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A national survey of physiotherapists' assessment and management practices for patients with COVID-19 in acute and rehabilitation care in the United Arab Emirates

Ogólnokrajowe badanie praktyk oceny i zarządzania fizjoterapeutów w leczeniu pacjentów z COVID-19 w opiece ostrej i rehabilitacyjnej w Zjednoczonych Emiratach Arabskich

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Abstract

Background. Physiotherapists have a significant role in the treatment and care of individuals with COVID-19, who suffer from a range of symptoms and complications. Treatment for these patients requires a multidisciplinary approach. The study aims to explore the practice patterns of assessment and management adopted by physiotherapists for patients with COVID-19 in critical care and rehabilitation settings in the United Arab Emirates (UAE).

Methods. A survey questionnaire was shared with physiotherapists working in the UAE's private and public hospitals. The questionnaire consisted of 60 questions that were divided into 5 sections: assessment in ICU and wards, treatment in ICU and wards, and patient education.

Results. The physiotherapy evaluation of patients was primarily focused on specific impairment measures. Respiratory rate was the highest reported assessment tool in the ICU, with 68% of physiotherapists always using it. More than 78% of ward assessments use physical examination and respiratory rate. Treatment in the ICU was primarily done with chest percussion and suction therapy; over 85% reported using them always or frequently. A total of 89% of respondents used positioning and postural drainage as part of their treatment in wards, and 100% chose walking as their method of mobilization.

Conclusion. Both ICU and acute care physiotherapists used similar assessment techniques focused on impairments and dyspnea-quantifying measures, with less emphasis on functional exercise capacity. They, however, used similar approaches to treatment in the ICU and wards, with slight variations in airway clearance and equipment use.

Keywords

COVID-19, pulmonary rehabilitation, chest physiotherapy, physiotherapy in critical care, survey

Streszczenie

Tło. Fizjoterapeuci odgrywają znaczącą rolę w leczeniu i opiece nad osobami z COVID-19, które cierpią na różnorodne objawy i powikłania.

Leczenie tych pacjentów wymaga podejścia multidyscyplinarnego. Celem badania jest zbadanie wzorców praktyk oceny i zarządzania przyjętych przez fizjoterapeutów w leczeniu pacjentów z COVID-19 w oddziałach intensywnej terapii i rehabilitacji w Zjednoczonych Emiratach Arabskich (ZEA).

Metody. Ankieta została rozesłana do fizjoterapeutów pracujących w prywatnych i publicznych szpitalach w ZEA. Kwestionariusz składał się z 60 pytań podzielonych na 5 sekcji: ocena na oddziale intensywnej terapii i w oddziałach, leczenie na oddziale intensywnej terapii i w oddziałach oraz edukacja pacjentów.

Wyniki. Ocena fizjoterapeutyczna pacjentów koncentrowała się głównie na określonych miarach upośledzenia. Częstość oddechów była najczęściej zgłaszanym narzędziem oceny na oddziale intensywnej terapii – 68% fizjoterapeutów używało jej zawsze. Ponad 78% ocen na oddziałach obejmowało badanie fizykalne i częstość oddechów. Leczenie na oddziale intensywnej terapii było przede wszystkim realizowane za pomocą oklepywania klatki piersiowej i terapii ssącej; ponad 85% respondentów zgłaszało, że używa tych metod zawsze lub często. Łącznie 89% respondentów stosowało pozycjonowanie i drenaż ułożeniowy jako część leczenia na oddziałach, a 100% wybierało chodzenie jako metodę mobilizacji.

Wnioski. Zarówno fizjoterapeuci na oddziałach intensywnej terapii, jak i w opiece ostrej stosowali podobne techniki oceny, skupione na miarach upośledzenia i ocenie duszności, z mniejszym naciskiem na funkcjonalną pojemność wysiłkową. Wykorzystywali jednak podobne podejścia do leczenia na oddziale intensywnej terapii i w oddziałach, z niewielkimi różnicami w oczyszczaniu dróg oddechowych i użyciu sprzętu.

