

# Physiotherapy interventions and profile of practice for COVID-19 patients in Jordan

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## Abstract.

**BACKGROUND:** Physiotherapy plays an essential role in combating the complications of coronavirus disease 2019 (COVID-19). Profiling the experiences and challenges of physiotherapy practice in a country will help in customizing the competencies needed for physiotherapy education and regulations of practice.

**OBJECTIVE:** To explore the experiences, knowledge, training, and barriers of practice for Jordanian physiotherapists who worked with COVID-19 cases at different work settings.

**METHODS:** An online survey was distributed to physiotherapists working at different Jordanian rehabilitation settings. Physiotherapists who had experience in dealing with COVID-19 cases were eligible to participate in the study.

**RESULTS:** The survey showed that only 38% of participants had received specialized training in dealing with COVID-19. Respiratory exercises were mostly used in the intensive care units or isolation wards (60%), and with patients having long-term complications (74%). Inadequate patients' referral to physiotherapy was reported by 88.6% of eligible participants. The majority of participants (68%) reported lack of adequate personal protective equipment (PPE) for physiotherapists. Challenges at the level of treatment skills, techniques, and communication were the most frequently reported by participants (44%), followed by challenges at the level of work policies (32%), then by challenges at the level of knowledge about the disease (28%).

**CONCLUSION:** The study showed gaps in knowledge, training, and work-related policies that all created challenges for physiotherapists dealing with COVID-19 cases in Jordan. We hope our data can help in providing a basis for developing educational and training programs, in addition to revising work-related policies, to promote physiotherapy management of COVID-19 in Jordan.

Keywords: Rehabilitation, knowledge, training, obstacles

## 1. Introduction

Coronavirus disease 2019 (COVID-19) is still an ongoing pandemic that is strongly affecting all levels of the health care system. The disease has yet infected more than 525 million people worldwide including more than 6 million deaths [1]. The pandemic reached Jordan in early March 2020, and the country encountered three major waves of the pandemic up till now. The total number of confirmed cases in Jordan reached more than one million including more than 14 thousand deaths [2]. The

disease may lead to serious manifestations requiring extended hospitalization [3]. Hospitalized and non-hospitalized patients may suffer from impaired pulmonary and physical malfunctioning [4], which leads to an increased need for rehabilitation services for COVID-19 patients (during and post-recovery). Physiotherapy (PT) is vital to the rehabilitation of COVID-19 patients in the acute, post-acute, and long-term phases of the disease [5], it also plays a role in reducing the length of stay in intensive care which in turn reduces the high cost of health care in many countries [6]. In Jordan, as part of the crisis management of the pandemic; the Jordanian ministry of health dedicated several hospitals in different regions of the country for COVID-19 cases only. Physiotherapists were part of the medical staff involved in the care

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plan for acute and post-acute patients [2]. Nevertheless, the rapid increase in the number of hospitalized cases, in addition to the new encounter of the disease itself and its consequences, resulted in a huge burden on Jordanian physiotherapists, which deserves to be reviewed and analyzed.

Studies investigating how physiotherapists adapted to work during the COVID-19 pandemic are still inadequate [7]. Unfortunately, data on physiotherapy staffing, description of tasks, or demographic profile of COVID-19 cases serviced by physiotherapists in Jordan are unavailable. A limited number of studies have been done to describe the profile of physiotherapy practice in the field of pulmonary and cardiopulmonary rehabilitation [8, 9]. In a previous study, the physiotherapy profile of practice in Jordanian intensive care units was surveyed and concluded that there are insufficient physiotherapy staffing, lack of specialized training, and inadequate understanding of the role of physiotherapists in the acute care setting [8]. Okasheh et al. surveyed the cardiorespiratory physiotherapy practice in Jordan and concluded that Jordanian physiotherapists lack training and autonomy in this specialized field of practice too [9].

As the evidence on the benefits of physiotherapy for active and recovered cases of COVID-19 patients is increasingly building up, we think it is necessary to profile physiotherapy interventions used by Jordanian physiotherapists during this pandemic. The main objectives of this study were to identify the major possible gaps in knowledge and training for COVID-19 physiotherapy management and also to explore the experiences of physiotherapists who worked with COVID-19 cases in Jordan and point out the main challenges they faced during their management of COVID-19 cases. To the best of our knowledge, such a study has not been performed in Jordan yet. We expect our results will have an impact on levels of professional development of competencies, and the promotion of policies regarding physiotherapy scopes of practice for COVID-19 management.

## 2. Methods

We used a cross-sectional national survey on physiotherapists working in Jordan at different work settings. The survey was conducted between July 2021 and September 2021.

