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ความเข้าใจของนักกายภาพบำบัดและความพร้อมของการให้บริการกายภาพบำบัดทางไกลในโรงพยาบาลเขตกรุงเทพมหานครและปริมณฑลสำหรับผู้ป่วยระบบกระดูกและกล้ามเนื้อ

UNDERSTANDING OF PHYSICAL THERAPISTS AND PREPAREDNESS OF PHYSICAL THERAPY TELEREHABILITATION IN BANGKOK AND VICINITY: MUSCULOSKELETAL SYSTEM

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บทคัดย่อ

ปัจจุบันมีการนำเทคโนโลยีมาใช้ทดแทนเพื่อให้ผู้ป่วยสามารถเข้าถึงการบริการกายภาพบำบัดได้สะดวกมากขึ้นในรูปแบบของการให้บริการกายภาพบำบัดทางไกล (PT Telerehabilitation) เพื่อลดการแพร่ระบาดของไวรัสโคโรน่า 2019 ซึ่งการบริการดังกล่าวต้องอาศัยทั้งความเข้าใจของนักกายภาพบำบัดและความพร้อมของสถานพยาบาล อย่างไรก็ตามปัจจุบันยังไม่มีการสำรวจข้อมูลดังกล่าวจากโรงพยาบาลในเขตกรุงเทพมหานครและปริมณฑล ซึ่งเป็นบริเวณที่มีประชากรหนาแน่นและความสามารถในการเข้าถึงเทคโนโลยีได้ เพื่อศึกษาระดับความเข้าใจของนักกายภาพบำบัดและระดับความพร้อมในการให้บริการกายภาพบำบัดทางไกลในโรงพยาบาลเขตกรุงเทพมหานครและปริมณฑล สำหรับผู้ป่วยระบบกระดูกและกล้ามเนื้อ การวิจัยครั้งนี้เป็นงานวิจัยเชิงสำรวจโดยการใช้แบบสอบถามผ่าน Google Form โดยผู้ตอบแบบสอบถามเป็นนักกายภาพบำบัดที่มีความเชี่ยวชาญทางระบบกระดูกและกล้ามเนื้อในโรงพยาบาลเขตกรุงเทพมหานครและปริมณฑล จำนวนนักกายภาพบำบัดตอบแบบสอบถามทั้งหมด 163 คน มาจากโรงพยาบาลเอกชน 100 คน และโรงพยาบาลรัฐบาล 63 คน พบว่านักกายภาพบำบัดมีความเข้าใจในการให้บริการกายภาพบำบัดทางไกลในภาพรวมอยู่ในระดับมาก โดยมีความเข้าใจในด้านกฎหมาย และองค์ประกอบในการให้บริการมากที่สุด และมีความพร้อมในภาพรวมและเฉพาะด้านกระดูกและกล้ามเนื้ออยู่ในระดับปานกลาง เพื่อสนับสนุนการให้บริการกายภาพบำบัดทางไกลมีประสิทธิภาพมากขึ้น นักกายภาพบำบัดควรได้รับการพัฒนาความรู้ความเข้าใจในเรื่องประเภทของการให้บริการกายภาพบำบัดทางไกลเพื่อให้สามารถเลือกประเภทในการให้บริการให้กับผู้ป่วยแต่ละคนได้อย่างเหมาะสม นอกจากนี้ยังต้องมีการพัฒนาระบบเทคโนโลยีในการให้บริการ การสื่อสาร รวมถึงสถานที่ในการให้บริการเพื่อให้เกิดประสิทธิภาพในการดูแลผู้ป่วยมากยิ่งขึ้น

คำสำคัญ: กายภาพบำบัด; การให้บริการกายภาพบำบัดทางไกล; ระบบกล้ามเนื้อและกระดูก; ความพร้อม; ความเข้าใจ

