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# Perspectives of healthcare professionals in Nigeria about physiotherapists' scope of practice and skills in ICU patients' management: a cross-sectional study

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## Abstract

**Background:** There is growing evidence for physiotherapy in the intensive care unit (ICU), but physiotherapy in the ICU and patients' referral rate remains low in Nigeria. This study assessed the healthcare professionals' perception of the physiotherapists' scope of practice and skills in managing patients in the ICU of selected teaching hospitals in Southern Nigeria. The study was a cross-sectional survey that involved seventy healthcare professionals working in the ICU who completed an adapted and validated questionnaire. The data obtained from the cross-sectional study were presented using descriptive statistics of mean, standard deviation, frequency distribution, and percentage.

**Results:** The mean age of the participants was  $39.74 \pm 7.08$  years. The majority of the participants had a bachelor's degree and had worked for a minimum of 5 years in the ICU, with all the participants working in a mixed ICU and 46.7% work in ICUs with four to six beds. Physiotherapists (PTs) are not posted exclusively to the ICUs, and PTs were reported to be on call in most of the ICUs during the weekdays and weekends. Patients were referred for physiotherapy by the physicians. Healthcare professionals had negative perceptions about PTs' scope in airway suctioning, nebulization, weaning, and adjustment of mechanical ventilators, intubation, extubation, and changing tracheostomy tubes for ICU patients. Participants had a positive perception about PTs' assessment skills in the ICU except for hypoxemia calculation, readiness for weaning, and the need for humidification.

**Conclusion:** Healthcare professionals working in the ICU in the selected hospitals had both negative and positive perceptions regarding certain areas about the scope of practice and skills of PTs in managing patients in the ICU.

**Keywords:** Physiotherapy practice scope, Intensive care unit, Physiotherapists' role, Healthcare professionals' perception

## Introduction

Adequate care of patients admitted in the ICU requires the contributions of ideas and skills from varied healthcare professionals that form an interdisciplinary team. Collaboration from inter-professional healthcare

providers promotes positive outcomes of care. This collaboration may include regular interaction between professionals, recognizing the unique contributions of different disciplines, and valuing professionals' expertise [1]. This collaboration is strengthened by the ability of each professional that forms the multi-team to know and understand the roles that each discipline plays in the patient care continuum and the common task and goals of the team for each patient [2]. The recognition of equality in expressing views and contributions towards a patient's care without fear of criticism by each

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professional is a crucial characteristic of an effective team [3]. In the ICU, contributions from physicians and other healthcare providers, including physiotherapists (PTs), are pivotal to patients' recovery.

Physiotherapy is part of the primary services provided in the ICU [4] and its scope of practice includes respiratory management and rehabilitation [5]. PTs carry out an individualized assessment of patients admitted to the ICU to identify the needs of each patient [5, 6]. The role of the PTs is pivotal in the prevention and management of respiratory, cardiovascular, musculoskeletal, and neuromuscular disorders in both intubated and spontaneously breathing patients in the ICU [5, 7–9].

Evidence has shown that physiotherapy for critically ill patients admitted to ICU is safe, feasible, and effective [10–13]. Physiotherapy was shown to prevent ventilator-associated pneumonia [14], improve pulmonary function [5, 12], improve respiratory muscle strength [15, 16], aid patient weaning off the mechanical ventilator [5, 15, 17], reduce ventilator length of stay [16], and the overall hospitalization costs [18].

Despite the growing evidence for physiotherapy in the ICU, patients' referral rate remains low, especially in developing countries like Nigeria [19]. Yeole et al. [20] observed that factors such as the attitude of the referring physicians and other team members towards physiotherapy in the management of patients in the ICU, the training and qualification of PTs, and the expertise and skills possessed by the PTs could affect the utilization of physiotherapy in ICU. This study investigated the perceptions of PTs' scope of practice and skills in the management of patients in ICU among referring physicians and other ICU team members in Southern Nigeria.