### 2.1. Survey development

Our literature review did not reveal any existing instrument that specifically measures the profile of physiotherapy practice in COVID-19 cases. Thus, we depended on previous questionnaires that collect data on physiotherapy practice and professional training in certain subspecialties to customize a questionnaire that meets our study objectives [8, 10, 11]. The study team consulted three physiotherapy experts from clinical and academic fields to give their feedback and suggestions on the questionnaire items and content. After receiving feedback, minor changes were made according to experts' suggestions, and the final electronic version was developed through "Google Forms" and sent via social media platforms for physiotherapists in Jordan, mainly through the official Facebook page of the Jordanian Physiotherapy Society and professional WhatsApp groups of physiotherapists in Jordan. The survey was delivered in Arabic language.

### 2.2. Survey content

The final 39-item questionnaire required less than 15 minutes to complete. It included 4 sections: demographic information (8 questions), education and training on COVID-19 (5 questions), main physiotherapy (PT) interventions used for COVID-19 patients (14 questions), and the main barriers and challenges of practice with COVID-19 cases (12 questions).

### 2.3. Survey participants

The survey targeted physiotherapists working in Jordan who had experience working with COVID-19 cases. All physiotherapists working in inpatient or outpatient settings with experience dealing with one or more active or post-COVID-19 cases were eligible to answer the survey. No incentives were offered for survey completion. Participation was voluntary. Participants were provided with contact information to answer their questions or inquiries regarding the survey. The study protocol was ethically approved by the institutional review board at The Hashemite University.

### 2.4. Data analysis

Data were analyzed using IBM SPSS version 26.0 statistical software (IBM SPSS Inc., Chicago, IL,

USA). Descriptive analyses were used to present the current situation regarding the training and experience of Jordanian physiotherapists on active and post-COVID-19 cases. Questions were analyzed descriptively using frequencies and percentages.

### 3. Results

#### 3.1. Response rate

The survey was answered by 66 physiotherapists; 50 physiotherapists (75.8%) were eligible to complete the survey, 14 physiotherapists (21.2%) were ineligible, and 2 physiotherapists (3%) were denied survey completion.

#### 3.2. Participants' characteristics

Sixty percent ( $n=30$ ) of respondents were males and 40% ( $n=20$ ) were females. The majority of respondents were in the age groups between 22–27 years old ( $n=19$ , 38%) and 34–39 years old ( $n=12$ , 24%). Thirty-eight participants (76%) held a Bachelor's degree in physiotherapy. The majority had more than 2 years of work experience (80%), while 66% ( $n=33$ ) of respondents were general practitioners of physiotherapy. Half of the respondents ( $n=25$ ) worked at private outpatient centers and almost half of the respondents had been infected with COVID-19 ( $n=24$ , 48%). Ninety-four percent ( $n=47$ ) of respondents got the full vaccination against COVID-19. All participants' demographics are presented in Table 1.

#### 3.3. Education and training on COVID-19

The survey inquired about COVID-19 handling, infection control, personal protective equipment (PPE), receiving specialized training in respiratory therapy, and mechanical ventilation handling; 72% ( $n=36$ ) of respondents had received specialized training in respiratory therapy (RT), 38% ( $n=19$ ) had received specialized training in COVID-19 handling, 58% ( $n=29$ ) had received training on infection control and PPE usage, and only 30% ( $n=15$ ) had received training in mechanical ventilation (Fig. 1A). Regarding the method by which the participants received their specialized training in COVID-19; 58% ( $n=11/19$ ) reported they received training through courses conducted at the workplace, while 42%

Table 1  
Participant characteristics

Variable	n	%
<b>Age</b>		
>60	1	2.0
22–27	19	38.0
28–33	8	16.0
34–39	12	24.0
40–45	8	16.0
46–50	2	4.0
<b>Sex</b>		
Male	30	60.0
Female	20	40.0
<b>Level of education</b>		
BSc	38	76.0
MSc	8	16.0
PhD	4	8.0
<b>Years of experience</b>		
<2	10	20.0
3–5	8	16.0
6–10	12	24.0
>10	20	40.0
<b>Field of specialty</b>		
GP	33	66.0
Cardiopulmonary	2	4.0
Musculoskeletal	6	12.0
Neurophysiotherapy	2	4.0
Pediatrics	3	6.0
Teaching and research	2	4.0
Other	2	4.0
<b>Type of hospital/center</b>		
Public hospital	14	28.0
Military hospital	7	14.0
Private hospital	4	8.0
Private center	25	50.0
<b>Previously infected with COVID-19</b>		
Yes	24	48.0
No	26	52.0
<b>Received vaccination against COVID-19</b>		
Yes	47	94.0
No	3	6.0

( $n=8/19$ ) reported that they received training during their academic study (Fig. 1B).