Abstract

Nowadays technologies have been adopted to improve patient access to rehabilitation services in the form of PT telerehabilitation to reduce the spread of COVID-19. The services require physical therapists' understanding and hospital preparedness. However, currently, there is no survey on such information from hospitals in Bangkok and outskirts of Bangkok, the areas with high population density and technology accessibility. This research aimed to study the level of physical therapists' understanding and preparedness for PT telerehabilitation services of hospitals in Bangkok and outskirts of Bangkok for patients with musculoskeletal problems. The study was conducted based on exploratory research design using a questionnaire on Google Form. Respondents were physical therapists who specialize in musculoskeletal system of hospitals in Bangkok and outskirts of Bangkok. The findings from the study showed that among 163 physical therapists who responded to the questionnaire, 100 persons came from private hospitals and 63 persons came from government hospitals. It was found that the physical therapists had overall understanding about PT telerehabilitation services at a high level except the understanding in the types of PT telerehabilitation which was in moderate level. They understood laws and elements for services the most. They had overall preparedness at a moderate level. In conclusion, to support PT telerehabilitation to gain more efficiency, physical therapists should be developed to have knowledge and understanding about types of PT telerehabilitation services so that they will be able to select appropriate service types that meet each patient. Besides, technology system for services should be developed as well as communication, places where services are provided to achieve more efficiency in caring for patients.

Keywords: Physical Therapy; Telerehabilitation; Musculoskeletal; Preparedness; Understanding

Introduction

According the COVID-19 pandemic, with more than 650 million infections and over 6.6 million deaths recorded worldwide [1], rapid measures were introduced to prevent its spread; for example, refraining from holding mass gatherings, refraining from travelling in crowded public transport, preventive methods in public health system to reduce its spread among medical workers, patients, and their relatives. Methods for service providing were changed to be online in the form of telehealth services.

Physical therapy services require a great deal of physical closeness and exposure to patients, probably causing a risk for the spread of infectious diseases that affect several physiological systems including physical and mental impairments [2]. Therefore, physical therapists must be involved to help patients recover the physical function and return to work as quickly, safely, and effectively as possible [3]. Musculoskeletal problem is one of the conditions are found in all age ranges. Although, these illnesses do not require emergency treatment, if patients have physical pain, it may result in a lower in quality of life and decrease a performance in their career. The hospitals in Bangkok and outskirts of Bangkok, both government and private hospitals have

a huge number of people receiving physical therapy services. Because of their opportunities for people to access necessary information technology, PT telerehabilitation system is an option that can be used to replace services provided at hospital to reduce crowding in hospitals and prevent the spread of COVID-19 and other diseases.

Over more recent years, alternative modes for delivering healthcare, such as telehealth have been adopted by many healthcare professions. Specific to the field of physical therapy, the pandemic has required the physical therapy profession to consider digital physical therapy practice as a method to deliver healthcare services. In addition, the current study showed that most of the physical therapists were willing to use telerehabilitation [4]. Moreover, many studies demonstrated high levels of patient satisfaction with telerehabilitation when in-person services were not available during the COVID-19 crisis [5-7].

The recent studies indicated that PT rehabilitation services for musculoskeletal conditions were efficient in both physical examination and treatment [8, 9]. The previous studies found that PT telerehabilitation provided to patients with shoulder [10] and low back pain [11, 12] gave results similar to treatment provided at a clinic. In addition, the evidences revealed that patients after undergoing hip and knee replacement surgery could improve their quality of life, range of motion, and reduced their pain after receiving PT rehabilitation [13, 14].

However, PT rehabilitation services are new technology in Thailand. It is possible that physical therapists do not under understanding about service providing or do not have preparedness for the services.

Objectives

This research was conducted to study the level of physical therapists' understanding and preparedness about PT rehabilitation services to be used as a guideline for developing PT rehabilitation system in Thailand accordingly.