## Methods

### Study design

The study was a questionnaire-based cross-sectional survey.

### Study population

The study population comprised of healthcare professionals (physicians and nurses) who have worked in the ICU for the past 12 months and gave their consent to participate.

### Sampling technique and sample size

The purposive sampling technique was used to select the teaching hospitals, and convenient sampling was used to recruit participants to the study. The sample size for this study included all consenting healthcare professional (HCP) who met the criteria for inclusion.

### Procedure for data collection

Ethical approval was sought and obtained from the Health Research Ethics Committee of the University of Ibadan/University College Hospital Ibadan (UI/UCH) before the commencement of the study (NHREC/05/01/2008a). The purpose of the study was explained to the participants, and their informed consent was sought and obtained. Quantitative data was collected using an adapted questionnaire from the questionnaire developed by Van Aswegen and Potterton [21]. The instrument was modified to assess the perception of the scope of practice of PTs and skills in managing patients in the ICU by other HCPs in the ICU team. The standard protocol for questionnaire adaptation was observed before the questionnaire was modified. Copies of the questionnaire were distributed to and collected from the participants by hand in one of the hospitals and through contact persons in other hospitals.

### Questionnaire description

A 37-item questionnaire developed by Van Aswegen and Potterton [21] to assess the scope of physiotherapy practice in South African ICUs was identified as relevant to the present study. The questionnaire was modified and adapted for use in Nigeria setting.

### Process of adaptation

Permission was sought and obtained from the developer of the question before it was modified and adapted. Questions were modified and some excluded (question 1 on provinces was removed; question 3 on type of hospital was removed because all the hospitals included were the same; in question 6, mixed type of ICU was included as an option; questions 4, 8, 15, 19, and 21 also were excluded; questions 23 and 24 were modified accordingly) to suit the Nigerian context. The language was modified to suit contextual usage. An expert panel meeting comprising three experts was held at the physiotherapy department, college of medicine, and Ibadan to validate the items selected from the questionnaire. A draft version of the modified questionnaire was produced after the expert panel meeting. The draft version of the modified questionnaire was pre-tested among ICU physicians and nurses who are involved in the management of patients in the ICU in one of the teaching hospitals in South-Western Nigeria. This was done to ascertain the clarity and comprehension of the questions among the target population. After the pre-test, an expert panel meeting was held to consider the result of the pre-test. Result of the pre-test: Four anesthetists noted that Bachelor of Medicine, Bachelor of Surgery (MBBS) should be included as an option in question three, two anesthetists

also noted that fellowship should be included as an option in question three, and two nurses noted that Registered Nurse (RN) should be included as an option in question three. Six participants suggested that “Not Sure” should be included as an option in questions 9, 10, and 11. At the end of the expert panel meeting, a final version of the questionnaire comprising of three sections and 35 items was produced. Section one collected information on socio-demographic characteristics of participants, section two obtained information on the perceptions of HCP on PTs assessment skills, while section three obtained information on HCP perceptions on PTs treatment skills.

**Data analysis**

Data were analyzed using Statistical Package of Social Science (SPSS) version 20.0 and summarized using descriptive statistics of mean, standard deviation, frequency counts, and percentages.

**Results**

Seventy healthcare professionals completed the survey. The mean age of the participants was 39.74 ± 7.08 years. 64.3% of the participants have a bachelor’s degree. The HCPs involved in this study consisted of nurses (50%), anesthetists (45.7%), and neurologists (4.3%). More than half (67.1%) of participants had 5 years or less experience working in the ICU, while about 33.9% have more than 5 years of experience working in the ICU (Table 1). Mixed-type ICU existed in all the centers. The number of beds in the two hospitals is more than 10, while the other centers had four to 10 bedded ICUs. Most ICUs (46.9%) had at least 4 to 6 beds actively in use per month. None of the ICUs had PTs working exclusively in it. Regarding patient referrals, 97.1% of respondents noted that

patients’ referrals are done only to physicians. PTs are on call on both weekdays (68.8%) and weekends (86.5%), and most of the PTs stay within the hospital during call hours (Table 2).