#### 3.4. Physiotherapy interventions used with active and post-COVID-19 cases

One of the main objectives of this survey study was to profile the most frequent physiotherapy interventions used with active and post-COVID-19 patients in Jordan. The main professional characteristics of PT sessions are summarized in Table 2. To get a closer look at the physiotherapy profile of interventions, we asked about the method of assessment used by PTs for their COVID-19 cases; 44% ( $n=22$ ) reported using comprehensive

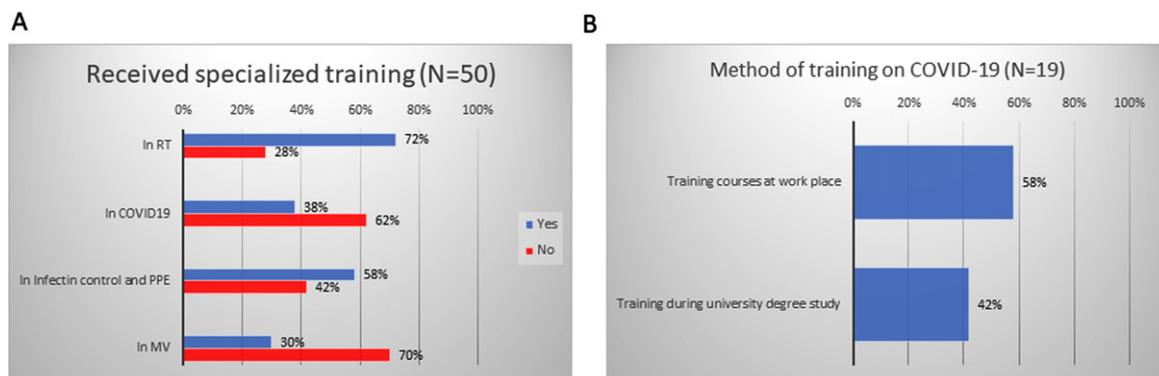


Fig. 1. The percentage of participants who received specialized training (A), and the method by which training on COVID-19 management was provided (B).

Table 2  
Professional characteristics of PT sessions for active and post-COVID-19 cases

Variable	n	%	Mean	SD
Daily working hours				
<8 hours	14	28.0		
≥8 hours	36	72.0		
Availability of dedicated PT hours for COVID-19 only patients?				
Yes	4	8.0		
No	46	92.0		
PT session duration for ICU patients (minutes)			22.7	12.9
PT session duration for patients in isolation wards (minutes)			20.1	10.8
PT session duration for outpatients/home visits (minutes)			36.1	14.3
Number of PT sessions per week for ICU patients			4.2	1.9
Number of PT sessions per week for isolation ward patients			4.1	2
Number of PT sessions per week for outpatient/home visits			3.1	1.4

PT assessment with standardized tools, 28% ( $n = 14$ ) reported depending on assessment previously done by other medical teams, 16% ( $n = 8$ ) reported immediate intervention without any assessment, and 12% ( $n = 6$ ) reported using a non-comprehensive assessment of their patients (Fig. 2A). The most frequent systemic complications encountered by the participating physiotherapists for active COVID-19 cases were complications of the respiratory system only (32%;  $n = 16$ ), followed by combined complications of respiratory, neuromuscular, and balance systems (30%;  $n = 15$ ), while combined complications of respiratory, cardiac, and musculoskeletal systems were reported by 22% ( $n = 11$ ) of participants (Fig. 2B). For long-term complications encountered by physiotherapists in post-COVID-19 patients; the most frequent complication reported was poor respiratory capacity ( $n = 42$ , 84%), followed by muscle weakness ( $n = 27$ , 54%). Easy fatigability, complications in the digestive system, loss of taste and smell, and poor appetite were reported by half of the partici-

pants ( $n = 25$ , 50%) (Fig. 2C). For PT interventions used with cases in the intensive care units (ICUs) and hospital isolation wards, respiratory exercises were the most frequent interventions ( $n = 30$ , 60%), followed by therapeutic exercises including stretching, strengthening, and range of motion techniques ( $n = 26$ , 52%). Respiratory care interventions such as airway suctioning and oxygen delivery were practiced by 40% ( $n = 20$ ) of participants (Fig. 3A). For PT interventions used with cases having long-term complications post-COVID-19; respiratory exercises were applied by the majority of participants ( $n = 37$ , 74%), followed by therapeutic exercises including stretching, strengthening, and range of motion techniques ( $n = 30$ , 60%). Balance exercises were applied more frequently than respiratory care techniques ( $n = 16$ , 32% for balance exercises;  $n = 15$ , 30% for respiratory care) (Fig. 3B). The majority of our participants reported that their PT interventions had achieved their goals of management ( $n = 39$ , 78%) (Fig. 3C).