Methods

Sample size calculation

Since there is no similar study done in thailand and unknown the number of overall physical therapists poppulation, sample size was calculated by using the Khazanie (1996) formula [15]. formula; 95% confidence interval, 5% precision. The sample size was estimated as follows:

$$n = \frac{z^2_{\alpha/2}}{4E^2}$$

The final sample size is 385 which was the proportion of orthopedics physical therapist 150 sample. The sample size is left over from another neurology and pediatrics physical therapists.

Subjects

In this study, survey research using the questionnaire was used to study the understanding of physical therapists and preparedness of musculoskeletal physical therapy telerehabilitation in Bangkok and outskirts of Bangkok. Study population are the physical therapists working at hospitals in Bangkok and outskirts of Bangkok who are registered and hold a license to practice physical therapy, with no less than 2 years of work experience

in musculoskeletal system and be able to respond to the online questionnaire on Google Form. This research was approved by the Human Research Ethics Committee of Srinakharinwirot University (SWUEC/E-457/2564).

Instruments

The research questionnaire was divided into 3 sections, i.e. general information of physical therapist, understanding about PT rehabilitation services, and preparedness for PT rehabilitation services. The response of research questionnaire for understanding about PT telerehabilitation was five sections true or false questions and for the preparedness was a 5-point Likert-type rating scale ranging from 1-strongly preparedness to 5-strongly preparedness. The questionnaire was examined by experts using item-objective congruence index (IOC) which had an acceptable consistency reliability.

Questionnaire Development

Questionnaires were created specifically for this study. Questions regarding the understanding and prepradness of physical therapists were prepared with the physical therapy telerehabilitation recommendation addressed by the American Physical Therapy Association [16]. The initial questionnaire was rated by 3 experts involved in the provision of physical therapy, and the item-level content validity index was 0.99. Minor changes in the questionnaire were made based on the suggestions received by the experts to make it more readily understandable to the subjects.

Statistical analysis

This study was analyzed descriptive statistics in demographic data that shown in percentage (nominal scale) and average score (± standardized deviation) (interval scale). The understanding about PT rehabilitation services and preparedness for PT rehabilitation services were shown average score (± standardized deviation) in overall and each section.

Results

According to Table 1, of the 163 participants, 61.3% was a physical therapist working in private hospitals and 38.7% working in government hospital. Most of participants age between 20-30, followed by those with 30-40 years, 41-50 years and 51 years of age and above, respectively. Most of them have more than 10 years work experience in physical therapy while only 14.1% have practiced PT telerehabilitation services.

Table 1 Descriptive Characteristics of Physical Therapist Participants.

Demographic variable	**No. (%)**
Age (year)	
20 - 30	70 (42.9)
31 - 40	57 (35.0)
41 - 50	24 (14.7)
Above 51	12 (7.4)
Year of Physical Therapy Experience	
2-5	50 (30.6)

Table 1 (Continued).

6-10	41 (25.2)
Above 10	72 (44.2)
Hospital Setting	
Government Hospital	63 (38.7)
Private Hospital	100 (61.3)
Physical Therapy Telerehabilitation Experience	
Yes	23 (14.1)
No	140 (85.9)

Data was recruited from 163 participants who responded to the questionnaire. All data expressed as number of participant (percentage).

Understanding of physical therapist to the use of PT telerehabilitation.

Of the 163 participants, all of them had understanding about the meaning of PT telerehabilitation services (0.99 ± 0.1), laws and regulations (3.45 ± 0.7), the components of PT telerehabilitation service (4.07 ± 0.5) and the role of PT telerehabilitation provided to patients with musculoskeletal problems (4.37 ± 0.6) in high level. Whereas average scores of the understanding about types of PT telerehabilitation were at the moderate level with the lowest mean score (2.95 ± 0.5). The results also showed that participants had understanding about subtypes of PT telerehabilitation such as audio-based technology service providing and web-based technology service providing at the low level. The pattern of understanding in all topics was found in the same direction both in participant from private hospital and government hospitals.

