Telerehabilitation during the COVID-19 Pandemic: Patients and Physical Therapists' Experiences

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Highlights of the Study

- This study was aimed at exploring satisfaction and attitudes of patients towards telerehabilitation during the COVID-19 pandemic, and at reporting physical therapists' (PTs) experience with the use of telerehabilitation.
- Most patients were satisfied with telerehabilitation during the COVID-19 pandemic, facing no difficulties in managing their conditions remotely.
- PTs had positive experiences with telerehabilitation during the COVID-19 pandemic using professional guidelines.
- PTs favour the use of telerehabilitation as an adjunct method during and after the COVID-19 pandemic.

Keywords

Telerehabilitation · COVID-19 pandemic · Patient satisfaction · Physical therapy patients

Abstract

Objectives: This study aimed to explore satisfaction and attitudes of patients towards the use of telerehabilitation during the COVID-19 pandemic and to report the experience of physical therapists (PTs) with the use of telerehabilitation.

Subjects and Methods: A modified Telemedicine Satisfaction and Usefulness Questionnaire was used to assess the satisfaction and attitudes of musculoskeletal patients who had received telerehabilitation services during the COVID-19

pandemic. Face-to-face semi-structured interviews were conducted with eight PTs to explore their experiences with telerehabilitation, including difficulties and benefits. **Results:** Out of 53 patients who received telerehabilitation, 46 questionnaires were completed, with a response rate of 86.8%. In general, the patients were satisfied with and had positive attitudes towards the telerehabilitation services. The majority (89.2%) of the patients felt more involved in their care via telerehabilitation and a majority (93.5%) believed that video call sessions were a convenient form of telerehabilitation during the COVID-19 pandemic. Seven out of 8 PTs reported benefits of telerehabilitation (i.e., reduced patients' waiting lists and improved access to physical therapy care). Also, they were in favour of continuing using

telerehabilitation to support the conventional physical therapy care, despite the lack of technological infrastructure.

Conclusion: The patients as well as the PTs were generally satisfied with their telerehabilitation experiences. Using telerehabilitation in Kuwait was favoured as an adjunct method during and after the COVID-19 pandemic. However, with extensive training, optimal allocation of resources, and the development of local guidelines, telerehabilitation would become an effective mean for the health delivery system in Kuwait.

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Introduction

During the COVID-19 pandemic, physical therapists (PTs) continued to deliver rehabilitation services to their patients, despite healthcare precaution measures. Thus, PTs needed to consider measures to provide safe access to PT services, and some PTs started to use telerehabilitation [1, 2]. Telerehabilitation is the “delivery of rehabilitation services at a distance using telecommunications technology to deliver healthcare” [3].

PTs are generally satisfied with the use of telerehabilitation [4–7]. However, the lack of physical contact between PTs and patients and the complexity of the technology have been found to be the main challenges. This impacted the confidence of PTs, particularly during patients’ assessment and treatment [6, 8, 9]. In the context of the COVID-19 pandemic, PTs accepted the need for remote healthcare delivery and showed positive perceptions towards telerehabilitation and a willingness to use it [10, 11]. They even modified some of the physical examination techniques, such as palpation, which patients were told to self-perform during the virtual sessions. This was intended to make telerehabilitation more feasible and acceptable during the pandemic [12, 13].

Patients have had positive perceptions of telerehabilitation services, mainly due to the huge advantages. Telerehabilitation increased the flexibility of session times and reduced the need of patients need to travel to attend clinics in person [5, 6, 14]. Moreover, physical and functional improvements were reported among patients with musculoskeletal (MSK) problems [15–17]. Patients found telerehabilitation as good as in-person sessions and they developed good therapeutic relationships with their therapists [6, 18]. In the context of the COVID-19 pandemic, several studies were conducted worldwide to assess the use and acceptability of telerehabilitation, and mixed findings were reported [11, 16, 19, 20]. For example, pa-

tients with pulmonary conditions accepted the online provisions and achieved improved clinical outcomes [11]. Likewise, patients perceived telerehabilitation as feasible and they accepted it, despite some technological challenges. However, these patients reported differences in the quality of service and preferred traditional in-person treatment over telerehabilitation care [19]. On the other hand, another study found no significant differences in patient satisfaction between those who received in-person PT and those who received telehealth PT [20].

