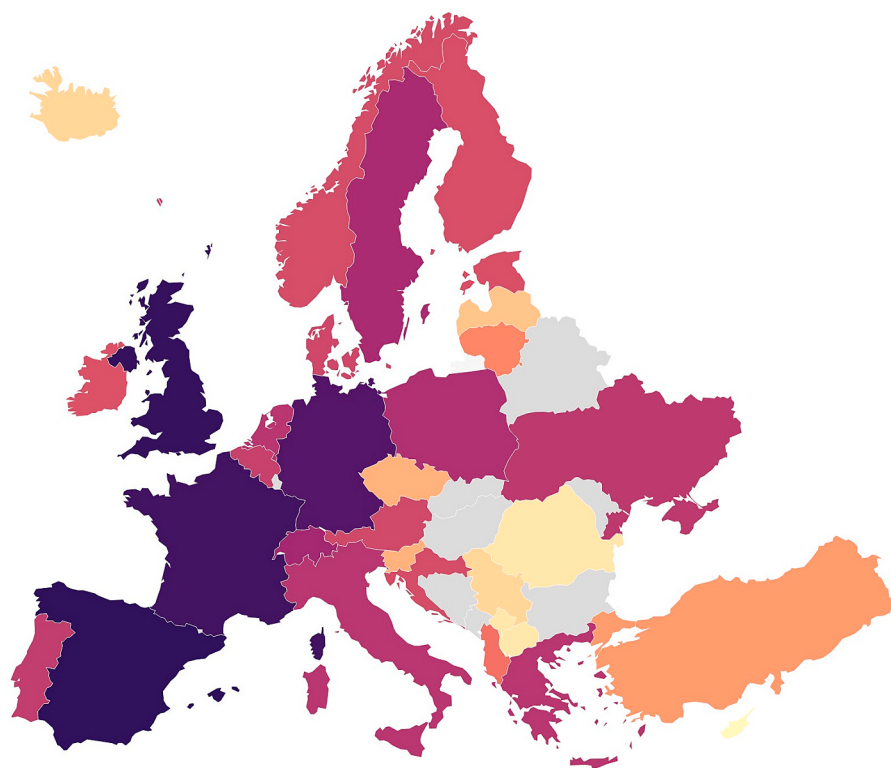


Fig. 2. Number of respondents per country. * Darker shades indicate a greater number of responses; however, this does not necessarily reflect the proportion of responses relative to the number of ICUs in each country.

Physiotherapy practice

Of all physiotherapist respondents ($n = 740$), the majority treated mechanically ventilated patients, providing both respiratory management and mobilisation/rehabilitation ($n = 625$, 84%). One in ten respondents provided only mobilisation/rehabilitation only ($n = 75$, 10%) (Fig. 3). In post-hoc analyses, no obvious patterns were observed for type of hospital, country, or experience.

Assessment

Most physiotherapists reported having received training on respiratory (88%) and ICU-acquired weakness (77%) assessment, both of which are regularly performed in clinical practice (Table 3). In contrast, assessment of delirium, dysphagia and ultrasound (both thoracic and muscle) are rarely used.

Respiratory techniques

For mechanically ventilated patients, variability was seen regarding respiratory techniques used. Whilst over half of the respondents reported regularly performing endotracheal suctioning and manually assisted coughing, this was less common for other techniques such as ventilator hyperinflation and tracheostomy management (Fig. 4, Supplementary File 3).

Mobilisation/rehabilitation

Variability was also seen regarding mobilisation/rehabilitation

techniques for mechanically ventilated patients (Fig. 5, Supplementary File 3). When questioned about safely achieving mobility milestones in patients undergoing advanced support or therapies, physiotherapists indicated that mobilisation/rehabilitation was a routine part of their practice. However, it was less frequently performed in patients receiving continuous renal replacement therapy or those on inotropes or vaso-pressors (Table 4).

Discussion

With over 800 participating ICUs from across 33 countries, this survey represents the largest evaluation to date of physiotherapy provision and practice in European ICUs. For the first time, previously underrepresented countries from South and Eastern Europe are being included. In general, physiotherapy required a referral, whereby respiratory management and rehabilitation were provided to both mechanically ventilated and non-ventilated patients. Respondents had a high level of experience, and most had received at least some ICU-specific training. While this training often included respiratory assessment and the evaluation of ICU acquired weakness, training related to more specialised or holistic assessment, such as lung ultrasound or delirium, was uncommon. This is surprising because the evidence for mobilisation/rehabilitation on reducing delirium is increasing [39].