Table 2 Understanding of physical therapists to the use of PT telerehabilitation.

Topic	All participants (N=163)		Participant from government hospital (N=63)		Participant from Private hospital (N=100)	
	Average score	Understanding level	Average score	Understanding level	Average score	Understanding level
1. Definition of PT telerehabilitation	0.99 ± 0.1	High	1 ± 0	High	0.98 ± 0.1	High
2. Types of PT telerehabilitation	2.95 ± 0.5	Moderate	2.93 ± 0.6	Moderate	2.96 ± 0.5	Moderate
2.1 Image-based telerehabilitation	0.93 ± 0.2	High	0.93 ± 0.2	High	0.93 ± 0.3	High
2.2 Virtual reality telerehabilitation	0.94 ± 0.2	High	0.93 ± 0.2	High	0.95 ± 0.2	High
2.3 Audio-based technologies	0.04 ± 0.2	Low	0.06 ± 0.2	Low	0.02 ± 0.1	Low
2.4 Web-based technology	0.11 ± 0.3	Low	0.07 ± 0.3	Low	0.13 ± 0.3	Low

Table 2 (Continued).

2.5 Vision-based technology	0.92 ± 0.3	High	0.92 ± 0.3	High	0.93 ± 0.3	High
3. Laws and regulations	3.45 ± 0.7	High	3.49 ± 0.7	High	3.42 ± 0.7	High
4. Components of PT telerehabilitation services	4.07 ± 0.5	High	4.11 ± .05	High	4.06 ± 0.5	High
5. Musculoskeletal PT telerehabilitation	4.37 ± 0.6	High	4.49 ± 0.6	High	4.30 ± 0.6	High

Data expressed as mean ± S.D. Full score for Definition of PT telerehabilitation and all subtypes of PT telerehabilitation is 1. Full score for Types of PT telerehabilitation, Laws and regulations, Components of PT telerehabilitation services and Musculoskeletal PT telerehabilitation is 5. Understanding level was classified into 3 levels: High (score 3.34 - 5.00), moderate (score 1.67 - 3.33), and Low (score 0.00 - 1.66) for questions number 2-5 and classified into 3 levels: High (score 0.67 – 1.00), moderate (score 0.34 – 0.66), and Low (score 0.00 - 0.33) for question number 1 and 2.1-2.5.

Preparedness of the Bangkok and vicinity hospital in the use of PT telerehabilitation.

The overall results demonstrated that the preparedness for the use of PT telerehabilitation was at moderately level both private hospital and government hospitals. The average score was highest in both skills related to the delivery of services using telerehabilitation technologies (3.4 ± 0.9) and the specific skills in musculoskeletal PT telerehabilitation (3.4 ± 0.9). The lowest score was found in the place to deliver PT rehabilitation service, such as calmness, safety, and privacy (3.1 ± 1.1) and service equipment and internet signal (3.1 ± 1.1). The top 3 diseases or conditions that participants had preparedness for service providing the most were low back pain, total knee arthroplasty and osteoarthritis, respectively.

Table 3 Preparedness of the Bangkok and vicinity hospital in the use of PT telerehabilitation (N=163).

Topic	All participants (N=163)		Participant from government hospital (N=63)		Participant from Private hospital (N=100)	
	Average score (Mean ± S.D.)	Understanding level	Average score (Mean ± S.D.)	Understanding level	Average score (Mean ± S.D.)	Understanding level
Overall preparedness of the physical therapist	3.3 ± 0.9	Moderate	3.3 ± 0.9	Moderate	3.3 ± 0.9	Moderate
Privacy place	3.1 ± 1.1	Moderate	3.0 ± 1.0	Moderate	3.2 ± 1.1	Moderate
Service equipment and internet signal	3.1 ± 1.1	Moderate	3.0 ± 0.9	Moderate	3.2 ± 1.2	Moderate