In the State of Kuwait, only one study investigated the perceptions of and willingness to use telerehabilitation among PTs during and after the COVID-19 pandemic [10]. However, the satisfaction and attitudes of patients towards telerehabilitation during the COVID-19 pandemic were not investigated. Also, the experiences of PTs who delivered telerehabilitation services have not been thoroughly investigated. Therefore, the objectives of this study were to investigate satisfaction and attitudes of patients and to explore experiences of PTs in the use of telerehabilitation during the COVID-19 pandemic. The hypotheses were that the satisfaction and attitudes of the patients and PTs towards telerehabilitation are positive and that the use of telerehabilitation system is beneficial for PT practice during the COVID-19 pandemic and beyond. The findings from this study should inform the decision-makers in healthcare organizations with the demands, barriers, usability, and perceptions of PT telerehabilitation services during and after the COVID-19 pandemic.

Materials and Methods

Quantitative and qualitative methods were used to collect the data over a 3-month period (July–September 2020). The study was conducted at two governmental rehabilitation centres, Physical Medicine and Rehabilitation Centre and Shaikhan Al Farsi Rehabilitation Centre. The study was approved by the institutional review boards at Kuwait University and the Ministry of Health (#1478/2020), Kuwait.

Participants

Patients with MSK problems and/or pain in various anatomical areas (e.g., shoulder, lower back, knee, etc.); 18 years of age or older; male or female were included in this study. Patients were recruited from the PTs’ lists of patients, both new and old cases, who were willing to receive telerehabilitation care during the pandemic. The PTs checked patient eligibility according to the inclusion criteria in this study. Accordingly, 53 patients were eligible to participate in the study.

Eight PTs agreed to use telerehabilitation with their patients at the time that this study was conducted. The PTs had no prior experience with telerehabilitation, and they used telehealth guidelines adopted from the Australian Physical Therapy Association

[21]. The guidelines ensured the safety and quality of the practice. Some of the guidelines such as those relating to billing and claiming were not used as they were not compatible with local work policies.

Instruments

Questionnaire

The self-reported Telemedicine Satisfaction and Usefulness Questionnaire (TSUQ) was used for quantitative aspects (online suppl. Material 1; see www.karger.com/doi/10.1159/000523775 for all online suppl. material). The validity of the TSUQ was previously established [22]. The TSUQ assessed patients' attitudes, satisfactions, and experiences regarding telerehabilitation, telerehabilitation technology, and PTs. Answers were provided on a four-point Likert scale that covered various degrees of agreement (from 1 for "strongly disagree" to 4 for "strongly agree"). The questionnaire was modified to suit the PT context. The modified questionnaire was piloted with 10 patients to test the suitability and readability of the changed items. Minor feedback was provided. Education level was added as a new item. Also, the "neutral" option was removed from the Likert scale to obtain accurate answers, in case the respondents chose "neutral" as the easy option and did not properly read the questions. The modified questionnaire was evaluated for internal consistency/reliability. Finally, the TSUQ was transformed into a web survey using Google Forms and a link was obtained.

Interviews

For the qualitative part of the questionnaire, face-to-face semi-structured in-depth interviews were conducted with PTs. The aims of the interview were to identify the PTs' perspectives on their usage of and experiences with telerehabilitation, as well as the perceived benefits and difficulties of using telerehabilitation. The interview questions were developed by the study researchers to achieve the study objectives. PTs were aware that the interviews would be audio-recorded.

Procedures

Before the telerehabilitation sessions begin, a text message was sent to the subjects. The message instructs the patient to be in a quiet room suitable for the online sessions and survey. WhatsApp or Zoom was used to conduct the online session. Text messages, video clips, flyers, and illustrations of exercises were used to support the telerehabilitation care. After completing the online session, the survey link was sent to the participants through WhatsApp. A family member or caregiver was available to provide the support during the online sessions and filled the questionnaire for the elderly participants. At the start of each interview, the participant's age, gender, education level, years of work experience, and rank were obtained. Open-ended follow-up questions and probes were then used to obtain detailed descriptions. Audio-recorded interviews were transcribed verbatim.