Survey results identified heterogeneous levels of access to specialised ICU physiotherapists and a wide variation in the use of specific techniques. Encouragingly, evidence-based interventions, particularly mobilisation/rehabilitation, were highly reported across Europe. In contrast, certain respiratory techniques — such as Mechanical Insufflation-Exsufflation — are used less frequently. This is similar to

Table 2
Respondents' characteristics (n = 845).

		Number of respondents (n)	Percentage of respondents (%)
Respondents' profession	Physiotherapist	740	87.6
	Intensivist/physician/ medical doctor	52	6.2
	ICU nurse	21	2.5
	Respiratory therapist*	14	1.7
	ICU nurse manager/ nursing lead	10	1.2
	Other	8	0.9
Respondents' current workplace			
Hospital type	University-affiliated	583	69.0
	Not university-affiliated	262	31.0
Patient group	Mainly adult patients	731	86.5
	All age groups	65	7.7
	Mainly paediatric patients	49	5.8
ICU Type	Mixed unit or across all types	367	43.4
	Mixed medical-surgical	210	24.9
	Medical	99	11.7
	Cardiothoracic or cardiac care	65	7.7
	Neurosurgical or neurological care	43	5.1
	Surgical	35	4.1
	Burns	7	0.8
	Trauma	6	0.7
	Other	13	1.5
Size of ICU (number of beds)	1–10 beds	277	32.8
	11–20 beds	349	41.3
	21–30 beds	119	14.1
	31–40 beds	54	6.4
	41–50 beds	21	2.5
	more than 50 beds	25	3.0

* Respiratory Therapists is a profession trained in critical care healthcare profession, separate from physiotherapy and uncommon in European countries.

reporting from Mechanical Insufflation-Exsufflation survey studies [40–42] and a recent ICU physiotherapy study from Australia [43]. However, hyperinflation was notably less common in our findings of

European practice, where suctioning emerged as the most routinely applied technique. These differences may reflect limited research evidence, variability in knowledge translation, or differences in specialist training across regions; however, these factors were not directly assessed in this study. Future research incorporating workforce metrics, educational frameworks, and health system characteristics would help to examine these associations more directly.

Physiotherapy provision across Europe

Only 41% of ICUs reported a dedicated ICU physiotherapist, with 46% having a shared role between the ICU and wards. This contrasts with the previous (Western) European survey [29] where 75% of ICUs reported an exclusive ICU physiotherapist. However, other national studies from South-East Europe reported 0–20% working exclusively in the ICU [14,25,27]. This heterogeneity among responding ICUs may reflect differences in healthcare systems, resources, and education. This variability may be influenced by historic context and structural factors related to physiotherapy development emphasizing importance of addressing the unique local challenges when considering educational programmes or guideline development. While this diversity may support context-specific care, it complicates outcome comparisons and quality benchmarking. The influence of European Union (EU) harmonisation

Table 3
Physiotherapy Assessment in ICU (n = 740).

Assessment	Training N (%)	Use in practice N (%)	Occasionally (< 50% of patients)	Never or not applicable (0%)
Respiratory	654 (88%)	588 (79%)	95 (13%)	57 (8%)
ICU acquired weakness	568 (77%)	453 (61%)	168 (23%)	119 (16%)
Delirium	276 (37%)	163 (22%)	162 (22%)	415 (56%)
Dysphagia	223 (30%)	104 (14%)	156 (21%)	480 (75%)
Thoracic ultrasounds	155 (21%)	28 (4%)	99 (13%)	613 (83%)
Muscle ultrasounds	64 (9%)	12 (2%)	34 (5%)	694 (94%)