Table 3 (Continued)

Service providing system (I.e., documentation)	3.3 ± 1.0	Moderate	3.1 ± 1.1	Moderate	3.4 ± 1.0	Moderate
Skills related to the delivery of services using telerehabilitation technologies	3.4 ± 0.9	Moderate	3.3 ± 0.9	Moderate	3.6 ± 0.9	Moderately high
Preparedness of physical therapist to musculoskeletal PT telerehabilitation	3.4 ± 0.9	Moderate	3.5 ± 0.9	Moderate	3.4 ± 0.9	Moderate
Top 3 conditions ready for the use of PT telerehabilitation	Percentage		Percentage		Percentage	
1. Low back pain	44.4		30.2		53.0	
2. Total knee arthroplasty	29.0		33.3		26.0	
3. Osteoarthritis of knee	19.1		28.6		13.0	

Data expressed as mean ± S.D. The preparedness was classified into 5 level: High (score 4.51-5.00), Moderately high (score 3.51-4.50), moderate (score 2.51-3.50), Low to moderate (score 1.51-2.50) and Low (score 1.00-1.50). The top 3 conditions ready for the use of PT telerehabilitation expressed as percentage.

Conclusions and Discussion

According to the research results, the physical therapists in hospitals in Bangkok and outskirts of Bangkok had understanding about PT telerehabilitation services overall at a high level, especially PT rehabilitation services for patients with musculoskeletal problems and they had skills in using equipment and technologies the most.

The study results revealed that the participants had understanding about the meaning of PT telerehabilitation services, components of PT telerehabilitation services, including related laws and regulations at a high level. It is possible that, during COVID-19 pandemic, currently remote health service is provided to treat patients by various fields of careers, such as physicians or pharmacists. Public relations have been conducted on such service in different channels, making people including health science personnel able to access information and practice guidelines increasingly. In addition, in 2021, the Physical Therapy Council issued the notification regarding Standards of Service in Respect of Medical Facilities via Telemedicine System, which prescribed the meaning of PT telerehabilitation including service system and PT telerehabilitation services, enabling physical therapists to have more channels to seek information from. These operation was in accordance with the study of Saito T suggested that PT telerehabilitation shall succeed when physical therapists have knowledge and understanding about PT telerehabilitation information [17].

The scores of understandings about types of PT telerehabillitation were at a moderate level and they had the lowest scores on audio-based and Web-based technology. It is possible that physical therapists did

not know about details about types of PT telerehabilitation and were confused between audio-based technology and vision-based technology that similarly uses communication modality on voice production. Physical therapists had low level on audio-based that may not see the benefit of non-visual communication because of only listening and no feedback. Moreover, many hospitals do not have their own websites that support web-based services and must have a company that operates the system and users log on to the system using the Web [18]. It is more difficult compared to vision.

Besides, such technique is not widely known. The results from this study indicated that physical therapists who had experience in PT telerehabilitation provided vision-based technology services, consistent with a study conducted by Brian Fiani showing that though audio-based technology service is performed over smartphones, vision-based technology service or other forms of services that allow physical therapists to communicate over images or videos can give more confidence to patients and risk reduction [19]. Therefore, selecting types of PT telerehabilitation to be suitable for patients is important, making services become successful and gain maximum efficiency.

Understanding about the PT rehabilitation for patients with musculoskeletal problems among physical therapists was at a high level. At present, most musculoskeletal system services are focused on exercise programs and gesture adjustment. Research studies in 2020 [20] found that exercise-based treatments in conjunction with providing knowledge about methods for daily routine adjustment could help patients better relieve from pain than undergoing manual technique treatments or using physical therapy equipment only. Research studies in 2019 found that exercise-based treatment programs using PT telerehabilitation system, compared to medical care provided in a clinic, gave the same treatment outcomes [13]. Both private and government hospital in Bangkok and vicinity have a huge number of patients undergo services per day. Thus, physical therapists have extensive and various experiences for treating patients by means of service techniques within a limited time. As a consequence, it is necessary to give exercise programs or self-care recommendation to patients to look after themselves at home. However, physical therapists in both government and private hospitals need to update their knowledge about treatments regularly. Today there are a great number of exercise-based treatment guidelines that can be applied to recommendations given through PT telerehabilitation services for patients with musculoskeletal problems.