Data Analysis

The modified questionnaire was evaluated for internal consistency/reliability using Cronbach's alpha test. Descriptive statistics were calculated for the demographic and survey data. *T* test and one-way ANOVA test were used to examine significant differences between the variables at $p < 0.05$. Data management, analysis, and presentation were implemented using SPSS (version 26.0; IBM Corp., Armonk, NY, USA).

For the interviews, thematic content analysis was performed to analyse the transcripts. Then, the coding process was done manually using word-processing software. Rigour was ensured through participant feedback; a couple of first transcripts with codes and quotations were sent back to the participants to check the accuracy of the contents. The reliability of the data was checked through peer-checking; the codes and subthemes of the main researcher and another researcher familiar with qualitative studies were compared for the first two transcripts.

Results

Questionnaire Results

Questionnaire Consistency and Rate of Completion

The modified questionnaire items were found clear and understandable. Cronbach's reliability coefficients ranged between 0.808 and 0.953, indicating that the questionnaire had a high degree of internal consistency. Only 46 TSUQs were completed out of 53, giving a response rate of 86.8%.

Patients

A majority of the patients (37%) were aged 35–50 years, whereas a minority (15.2%) were above 60 years old. While patients from age groups 18–34 years and 51–60 years were 28.3% and 19.6%, respectively. There were more females (82.6%) than males (17.4%) and more Kuwaitis (76.1%) than non-Kuwaitis (23.9%). A majority of respondents held a bachelor's degree (41.3%), while others held Diploma (23.9%), high school (28.3), and only 6.5% were below high school.

Patients' Experiences with Telerehabilitation

Patients had a positive experience with telerehabilitation, with an average weighted mean of 3.18 (Table 1). No significant differences were seen between patient demographics (ages, gender, nationality, or education levels) and their experiences with telerehabilitation ($p > 0.05$; Table 2).

Patients' Attitude towards Telerehabilitation Technology

Patients had positive attitudes towards telerehabilitation technology, with an average weighted mean of 3.2 (Table 1). Significant differences were identified between some patient demographics (ages, education levels) and their attitude towards telerehabilitation ($p > 0.05$; Table 2). In particular, patients in the age group of 35–50 years demonstrated a more positive attitude towards the telerehabilitation services than patients in the other age

Table 1. Patients' experiences, attitude, and satisfaction with PTs' performance and telerehabilitation services

Questions	Strongly agree, n (%)	Agree, n (%)	Disagree, n (%)	Strongly disagree, n (%)	Mean	SD
<i>Patients' experiences with telerehabilitation</i>						
I feel more involved in my care when using telerehabilitation system	17 (37.0)	24 (52.2)	3 (6.5)	2 (4.3)	3.22	0.758
I can explain my medical problems well during a video call	16 (34.8)	23 (50.0)	6 (13.0)	1 (2.2)	3.17	0.739
I can follow my PTs' advice better via the telerehabilitation system	14 (30.4)	27 (58.7)	4 (8.7)	1 (2.2)	3.17	0.677
Weighted mean					3.19	
SD					0.615	
<i>Patients' attitude with telerehabilitation technology</i>						
Telerehabilitation technology is easy to use	19 (41.3)	21 (45.7)	5 (10.9)	1 (2.2)	3.26	0.743
I can always trust the technology to work	15 (32.6)	25 (54.3)	4 (8.7)	2 (4.3)	3.15	0.759
It was easy to learn to use telerehabilitation technology	17 (37.0)	25 (54.3)	2 (4.3)	2 (4.3)	3.24	0.736
Weighted mean					3.22	
SD					0.689	
<i>Patients' satisfaction with PTs' performance via telerehabilitation</i>						
My PT answers my questions	31 (67.4)	15 (32.6)	0 (0.0)	0 (0.0)	3.67	0.474
My PT engages me in my care	29 (63.0)	17 (37.0)	0 (0.0)	0 (0.0)	3.63	0.488
My PT deals with my problems	29 (63.0)	16 (34.8)	1 (2.2)	0 (0.0)	3.61	0.623
My PT can get a good understanding of my medical problems during a video call	27 (58.7)	16 (34.8)	3 (6.5)	0 (0.0)	3.52	0.623
Talking to a PT on a video call is as satisfying as talking to them in person	22 (47.8)	17 (37.0)	5 (10.9)	2 (4.3)	3.28	0.834
Weighted mean					3.54	
SD					0.505	
<i>Patients' satisfaction with telerehabilitation services</i>						
My privacy is protected during video call sessions	27 (58.7)	19 (41.3)	0 (0.0)	0 (0.0)	3.59	0.498
The lack of physical contact during a video call session is not a problem	15 (32.6)	18 (39.1)	11 (23.9)	2 (4.3)	3.00	0.869
Video call sessions are a convenient form of healthcare delivery for me during the pandemic	20 (43.5)	23 (50.0)	2 (4.3)	1 (2.2)	3.35	0.674
Video call sessions save my time	22 (47.8)	20 (43.5)	3 (6.5)	1 (2.2)	3.37	0.711
Video call sessions make it easier for me to contact the PT service	25 (54.3)	16 (34.8)	2 (4.3)	3 (6.5)	3.37	0.853
My health is better than it was before I used telerehabilitation	13 (28.3)	24 (52.2)	5 (10.9)	4 (8.7)	3.00	0.869
Telerehabilitation system helps me to better manage my health and medical needs	13 (28.3)	22 (47.8)	9 (19.6)	2 (4.3)	3.00	0.816
Telerehabilitation system helps me to monitor my health condition	12 (26.1)	29 (63.0)	3 (6.5)	2 (4.3)	3.11	0.706
In general, I am satisfied with telerehabilitation system	17 (37.0)	18 (39.1)	9 (19.6)	2 (4.3)	3.09	0.865
Weighted mean					3.21	
SD					0.657	

