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Title:

Developing minimum clinical standards for physiotherapy in South African ICUs: a qualitative study.

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Running title:

Minimum clinical standards for physiotherapy

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Summary:

Rationale, aims and objectives: Physiotherapists are integral members of the intensive care unit (ICU) team. Clinicians working in ICU are dependent on their own experience when making decisions regarding individual patient management, thus resulting in variation in clinical practice. No formalized clinical practice guidelines or standards exist for the educational profile or scope of practice requirements for ICU physiotherapy. This study explored perceptions of physiotherapists on minimum clinical standards that ICU physiotherapists should adhere to for delivering safe, effective physiotherapy services to critically-ill patients.

Method: Experienced physiotherapists offering a service to South African ICUs were purposively sampled. Three focus group sessions were held in different parts of the country to ensure national participation. Each was audio-recorded. The stimulus question posed was: 'What is the minimum standard of clinical practice needed by physiotherapists to ensure safe and independent practice in South African ICUs'? Three categories were explored, namely knowledge, skill and attributes. Themes and sub-themes were developed using the codes identified. An inductive approach to data analysis was used to perform conventional content analysis.

Results: Twenty-five physiotherapists participated in one of three focus group sessions. Mean years of ICU experience was 10.8 years (± 7.0 ; range 3-33). Three themes emerged from the data namely integrated medical knowledge, multidisciplinary teamwork and physiotherapy practice. Integrated medical knowledge related to anatomy and physiology, conditions that patients present with in ICU, the ICU environment, pathology and pathophysiology, and pharmacology. Multidisciplinary teamwork encompassed elements related to communication, continuous professional development, cultural sensitivity, documentation, ethics, professionalism, safety in ICU and technology. Components related to physiotherapy practice included clinical reasoning, handling skills, interventions and patient care.

Conclusions: The information obtained will be used to inform the development of a list of standards to be presented to the wider national physiotherapy and ICU communities for further consensus-building activities.

Text

Introduction

In recent years, the demand for costly critical care treatment has increased worldwide. Various stakeholders have explored ways to deliver cost-effective treatment, and improve patient outcomes. In preparing health professionals for a new century, Julio Frenk and colleagues recommended that health professionals in all countries should be educated to mobilise knowledge and to engage in critical reasoning and ethical conduct so that they are competent to participate in patient and population-centred health systems as members of locally responsive and globally connected teams (1). The intensive care unit (ICU) is a unique learning and team environment, offering clinical diversity and workplace experiences found infrequently elsewhere, while achieving measurable cognitive and procedural learning outcomes (2). Physiotherapists play a crucial and growing role in the multidisciplinary team approach to patient management and rehabilitation in ICU, and in terms of improving health-related quality of life and functional outcome in survivors of critical illness (3). The way in which physiotherapy is provided can affect patient outcome from ICU. It is therefore important to clarify competencies required to ensure a safe and effective clinical practice.

Physiotherapy in acute care settings differs from other fields of physiotherapy due to the particular focus on cardiorespiratory health, the short-term acute nature of patients' problems, and the higher likelihood of significant negative consequences (morbidity and mortality) of inadequate decision making and intervention (4). Clinical reasoning forms an important part of the decision-making process regarding critically ill patients. Clinical reasoning is a complex and constantly evolving process (5). It is an integral component of clinical practice, and is a term used interchangeably with an assortment of synonyms such as clinical decision-making, clinical problem-solving, clinical judgement and clinical rationale (6). The actions, behaviour, knowledge and thought processes that constitute the clinical reasoning process as observed in experienced clinicians has been under-researched in cardiorespiratory physiotherapy (7) and little is known about clinical reasoning in cardiorespiratory physiotherapy, or the best way to develop this highly cognitive skill (8).

What is known is that cardiorespiratory physiotherapy decision making is affected by factors related to the nature of the decision itself (such as the complexity and difficulty of the decision), factors related to the context in which the decision occurred (such as physical, organisational and socio-professional factors), and factors related to the physiotherapists themselves (such as decision making capabilities, physiotherapy frames of reference, and level of clinical experience) (9). Cardiorespiratory physiotherapy clinical decision making is known to have evolved on a continuum from novice to experienced practice along four

interrelated dimensions: 1) an individual practice model that was informed by a multidimensional knowledge base and personal attributes of the practitioner; 2) refined approaches to clinical decision making; 3) working in context; and 4) developing social and emotional capabilities (4). However how this applies explicitly to critical care physiotherapy practice has not been explored.

Differences exist between novice and cardiorespiratory experts in the organisation of the therapists' knowledge base and use of their cognitive strategies (6). Understanding the characteristics of expertise has the potential to meaningfully inform, shape, and facilitate the appropriate continuing professional development pathways of beginning health practitioners, and provide practicing physiotherapists with a basis for critical appraisal of their decision making (10), thereby facilitating efficient and effective practice, and potentially enabling clinicians to hasten the process of reaching such a status of expertise to ensure safe and independent practice.