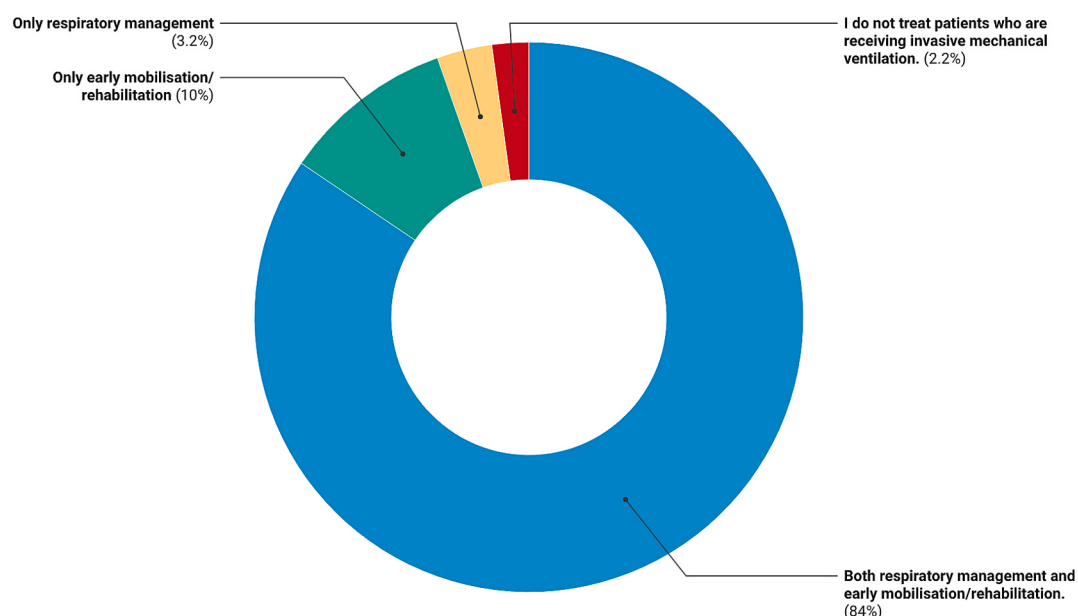


Fig. 3. Physiotherapists treating invasively mechanically ventilated patients (n = 740).

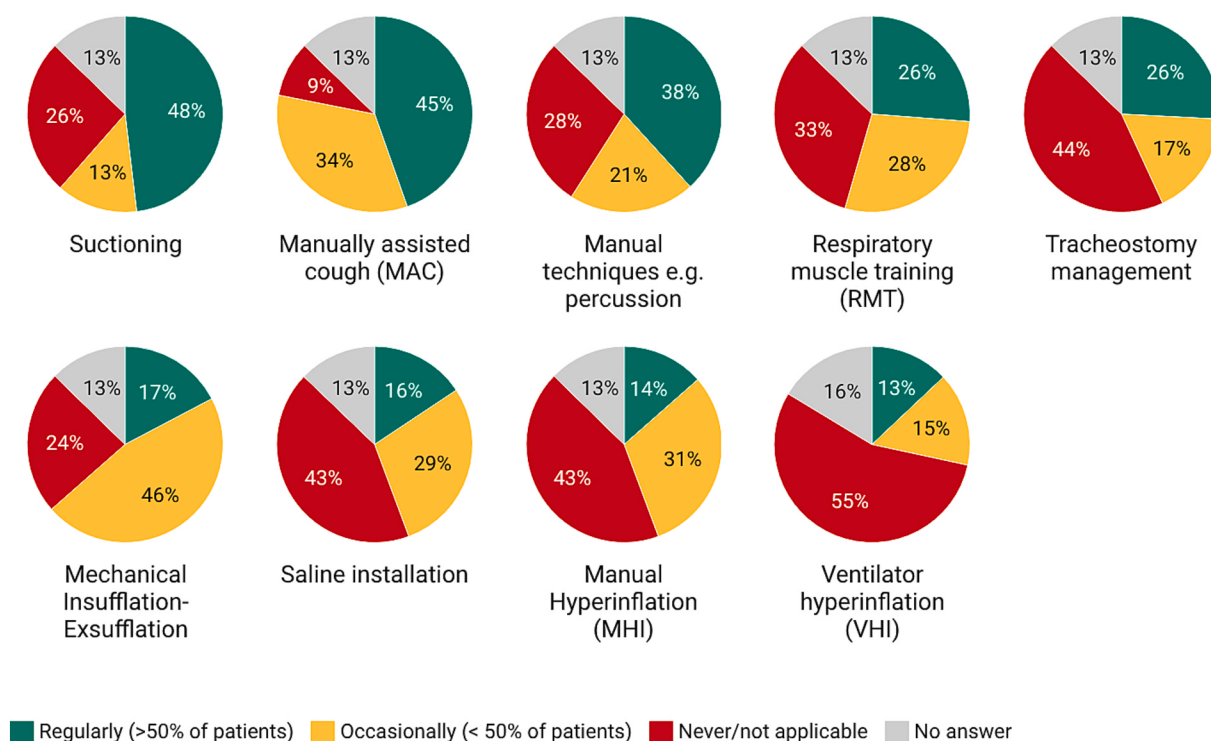


Fig. 4. Variability in performing respiratory techniques (n = 647).