Słowa kluczowe

COVID-19, rehabilitacja pulmonologiczna, fizjoterapia klatki piersiowej, fizjoterapia w opiece krytycznej, ankieta

Introduction

The coronavirus disease of 2019 (COVID-19), caused by the new virus SARS-CoV-2, represents a significant and potentially major health concern not previously identified in humans [1]. The ramifications of COVID-19 necessitate the integration of physiotherapists within multidisciplinary teams to address its challenges [2]. These professionals use various interventions to improve breathing in individuals diagnosed with respiratory conditions [3]. Physiotherapists working in both general wards and intensive care units (ICUs) face increased responsibilities. They need to be highly aware of interventions like patient positioning and mobilization and play a key role in rehabilitating patients with hypoxemia. Moreover, they are often expected to oversee the care of COVID-19 patients in home settings, highlighting the evolving role of physiotherapy in this pandemic [4]. In a study based on 70 hospitals in the Netherlands, early physiotherapy interventions (mobilization and stimulation of activities) implemented on patients receiving intensive care have been found to minimize their chances of developing physical impairments [5]. While federal healthcare authorities and the National Emergency Crisis and Disaster Management Authority of the United Arab Emirates (UAE) have provided exhaustive guidelines for COVID-19 infection control and medical management [6], specific protocols for physiotherapy interventions are still lacking. Given the significant impact of physiotherapy on the recovery of patients with COVID-19, both in acute care settings and during rehabilitation, this survey was aimed at elucidating the practice patterns of physiotherapists in the UAE with a view towards developing evidence-based national physiotherapy guidelines for these patients.

Methods

Research Design

The current study is a UAE-based cross-sectional survey.

Participants

The study focused on a purposive sample of physiotherapists in the UAE who hold at least a bachelor's degree in physiotherapy or higher. The physiotherapists who were working in the UAE at a (private or government) hospital with a valid license and dealing with COVID-19 patients (in a ward or an ICU) were included in the study.

Sample size calculation

In this study, we used a complete enumeration method to target all physiotherapists registered with the Emirates Physiotherapy Society. Among 340 registered physiotherapists, 150 of them were working either in acute care or in-wards pulmonary care. We contacted 150 physiotherapists from 20 different hospitals, both private and government, via email, receiving replies from 100 of them. As only 100 physiotherapists (100/150) responded to the survey, the response rate was 66.66%.

Questionnaire

For this survey, participants were required to give their consent as approved by the University of Sharjah's ethical com-

mittee. We used a valid questionnaire obtained from an Indian study on COPD conducted by one of this study's authors (GKA) [7]. The questionnaire was sent to three experts (senior physiotherapists) specialized in cardiorespiratory physiotherapy for assessing its face validity. After reviewing the questionnaire, they recommended using the same questionnaire, without further modifications, for patients with COVID-19.

The questionnaire comprised 60 questions that were divided into 5 sections: assessment measures in ICU and wards, treatment techniques in ICU and wards, and patient education. The responses given by the participants depend on whether the admission was in the ICU or the ward. Closed questions with a Likert-type scale facilitated easy completion of the survey and provided quantifiable responses. The categories for responses were always, frequently, sometimes, rarely, and never.

Detailed study procedure

Before going to the Emirates Physiotherapy Society (EPS), the study investigators obtained a list of hospitals and society registered members where data can be collected. The researcher compiled a cover letter introducing the research's purpose to the study population, along with an attached questionnaire, and emailed it to the physiotherapists. Also, a hyperlink with the informed consent form was sent to all research participants for receiving their consent if they were willing to be a part of the study. To ensure a high response rate, respondents were given a two-week window to complete the survey, followed by follow-up messages for any incomplete submissions.

Statistical analysis

Data were analyzed with SPSS version 23, where numerically coded responses were used to generate descriptive summaries and frequency analyses. According to the 5-point Likert scale, the frequency variables related to assessment, treatment, and patient education were categorized as "always, frequently, sometimes, rarely, and never."

Results

The questionnaire was sent to 150 physiotherapists. A response rate of 66.66% was achieved with the reception of 100 completed responses. The ratio of female to male physiotherapists was 1.173. The participants had a median age of 32.92 (22-56) years. Table 1 summarizes the demographic information of all participants. Eighty-four percent of the participants had a bachelor's degree in physiotherapy, 14% had a master's degree in cardiopulmonary or musculoskeletal physiotherapy, and only 2% had a doctoral degree (PhD).