There are no specialist ICU physiotherapy posts available in South African (SA) public or private sector hospitals. This situation is most concerning as many physiotherapy posts in ICUs are staffed by junior therapists. Most countries include basic preparation of entry level physiotherapists to provide care to the vulnerable critically ill population on entry to the profession. However, the training of undergraduate students in critical care is not standardised, and no pre-defined ICU physiotherapy competencies exist. While many hospitals provide in-service training to orientate all staff in providing an on-call and weekend physiotherapy service, the content of these training sessions is not standardised. Clinicians working in ICU are often dependent on their own experience when making decisions regarding individual patient management, thus resulting in variation in clinical practice, reported nationally (11) and internationally (12,13) in terms of the physiotherapy techniques used and the service provided, highlighting the potential detrimental impact on patient outcome.

Evidence-based recommendations for effective and safe diagnostic assessment and intervention strategies for the physiotherapy treatment of patients in ICUs exist (14-18), and recently minimum standards of clinical practice needed by physiotherapists to ensure safe and independent practice in critical care have been explored (12,19, 20). A recent pragmatic trial demonstrated that a comprehensive physiotherapy service which incorporates the best available evidence to address pulmonary dysfunction and promote early mobility resulted in decreased number of reintubations and burden on nursing care when compared to usual physiotherapy care (21).

Increasingly there is a focus on the need for competencies in safeguarding and enhancing patient safety that have been integrated throughout frameworks such as The Safety Competencies (22) and CanMEDS 2015 (23). The Safety Competencies describes a framework summarised into six key domains of patient safety competencies for all members of the multidisciplinary team that work in critical care (22). The CanMEDS 2015 Framework is now incorporated into residency training accreditation, evaluation and examinations as well as the standards for specialty training and continuing professional development across professions and jurisdictions. These frameworks and associated education and practice standards work symbiotically to prepare clinicians with a view to optimise patient care and outcomes. Work is currently underway to reach consensus on a competency framework for physiotherapists working in the Australasian region (12).

Initial work on the establishment of minimum standards for clinical physiotherapy practice in SA ICUs was recently published (19). This study aimed to explore the perceptions of experienced physiotherapists as to the minimum clinical standards for physiotherapy in SA ICUs. Our specific objectives were to better understand the 1) knowledge base to be mobilised, 2) skills and competencies to possess, and 3) attributes to be engaged by physiotherapists working in ICU to ensure safe and effective service delivery to critically ill patients.

Methods:

A purposive sampling method was used to identify participants for the focus group sessions. The target population was experienced physiotherapists (clinicians and academics) who offer a service to SA ICUs. Participants were deemed eligible if they had been qualified for five years or longer and met at least one of the following criteria: 1) had three years working experience in ICU, 2) two years' experience working in a senior role in ICU or 3) had published a minimum of five papers in critical care. Description of the method followed to identify and recruit suitable participants, as well as a description on the study procedures followed has been previously reported (19). Three focus group sessions were held and each was audio-recorded. Each focus group consisted of academics and clinicians. Information on each participant was collected through completion of a demographic information form prior to commencement of the focus group discussion. Thereafter, the following stimulus question was posed to participants in each focus group: 'What is the minimum standard of clinical practice (basic knowledge, skills and attributes) needed by physiotherapists to ensure safe and independent practice in SA ICUs'? For this study, the term 'independent practice' was defined as autonomous physiotherapy practice considering the first line practitioner status

that qualified physiotherapists in SA are registered with through the Health Professions Council of SA after completion of compulsory community service. One of authors (SP) facilitated each focus group session. The facilitator had no prior relationship with any of the participants as he was a visiting physiotherapy researcher from Australia. A nominal group technique was used to summarise the information obtained from all the focus group sessions and initial results were previously reported (19). The authors decided to have all audio-recordings of the three focus group sessions independently transcribed by an external company (Perfect Transcribers, Parktown, Johannesburg, 2193, SA) to summarise additional information obtained during the discussions. Transcripts received were checked for accuracy by three of the researchers (HvA, NP, SH) through listening to the recordings while reading the transcribed notes. Any mistakes in transcription were corrected. An inductive approach to data analysis was used to perform conventional content analysis (24). A predetermined framework consisting of the categories basic knowledge, skills and attributes was imposed on the data. Coding of the raw data was performed by two of the researchers (HvA, NP) who created one set of codes each for each category (basic knowledge, skills, attributes) from the raw data of the three focus group sessions. Two of the researchers (SH, SP) reviewed the identified codes by reading the transcriptions and coding analysis. Themes were developed for each category (basic knowledge, skills and attributes) using the codes identified. Explanatory quotes from the raw data are provided to enhance understanding of participants' viewpoints.

Results:

Baseline characteristics of participants

Twenty five physiotherapists (21 females and four males) consented to participate in one of the three focus group sessions. Mean age of the group was 37.35 years (± 8.1 ; range 27-55) and mean years of ICU experience was 10.81 years (± 7.01 ; range 3-33). Detailed participant demographic information has been reported elsewhere (19). The duration of the focused group sessions was on average 5 hours. Two of the authors (SH, SP) were present at all three focus group sessions and reported saturation of data by the end of the third session.