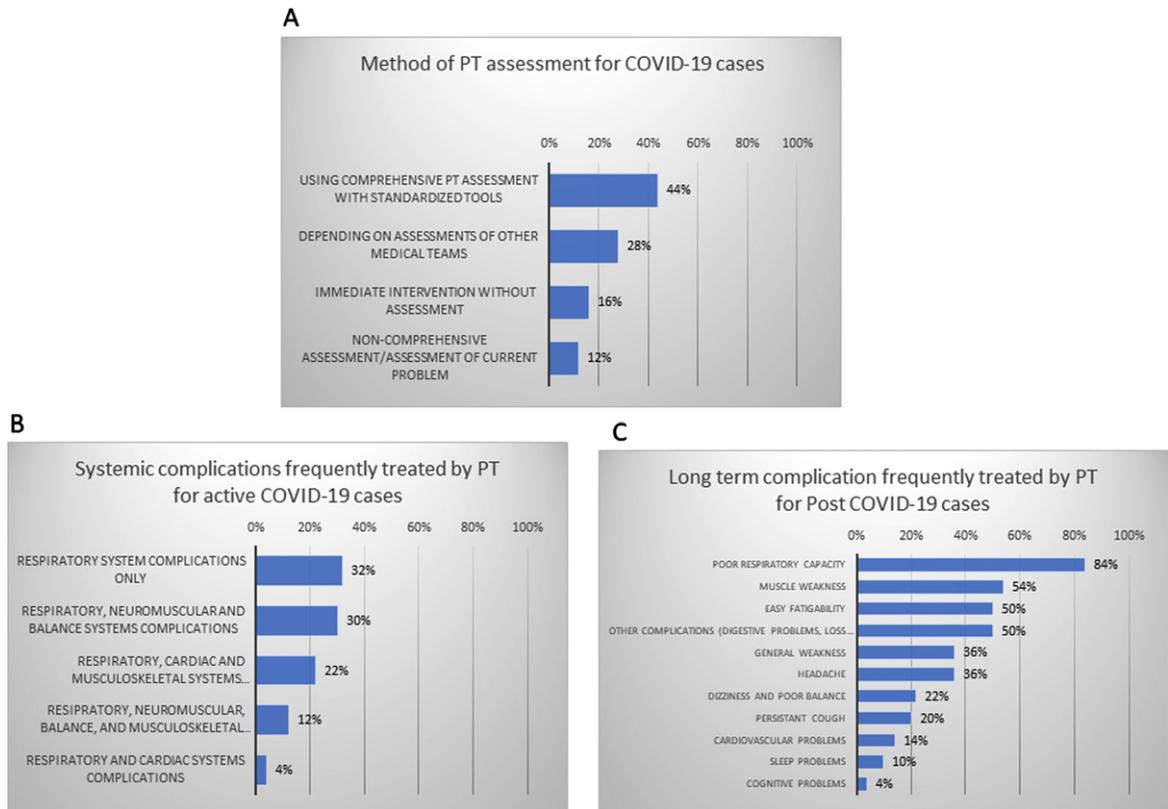


Fig. 2. Method of physiotherapy assessment used by participants for their COVID-19 cases (A). The percentages of systemic complications for active COVID-19 cases (B), and long-term complications for post-COVID-19 cases (C).

### 3.5. Barriers and challenges for dealing with COVID-19 cases

The last part of our survey was about barriers and challenges faced by participants dealing with COVID-19 cases. We asked whether all active COVID-19 patients who were admitted to hospitals were referred to physiotherapy or not; 88.6% ( $n = 39/44$ ) of eligible answers reported no referral (Fig. 4A). Also, 68% ( $n = 34$ ) of participants reported that personal protective equipment (PPE) and other needed equipment for infection control were not adequately available for PTs (Fig. 4B).

