Tele rehabilitation technologies for the older adults in Algeria during Covid-19 era: Status-quo, horizons, and the obstacles
An analytical descriptive study for the view of a sample of the physical treatment experts in Algeria

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Abstract

This study aims at revealing the status-quo and the horizons of adopting the telerehabilitation technology for the older adults from the view of a sample of physical treatment experts in Algeria during Covid-19 era and the obstacles of its application. Findings show that the experts' evaluation of the horizons of adopting the technique of telerehabilitation in Algeria during Covid-19 era is low. The author recommends organizing training sessions in the domain of telerehabilitation for the physical treatment experts and patients. Moreover, he recommends mixing the telerehabilitation with the traditional one.

Keywords: Telerehabilitation technique; Covid-19; older adults; physical treatment.

تكنولوجيا إعادة التأهيل عن بعد لكبار السن في الجزائر خلال جائحة كوفيد 19:
الواقع والآفاق ومعيقات التطبيق
دراسة وصفية تحليلية لوجهة نظر عينة من المختصين في العلاج الفيزيائي في الجزائر

ملخص

هدفت هذه الدراسة إلى الكشف عن واقع وآفاق اعتماد تكنولوجيا إعادة التأهيل عن بعد لكبار السن من وجهة نظر المختصين في العلاج الفيزيائي في الجزائر خلال جائحة كوفيد19 ومعيقات تطبيقها.

وقد كشفت نتائج الدراسة أن تقييم المختصين لآفاق اعتماد تقنية إعادة التأهيل عن بعد في الجزائر في ظل انتشار فيروس كورونا كان ضعيفا، وأوصى الباحث بعقد دورات تدريبية في مجال إعادة التأهيل عن بعد لكل من المختصين في العلاج الفيزيائي والمرضى ، وضرورة المزاوجة بين النمط التقليدي لإعادة التأهيل وجها لوجه وإعادة التأهيل عن بعد.

الكلمات المفاتيح: تقنية إعادة التأهيل عن بعد، فيروس كورونا، كبار السن، العلاج الفيزيائي.

Technologies de télé réadaptation pour les personnes âgées en Algérie pendant la pandémie du Covid-19 : statu quo, horizons et obstacles

Résumé

Cette étude vise à révéler la réalité et les perspectives de l'adoption de la technologie de télé-réadaptation pour les personnes âgées du point de vue des physiothérapeutes en Algérie pendant la pandémie de COVID-19 et les obstacles à son application.

Les résultats ont révélé que l'évaluation par les experts des horizons de l'adoption de la technique de télé réadaptation pendant cette période est faible. L'auteur recommande d'organiser des séances de formation dans le domaine de la télé réadaptation pour les experts en traitement physique et les patients. De plus, il recommande de mélanger la télé réhabilitation avec la méthode traditionnelle.

Mots- clés: Télé réadaptation; COVID-19; personnes âgées; traitement physique.

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1. Statement of the problem

Covid-19 pushed all the governments worldwide to impose stringent policies, mainly the lockdown, on all the levels to guarantee the social distancing in an attempt to control the spread of the virus, reduce the pressure on the healthcare units, and reorient the resources towards high levels to take care of Covid-19 patients(1).

Healthcare for the chronic diseases patients and the older adults has been strongly affected due to Covid-19 because most of the efforts of the health organizations had focused on the effects of the pandemic and its spread. The circumstances the world witnessed showed the necessity of telemedicine and phone and online medical services. However, the health organizations in the developing countries still suffer the absence of the factors of success.

The world now is about to witness the 5th wave of the pandemic. Some countries are moving towards the preventive measures and lockdown. This requires the telemedicine to reduce the negative effects of the pandemic on the healthcare system. In response to this new situation, the natural healthcare personnel must find alternatives and solutions to provide the necessary healthcare for patients(2).Noticed that the single current circumstances that are simultaneous with Covid-19 era will allow the emergence of a new style that is about providing telerehabilitation on a large scale(3).

Some studies in the developed countries noted that it is possible to use the telerehabilitation for the older adults who suffer motor or cognitive disabilities. It proved its efficiency compared to the traditional one (face to face) for those who live far in the rural areas and cannot have easy access to healthcare by specialists in the natural treatment. However, despite that distant healthcare has may advantages such as the easy access of the patients to the specialized healthcare, saving the transportation fees, reducing the medical appointments, and the easy coordination between the patients and therapists, it has not been fully taken advantage of because there is not much demand on this service especially by the older adults because they believe it is a cultural change and feel uncomfortable and afraid about modern technology(4).