Table 2. Comparison of the patients' attitudes and satisfaction about telerehabilitation with demographic data variables

Variables	Attitudes towards telerehabilitation experience, mean $\pm$ SD	Attitudes towards telerehabilitation technology, mean $\pm$ SD	Satisfaction with PTs' performance, mean $\pm$ SD	Satisfaction with telerehabilitation service, mean $\pm$ SD
<i>Gender</i>				
Male	2.88 $\pm$ 0.50	2.83 $\pm$ 0.43	3.47 $\pm$ 0.68	3.13 $\pm$ 0.67
Female	3.25 $\pm$ 0.62	3.26 $\pm$ 0.71	3.55 $\pm$ 0.47	3.22 $\pm$ 0.66
<i>p</i> value	0.114	0.083	0.678	0.748
<i>Age</i>				
18–34 years old	3.18 $\pm$ 0.29	3.18 $\pm$ 0.29	3.69 $\pm$ 0.54	3.26 $\pm$ 0.45
35–50 years old	3.39 $\pm$ 0.80	3.56 $\pm$ 0.63	3.71 $\pm$ 0.45	3.47 $\pm$ 0.62
51–60 years old	3.11 $\pm$ 0.37	3.14 $\pm$ 0.58	3.24 $\pm$ 0.47	2.98 $\pm$ 0.51
Above 60 years old	2.80 $\pm$ 0.70	2.52 $\pm$ 0.97	3.22 $\pm$ 0.52	3.73 $\pm$ 0.93
<i>p</i> value	0.199	0.005*	0.023*	0.047*
<i>Nationality</i>				
Kuwaiti	3.17 $\pm$ 0.63	3.22 $\pm$ 0.71	3.52 $\pm$ 0.51	3.19 $\pm$ 0.71
Non-Kuwaiti	3.24 $\pm$ 0.57	3.18 $\pm$ 0.63	3.60 $\pm$ 0.48	3.26 $\pm$ 0.46
<i>p</i> value	0.743	0.847	0.676	0.755
<i>Education level</i>				
Illiterate	2.33 $\pm$ 0.57	1.88 $\pm$ 1.01	3.00 $\pm$ 0.40	2.11 $\pm$ 1.07
High school	3.15 $\pm$ 0.64	3.25 $\pm$ 0.61	3.60 $\pm$ 0.50	3.25 $\pm$ 0.53
Diploma	3.30 $\pm$ 0.40	3.36 $\pm$ 0.45	3.58 $\pm$ 0.46	3.14 $\pm$ 0.51
Bachelor's degree and above	3.28 $\pm$ 0.63	3.31 $\pm$ 0.62	3.56 $\pm$ 0.52	3.38 $\pm$ 0.61
<i>p</i> value	0.079	0.004*	0.297	0.014*

* Indicate a significant difference.

groups. Moreover, patients who held a diploma or above had more positive attitudes towards telerehabilitation than those whose highest education level was a high school certificate.