Although a framework of categories related to basic knowledge, skills and attributes was predetermined for data presentation, the richness of information obtained inspired the development of three overarching themes namely integrated medical knowledge (Figure 1), multidisciplinary teamwork (Figure 2) and physiotherapy practice (Figure 3) to represent minimum standards for physiotherapy clinical practice in SA ICUs.

Integrated Medical Knowledge

- Anatomy and physiology

Knowledge of the human body in relation to anatomy and physiology was frequently mentioned. Knowledge of respiratory physiology was particularly emphasized, “...*sufficient understanding about oxygenation, oxygenation dissociation curves, how that impacts [patient presentation], what is shunting...*” [focus group 3].

- Conditions that patients present with in ICU

Basic knowledge of the various conditions that patients may present with in ICU was mentioned for safe and independent practice by physiotherapists. Knowledge of conditions such as types of trauma; cardiovascular or pulmonary diseases; and postoperative patient presentation was highlighted. The impact of patient management on physiotherapy intervention was noted, “*Understanding of medical and surgical management and how it integrates with physiotherapy*” [focus group 1].

- ICU environment

Participants felt that physiotherapists need basic knowledge regarding the critical care environment to work safely in ICU. This included knowledge about airway management; mechanical ventilation; infection control protocols; and equipment specific to an ICU setting. The uniqueness of the ICU setting was noted, “...*because that's what makes ICU different..., is the equipment*” [focus group 2]. Participants felt that basic skills related to working within the ICU environment are important to have to ensure safe and independent practice by physiotherapists managing complex patients in this dynamic setting. These skills included an understanding of patient monitoring equipment; handling attachments to patients; airway management; and, mechanical ventilation. Skill in using a mechanical ventilator for physiotherapy purposes was noted, “*Know how to work your way around the ventilator so that you can do ventilator training, or hyperinflation...*” [focus group 1].

- Pathology and pathophysiology

Basic knowledge of pathology and pathophysiology was deemed important as minimum standards for clinical practice for physiotherapists working in ICU. This was related to the variety of conditions that patients present with in an ICU environment, “*various medical/surgical conditions. Heart, pneumonia, by-pass grafts...*” [focus group 1] and how pathology impacts on the outcomes of patients with critical illness, “*...and I think also the knowledge about what happens if your patient is a long ventilation patient, what it actually does...*” [focus group 1].

- Pharmacology

Knowledge about the medications used in ICU was deemed important. This included the use of different medications in ICU, “*what medications can be used for nebulisation and why*” [focus group 1]; administration of oxygen therapy, “*...[what is] a venturi mask, non-rebreathing mask...*” [focus group 1]; types of cardiovascular system medications used in patient care; and precautions related to pharmacological therapy.

Multidisciplinary Teamwork

- Communication

Basic knowledge of and skill in communication were emphasized by participants. This included patient communication; communication with multidisciplinary team members; and non-verbal communication. Verbal and non-verbal communication was noted, “*Speaking, approaching a critical[ly ill] patient, so verbal, eye contact, [unclear] cooperation, feedback to patient*” [focus group 2]. Basic attributes related to communication that were highlighted by participants and included being a good communicator; having counselling skills; being approachable; being assertive; having empathy and offering sympathy; having listening skills; and, being a motivator.

- Continuous professional development (CPD)

Participants felt that basic knowledge of the importance of CPD and skills in maintaining CPD in the field of physiotherapy in critical care are important as a minimum standard of clinical practice for physiotherapists in ICU. Continuous professional development included self-study and critical appraisal, “*...update yourself and keep up with the latest evidence...*”

[focus group 2]. The importance of reading literature relating to physiotherapy in ICU was noted, *“So knowledge of current...practice, and we need knowledge of current... research in the field of ICU physiotherapy”* [focus group 3] and, *“Maybe it’s just reading. They need to know that they must keep abreast”* [focus group 2]. Participants also highlighted maintaining CPD as a basic attribute that physiotherapists need to have to work safely and independently in ICU. These attributes included life-long learning; self-reflection; and, evidence-based practice. Self-reflection was described as, *“...ability to assess own scope of practice and knowledge and skills...”* [focus group 1].

- Cultural sensitivity

Participants felt that basic knowledge of diverse cultures in the SA setting is important as a minimum standard for physiotherapy practice in ICU. This includes cultural beliefs, *“...cultural beliefs of the patient as well as the team...”* [focus group 1] and cultural sensitivity, *“I think the knowledge will influence your behaviour because if you were ignorant of it you wouldn’t know to change your behaviour”* [focus group 3]. Basic skills related to cultural sensitivity were mentioned. This was based on an ability to communicate verbally and non-verbally with people of diverse cultural backgrounds. Participants felt that cultural sensitivity, as a basic attribute, was important. In this context, cultural sensitivity was summarised as the ability to be adaptive, *“...respect of others’ cultures and beliefs”* [focus group 1].

- Documentation

Knowledge about the importance of accurate record keeping in ICU was highlighted. Its medico-legal implications were noted, *“Knowing that you have to do it to work, doing it effectively and legal”* [focus group 1]. Skill in documentation was also mentioned. One participant described this as, *“...being concise in one’s documentation”*, and *“When you’re reporting to a doctor you don’t want [it] to be...long-winded...it must be concise and to the point”* [focus group 2].