Unlike the developed countries that established telerehabilitation systems for the motor and cognitive disabled patients, the patients in the underdeveloped countries face many obstacles on the personal and technical levels. As for the personal level, some studies pointed out to the fear of patients of giving their personal information(5).

the need of high levels of the physical, emotional, and cognitive efforts of the patients(6), and the appearance of stress and depression symptoms for the older adults when using the information and communications technologies ICTs namely the internet(7). Concerning the technical level, the obstacles are related to the lack of the technical resources and low access of internet in the houses and lack of doctors and experts in using the modern devices and the specialized software(8). These obstacles, namely the psychological, may vanish with the use of the hybrid method as an auxiliary type to adapt with the modern technology(9). Some studies confirmed the existence of a positive correlation between the use of the computer and the cognitive function for the older adults(10). This is because the older adults who have better cognitive capacities are the most who accept the use of the modern technology since the educational level is one of the determinants of the technology use by the older adults(11).

and the individuals who have higher education degrees lean to acquire new skills in a more effective way(12).

Despite the widening of the telemedicine and telerehabilitation services and the increase of interest in these services in other developed countries, there are still big challenges and obstacles that hinder them in the less developed countries such as Algeria despite the urgent need to bridge the gap between the increasing demand and the supply of the telerehabilitation services namely during the unprecedented circumstances such as Covid-19 where face to face services are difficult to access.

The biggest challenge is the acceptance of this technique by the experts in rehabilitation and physical treatment. Their acceptance or refusal affects the success of this style of rehabilitation[(13)].

Based on what has been said, this study aims at revealing the status-quo, horizons, and the obstacles of applying the telerehabilitation technology for the older adults in Algeria during Covid-19 pandemic as seen by some experts in the physical treatment in Algeria. Thus, we aim at answering the following questions:

1- What is the status-quo of using the telerehabilitation for the older adults during Covid-19 from the view of some experts in the physical treatment?

2- What are the horizons of adopting the telerehabilitation for the older adults during Covid-19 from the view of some experts in the physical treatment?

3- What are the obstacles of applying the telerehabilitation from the view of some experts in the physical treatment?

2. Aims of the study

This study aims at revealing the extent of the application and acceptability of the technology of telerehabilitation for the older adults during Covid-19 from the view of some experts in the physical treatment. Moreover, it aims at finding the future horizons and status-quo of this technology and the obstacles it faces in Algeria through the imaginations of the experts in the physical treatment about their readiness to use it as an auxiliary treatment, or as an alternative for the traditional treatment during Covid-19 .

3. Conceptual processing of the study

This study is based on 4 variables that must be procedurally determined since the beginning. The most difficulty the researchers suffer in the human (and social) fields is the generalities of the language[(14)]. Thus, the processing of the terms' determination of this study is mean to achieve the necessary amount of the meanings it includes.

3.1. Telerehabilitation technology: It can be defined as providing rehabilitation services through ICTs. It includes the services of evaluation, prevention, treatment, teaching, and consultation. This may be a beneficial style to increase the quantity and density of the rehabilitation. Telerehabilitation allows the patients to interact with the service providers. It includes the domains of medicine that use telerehabilitation such as: the motor training exercises, pronunciation treatments, virtual reality, and robotics. It includes the famous used ways such as webcams, visio-conferences, phone lines, and other web pages that contain rich applications.

3.2. Covid-19: According to the WHO, it is a type of fast spreading viruses that cause diseases such as flu to more sever ones such as MERS and SARS[(15)].

3.3. The older adults: The older adults have been defined for a long time as those whose chronologic age exceeds 65. However, this classification is old. Thus, researchers in Tokyo Hospital (Metropolitan for the older adults) provided a more flexible definition that considers 75 years old to be the beginning of old age based on comprehensive proofs in the social, cultural, and medical sciences[(16)].

WHO looks at this issue from another perspective. It divided the human age into 6 phases. Before 17, it is under the legal age. As for 18-25, it is called adolescence. Then 26-65, it is called the youth. 66-79 is the middle aged. As for 80-90, they are the older adults while those who exceed 100 are the centenarians[(17)].

3.4. The physical treatment: rehabilitation is defined as a set of interventions to improve the performance and limit the disability of the individuals who suffer health cases in their interaction with their environment.

In more simple terms, rehabilitation helps the child, the adult, or the old to enjoy the maximum independence in his practice of the daily life activities. It enables him to participate in the domains of learning, job, entertainment, and making beneficial roles in life such as family care. Rehabilitation achieves that through treating the health cases such as pain and improving the individuals' way of performing his functions in the daily life and provides him

with the necessary support to overcome the difficulties he faces in thinking, seeing, hearing, communicating, eating, or moving. Anybody may need rehabilitation at a specific phase of life after an accident or a surgery, or due to a disease or any disability resulting from agedness[(18)].