Patients' Satisfaction with PTs' Performance via Telerehabilitation

Patients were satisfied with their PTs' performance during the telerehabilitation sessions, with an average weighted mean of 3.5 (Table 1). Significant differences were identified between some patients' demographic (age) and their satisfaction with PTs' performance ($p > 0.05$; Table 2). Patients' age group 35–50 years old were more satisfied with PTs performance via telerehabilitation than patients in the other age groups ($p < 0.05$; Table 2).

Patients' Satisfaction with the Telerehabilitation Services

Patients were satisfied with the telerehabilitation services, with an average weighted mean of 3.2 (Table 1). Significant differences were identified between some patients' demographic (age, education level) and their satisfaction with telerehabilitation services ($p > 0.05$; Table 2).

Patients between 35 and 50 years old demonstrated more positive satisfaction towards the telerehabilitation services than the patients in the other age groups. Moreover, patients who held a bachelor's degree and above were more satisfied than were the others.

Interview Results

Eight PTs, seven females, and one male participated in the interviews. Five of them were from the Physical Medicine and Rehabilitation and three were from the Shai-khan Al Farsi Rehabilitation. Four were non-Kuwaiti and four were Kuwaiti. The ages of the participants ranged between 24 and 47 years. Seven participants had a bachelor's degree, and one had a Ph.D. The number of years of work experience of the participants was 5–25 years.

Interview Themes

Telerehabilitation Practice during the COVID-19 Pandemic

All the PTs ($n = 8$) reported that the use of telerehabilitation was crucial during the pandemic, as it was considered a good alternative to avoid spreading infection. One of the PTs (PT3) stated the following: "We use telere-

habilitation to provide physical therapy for many patients to avoid physical contact that could lead to spreading the viral infection among them.” All the PTs ($n = 8$) stated that they used telerehabilitation with their patients by sending text messages and making video calls through Zoom and WhatsApp. However, the PTs stated that all their patients preferred WhatsApp video calls; this was particularly true of elderly patients because they had not encountered any difficulties in using it compared to other applications.

All the PTs ($n = 8$) confirmed that their workplaces lacked any recognized guidelines or policies for telerehabilitation, and they all agreed with the need for guidelines to organize telerehabilitation practice. One of the PTs stated the following: “*Setting up guidelines is crucial to standardise the practice at an optimum level.*” Six of the eight PTs reported that they were pleased to use the guidelines provided to them by the investigators; they considered the guidelines professional and helpful in delivering telerehabilitation services.

Adherence and Acceptance of PTs and Patients

Most of the PTs ($n = 7$) preferred telerehabilitation as an adjunct technique during and after the pandemic, and they preferred to initially examine patients in person and then continue the treatment through telerehabilitation. Most of the PTs ($n = 6$) indicated that most of their patients and their caregivers were happy with telerehabilitation. They also said that most of their patients were cooperative and followed the exercise instructions, in which young patients were more committed to attending the online sessions than elderly patients were.

Benefits of Telerehabilitation

Most of the PTs ($n = 7$) stated that telerehabilitation had helped them in reducing waiting lists, reducing their occupational stress, and improving access to physiotherapy care during the pandemic. One of the PTs stated the following: “*It helps us to manage the case load and to reduce the waiting list.*” Five of the PTs stated that telerehabilitation had saved effort and time for both them and their patients, especially patients who had problems with taking leave from work, travelling long distances, and managing the traffic. Most of the PTs ($n = 7$) confirmed that their telerehabilitation sessions had been effective, as the referral cases had achieved improved function, with less or no pain. Five of the PTs declared that telerehabilitation had helped them improve some of their clinical skills, including visual analogue scale for pain assessment, range-of-motion clinical estimation, some observational assessments, such as posture analysis, some functional as-

sessments (e.g., getting out of bed or a chair) and some neurodynamic tests. Also, telerehabilitation encouraged them to read more.