- Ethics

Participants felt that basic knowledge on ethics is important as a minimum standard for physiotherapy practice in ICU. Aspects related to ethics such as scope of practice; obtaining

consent for treatment; and, ethics in healthcare were highlighted. Basic attributes related to ethics were also raised and included displaying ethical behaviour; being hard working; and, knowing one's limitations.

- Professionalism

Participants highlighted the importance of basic skills in professional behaviour as a minimum standard for safe and independent practice in ICU. Professional behaviour included managing workload; ability to work under pressure in a focused manner; managing stress; coping skills (high patient mortality rate); dedication to work; and, working within one's scope of practice. Basic attributes that participants felt were important for a physiotherapist to have to work safely and independently in ICU related to the multidisciplinary team and included being respectful; and, professional decorum, *"Ability to speak your mind in a way that doesn't offend other team members"* [focus group 2]. Being able to accept suggestions made by others was noted, *"Willingness to adapt your treatment to the needs of other team members..."* [focus group 2]. Other attributes related to professionalism that were highlighted included leadership; decisiveness; problem-solving; resourcefulness; patience; perseverance and integrity. Emotional intelligence was noted, *"...an emotional intelligence appropriate to the ICU context..."* [focus group 3].

- Safety in ICU

Participants felt that knowledge about safety aspects in ICU (for example infection control; patient care; recognizing emergencies and dealing with emergencies; and precautions related to care of specific patient populations in ICU) was important to work safely and independently in this environment. The importance of safety for everyone in ICU was noted, *"Be aware of safety precautions and measures, [related to] patient, therapist and other staff..."* [focus group 1]. Participants felt that basic skills in safety in ICU are also important. These included handling emergency situations; performing basic life support; risk assessment; providing a safe environment for patients; and, precautions to physiotherapy. Safety in relation to the critical care environment was noted, *"...safety specifically in the ICU context...there's a lot more safety features you need to be aware of"* [focus group 3], and *"To be able to identify which technique is not appropriate for a given patient at a particular time"* [focus group 1].

- Team members

Participants felt that basic knowledge about the multidisciplinary team members that work in ICU was important. This included the roles of different team members in patient care; patient referral systems; and the importance of being able to work in a team. Participants felt that physiotherapists should have basic skills in collaboration with others and working together in a team.

- Technology

Computer literacy was mentioned as a necessary component of knowledge to work safely and independently in ICU.

Physiotherapy Practice

- Clinical reasoning

Knowledge about clinical reasoning was highlighted and included interpretation of assessment findings; patient care; progression of patient care and problem-solving. Interpretation of information in ICU was described as, *“Interpret large volumes of data, e.g. blood gases, CTs, x-rays, clinical aspect...”* [focus group 1] and *“I get all the information, all my knowledge together, what I’ve seen, and I sum up and I get to a conclusion”* [focus group 2] and *“It’s not just knowledge in isolation of the systems. It is that interaction between the systems and the depth...”* [focus group 3]. Participants felt that physiotherapists who work in ICU should also have basic skills in performing clinical reasoning which included interpretation of information; evidence-based practice; needs-based intervention; and, progression of intervention. Achieving progression in patient care was noted, *“Ability to push patient safely and yet effectively to achieve goals”* [focus group 1].

- Handling skills

Aspects of knowledge regarding handling skills included attachments to patients; using ICU equipment; handling the patient in relation to positioning in bed and transfers out of bed, *“So hoist, seat transfers, sheet transfers...”* [focus group 1].

- Interventions

Participants felt that basic knowledge of patient assessment was important in order to work safely and independently in ICU. Patient assessment included assessment of equipment; system-based assessment such as cardiovascular, haematological, musculoskeletal, neurological, respiratory and renal; radiological assessment; and assessment of exercise capacity. An ability to identify abnormal findings was noted, “...*knowledge of what is normal and what is abnormal*” [focus group 1]. Basic skills in performing diverse holistic assessment of potentially complex patients in ICU were emphasized. Patient assessment skills included interpretation of ICU documentation and radiology test results; performing system-based assessment; and using outcome measures.

Knowledge about various physiotherapy interventions used in patient care in ICU was highlighted. This included indications for physiotherapy; respiratory physiotherapy techniques such as manual chest clearance techniques; rehabilitation interventions such as exercise therapy and mobilisation; assistive devices such as electronic hoists and tilt tables; and guidelines for patient management. Participants felt that if a physiotherapist were to work safely and independently in ICU, they should have basic skills in using physiotherapy equipment; patient handling; providing pulmonary/ventilation support and intervention; and providing neuromusculoskeletal management and rehabilitation. The importance of functional rehabilitation was noted, “*Highest functional level...*” [focus group 3] and “*So it could be rolling, it could be bridging, it could be to sit to stand,...*” [focus group 1].