4. Literature review

Based on the previous studies which are considered an important source to interpret and compare the results of the study, and due to the lack of the academic studies on telerehabilitation, we relied on a very limited number of studies that appeared in USA and Italy since 2019. We shall present them chronologically.

4.1. The study of G, Milani et al, (2021) entitled "Telerehabilitation in Italy During the COVID-19 Lockdown: A Feasibility and Acceptability Study". The study was published on 8 July 2021 in Italy and aimed at knowing the feasibility and acceptability of telerehabilitation during Covid-19 on a sample of old patients who suffer motor disabilities. Among 23 patients, 11 accepted to take part of the telerehabilitation program through video. The obstacles that hinder the telerehabilitation had been determined and the demographic, clinical, and psychological variables had been analyzed as success indexes[(19)].

4.2. The study of Knepley et al (2021) entitled "Impact of Telerehabilitation for Stroke-Related Deficits". The study was carried out in USA on 23 April 2021. It aimed at describing the telerehabilitation types for the stroke that are provided during telerehabilitation programs and evaluating whether the method is effective such as the traditional treatment for the outpatients in improving their satisfaction and the disability after the stroke. A research on the expression "telerehabilitation and stroke" had been made in the available literature. All the texts have been revised and the papers have been recorded for the methodological quality using Pidro Scale. Findings showed the inclusion of 34 papers with 1025 patients that include the Virtual Reality technique, robotics, and motor rehabilitation exercise. The findings that have been measured repeatedly included the motor function, speech, disability, and satisfaction. All the studies showed an improvement after the treatment. The studies that compared the telerehabilitation and the traditional one showed equivalent functional results. Findings also showed that the treatment with robotics at home and with Virtual Reality is less expensive than the personal treatment[(20)].

4.3. The study of Werneke et al. (2021) entitled "TelerehabilitationDuring the COVID-19 Pandemic in Outpatient Rehabilitation Settings: A Descriptive Study". The study was carried out in USA on 13 April 2021 on a sample of 222.680 patients, of which 59% were females, whose average ages were 55 years old. The study aimed at describing the main characteristics of the patient and the available results of the treatment using telerehabilitation during Covid-19 compared to the traditional treatment. The study also described the telerehabilitation types and the calls frequency levels according to each case. The observation was used to report the variables and the results of the patients including the physical function. The study showed new results on the types of telerehabilitation and the way of managing the rehabilitation of the outpatients throughout USA. It provided detailed descriptive information using national database that contains the list of the patients and their demographic characteristics and the results scales[(21)].

4.4. The study of Cramer et al. (2019) entitled "Efficacy of Home-Based Telerehabilitationvs In-Clinic Therapy for Adults After Stroke:A Randomized Clinical Trial". The study was carried out on 14 June 2019 on a sample of 124 patients who survived stroke. They had a disability in the arms from 4 to 36 weeks throughout 11 areas in USA. The experimental method had been used in the period from 18 September 2015 to 28 December 2017 which marked the treatment period. Findings show big improvement in the motor function of the arm regardless the nature of the rehabilitation provided (telerehabilitation or in the clinic). The study concluded that the telerehabilitation allows more access to the rehabilitation treatment[(22)].

The literature review shows that the studies investigated the health care with telerehabilitation during Covid-19 and the traditional one. They aimed at knowing the feasibility and acceptability of the telerehabilitation program during Covid-19 on a sample of patients, its effectiveness in the continuity of the physical rehabilitation during the pandemic spread through establishing a plan to react to the virus spread, the effects of the pandemic on the health organizations, and the experience of shifting from the traditional treatment to the telemedicine. There were different methods used such as the experimental and the analytical descriptive. Other studies used the structured interviews, observation, and the experimentation to collect data. In this context, the study at hand shares the same topic with the previous studies. However, it uses a different method, sample, and perspective.

5. Methodology of the study

To achieve the aims and answer its questions, we used the descriptive analytical method since it is a method used by the researcher to reach his goal and is a guide in the different phases of the research (Khaled Yusuf Al Ammar[(23)]. Moreover, in accordance with the nature of the study topic, analysis and organized interpretation were the main characteristics of this method[(24)].Furthermore, it commits to describing the studied phenomenon and depicting it quantitatively through data collection, classification, interpretation, and subjection to the meticulous[(25)].Based on what has been said, the methodological procedures took the subsequent format respecting the main methodological bases.

5.1. Population of the study

This study dealt with the experts in the physical treatment in Algeria. They are our population of the study and are characterized with the trait of the physical treatment in Algeria according to Angress Morris concept of population of the study[(26)].