To get a closer look on the challenges, we asked participants about levels of cooperation, awareness, and satisfaction with regards to their professional role with COVID-19 cases. For the level of cooperation between physiotherapists and their patients or patients' families; 76% ( $n = 38$ ) of participants considered it a challenge (Fig. 5A) and 44% ( $n = 22$ ) reported a neutral level of cooperation, while 40% ( $n = 20$ ) reported high levels of cooperation (Fig. 5C). For the level of cooperation between physiotherapists

and other medical teams dealing with COVID-19 cases; 66% ( $n = 33$ ) of participants considered it a challenge (Fig. 5B) and 40% ( $n = 20$ ) reported neutral level of cooperation, while 32% ( $n = 16$ ) reported high levels of cooperation with other medical teams (Fig. 5C). Regarding the level of awareness of PT role as perceived by other medical teams; the majority of participants 38% ( $n = 19$ ) reported neutral level, while 32% ( $n = 16$ ) reported low levels of awareness (Fig. 5C). The levels of awareness on PT role with regards to COVID-19 as perceived from patients or patients' families were a bit higher, as 44% ( $n = 22$ ) reported neutral level and 30% ( $n = 15$ ) reported high levels of awareness (Fig. 5C). The majority of participants 56% ( $n = 28$ ) reported a neutral level of satisfaction regarding their current skills and knowledge with regards to COVID-19 management, while 34% ( $n = 17$ ) reported high levels (Fig. 5C). For satisfaction on the current professional role and authorized PT practices with regards to COVID-19 patients; 42% ( $n = 21$ ) reported neutral level of satisfaction while 34% ( $n = 17$ ) reported low levels (Fig. 5C).

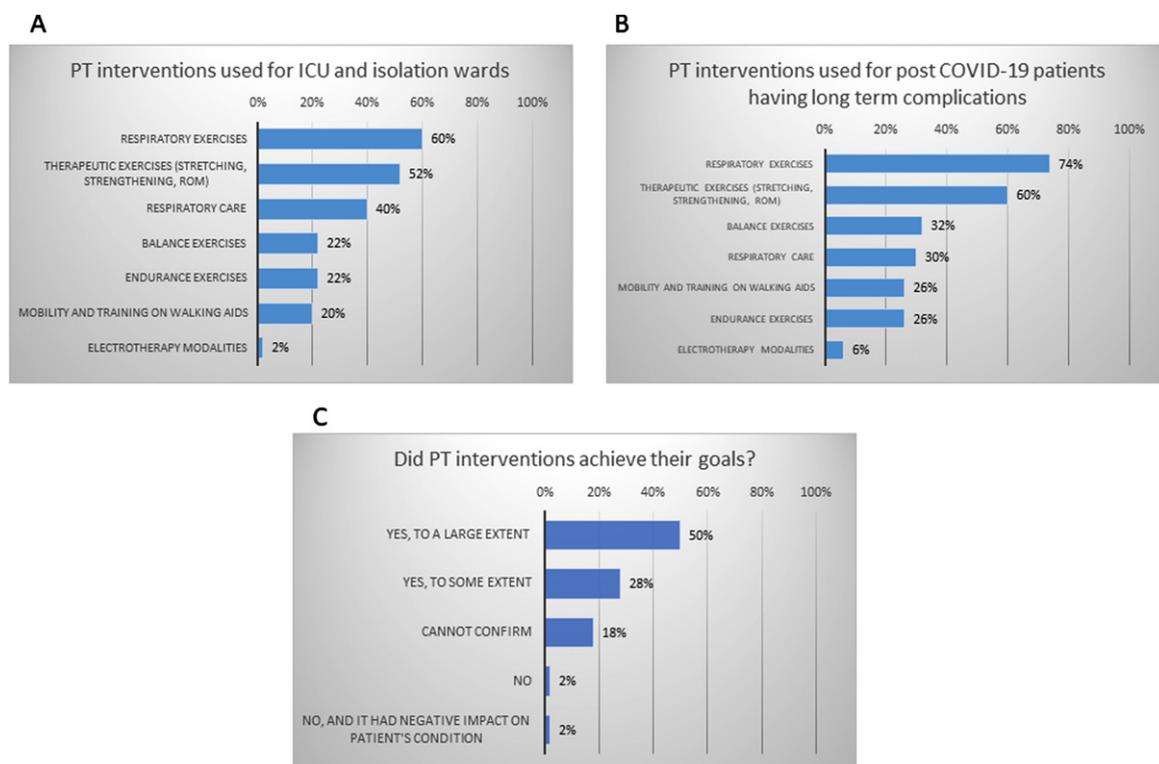


Fig. 3. The most frequent physiotherapy interventions used for COVID-19 patients in ICUs and isolation wards (A), and patients having long-term complications post-COVID-19 (B). Participants' report on achieving physiotherapy goals for their COVID-19 patients (C).