- Patient care

Aspects of knowledge related to patient care that was mentioned included guidelines and protocols, “*You need to know the protocols before you do the progression*” [focus group 1]; patient-centred care; impact of interventions on patients; and ending off a treatment session, “*...it’s no use just being able to treat, you must know how to settle a patient, how to conclude your treatment*” [focus group 2]. Basic attributes related to patient care were highlighted and included availability; dedication; having a passion for ICU; flexibility; and, having a holistic approach to patient care. These were described as, “*...being prepared to do the job, and sometimes without reward*” [focus group 2], and “*Always putting [the] patient first*” [focus group 1].

Discussion:

This paper reports on the perceptions of experienced physiotherapists regarding the minimum standards of clinical practice for physiotherapy to ensure safe and independent practice in SA ICUs. An earlier publication by the authors describes the nominal group technique (NGT) process used to identify minimum standards of clinical practice by ranking of items (19). Overall consensus was reached on six concepts, namely knowledge of normal integrated anatomy and physiology; knowledge of and skill to conduct a holistic assessment of an ICU patient; knowledge and skill of clinical reasoning and knowledge of physiotherapy techniques. None of the attributes explored during the NGT process reached overall consensus (19). The current paper explores the context of the ideas generated in discussions between these experienced physiotherapists who participated in the NGT process as they attempted to reach consensus on the minimum standards of clinical practice for ICU physiotherapists.

The ICU setting is a complex environment and as a result health care professionals who work in ICU are focusing on describing minimum standards of clinical practice for this setting to facilitate optimal care of patients during their ICU stay to enable improved patient outcomes. Minimum standards of clinical practice for physiotherapists working in ICU in Australia and New Zealand were recently published (12), with these authors using a Delphi technique to develop a 132-item consensus framework for minimum standards of practice for physiotherapists in ICU. No other published minimum standards of clinical practice for physiotherapy in ICU could be found.

In this study, integrated medical knowledge arose as one of the requirements for minimum standards of clinical practice for physiotherapy in SA ICUs. The Australasian consensus framework for minimum standards of practice for physiotherapy in ICU emphasized the importance of knowledge of pharmacology, in particular precautions/implications of certain medication usage to physiotherapy; knowledge of the ICU environment specifically the type of equipment used in ICU, handling of attachments to patients and modes of mechanical ventilation; knowledge of pathophysiology and conditions that patients present with in ICU such as types of traumatic injury, postoperative conditions, and cardiac or pulmonary diseases. Knowledge of the impact of medical or surgical management of patients on physiotherapy was also described (12). In agreement with findings from this study, Holdar et al. (5) described that a basic knowledge of anatomy and physiology was useful to facilitate clinical decision making by physiotherapists who work in acute care settings. The aspects raised by participants in this study under the theme of integrated medical knowledge is therefore evidence-based and supports the notion for inclusion in a consensus framework for minimum standards of clinical practice for physiotherapists working in SA critical care settings.

Multidisciplinary teamwork was established as another requirement for minimum standards of clinical practice for physiotherapy in SA ICUs. The Australasian consensus framework for minimum standards of practice for physiotherapy in ICU included knowledge of CPD, especially evidence-based physiotherapy practice in ICU; skills related to safety aspects in ICU, in particular the identification of precautions or contraindications to physiotherapy; and, skills in inter-professional communication (12). This supports some of the aspects raised by participants in this study. However, the Australasian framework did not report on knowledge or skills related to cultural sensitivity, ethics or use of technology in ICU which were raised by participants in this study. In an era where computer technology is steadily infiltrating the health care environment, especially in critical care settings, skill in computer literacy is becoming more relevant for all members of the ICU team (25). Most participants in the current study were from the private healthcare sector which may explain why they deemed knowledge regarding documentation in light of medico-legal issues to be important as a minimum standard for clinical practice in SA ICUs. It is possible that physiotherapists who work in the private healthcare sector in SA are more aware of the risk of litigation compared to those who work in the public healthcare sector. Smith et al. (10) expressed similar sentiments regarding lack of awareness of risk of litigation among physiotherapists who work in public healthcare settings in Australia. Skill in communicating and collaborating with members of the multidisciplinary team who care for patients with cardiorespiratory problems and with patients themselves is important to ensure appropriate clinical decision-making regarding patient care is made by the physiotherapist (5, 10). This supports the findings from this study. The Canadian Patient Safety Institute released The Safety Competencies document in 2008 to enhance patient safety across health care professions (22). This document highlights that all members of the multidisciplinary team should work together as a team, communicate effectively, contribute to a culture of patient safety and optimise human and environmental factors within the health care facility to ensure patient safety (22). This supports the elements related to safety in ICU that were raised by participants in this study.