More than half of the participants (62.9%) perceived PTs to be trained to review ICU charts as part of the patient assessment process. Greater percentage of the participants had a positive perception about PTs’ skills in assessing the arterial blood gas status of the patients (55.7%) and dynamic and static lung compliance (50 %). The majority of the participants had a negative perception about the PTs’ skills in assessing hypoxemia (57.1%),

**Table 2** ICU demographical characteristics

Variable	Category	Frequency	Percentage (%)
<b>TOP = 70</b>			
Type of ICU	Mixed	70	100
Number of ICU beds	<4	1	1.4
	4-6	40	57.1
	7-10	17	24.3
	>10	12	17.1
Active beds	4-6	50	71.4
	7-8	9	12.9
	9-12	8	11.4
	13-18	3	4.3
Number of ICU/ward PTs	1-2	4	5.7
	3-4	12	17.1
	>4	11	15.7
	All	9	12.9
	Not sure	34	48.6
Exclusive ICU PTs	Yes	5	7.1
	No	55	78.6
	Not sure	10	14.3
No. of exclusive ICU PTs	None	60	85.7
	3-4	3	4.3
	>4	2	2.9
	Not sure	5	7.1
Patient referral	Physicians	68	97.1
	Nurse	2	2.9
PT weekday calls	Yes	49	70
	No	21	30
PT weekend calls	Yes	62	88.6
	No	8	11.4
PTs available during call hours	None	8	11.4
	Yes	47	67.1
	No	15	21.4
Patient referral during calls	Medical officer	25	35.7
	Registrar	15	21.4
	Consultant	30	42.9

PT physiotherapist, ICU intensive care unit, No. number, TOP total number of participants

**Table 1** Demographical characteristics of the participants

Variable	Category	Frequency	Percentage (%)
Gender	Men	23	32.9
	Women	47	67.1
Education	RN	8	11.4
	Bachelor/MBBS	45	64.3
	MSc	9	12.7
	PGD	5	7.1
	Fellowship	3	4.3
Profession	Anesthetists	32	45.7
	Nurse	35	50
	Neurologist	3	4.3
Years of practice	1-5	47	67.14
	>5<=10	17	24.28
	>10	6	8.57

patient readiness for weaning (54.3%), and patients' need for nebulization (57.1%). Further details can be found in Table 3.

Greater percentage of the participants had a positive perception about PTs' scope of practice in the use of manual chest clearance technique to treat patients in the ICU (87.1%) and the use of postural drainage in patient management in the ICU 57.1%. Also, participants had a negative perception about PTs' scope of practice in airway suction 65.7%, manual hyperinflation 58.6%, intermittent positive pressure breathing 52.9%, and the blow of bottle 58.6%. Further details can be found in Table 4.

The participants were also asked questions about PTs' involvement in ICU team activities. ICU team rounds are held in most of the ICUs. Majority (90%) of the participants noted that PTs do not participate in the ICU team rounds in their ICUs. PTs do not participate in morbidity and mortality meetings held in the majority of the ICUs. PTs do not present seminars in most of the ICUs. As shown in Table 5.

**Discussion**

This study explored the perception of HCPs working in the ICU of the selected teaching hospitals in Southern Nigeria about PTs' scope of practice and skill in managing patients in the ICU. This study showed that there were more nurses than other HCPs who completed the survey. There are more nurses than other HCPs