Difficulties Faced in Using Telerehabilitation

Half of the PTs ($n = 4$) reported that some patients had expressed concerns about whether telerehabilitation is as effective as hands-on interventions and machines. In addition, five of the PTs said that some patients, especially elderly patients, could not understand their instructions through online sessions to perform the required exercises, so they asked instead to come to the clinic to understand how to perform the exercises. Five of the eight PTs said that they lacked equipment and support from the information technology department, such as computer systems with cameras, microphones, and strong internet connections, which should be organized by the hospital management. Most of the PTs ($n = 7$) stated that they had experienced difficulties in performing some physical examinations through telerehabilitation, such as palpation and manual muscle tests. Two of the PTs lacked confidence in their ability to identify patients' problems and make an adequate clinical diagnosis remotely. One of the PTs (PT6) stated the following: “*I have little experience in remotely diagnosing if a problem stems from the muscle or the joint.*”

Discussion

Patients' Experiences with Telerehabilitation

In this study, most of the patients' experiences with the telerehabilitation services were positive, as they had not experienced difficulties in explaining their physical problems and following their PTs' advice via video calls. This was confirmed by most of the PTs who reported that their patients were cooperative in their responses to the exercise instructions via video call. Most of the PTs revealed that telerehabilitation had made patients more self-disciplined and autonomous in practising exercises at home. A similar finding was reported among Swedish patients [15]. Many studies also found that patients with chronic conditions consider telerehabilitation a suitable method for education and self-empowerment [23–25].

Patients' Attitudes towards Telerehabilitation as a Technology for Healthcare Delivery

We observed that most of the patients had positive attitudes towards using telerehabilitation technology. As the technological platforms should be easy to use and ac-

cessible to improve confidence and acceptance among telehealth users [5], most of the PTs in this study confirmed that patients, especially elderly patients, preferred conducting video calls through WhatsApp because they were familiar with it and found it easy to use. This is consistent with an Australian study, in which patients were happy to use telehealth to manage their chronic MSK conditions using a suitable technology to access telehealth service [6]. Using an unsuitable, non-user-friendly platform can negatively affect users' satisfaction with remote healthcare delivery [26]. This study shows that respondents in the age group of 35–50 years had more positive attitudes towards telerehabilitation services and were more satisfied with such services than those above 60. This could be because most of the former age group had a bachelor's degree or higher, and their ability to use and learn new technology would be better than older patients. So, this might have given them greater awareness of the benefits of using these services. This was confirmed by interviews in which the PTs reported that young and middle-aged patients were more committed to attending online sessions compared to elderly patients. A previous study found that the education levels of patients impact their awareness of telemedicine technology [27], indicating that the better educated individuals are, the more willing they are to use technology [11, 27, 28]. In Saudi Arabia, training sessions were provided for elderly patients to increase their understanding of telerehabilitation and their subsequent satisfaction with its usefulness [29]. Furthermore, the use of a hybrid service of face-to-face visit and telerehabilitation was more accepted by elderly patients [26].

Patients' Satisfaction with Performance of PTs

In this study, most of the patients were satisfied with their PTs' performance during telerehabilitation sessions, in particular the instructions they received and their usefulness. Most of the PTs in the interviews reported that telerehabilitation had enhanced some of their clinical skills in managing patients via video calls. Similar studies have reported that patients developed strong therapeutic relationships with their therapists via telehealth [6, 18]. However, the interviews revealed that a lack of information technology support, a shortage of advanced equipment (e.g., computers with cameras), and a lack of strong internet connections had affected the PTs' performance and usage of telerehabilitation, which was also confirmed by previous studies [8, 26]. In Sweden, patients acknowledged that the continuous feedback and motivation from their therapists to practise exercises increased their self-discipline [15]. Another study from Poland, where telere-

habilitation was offered during the COVID-19 pandemic to 69 children with Duchenne muscular dystrophy, found that both Duchenne muscular dystrophy patients and their caregivers were more willing to continue using home-based rehabilitation because of the PTs' guidance through online communication and videos [30]. On the contrary, patients in other studies reported that they had lost therapy motivation because their healthcare professionals had not paid attention to their performance during online sessions [16]. This highlights the importance of continuous feedback and proper guidance in motivating patients to perform their exercises at home, alongside following up and monitoring their progress.