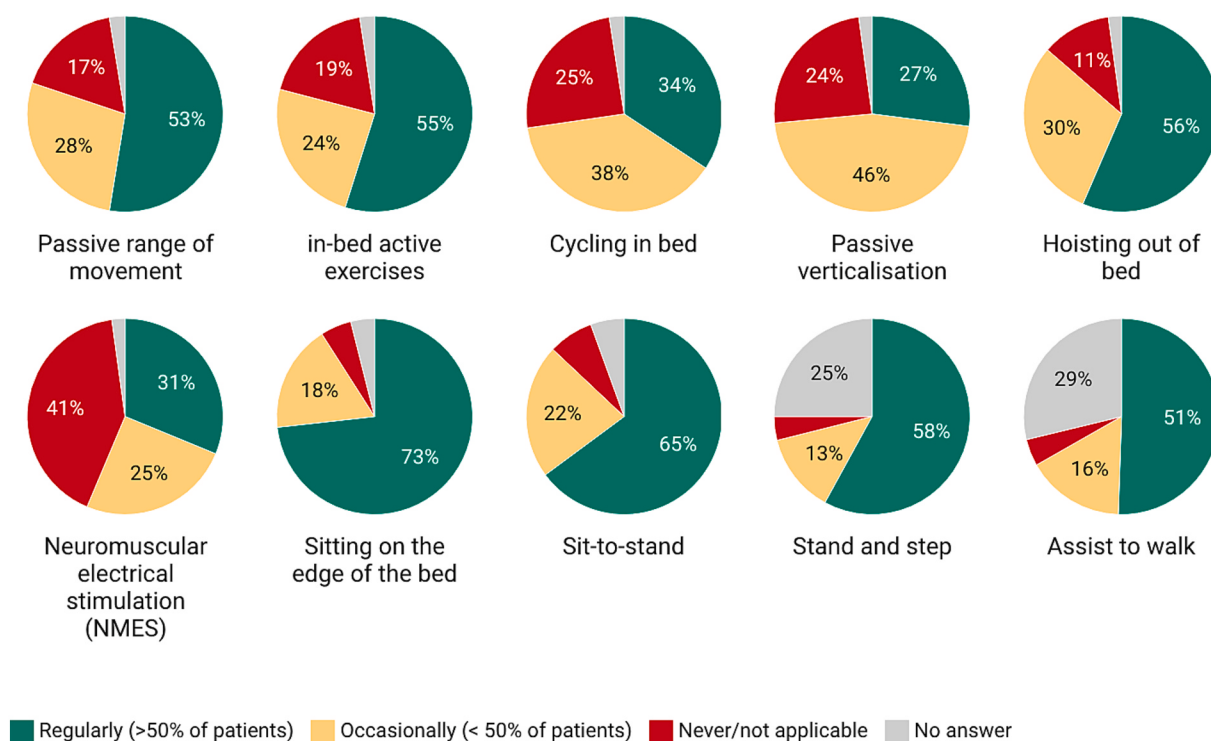


Fig. 5. Variability in performing early mobilisation/rehabilitation techniques (n = 724).

efforts, such as the Bologna process to benchmark physiotherapy education and professional standards [44], remains unclear in the context of ICU physiotherapy. Similar disparities are reported globally, indicating a broader challenge in ICU physiotherapy provision [23,45].

Nevertheless, European physiotherapists are consistently treating

mechanically ventilated patients by providing both respiratory management and mobilisation/rehabilitation. This rate (84%) is slightly lower than the 100% provision previously reported by Norrenberg and Vincent [29], but some national surveys demonstrated limited involvement of physiotherapists in respiratory management [14,27].

Table 4
Safe mobilising of patients receiving advanced support or therapy (n = 724).