Assessment in ICU

In assessing COVID-19 patients in ICU across UAE hospitals, various methods have been identified, as outlined in Table 2. Assessment techniques fell broadly into two categories: impairment measures and dyspnea quantifying measures. Impairment measures included physical evaluation, arterial blood gases, heart rate, respiratory rate, blood pressure, and chest x-rays. Physical examinations were frequently employed, with 36% of respondents using it often and 24% always employed this method; a mere 7% rarely used it. Interestingly, arterial

blood gas analyses were less common: 8% always used them, 41% used them sometimes, and 32% never used them. Contrastingly, dyspnea quantifying measures, like the medical research council dyspnea scale (MRC), were rarely used by 59% of physiotherapists, with 15% never employing them. Heart and respi-

ratory rate assessments were always used by 52% and 68% of physiotherapists respectively. Blood pressure was also frequently assessed by 55% of physiotherapists. However, chest x-rays were sometimes used by 48% of respondents but it was rarely used (17%) or never employed (9%) by other respondents.

Table 1. Demographic distribution of research participants

Demographics		% (frequency)
Age - years [mean (range)]		32.92 (22-56)
Gender	Female	54 (54)
	Male	46 (46)
Emirate	Abu Dhabi	55 (55)
	Dubai	42 (42)
	Ras Al Khaimah	3 (3)
Years of Experience working in ICU/ In patient Ward	1-2 years	6 (6)
	3-5 years	14 (14)
	More than 5 years	80 (80)
Educational Level	BSc	84 (84)
	MSc	14 (14)
	Ph.D.	2 (2)
Type of Hospital	Public	49 (49)
	Private	51 (51)

Table 2. Percentage of physiotherapists responded to assessment techniques used on COVID-19 ICU patients

Frequency					
Impairments measures	Always (91-100%)	Frequently (61-90%)	Sometimes (31-60%)	Rarely (1-30%)	Never (0%)
Physical Examination	24.00%	36.00%	33.00%	7.00%	0.00%
Arterial Blood Gases	8.00%	14.00%	41.00%	5.00%	32.00%
Heart Rate	52.00%	12.00%	22.00%	8.00%	6.00%
Respiratory rate	68.00%	28.00%	4.00%	0.00%	0.00%
Blood pressure	26.00%	55.00%	5.00%	9.00%	5.00%
Chest Xray	2.00%	24.00%	48.00%	17.00%	9.00%
Dyspnea Quantifying Measures	Always (91-100%)	Frequently (61-90%)	Sometimes (31-60%)	Rarely (1-30%)	Never (0%)
Medical research council dyspnea scale	0.00%	14.00%	12.00%	59.00%	15.00%
Borg scale	39.00%	33.00%	18.00%	10.00%	0.00%

Assessment in wards

Ward patient assessments frequently covered impairments, dyspnea, functional exercise capacity, and health-related quality of life. Predominantly, physiotherapists in the UAE consistently utilized methods such as physical examination (79%), pulse oximetry (69%), heart rate (77%), respiratory rate (81%), peripheral muscle strength assessment (55%), and the medical research council dyspnea scale (56%). On the contrary, the world health organization quality-of-life scale

(WHOQOL-BREF) was never employed by 71% of the respondents. Several other methods, including arterial blood gases and chest x-rays, were rarely adopted by the physiotherapists in their ward assessments. Yet, some methods like the 6-minutes-walk test were used more frequently. Overall, data suggested a discernible pattern in preferred assessment techniques among physiotherapists treating patients with COVID-19 admitted in hospital wards in the UAE, with certain tools consistently favored and others seldom used.