**Table 3** Perception of HCPs about PTs' assessment skills

Skill	PP <sup>a</sup>	NP <sup>b</sup>
	N (%)	N (%)
TOP = 70		
ICU chart review	44(62.9)	26(37.1)
Arterial blood analysis	39(55.7)	31(44.3)
DSLCC	35(50.0)	35(50.0)
Hypoxemia calculation	30(42.9)	40(57.1)
X-ray/CT scan	51(72.1)	19(27.1)
Auscultation	50(71.4)	20(28.6)
Strength of cough	58(82.9)	12(17.1)
Thoracic expansion	56(80.0)	14(20.0)
Percussion note	47(67.1)	23(32.9)
Respiratory muscle training	55(78.6)	15(21.4)
Readiness for weaning	32(45.7)	38(54.3)
Readiness for mobilization	50(71.4)	20(28.6)
Peripheral muscle training	37(52.7)	33(47.3)
Need for humidification	30(42.9)	40(57.1)

TOP total number of participants, ICU intensive care unit, DSLCC dynamic and static lung compliance calculation

<sup>a</sup> Positive perception

<sup>b</sup> Negative perception

**Table 4** Perception of HCPs about PTs' treatment skills

Technique	PP <sup>a</sup>	NP <sup>b</sup>
	N (%)	N (%)
TOP = 70		
MCCT	61(87.1)	9(12.9)
Postural drainage	40(57.1)	30(42.9)
Airway suctioning	24(34.3)	46(65.7)
Manual hyperinflation	29(41.4)	41(58.6)
IPPB	33(47.1)	37(52.9)
Incentive spirometry	41(58.6)	29(41.4)
ACBT	44(62.9)	26(37.1)
IMT	42(60.0)	28(40.0)
Flutter device	36(51.4)	34(48.6)
Blowing of bottle	29(41.4)	41(58.6)
Blowing of glove	45(64.3)	25(35.7)
Deep breathing exercise	46(64.7)	24(35.3)
Nebulization	36(51.4)	34(48.6)
Mobilization in bed	48(68.6)	22(31.4)
Mobilization out of bed	53(75.7)	17(24.3)
Positioning in bed	53(75.7)	17(24.3)
Positioning out of bed	53(75.7)	17(24.3)
PMSE	65(92.9)	5(7.1)
AMV	15(21.4)	55(78.6)
AIWMV	5(7.1)	65(92.9)
ISNIVS	4(5.7)	66(93.3)
Intubation of patients	0(0.0)	70(100)
Extubation of patients	0(0.0)	70(100)
CTT	0(0.0)	70(100)

TOP total number of participants, MCCT manual chest clearance techniques, IPPB intermittent positive pressure breathing, ACBT active cycle of breathing, IMT inspiratory muscle training, PMSE peripheral muscle strengthening exercises, AMV adjustment of mechanical ventilator settings, AIWMV active involvement in weaning off mechanical ventilator, ISNIV implementation and supervision of non-invasive ventilatory support, CTT change of tracheostomy tube

<sup>a</sup> Positive perception

<sup>b</sup> Negative perception

because more nurses are needed for nursing in ICU, nurse to patient ratio is expected to be 1:1; therefore, more nurses are usually employed than other HCPs [22, 23]. Most of the participants in this study had bachelor's degrees and had 5 years or less experience working in the ICU. All the participants in this study work in a mixed-type of ICU, with the majority of the ICUs where the participants in this study work being 4–6 bedded and mainly occupied through the month. In Nigeria, only mixed ICUs are available because critical care is still evolving and has not yet attained specialized ICUs status.

PTs are not posted exclusively to work in the ICU as reported by most participants in this study which contradicts previous studies [5, 21, 24, 25]. This may be

**Table 5** PTs involvement in ICU team as reported by other HCPs

Variables		Frequency (N)	Percentage (%)
Are there ICU team rounds in your ICU?	Yes	46	65.7
	No	24	34.3
Are PTs part of ICU team rounds?	Yes	7	10
	No	63	90
How often are the ICU team rounds?	Daily	63	1.4
	Weekly	6	8.6
	Monthly	1	90
Are PTs part of morbidity and mortality meetings?	Yes	10	14.3
	No	60	85.7
Do PTs present seminars?	Yes	13	18.6
	No	57	81.4