	No mobilisation n (%)	In bed	Bedside sitting	Transfer to sitting outside of the bed	Standing	Walking	Missing answers
Ventricular assist devices (e.g. LVAD, RVAD)	333 (46%)	180 (25%)	150 (21%)	173 (24%)	147 (21%)	275 (38%)	36 (5%)
External ventricular drainage (EVD)	316 (44%)	203 (28%)	159 (22%)	150 (21%)	142 (20%)	255 (35%)	37 (5%)
Extracorporeal life support (e.g. ECMO, ECCO, ILA)	310 (43%)	206 (28%)	139 (19%)	110 (15%)	203 (28%)	144 (20%)	20 (3%)
Pulmonary arterial catheter	284 (39%)	220 (30%)	170 (23%)	152 (21%)	341 (47%)	329 (45%)	2 (<1%)
Continuous renal replacement therapy	190 (26%)	352 (49%)	284 (39%)	207 (29%)	267 (37%)	185 (26%)	23 (3%)
Patients on inotropes/ vasopressors	189 (26%)	394 (54%)	368 (51%)	310 (43%)	335 (46%)	270 (37%)	13 (2%)

*Respondents could provide multiple responses, so answers will not add up to 100%. Some respondents did not select their answers for each advanced support or therapy treatment, hence, variation in the number of responses.

Thus, the broader geographical representation of European ICUs in our survey might explain this. The PEAiCE study supports previous findings regarding the wide variation in the use of specific assessment and treatment techniques. These results might have been biased as we were specifically asking for the most senior physiotherapist to participate in the survey, but the same methodology was adopted in the previous European survey [29].

Role of physiotherapists in the delivery of respiratory management and mobilisation/rehabilitation in Europe

Physiotherapists are central to respiratory management and mobilisation/rehabilitation in ICU settings, yet their roles can vary widely across Europe due to differences in ICU culture, legal frameworks, and financial systems [26,46]. While evidence supports dedicated rehabilitation models with structured goals and continuity, implementation remains inconsistent [47]. Interventions range from guideline-based to outdated practices, reflecting variable knowledge translation. Physiotherapists working in ICUs in Europe have high academic qualifications, many holding a Master's (40%) or a Doctorate degree (4%), which has been reported even higher in other national surveys. Nevertheless, working with the ICU population requires specialised knowledge and skills. The HERMES curriculum offers a benchmark [48], but disparities in postgraduate education and the scope of practice limit its impact. Although some form of ICU-specific training was common (91%), only a few completed an ICU or cardio-respiratory post-graduate Master's degree (20%) or specialisation (24%). The previous Western European survey reported 72% having some form of post-graduate specialisation [29]. This underscores persistent inconsistencies in access to specialised postgraduate education and cardiorespiratory training across countries [49]. These findings emphasise the need for critical evaluation of national systems and support the development of standardised training pathways to reduce disparities and raise care standards across Europe.

Survey and Networking

This study represents the largest European study to date examining physiotherapy provision and practice in ICUs, offering valuable new insights into Eastern and Southern European countries that have been historically underrepresented. While a few national surveys have been conducted over the past decade [14,25,27], this study presents first-time data from several countries. This comprehensive survey presents a contemporary picture of ICU physiotherapy in Europe post the COVID-19 pandemic, including the provision, access, and use of specialised assessment, respiratory, and rehabilitation techniques. By identifying several disparities and heterogeneity, it enables a physiotherapy research network across Europe, with further research and knowledge transfer possibilities.

Limitations

There was a potential risk of duplicate responses from the same ICU, which could affect data accuracy. However, doubled entries were identified and excluded, and we consider the risk of duplication minor and unlikely to affect the main results. Although the survey included detailed questions on specialised techniques, all surveys were completed as the platform required compulsory questions to be answered. There may be a potential selection bias, as the survey respondents may be those better connected to ICU networks, hence more specialised or educated. The use of the snowball sampling method to expand recruitment to marginalised European regions could have contributed to selection bias and made the precise calculation of a response rate impossible [36]. Due to variation in survey dissemination methods and incomplete denominator data in several countries, precise response rates could not be calculated. Therefore, findings should be interpreted as reflecting participating ICUs rather than confirmed national representativeness, and cross-country comparisons should be considered with caution.