Table 3. Percentage of physiotherapists responded to assessment techniques used on COVID-19 ward patients

Frequency					
Impairments measures	Always (91-100%)	Frequently (61-90%)	Sometimes (31-60%)	Rarely (1-30%)	Never (0%)
Physical Examination	79.00%	12.00%	8.00%	1.00%	0.00%
Arterial Blood Gases	6.00%	12.00%	39.00%	38.00%	5.00%
Pulse oximeter	69.00%	26.00%	5.00%	0.00%	0.00%
Heart Rate	77.00%	12.00%	8.00%	3.00%	0.00%
Respiratory rate	81.00%	12.00%	6.00%	1.00%	0.00%
Chest Xray	7.00%	16.00%	44.00%	22.00%	11.00%
Pulmonary Function test	6.00%	12.00%	24.00%	48.00%	10.00%
Peripheral muscle strength	55.00%	32.00%	7.00%	5.00%	1.00%
Dyspnea Quantifying Measures	Always (91-100%)	Frequently (61-90%)	Sometimes (31-60%)	Rarely (1-30%)	Never (0%)
Medical research council dyspnea scale	56.00%	31.00%	11.00%	0.00%	2.00%
Borg scale	32.00%	14.00%	17.00%	23.00%	14.00%
Baseline dyspnea index	12.00%	10.00%	4.00%	49.00%	25.00%
Transitional dyspnea index	0.00%	14.00%	39.00%	40.00%	7.00%
Functional exercise capacity measures	Always (91-100%)	Frequently (61-90%)	Sometimes (31-60%)	Rarely (1-30%)	Never (0%)
2 minutes' walk test	14.00%	28.00%	33.00%	5.00%	20.00%
6 minutes' walk test	12.00%	30.00%	35.00%	7.00%	16.00%
12 minutes' walk test	11.00%	32.00%	33.00%	6.00%	18.00%
Self-Paced Walk Test	8.00%	33.00%	25.00%	29.00%	5.00%
Health-related quality of life measure	Always (91-100%)	Frequently (61-90%)	Sometimes (31-60%)	Rarely (1-30%)	Never (0%)
Short form-36	39.00%	0.00%	28.00%	0.00%	23.00%
WHOQOL-BREF World Health Organization Quality-of-Life Scale	0.00%	0.00%	21.00%	8.00%	71.00%

Treatment in the ICU

For COVID-19 ICU patients, the treatment modalities utilized by physiotherapists revealed a consistent preference for certain techniques. Humidification (62%), nebulization (68%), percussion (66%), vibration (59%), suctioning (68%), positioning (70%), mobilization (58%), and facilitation techniques (44%)

were frequently employed. Notably, positioning stood out with 70% of physiotherapists frequently using it, while 2% rarely did it. All respondents reported using techniques such as humidification, vibration, suctioning, positioning, and percussion at least once. However, nebulization (4%), mobilization (6%), and facilitation techniques (4%) were occasionally reported as never used.

Table 4. Percentage of physiotherapists responded to treatment techniques used on COVID-19 ICU patients

Frequency					
Techniques	Always (91-100%)	Frequently (61-90%)	Sometimes (31-60%)	Rarely (1-30%)	Never (0%)
Humidification	22.00%	62.00%	16.00%	0.00%	0.00%
Nebulization	12.00%	68.00%	3.00%	13.00%	4.00%
Percussion	31.00%	66.00%	3.00%	0.00%	0.00%
Vibration	24.00%	59.00%	15.00%	2.00%	0.00%
Suctioning	18.00%	68.00%	12.00%	2.00%	0.00%
Positioning	12.00%	70.00%	16.00%	2.00%	0.00%
Mobilization	8.00%	58.00%	21.00%	7.00%	6.00%
Facilitation Technique	4.00%	44.00%	43.00%	5.00%	4.00%

Treatment in the ward

While evaluating treatment methods for ward patients, various options ranging from techniques to alleviate dyspnea to equipment and strategies promoting movement were explored. Interestingly, walking emerged as the dominant treatment method for COVID-19 ward patients, with 88% of physiotherapists 'always' adopting it and 12% 'frequently'. Physiothera-

pists showcased consistency in their therapeutic approaches to these patients. Commonly, they "frequently" employed strategies like pursed lip breathing (49%), positioning (69%), postural drainage (69%), and techniques like vibration (78%) and suctioning (58%), among others. Notably, underutilized treatments included the acapella method, with 68% "rarely" using it, along with the RC-cornet (39%) or the flutter technique (29%).