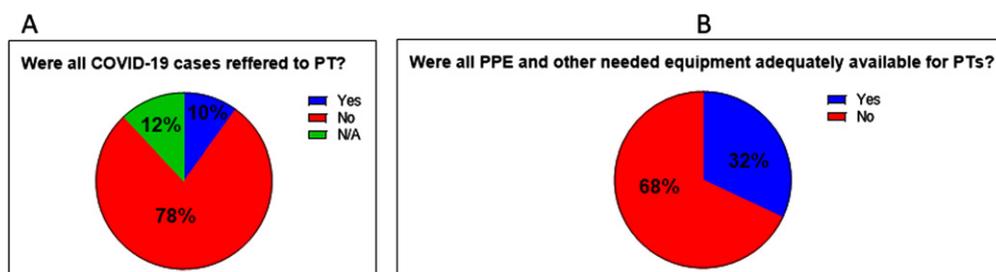


Fig. 4. Participants report on cases referral to physiotherapy (A). Participants report on the availability of PPE and other needed equipment for physiotherapists during the management of active COVID-19 cases (B).

The main challenges faced by physiotherapists while dealing with COVID-19 patients were challenges at the level of treatment skills, techniques, and communication with patients ( $n = 22$ , 44%), followed by challenges at the level of workplace policies for PT practices ( $n = 16$ , 32%), then by challenges at the level of knowledge about the disease and its progression ( $n = 14$ , 28%) (Fig. 6A).

Most of our participants got their resources on COVID-19 from general information websites ( $n = 34$ , 68%), while 58% ( $n = 29$ ) got their resources

from WHO periodic reports on the pandemic, and the least frequent information resource relied on by our participants was the WCPT periodic reports on COVID-19 ( $n = 12$ , 24%) (Fig. 6B).

#### 4. Discussion

As with other countries worldwide, Jordan faced an increased number of COVID-19 cases in three major waves during 2020 and 2021. Many physiotherapists

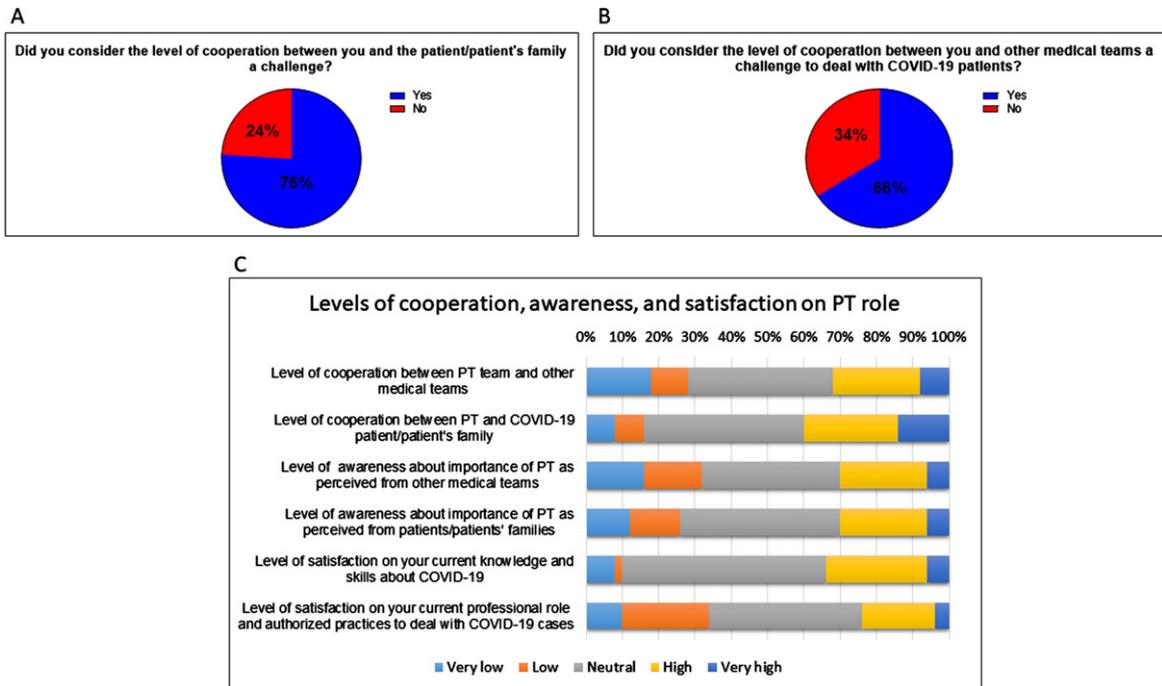


Fig. 5. Participants' perception regarding challenges faced at the cooperation level with patients and patients' families (A), and with other medical teams (B). Levels of cooperation and awareness on PT role as perceived by patients and other medical teams, and levels of satisfaction on knowledge, skills, and professional authorization during the management of COVID-19 patients (C).