This survey is not representative of all European countries; despite translation into 11 languages, some countries contributed with very few or no responses. This may have resulted in the over- or underrepresentation of certain regions. In some cases, a lack of responses may reflect an absence of ICU physiotherapy provision, limited research engagement, low visibility of professional networks, survey dissemination constraints, or language barriers that hindered questionnaire completion. The issue of non-participation is complex and may depend on several structural and procedural factors and requires further research. Despite all efforts, most responses were received from larger Western European countries, where ICU physiotherapy is well-established.

Conclusions

This survey highlights substantial heterogeneity in reported physiotherapy provision among participating European ICUs, with marked variation in staffing models, clinical responsibilities, and the application of respiratory and mobilisation/rehabilitation techniques. While many physiotherapists are involved in both respiratory management and mobilisation/rehabilitation of mechanically ventilated patients, inconsistencies in access, training, and technique usage suggest variable implementation of best practices. These findings underline the need for a clear definition of the ICU physiotherapist's role, scope of practice, harmonised training standards, and enhanced collaboration. The establishment of a European physiotherapy research network through this project offers a promising platform for advancing evidence-based practice, supporting workforce development, and ultimately improving outcomes for critically ill patients.

Implications

Current physiotherapy provision and practice in ICUs across Europe remain varied and heterogeneous. The study's findings underscore the

need for targeted education and a clearer definition of the professional scope of ICU physiotherapists, guiding future training and workforce planning to strengthen interprofessional care across Europe, especially in underrepresented regions.

CRediT authorship contribution statement

Agnieszka Lewko: Writing – review & editing, Writing – original draft, Validation, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Sabrina Eggmann:** Writing – review & editing, Writing – original draft, Validation, Project administration, Methodology, Investigation, Conceptualization. **Ólöf Ragna Ámundadóttir:** Writing – review & editing, Investigation, Methodology. **Katrine Astrup:** Writing – review & editing, Investigation, Methodology. **Vitor Hugo Azevedo:** Writing – review & editing, Investigation, Methodology. **Denise Battaglini:** Writing – review & editing, Validation, Methodology. **Snježana Benko Meštrović:** Writing – review & editing, Validation, Investigation. **Joanne Dowds:** Writing – review & editing, Validation, Investigation, Methodology. **František Duška:** Writing – review & editing, Validation. **Frances Eriksson:** Writing – review & editing, Validation, Investigation, Methodology. **Johanna Hästbacka:** Writing – review & editing, Validation, Investigation, Methodology. **Beatriz Hernández-Méndez:** Writing – review & editing, Validation, Investigation, Methodology. **Cheryl Elizabeth Hickmann:** Writing – review & editing, Validation, Investigation, Methodology. **Alessia Ippolito:** Writing – review & editing, Validation, Methodology. **Joan-Daniel Martí Romeu:** Writing – review & editing, Validation, Investigation, Methodology. **Alexander Müller:** Writing – review & editing, Validation, Investigation, Methodology. **Irini Patsaki:** Writing – review & editing, Validation, Investigation, Methodology. **Laura Rutkauskienė:** Writing – review & editing, Validation, Investigation, Methodology. **Charlotte Marie Schanke:** Writing – review & editing, Validation, Investigation, Methodology. **Vjollca Shpata:** Writing – review & editing, Validation, Investigation, Methodology. **Danilo Terzo:** Writing – review & editing, Validation, Methodology. **Kateryna Tymruk-Skoropad:** Writing – review & editing, Validation, Investigation, Methodology. **Kerli Uba:** Writing – review & editing, Validation, Investigation, Methodology. **Marika van der Schaaf:** Writing – review & editing, Validation, Investigation, Methodology. **Tomasz Zwoliński:** Writing – review & editing, Validation, Investigation. **Peter Nydahl:** Writing – review & editing, Writing – original draft, Validation, Project administration, Methodology, Investigation, Conceptualization. **David McWilliams:** Writing – review & editing, Writing – original draft, Validation, Project administration, Methodology, Investigation, Conceptualization.

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Ethical approval, consent and anonymity

The research was granted ethical approval by Coventry University's Research Ethics Committee on 19 December 2022 (code P136453). A study information sheet was included at the beginning of the survey, with participants completing an online consent form prior to commencing the survey. Data were collected anonymously, and no personal characteristics were collected.

Declaration of generative AI-assisted technologies.

During the preparation of this work, the authors used Grammarly Professional to check language accuracy. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence

the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.iccn.2026.104390>.

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