Table 5. Percentage of physiotherapists responded to treatment techniques used on COVID-19 ward patients

Frequency					
Dyspnea relieving strategies	Always (91-100%)	Frequently (61-90%)	Sometimes (31-60%)	Rarely (1-30%)	Never (0%)
Pursed Lip Breathing	12.00%	49.00%	32.00%	7.00%	0.00%
Positioning	21.00%	69.00%	6.00%	4.00%	0.00%
Traditional airway clearance techniques	Always (91-100%)	Frequently (61-90%)	Sometimes (31-60%)	Rarely (1-30%)	Never (0%)
Postural drainage	29.00%	69.00%	2.00%	0.00%	0.00%
Percussion	36.00%	49.00%	12.00%	2.00%	1.00%
Vibration	11.00%	78.00%	9.00%	2.00%	0.00%
Facilitation of coughing	30.00%	69.00%	1.00%	0.00%	0.00%
Suctioning	8.00%	58.00%	22.00%	8.00%	4.00%
Other measures	Always (91-100%)	Frequently (61-90%)	Sometimes (31-60%)	Rarely (1-30%)	Never (0%)
Humidification	12.00%	34.00%	22.00%	21.00%	11.00%
Nebulization	3.00%	35.00%	49.00%	4.00%	9.00%
Facilitation techniques	14.00%	59.00%	21.00%	6.00%	0.00%
Equipment	Always (91-100%)	Frequently (61-90%)	Sometimes (31-60%)	Rarely (1-30%)	Never (0%)
Flutter	0.00%	29.00%	32.00%	29.00%	10.00%
RC-cornet	0.00%	25.00%	29.00%	39.00%	7.00%
Acapella	2.00%	7.00%	21.00%	68.00%	2.00%
Quake	6.00%	12.00%	32.00%	29.00%	21.00%
Incentive spirometer	8.00%	49.00%	41.00%	2.00%	0.00%
Inspiratory muscle trainer	12.00%	69.00%	11.00%	8.00%	0.00%
Mobilization	Always (91-100%)	Frequently (61-90%)	Sometimes (31-60%)	Rarely (1-30%)	Never (0%)
Walking	88.00%	12.00%	0.00%	0.00%	0.00%
Upper extremity training	44.00%	48.00%	8.00%	0.00%	0.00%
Lower extremity training	43.00%	49.00%	8.00%	0.00%	0.00%
Strength training	9.00%	54.00%	30.00%	7.00%	0.00%

Patient education

Physiotherapists frequently educated their patients on breathing exercises, which was the most common patient education topic. According to the survey, 89% of physiotherapists always provided education on breathing exercises when discharging their patients so that they could have better post-admission patient outcomes. Other important topics that were "always" shared by practitioners included strategies for relieving dyspnea (30%), relaxation techniques (49%), sputum clearance techniques (49%), and

whole-body exercises (25%). Whole body exercise education was 'frequently' taught, with 70% of respondents acknowledging how they shared such clinical knowledge with their patients. Other "frequently" used patient education topics included strategies for relieving dyspnea (48%), relaxation techniques (40%), energy conservation methods (39%), and sputum clearance techniques (48%). However, a significant proportion of physiotherapists "rarely" educated their patients on discharge about energy conservation and 1% "never" informed their patients on the same.

Table 6. Patient education on discharge

Educational Topics	Frequency				
	Always (91-100%)	Frequently (61-90%)	Sometimes (31-60%)	Rarely (1-30%)	Never (0%)
Strategies for relieving dyspnea	30.00%	48.00%	20.00%	2.00%	0.00%
Relaxation technique	49.00%	40.00%	11.00%	0.00%	0.00%
Energy conservation	2.00%	39.00%	38.00%	20.00%	1.00%
Sputum clearance technique	49.00%	48.00%	3.00%	0.00%	0.00%
Breathing exercise	89.00%	10.00%	1.00%	0.00%	0.00%
Whole-body exercise	25.00%	70.00%	5.00%	0.00%	0.00%

The responses for each question was scored as Always (5), Frequently (4), sometimes (3), Rarely (2), and Never (1). The total scores for physical assessment in the ICU and wards (in-patient setting), and Physiotherapy treatment techniques in the ICU and wards were calculated. The mean scores for all these four questionnaire domains were calculated and compared based on the participants qualification, work experience and the workplace. The total scores for all these four questionnaire domains were categorized as lower and higher scores with a cut-off value. One way ANOVA was used to compare the mean scores of different questionnaire

domains based on the respondents workplace, years of experience, and the qualification.