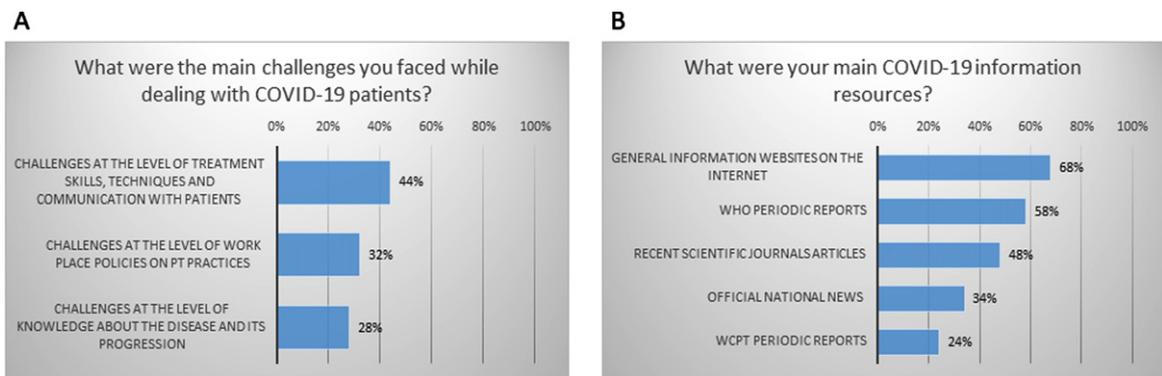


Fig. 6. Main challenges faced by participants while dealing with COVID-19 cases (A). Participants' main resources of information about COVID-19 (B).

all over the country had to deal either with active or recovered COVID-19 cases due to the respiratory and physical complications that can be imposed by the disease which require physiotherapy interventions. Rehabilitation professionals, including physiotherapists, should be in their highest level of competency to provide the service to the affected population [12]. To the best of our knowledge, no previous studies have been done to explore the experiences, knowledge, training, and challenges of physiotherapy practice

for COVID-19 in Jordan. We surveyed the eligible physiotherapists in Jordan who worked with active COVID-19 or post-COVID-19 patients in a trial to describe the profile of physiotherapy management for COVID-19 in Jordan.

#### 4.1. Education and training on COVID-19

Our results showed a substantial gap in standardized dealing with COVID-19 patients among

physiotherapists in Jordan. Despite the fact that the majority of our survey participants had received specialized training in respiratory therapy as part of their education, most of them did not receive sufficient specialized training for the rehabilitation of COVID-19 patients. Perhaps the rapid increase in the number of cases nationwide, and the urgent need to interfere clinically with the cases did not allow enough time for specialized education and training of physiotherapists. Studies on implementing standardized physiotherapy guidelines and evidence-based practice in the management of COVID-19 or any other condition have revealed that, despite the fact that there are several guidelines, it seems that physiotherapists had many barriers to implementing these guidelines and evidence-based findings into practice, such as socioeconomic, cultural differences, and time barriers. In addition to the need for technical equipment to utilize these guidelines correctly and effectively [13–16]. Also, the lack of understanding of PT's role in such pandemic circumstances led to decreased support from health and educational authorities for the importance of involving and training physiotherapists, which in turn minimizes the opportunities for receiving specialized training in COVID-19 rehabilitation [16, 17–20].

#### 4.2. *Profile of PT interventions*

The reported characteristics of physiotherapy sessions for COVID-19 patients in Jordan did not reveal any unique features from the usual physiotherapy sessions provided for non-COVID-19 cases [21]. Our study results on daily working hours and the duration of PT sessions in the intensive care unit (ICU) are consistent with a previous study on the profile of practice in Jordanian ICUs [8]. The evidence shows that patients with COVID-19 can benefit from more frequent and longer duration physiotherapy sessions during their hospital stay [22], our study results in this aspect can be utilized as a baseline for future clinical trials on maximizing the frequency and duration of physiotherapy sessions for COVID-19 and post-COVID-19 syndrome patients.

Our study also revealed the methods of assessment used by our participants for their COVID-19 patients. Although we did not ask about the specific tests or tools used for assessing the patients, we got a general impression about the methods of assessment practiced by our participants, which shows that some physiotherapists were passive recipients of COVID-19 patients, or practiced without proper assessment.

This should raise the alarm about the standards of clinical practice for physiotherapists in Jordan, and motivate towards emphasizing the independent rehabilitation-oriented assessment to be implemented by physiotherapists.