The last theme that emerged from this study was physiotherapy practice. Skinner et al. (12) described clinical reasoning; skills associated with the ICU environment such as assessing and interpreting patient monitoring equipment and mechanical ventilation modes and settings; patient assessment skills related to performing system-based assessment, interpretation of laboratory results and radiological test results, and use of outcome measures; and, skills in application of physiotherapy management strategies in ICU such as using a variety of physiotherapy equipment to provide respiratory care and providing functional rehabilitation to patients. Therefore, the perceptions of participants in this study about physiotherapy practice in ICU is evidence-based and should be included in a

framework for the development of minimum standards of practice in ICU. Jones (1994) [cited by Case et al. (6)] stated: 'The success of one's clinical reasoning can be attributed to a combination of thinking, interpersonal and clinical skills combined with an organised and accessible knowledge base.' Inexperienced physiotherapists are known to use a propositional knowledge base as they conduct clinical reasoning (6). It is therefore important that inexperienced physiotherapists are exposed to clinical case scenarios that test their clinical reasoning skills at undergraduate level and that they are supported by senior or more experienced physiotherapists as they enter into the clinical environment so that they gain the relevant clinical experience required and have adequate opportunities for reflective thinking in order to develop their clinical reasoning skills (6). This certainly applies to the complex and acute critical care environment and supports the fact that skill in clinical reasoning and in CPD was deemed important by participants in this study as a minimum standard for physiotherapy clinical practice in ICU.

Attributes related to minimum standards for clinical physiotherapy practice in ICU were explored in this study. Skinner et al. (12) did not consider attributes of physiotherapists in the Australasian minimum standards of clinical practice consensus framework. An attribute is a characteristic or inherent part of a person. Formative and transformational qualities are essential for healthcare practitioners to ensure population healthcare needs are appropriately addressed (1). Such qualities are integrated into the roles of being a communicator, collaborator, professional, health advocate and scholar (1). These qualities were expressed in the sub-themes of communication, CPD, professionalism and team members in this study. One could argue that these attributes are not necessarily specific to the ICU environment but apply to the broader scope of physiotherapy practice as well. This may explain why Skinner et al. (12) did not include attributes in their minimum standards consensus framework. Attributes related to professionalism that were highlighted in this study included leadership and decisiveness. Smith et al. (4) describe the effect of experience on clinical decision making by physiotherapists working in acute care settings. They describe the transition of novice to expert physiotherapist as: 'The motivation to provide optimal care, the use of reflection to evaluate experiences with patients, the critical assessment of new knowledge, and progressive increases in self-confidence.' These were key factors to ensure progression to the level of expert physiotherapist (4). One may then argue that attributes such as leadership and decisiveness may not be appropriate as key attributes for minimum standards of clinical physiotherapy practice in an ICU setting.

A possible limitation to this study is the unexpected long duration of some of the focus group sessions which might have led to response fatigue and possible loss of participants' focus from the primary question posed to the group at the beginning of the session. The influence

of these factors on the data collected was minimised by ensuring that the facilitator for each focus group remained the same. The lack of physiotherapy representation from public sector hospitals may have skewed some of the information obtained. Our participants were experienced in the field of critical care and by the third focus group session saturation of information was obtained. We are therefore confident that the perceptions expressed by participants are a true reflection of the requirements for the profession in this space.

Conclusion:

The qualitative information reported in this paper provides richness to the discussion about minimum standards of clinical practice for physiotherapists in SA ICUs. It explores concepts that must be included in a list which can be presented to a Delphi panel (with equal representation of physiotherapists from public and private health care sectors) to reach final consensus on minimum standards of clinical practice for physiotherapists in ICU.

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References:

1. Frenk J, Chen L, Bhutta ZA, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *Lancet*. 2010;376(9756):1923-1958. doi:10.1016/S0140-6736(10)61854-5.
2. O'Connor E, Martin-Loeches I. A blueprint for improving undergraduate education in intensive care medicine. *Crit Care (London, England)*. 2016;20(1):212-212. doi:10.1186/s13054-016-1383-5.
3. Kho M, Connolly B, Parry S, Zanni J. Physiotherapy in the ICU: current evidence and practical applications. *Physiotherapy*. 2015;101:e15-e16. <http://dx.doi.org/10.1016/j.physio.2015.03.022>.
4. Smith M, Joy H, Ellis E. Effect of experience on clinical decision making by cardiorespiratory physiotherapists in acute care settings. *Physiother Theory Pract*. 2010;26(2):89-99. doi:10.3109/09593980802698032.
5. Holdar U, Wallin L, Heiwe S. Why Do We Do As We Do? Factors influencing clinical reasoning and decision-making among physiotherapists in an acute setting. *Physiother Res Int*. 2013;18(4):220-229. doi:10.1002/pri.1551.
6. Case K, Harrison K, Roskell C. Differences in the clinical reasoning process of expert and novice cardiorespiratory physiotherapists. *Physiotherapy*. 2000;86(1):14-21. [http://dx.doi.org/10.1016/S0031-9406\(05\)61321-1](http://dx.doi.org/10.1016/S0031-9406(05)61321-1).
7. Thackray D. A new conceptual model of clinical reasoning in cardiorespiratory physical therapy. *Physiotherapy*. 2015a;101(Supplement 1):e1505. <http://dx.doi.org/10.1016/j.physio.2015.03.1486>.
8. Thackray D. Simulation: a new teaching strategy for facilitating the development of clinical reasoning in cardiorespiratory undergraduate physical therapists. *Physiotherapy*. 2015b;101(Supplement 1):e1504. <http://dx.doi.org/10.1016/j.physio.2015.03.1485>.
9. Smith M, Higgs J, Ellis E. Physiotherapy decision making in acute cardiorespiratory care is influenced by factors related to the physiotherapist and the nature and context of the decision: a qualitative study. *Aust J Physiother*. 2007;53(4):261-267. [http://dx.doi.org/10.1016/S0004-9514\(07\)70007-7](http://dx.doi.org/10.1016/S0004-9514(07)70007-7).