According to the study results, the top two preparedness physical therapists had the most were skills in using PT telerehabilitation equipment and technologies and service providing system. It is possible that nowadays, during COVID-19 pandemic, meeting, working or communicating between each other are performed online more and more. Meanwhile, many hospitals increase online service providing during the COVID-19 pandemic. Moreover, hospitals collect data electronically while patient data management system and cyber security system are available in hospitals as today's hospital standards, making physical therapists familiar with using relevant equipment, technologies, and systems. Preparedness of those systems shall facilitate the development of PT telerehabilitation in the future, consistent with the study conducted by Saito T [17] indicating that factors related to technologies, communication, and internet signal of service system play an important role in enabling PT telerehabilitation to achieve efficiency and gain trust from patients. Nonetheless, there was a lower mean score of preparedness for place, such as calmness, safety, and privacy than other aspects. It is

possible that hospitals in Bangkok and outskirts of Bangkok have space limitation, especially private hospitals that are constructed in a limited space. Space utilization in each hospital zone must be ensured it reaches maximum value; therefore, calm and quite places are not enough for service.

The study showed that the participants had preparedness for PT telerehabilitation services for musculoskeletal system at a high level. The top 3 diseases or conditions that the participants had preparedness for service providing the most were low back pain, total knee arthroplasty and osteoarthritis the most, respectively. All these three diseases or conditions are the most found at present and explicit treatment guidelines are available like exercise and daily routine adjustment [21, 22]. The research studies in 2019 revealed that PT telerehabilitation given to patients suffer from low back using web-based technology for McKenzie therapy gave the same results as medical care provided in a clinic [11]. Besides, treatments using vision-based technology service given to patients with total knee arthroplasty [14, 23] and knee osteoarthritis showed that patients had symptom improvement and better physical function while patients undergoing the treatments accepted such type of services [24, 25].

Currently, the PT telerehabilitation has become more widely used. To meet the needs of Thailand's health system that faces challenging situations in all areas, such as hospital overflow, inequity, and difficult access to treatment in rural and wilderness areas. Being an aging society, which is expected to quickly enter into a complete aging society. The frequency of new and re-emerging diseases is increasing. People must live a new normal way of life, resulting in PT telerehabilitation system becoming a convenience for the people in terms of transportation and save time for waiting in line. Reduce the chance that patients have to leave their homes. Reduce the number of people inside the hospital and increase safety from disease as well. When physical therapists had understanding and preparedness of physical therapy that can encourage using telerehabilitation in musculoskeletal system at Bangkok and Vicinity.

Age ranges and work experience of the respondents may have an effect on attitude towards and skills in using advanced technologies. Therefore, if further survey is required, age ranges and work experience should be more distributed and varied to ensure results obtained shall meet the fact increasingly.

PT telerehabilitation services require both the understanding of physical therapist and the preparedness of the hospital. To achieve efficiency, physical therapists should be developed to understand methods, regulations, laws, especially types of telerehabilitation for being able to select for patients to meet necessity and requirement the most. Besides, preparedness for place, equipment, internet signal, technologies for PT telerehabilitation services and skills in using equipment should be available to ensure PT telerehabilitation can be served as completely as possible. Despite the lack of physical contact with patients, the PTs agreed that telerehabilitation would offer patients an easy method of being prescribed a therapeutic programme, save time and money, and maintain patient privacy. Further, the PTs reported barriers and suggested adaptations for this method of service delivery.

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