The main complications treated by our participants for their active COVID-19 cases ranged from respiratory manifestations to multisystem manifestations affecting neuromuscular, balance, and cardiac systems. The literature about the virus supports our findings as the consensus on multisystem involvement of the disease is largely expanding [23]. The long-term complications frequently treated by our participants ranged from “poor respiratory capacity” to “cognitive problems”; these post-COVID-19 symptoms are not uncommon as post-acute COVID-19 syndrome is now well defined in the literature [24]. Regarding the main physiotherapy interventions used by our participants; respiratory exercises were the most frequent intervention. Respiratory exercises are one of the cornerstones in pulmonary rehabilitation [25], which is one of the most important strategies in the rehabilitation of COVID-19 patients [26, 27]. In addition to respiratory exercises, interventions targeting neuromuscular complications were reported by most of our participants. Rehabilitation of long-term COVID-19 or post-COVID-19 syndrome patients suffering from neuromuscular complications is of great importance and forms a major part of the rehabilitation process [26, 28].

The majority of our participants believe that their interventions had achieved their goals. However, the study did not investigate the methods by which the participants measured their treatment outcomes. This can open interesting questions to answer in future studies.

#### 4.3. *Barriers and challenges*

Physiotherapists are considered key health team members dealing with cardiorespiratory disorders including COVID-19 disease [29, 30], however, our results revealed that most patients were not referred to physiotherapy, also the impression of participants about levels of awareness and cooperation between physiotherapists and other medical teams dealing with COVID-19 cases was unsatisfactory. These results are consistent with previous studies from other developing countries which showed that the lack of recognition and awareness about the role of physiotherapy in such disasters and epidemics by various medical and healthcare authorities, could explain the

limitation in physiotherapists' role in dealing with COVID-19 cases [15, 31]. In addition, there is a lack of coordination and communication between physiotherapists and key healthcare professionals that could be related to team disharmony as well as the feeling of professional inequality from other medical teams, which may contribute to inadequate involvement of physiotherapists in COVID-19 patients care [32]. Our participants mentioned other challenges facing physiotherapists during COVID-19 management, including inadequate availability of personal protective equipment (PPE). In many cases, physiotherapy treatments require close proximity between the therapist and the patient, thus, physiotherapists are at high risk of infection, and strict infection control measures should be applied during practice [33]. Like other developing countries, Jordan was suffering from a shortage of personal protective equipment, therefore, it was prioritizing the allocation of these equipment to frontline responders, which may explain the shortage of these equipment for physiotherapy staff. This also reflects the barriers and challenges, as physiotherapists were not considered frontline healthcare providers. Our results regarding sources of information on COVID-19 for physiotherapists varied between the participants and did not show a unified trend. We believe that this is an important point that should be focused on upon developing national educational and training programs for Jordanian physiotherapists. As an essential part of the health care system, physiotherapists should learn how to acquire updated, trusted information, and a high level of evidence-based guidelines of practice regarding COVID-19 prevention and management.

## 5. Limitations of the study

The major limitation we faced was the small sample of participants. This was due to the limited number of eligible physiotherapists who had experienced dealing with at least one case of active COVID-19 patient or post-COVID-19 complications. Unfortunately, there are no official numbers for physiotherapy staffing in the hospitals dedicated only for COVID-19 cases, nor could we get the average rate of referrals to physiotherapy services in these hospitals. In addition to the limitations in sample size and rates of referrals, the study results were limited to descriptive statistics and no statistical differences were evaluated regarding different workplace settings in terms of physiotherapy interventions or types of complica-

tions treated by physiotherapy. However, this study is the first to describe physiotherapy profile of practice for COVID-19 patients in Jordan and we hope our results can benefit other investigators interested in physiotherapy management for COVID-19, and provide a basis for future studies on treatment skills, education, and policies of practice in the scope of physiotherapy for COVID-19 management.

## 6. Conclusion

The COVID-19 pandemic is still ongoing in Jordan and many countries worldwide. The role of physiotherapy in the management of active and post-COVID-19 cases is growing and expanding as the complications of the disease can be combated directly by physiotherapy interventions. The results of our study provide a descriptive status of physiotherapy interventions for active and post-COVID-19 cases in Jordan. In addition, the study provides a general look at the gaps in knowledge, skills, and policies of practice that are faced by physiotherapists while dealing with COVID-19 cases and represent serious challenges that need to be taken into consideration.

## Ethical approval

This study was ethically approved by The Institutional Review Board at The Hashemite University (No. 13/8/2021/2022).

## Informed consent

Informed consent was obtained from all subjects involved in the study.

## Conflict of interest

The authors declare no conflict of interest.

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