10. Smith M, Higgs J, Ellis E. Characteristics and processes of physiotherapy clinical decision making: a study of acute care cardiorespiratory physiotherapy. *Physiother Res Int*. 2008;13(4):209-222. doi:10.1002/pri.419.
11. Lottering M, Van Aswegen H. Physiotherapy practice in South African intensive care units. *S Afr J Crit Care*. 2016;32(1):11-16. doi:10.7196/SAJCC.2016.v32i1.248.
12. Skinner EH, Thomas P, Reeve JC, Patman S. Minimum standards of clinical practice for physiotherapists working in critical care settings in Australia and New Zealand: a modified Delphi technique. *Physiother Theory Pract*. 2016;32(6):468-482. doi:10.3109/09593985.2016.1145311.
13. Norrenberg M, Vincent JL. A profile of European intensive care physiotherapists. *Intensive Care Med*. 2000;26(7):850-856. doi:10.1007/s001340051292.
14. Adler J, Malone D. Early mobilization in the intensive care unit: a systematic review. *Cardiopulm Phys Ther J*. 2012;23(1):5-13. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3286494>.
15. Kayambu G, Boots R, Paratz J. Physical therapy for the critically ill in the ICU: a systematic review and meta-analysis *Crit Care Med*. 2013;41(6):1543-1554. doi:10.1097/CCM.0b013e31827ca637.
16. Sommers J, Engelbert RHH, Dettling-Ihnenfeldt D, et al. Physiotherapy in the intensive care unit: an evidence-based, expert driven, practical statement and rehabilitation recommendations. *Clin Rehabil*. 2015;29(11):1051-1063. doi:10.1177/0269215514567156.
17. Stiller K. Physiotherapy in intensive care: an updated systematic review. *Chest*. 2013;144(3):825-847. doi:10.1378/chest.12-2930.
18. Tipping C J, Harrold M, Holland A, Romero L, Nisbet T, Hodgson C L. The effects of active mobilisation and rehabilitation in ICU on mortality and function: a systematic review. *Intensive Care Med*. 2016 (online first). http://icmjournal.esicm.org/journals/abstract.html?v=0&j=134&i=0&a=4612_10.1007_s00134-016-4612-0&doi Accessed February 13, 2017.
19. Hanekom S, Van Aswegen H, Plani N, Patman S. Developing minimum clinical standards for physiotherapy in South African intensive care units: the nominal group technique in action. *J Eval Clin Pract*. 2015;21(1):118-127. doi:10.1111/jep.12257.

20. 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):658-658. doi:10.1186/s13054-014-0658-y.
21. Hanekom SD, Louw Q, Coetzee A. The way in which a physiotherapy service is structured can improve patient outcome from a surgical intensive care: a controlled clinical trial. *Crit Care*. 2012;16(6): R230. doi:10.1186/cc11894.
22. Frank JR, Brien S, (Editors) on behalf of The Safety Competencies Steering Committee. *The Safety Competencies: enhancing patient safety across the health professions*. 2008. <http://www.patientsafetyinstitute.ca/en/toolsResources/safetyCompetencies/Documents/Safety%20Competencies.pdf> Accessed April 6, 2017.
23. Royal College of Physicians and Surgeons of Canada. *CanMEDS: Better standards, better physicians, better care*. 2015. <http://www.royalcollege.ca/rcsite/canmeds/canmeds-framework-e> Accessed February 13, 2017.
24. Thomas DR. A general inductive approach for analyzing qualitative evaluation data. *Am J Eval*. 2006;27(2):237-246. doi:10.1177/1098214005283748.
25. Bauman KA, Hyzy RC. ICU 2020: Five interventions to revolutionize quality of care in the ICU. *J Intensive Care Med*. 2014;29(1):13-21. doi: 10.1177/0885066611434399.