PT physiotherapists

because critical care is still evolving, and specialization among PTs in Nigeria is also evolving. Also, this could be a result of the professional disharmony in Nigeria's healthcare system, which has made the multidisciplinary team approach in patient care almost impossible [26]. Posting of PTs to ICU is practiced in developed countries where specialization in critical care among PTs has been established, and teamwork and collaborative practice are the norm in patient management. We also found that patients' management by PTs in the ICU is solely dependent on physicians' referral which is in line with Lottering and Aswagan [27] and Sigera et al. [28]. It is important to note that physiotherapy interventions may be underutilized if the referring physician is not knowledgeable or has a negative perception of physiotherapists' skill and scope of practice in managing patients in ICU [29]. The cases reported by Lottering and Aswagan [27] and Sigera et al. [28] may not be exactly like the case in Nigeria in the sense that though physiotherapy work on referral in ICU in those places, physiotherapy was not underutilized like observed in Nigeria [19]. The difference in utilization level lies in knowledge and perception of role, the scope of practice, and the skill of PTs by referring physicians. Also, in the present study, we found that PTs work during call hours during the weekday and the weekends. This is impressive as PTs can always see the patients several times a day as recommended by various clinical trials of physiotherapy in ICU care [30–32]. From this study, the scope of PTs' practice was generally perceived to comprise both respiratory management and mobilization. This finding is consistent with that of previous studies in Europe, Greece, India, and South Africa [5, 21, 24, 25, 33]. However, as seen in other countries, mainly developed countries, specific roles of PTs were

perceived negatively by other HCPs in this study. These specific roles and skills were airway suctioning, manual hyperinflation, involvement in weaning, and implementation of non-invasive ventilation. This difference could be due to the poor interprofessional education in Nigeria. Participants in the present study saw the review of patients' charts in the ICU as part of the assessment skill that PTs possessed, which corroborated previous studies [5, 25].

The findings from this study show that PTs do not attend ICU team rounds. Also, they do not take part in teaching other HCPs in the ICU. This further points out the lack of teamwork for many reasons which were not explored in this study. Overall, the findings from this study contradict that of Lottering and Aswagan [27], where PTs were involved in ICU team rounds at least once a day. The difference in the present and previous studies could also be attributed to poor interprofessional education and teamwork among Nigeria's HCPs. This has been reported in other studies in Nigeria [34, 35], which may reflect the failing health system in Nigeria.

### Conclusion and recommendation

HCPs working in the ICU in the selected hospitals had a mixed perception about the PTs' scope of practice and skills in managing patients in the ICU. There was an overall negative perception about PTs' involvement with nebulization, intubation, extubation, and implementation of weaning and supervision of non-invasive ventilation, adjustment of ventilator setting for patients in the ICU. Factors predicting these perceptions need to be explored in another study to proffer a solution to the poor referral rate and underutilization of physiotherapy in Nigerian ICUs. This also calls for the need for interprofessional education among ICU team members and emphasis on



adopting a multidisciplinary approach in the patient care in the Nigeria ICU and the ICUs of other countries where similar challenges may exist.

#### Abbreviations

ICU: Intensive care unit; PTs: Physiotherapists; HCP: Healthcare professionals; MBBS: Bachelor of Medicine, Bachelor of Surgery.

#### Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s43161-021-00066-4>.

**Additional file 1.** Questionnaire to explore healthcare professionals' perception of physiotherapist scope of practice and skills in the management of patients admitted to the Intensive Care Unit.

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#### Authors' contributions

NO and MC were responsible for the conceptualization/design; MC and AS did acquisition and analysis; NO did interpretation of data; MC and NO were responsible for drafting and revision. The authors read and approved the manuscript.

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#### Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

#### Declarations

#### Consent for publication

Not applicable

#### Competing interests

The authors declare that they have no competing interest.

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