The ICU and ward treatment mean scores were significantly higher in the respondents with bachelor's degree compared to the higher degrees. The ICU assessment scores were significantly higher in the respondents working in the private hospitals compared to those working in the public hospitals whereas the ICU and ward treatment scores were significantly higher in the public hospital therapists compared to private hospital therapists. The respondents mean assessment and treatment scores were not significantly different based on the number of years of experience.

Table 7. Comparison of mean assessment and treatment practice pattern scores among the participants based on the qualification, workplace, and years of experience

Participant characteristics		ICU assessment scores	ICU Treatment scores	Acute care/ward assessment scores	Acute care/ward Treatment scores
Qualification	Bachelors	27.92 ± 3.10	32.32 ± 3.39	62.80 ± 5.36	102.40 ± 11.98
	Masters	28.71 ± 1.59	21.14 ± 2.28	61.35 ± 4.14	80.71 ± 6.60
	Doctorate	29.00 ± 1.41	23.50 ± 10.60	67.00 ± 1.41	84.50 ± 21.92
	p	0.57	0.001	0.31	0.001
Years of experience	0-2 years	26.50 ± 3.83	31.33 ± 4.45	62.83 ± 4.57	107.00 ± 14.07
	2-5 years	28.21 ± 2.24	30.42 ± 4.29	65.50 ± 3.36	102.28 ± 10.57
	5-10 years	27.62 ± 3.27	30.93 ± 5.58	62.46 ± 6.56	98.62 ± 13.27
	> 10 years	28.47 ± 2.68	30.29 ± 5.49	62.00 ± 4.49	97.31 ± 14.91
	p	0.32	0.93	0.17	0.32
Facility/ workplace	Public	26.91 ± 2.98	32.81 ± 2.14	65.16 ± 4.35	109.2449 ± 7.78
	Private	29.13 ± 2.40	28.43 ± 6.37	60.31 ± 4.84	89.1765 ± 11.01
	p	0.001	0.001	0.001	0.001

Chi-square test was used to compare the frequencies of higher and lower scores categorized for different questionnaire domains based on the respondents work place, years of experience, and the qualification. The frequencies of higher scores in the ICU and ward treatment scores were significantly more

among the respondents with a higher degree compared to those with a bachelor's degree. The frequencies of higher scores in the ICU and ward treatment scores were significantly more among the respondents working in the public sector compared to the private sector.

Table 8. Frequencies of practice pattern scores (categorized as higher and lower scores) among the participants based on the qualification, workplace, and years of experience

Participant characteristics			Frequency of ICU assessment scores	Frequency of ICU Treatment scores	Frequency of Acute care/ward assessment scores	Frequency of Acute care/ward Treatment scores
Qualification	Bachelors (n = 84)	higher	11.9%	65.5%	35.7%	56.0%
		lower	88.1%	34.5%	64.3%	44.0%
	Masters (n = 14)	higher	7.1%	0.0%	14.3%	0.0%
		lower	92.9%	100.0%	85.7%	100.0%
	Doctorate (n = 2)	higher	0.0%	50.0%	100.0%	0.0%
		lower	100.0%	50.0%	0.0%	100.0%
	p		0.76	0.001	0.04	0.001
	Years of experience	0-2 years (n = 6)	higher	0.0%	83.3%	16.7%
lower			100.0%	16.7%	83.3%	33.3%
2-5 years (n = 14)		higher	14.3%	71.4%	57.1%	57.1%
		lower	85.7%	28.6%	42.9%	42.9%
5-10 years (n = 32)		higher	6.3%	56.3%	40.6%	50.0%
		lower	93.8%	43.8%	59.4%	50.0%
> 10 years (n = 48)		higher	14.6%	47.9%	25.0%	39.6%
		lower	85.4%	52.1%	75.0%	60.4%
p		0.52	0.21	0.09	0.44	
Facility	Public	higher	6.1%	87.8%	42.9%	85.7%
		lower	93.9%	12.2%	57.1%	14.3%
	Private	higher	15.7%	25.5%	11.8%	9.8%
		lower	84.3%	74.5%	88.2%	90.2%
	p		0.12	0.001	0.001	0.001