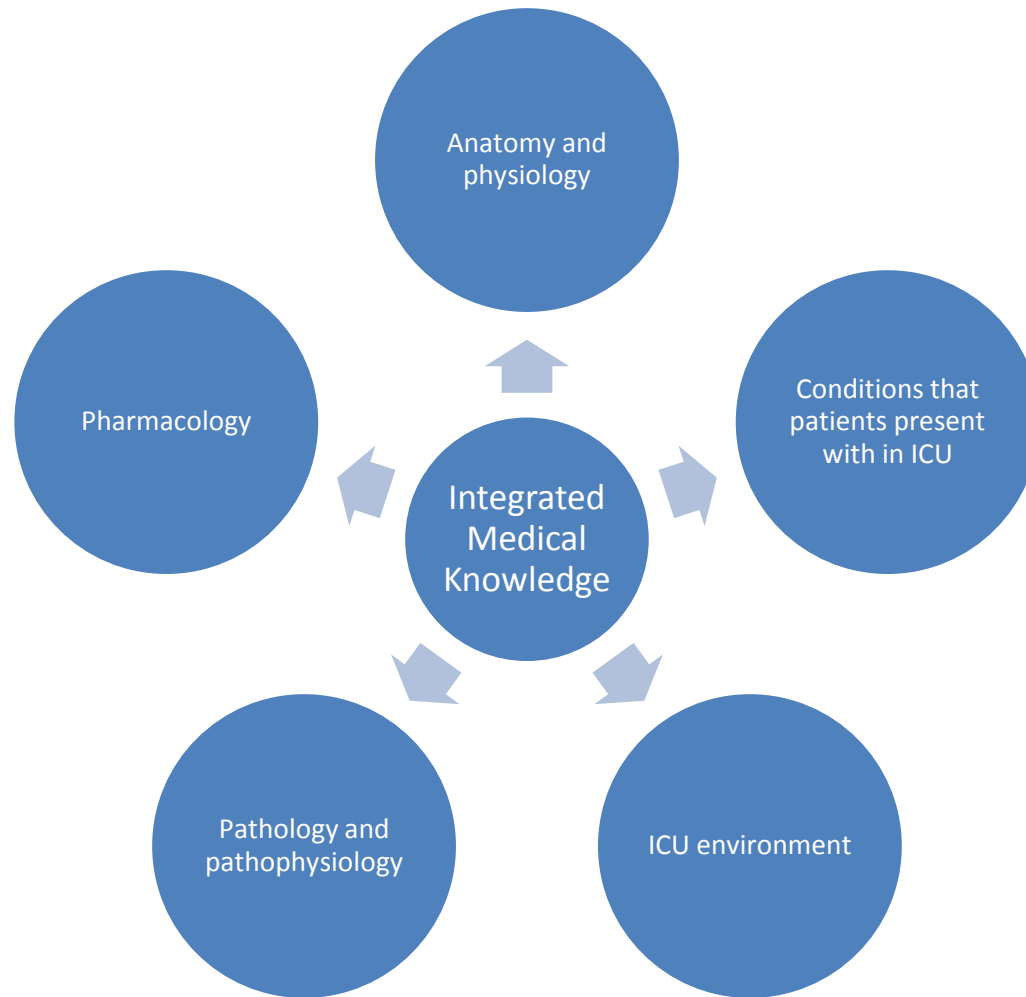


Fig 1



Fig 2

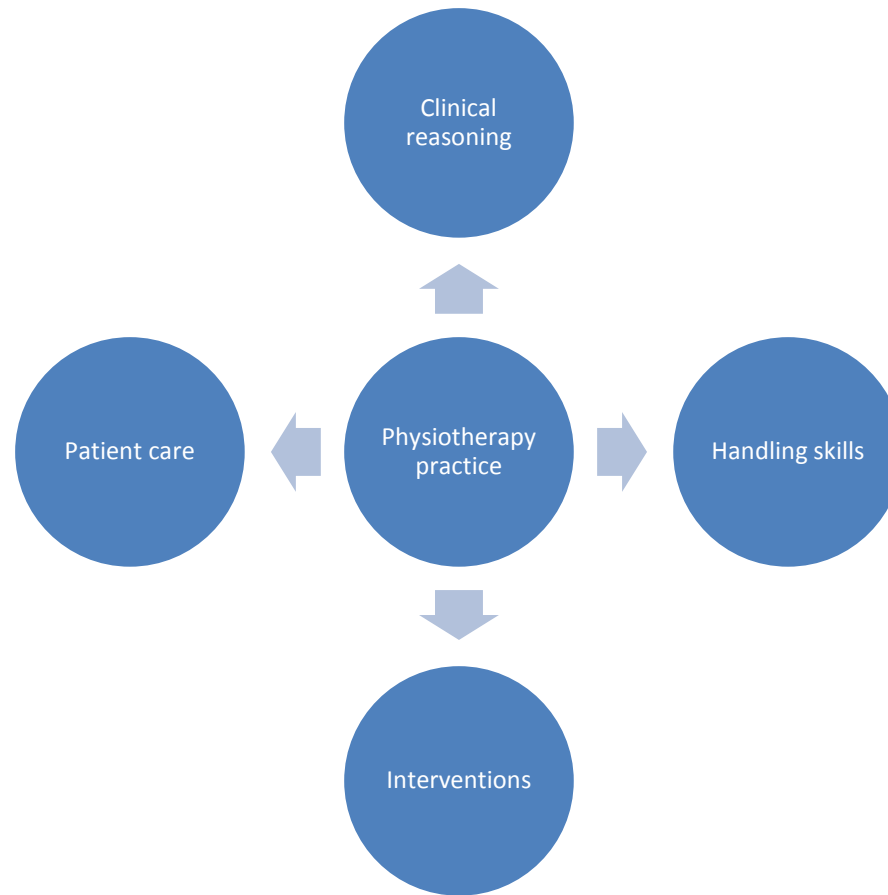


Fig 3

Figure legends

Figure 1: Components of integrated medical knowledge required for independent and safe physiotherapy practice in an intensive care unit setting.

Figure 2: Elements concerning multidisciplinary teamwork in ICU.

Figure 3: Components related to independent and safe physiotherapy practice in ICU.