Patients' Satisfaction with the Telerehabilitation Services

The findings show the patients' general satisfaction regarding their experiences with the telerehabilitation services. The findings reveal that there was an improvement in the patients' health after telerehabilitation care. Similarly, most of the PTs stated in the interviews that their patients were happy with the telerehabilitation care they had received. This was due to the advantages of telerehabilitation in reducing waiting lists and improving access to PT services, particularly during the pandemic. These findings are consistent with those of previous studies [5, 6, 14, 16]. Our interviews revealed that the telerehabilitation care delivered was effective, as some patients were cured, in terms of pain and function, and became more independent, similar to previous studies [23–25]. PTs managed to use and modify several assessments for remote use, such as visual analogue scale for pain assessment. However, most of the PTs reported the lack of physical assessments in remote rehabilitation, such as palpation and manual muscle tests, which can help to properly diagnose physical problems. This finding was also reported in previous studies [6, 8, 9].

In the context of the COVID-19 pandemic, researchers conducted a systematic review to identify the most appropriate MSK assessments for PT during remote sessions. As a result, a framework for remote MSK assessments consisting of modified traditional tests was constructed as a practical guide for primary care settings [12]. Another study identified a set of virtual MSK examination guidelines, both written and visual, when evaluating the shoulder, hip, knee, ankle, cervical spine, and lumbar spine to facilitate and demonstrate specific physical examination techniques that the patient can self-perform during remote sessions, such as palpation and muscle strength tests [13].

In a recent Kuwaiti study, PT managers working in governmental hospitals reported that patients' privacy and confidentiality were considered barriers for telerehabilitation use [10]. However, in the present study, all the patients believed that their privacy had been protected while using the telerehabilitation services. Nevertheless, all the PTs interviewed said that following guidelines properly would help to secure privacy for patients and maintain the rights of both patients and healthcare providers.

Clinical Implications

This is the first-ever study in Kuwait to examine telerehabilitation during the pandemic, from patients and PTs' perspectives. Based on the study findings and interviews, several recommendations are suggested: (1) improve the public's awareness of telehealth services and their benefits, particularly during the pandemic; (2) train PTs in professional ways to deliver telehealth services, including rehabilitation care; and (3) develop policies and guidelines to standardize care and organize the process to ensure safe and effective practice. Moreover, an online helpdesk could be implemented to provide guidance and support for patients (particularly elderly patients) in utilizing telerehabilitation services.

This study had at least two limitations; firstly, only telerehabilitation patients with MSK conditions were surveyed, and patients from private hospitals or centres were excluded from this study, due to differences in work policies – these factors limit the generalizability of the results beyond the study sample. Secondly, the study relied on self-reported data; thus, the participants may not have recalled all relevant information. Future studies should consider other areas of PT practice, such as neurology, paediatric, and pulmonary rehabilitation that would benefit from the adoption of comprehensive telerehabilitation guidelines in the state of Kuwait.

Conclusion

This study found that patient satisfaction with the use of telerehabilitation for MSK problems was high, especially among younger and better educated patients. We conclude that there is general satisfaction and acceptance among patients and PTs with telerehabilitation care, confirming the benefits of remote healthcare delivery. Telerehabilitation was preferred as an adjunct service during and after the pandemic. With extensive training, resources allocation, and the development of

local guidelines, telerehabilitation would become an effective mean for the health delivery system in the State of Kuwait.

Statement of Ethics

Ethical approval for data collection was obtained from the Research Committee of the Ministry of Health, Kuwait (Reference Number: 2020/1479). The study was conducted in accordance with the principles and guidelines of the Declaration of Helsinki for medical research involving human subjects. The informed consent form was obtained from each participant who agreed to participate in completing the questionnaire or the interview.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

Ali Jasem Buabbas, Sarah Ebraheem Albahrouh, Hesham N. Alrowayeh, and Hamza Alshawaf were responsible for the conception of the study, design of the questionnaire, research strategy, acquisition of data, analysis and interpretation of data, drafting the manuscript, critical revision, and final approval of the manuscript.

Data Availability Statement

The datasets used and/or analysed in the current study are available from the corresponding author on reasonable request. The TSUQ was used for quantitative aspects.

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