Discussion

The novel findings of the study

Physiotherapists apply comparable evaluation and therapeutic methodologies for their patients, regardless of whether they were hospitalized in either ICUs or regular wards at healthcare centers in the UAE. The assessment focused on specific indicators of respiratory impairment, including respiratory rate, heart rate, physical examination, pulse oximeter, blood pressure, and chest X-ray. Patients with COVID-19 admitted in the ICUs and wards were assessed almost equally. However, respondents working in the wards used pulmonary function tests and arterial blood gas analyses less frequently. Measures to quantify dyspnea, such as the MRC and Borg Scales, were used by less than half of the respondents in both ICUs and wards. In the wards, evaluations of functional exercise capacity and health-related quality of life were infrequently performed, and measures such as the 2 minute walk test, 6 minute walk test, 12 minute walk test, self-paced walk test, WHOQOL-BREF, and short form 36 were rarely used.

Both ICUs and wards primarily used positioning, traditional airway clearance techniques (like percussion, postural drainage, vibration), and ambulation for treatment. Resistance training was infrequently utilized. A minor proportion of respondents reported using airway clearance devices such as RC-Cornet, flutter, acapella, and quake.

Assessment methods

Assessment in the ICU

In the clinical management of hospitalized patients, monitoring vital parameters is of crucial importance. Vital signs including

respiratory rate, pulse, blood pressure, oxygen saturation, and temperature are consistently acknowledged as integral components of patient assessment [8]. Among the methods of recording blood pressure, non-invasive blood pressure (NIBP) is predominantly utilized [9]. The significance of monitoring respiratory rate, often denoted as respiratory frequency, has been underscored in numerous scholarly investigations across diverse healthcare disciplines [10]. Regarding measures for quantifying dyspnea, the medical research council (MRC) dyspnea scale has a longstanding history in evaluating the impact of breathlessness on daily functionalities [11]. Furthermore, the modified borg scale has been validated as a dependable tool for assessing dyspnea [12]. An analogous study centered on chest physiotherapy underscored the importance of evaluating key parameters like heart rate, respiratory rate, and SpO₂ [13]. In this research, while physical examinations and vital parameter evaluations (encompassing heart and respiratory rates) were standard procedures, there was a varied frequency in the utilization of arterial blood gases and dyspnea quantification tools, such as the MRC scale, among physiotherapists. Some of these assessment methods observed sporadic application. Physiotherapists in the UAE might gain advantages from enhancing their interpretation and reasoning skills related to lesser-used assessment tools in acute care highlighted in the survey.

Assessment in wards

A variety of objective assessments are available for evaluating respiratory function. Primarily, pulmonary function tests

(PFTs), encompassing spirometry, diffusion capacity, and lung volumes, are regularly utilized [14]. Among the critical impairment evaluations highlighted in the survey was the 6-minute walk test (6MWT). Recognized as an essential tool for gauging functional exercise capacity, the 6MWT is a foundational element of lung allocation scores [15]. Regarding the Health-related quality of life (HRQoL) assessments, the questionnaire noted two principal instruments: the Short-Form 36-item questionnaire (SF-36), esteemed for its effectiveness in assessing HRQoL [16], and the WHOQOL-BREF, globally recognized as the premier generic HRQoL assessment tool [17]. Historically, physiotherapist evaluations of COPD patients prioritized patient observation, pulse oximetry, and auscultation, with the majority employing these regularly. Conversely, less than 18% incorporated functional capacity evaluations, and HRQoL measures remained infrequently used [18]. A distinct Canadian study highlighted the commonality of assessing exercise capacity and HRQoL, often utilizing both 6-minute and occasionally, 12-minute walk tests for pre- and post-rehabilitation evaluations [19]. Contrarily, the current study identified respiratory rate, physical examination, and heart rate as predominant impairment measures. While the medical research council dyspnea scale was the primary dyspnea quantifying tool, the 12-minute walk test was the most utilized for functional exercise capacity assessment.

Treatment techniques

Treatment in the ICU

Percussion emerged as the predominant technique, with mobilization and facilitation methods being less utilized. The study offered eight therapeutic strategies, including positioning, which aims to optimize the alignment between ventilation/perfusion (V'/Q'), lung capacities, and mucociliary clearance. This alignment aids in minimizing the strain on both the respiratory (WOB) and cardiovascular systems [20]. A significant portion of respondents also selected facilitatory techniques. Notably, chest percussion and vibration have been proven effective in facilitating sputum removal, particularly for patients with abundant airway secretions [21, 22]. Additionally, airway humidification plays a vital role in mechanically ventilated patients [23]. Nebulizers are increasingly being recognized as a preferred method for delivering inhalation therapy, especially in acute and critical care settings [24]. An intensive care unit (ICU) investigation reported a 31% decrease in ventilator-associated pneumonia linked to physiotherapy [25]. Concurrently, a UK study highlighted that traditional chest physiotherapy techniques like vibration and percussion were seldom utilized in AECOPD patients, whereas 88% frequently employed ACBT [26]. A separate South African study revealed consistent findings on the prevalent use of manual therapy, suction, mobilization, and positioning in both government and private ICU settings [27].

Treatment in the wards

In the "treatment in wards" survey, a comprehensive questionnaire was administered, categorizing treatments into five distinct groups: dyspnea alleviation methods, standard airway clearance techniques, miscellaneous interventions, equipment, and mobilization [35]. For patients with chronic obstructive pulmonary disease (COPD), pursed lip breathing is a com-

monly adopted method to mitigate dyspnea [28]. Historically, postural drainage (PD) was a premier technique for airway clearance [29]. Additionally, suctioning is pivotal for mitigating airway obstructions and atelectasis that result in hypoxia, subsequently impeding gas exchange [30]. Nebulization therapy holds an indispensable role in respiratory disease treatment [31]. Studies indicate that incentive spirometry (IS) augments lung volumes and diminishes pneumonia occurrences in ward-admitted patients [32]. Endorsements from the American College of Sports Medicine, the Thoracic Society, and the European Thoracic Society advocate for exercise regimens to bolster cardiopulmonary health, muscular strength, and flexibility in COPD patients [33]. An Indian study revealed participants often engaged in activities like mobilization, chest manipulation, and breathing exercises among others [34]. Notably in this study, positioning emerged as the predominant method for dyspnea relief, with 90% of respondents using it regularly. Conventional airway clearance methods like PD were commonly used, while the incentive spirometer and inspiratory muscle trainer were the equipment of choice. Mobilization was largely characterized by walking and limb training, with strength training less commonly employed.

Patient education

In this Study, the types of education included strategies for relieving dyspnea, relaxation techniques, energy conservation, sputum clearance techniques, breathing exercises, and whole-body exercises. The results indicate that breathing exercises, sputum clearance techniques, and relaxation techniques were provided with the highest frequency. On the other hand, energy conservation was provided less frequently, with only 2% of physiotherapists reporting that they always provided this type of education. Numerous pharmacological and non-pharmacological remedies exist to alleviate dyspnea and enhance the well-being of patients. Understanding the key worries of individuals suffering from breathlessness and the favorable impact of effective communication between medical professionals and patients is essential for a comprehensive clinical evaluation and measuring outcomes in clinical practice and research [35]. A comparable investigation conducted in India discovered that physiotherapists consistently engaged in educating patients and their families, as well as raising awareness about various disease conditions and their potential outcomes [36].

Study strengths

The primary strength of this study lies in its pioneering nature, as it represents the first survey of its kind conducted in the United Arab Emirates (UAE) to ascertain practice patterns. Additionally, the robustness of the research is further underscored by the considerable sample size employed. Furthermore, the inclusion of a diverse range of hospitals contributes to the comprehensiveness and generalizability of the findings, ensuring a broad representation of healthcare facilities across the region.

Study limitation

A significant limitation of this study is the lack of statistical analysis for subgroups. It is imperative for future studies to incorporate such analyses to ensure a comprehensive examination of all relevant data dimensions.

Conclusion

In conclusion, the assessment techniques utilized by both ICU and ward physiotherapists were similar, with a primary focus on impairments and dyspnea quantifying measures and less emphasis on functional exercise capacity. Treatment approaches were also similar between the two settings, albeit with slight differences in airway clearance and equipment use.

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