Since the study tool is made up of individuals who had been chosen in different ways from the big population of studying a specific phenomenon[(27)], our sample is made up of 30 experts in the physical treatment in Algeria from both the private and public sectors from different regions of the country. They have been chosen based on the general characteristics that include: the gender, age, educational level, professional experience, work sector, and the geographic zone. We had access to the sample in the period from 01/06 to 01/07 2021 through the study tool that is an electronic questionnaire whose consistency coefficient was (0.96) and values of its axes validity were between (0.95) and (0.96) according to Cronbach's Alpha. Its statements has been formulated based on the literature about telerehabilitation according to Likert 5 scale (5= strongly agree, 4= agree, 3= neutral, 2= disagree, 1= strongly disagree).

The questionnaire has been reviewed by a group of teachers to confirm its linguistic correctness and ability to collect the needed data.

In order to comment and analyze the results easily and clearly, we used the statistical style through uploading the data on Excel and using SPSS for the analysis after coding. We used the descriptive statistics to calculate the arithmetic means and the standard deviations and to find the percentages and present them in the form of tables and figures.

5.2. Characteristics of the sample

This refers to the demographic characteristics of the members of the sample who answered the questionnaire. The below figures show a description of the study sample according to the variables of the gender, age, educational level, professional experience, profession sector, and the geographic zone of the profession

The gender of the sample and the age categories

The sample includes members according to the ages and the genders illustrated in the following figures:

Figure 01: Description and distribution of the sample according to the gender

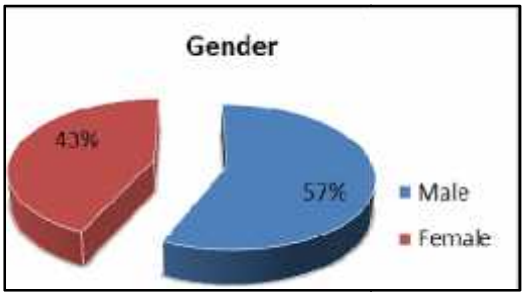
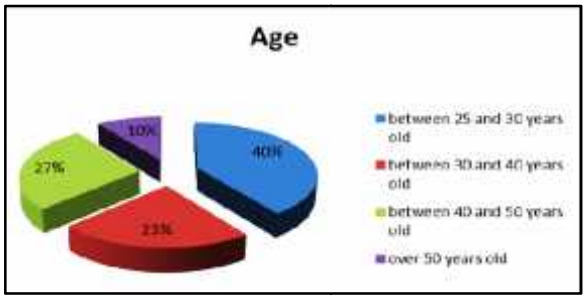


Figure 02: Description and distribution of the sample according to the age



Source: prepared by the author relying on the results of the statistical analysis

We notice from the results in figure 01 that the distribution of the sample members shows 57% are males and 43% are females. As for figure 02, it indicates that 40% are between 25 and 30 years old.

The educational level and the professional experience

The following figures show the distribution of the members of the sample according to the variables of the educational level and the professional experience

Figure 03: Description and distribution of the sample according to the educational level

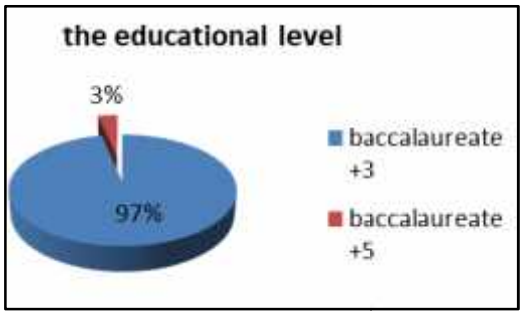


Figure 04: Description and distribution of the sample according to the professional experience

Source: prepared by the author relying on the results of the statistical analysis

According to figure 03, we notice that 97% of the members have a bachelor degree. Figure 04 shows that 43% have a professional experience between 0 to 5 years. This is logical because almost half of the members are young aged between 25 and 30.

The work sector and the geographical zone of the profession:

The study sample is distributed according to the work sector and geographical zone of the profession as shown in the following figures:

Figure 05: Description and distribution of the sample according to the work sector

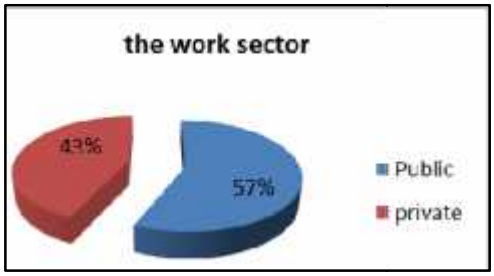


Figure 06: Description and distribution of the sample according to the geographical zone of the profession

Source: prepared by the author relying on the results of the statistical analysis

Results of figure 05 show that 57% work in the public sector while 43% are in the private. As for figure 06, it shows that 37% are centered in the East, 33% are in the North, 20% are in the West, and 10% are in the South.

6. Presenting and analyzing the results according to the study questions

In the light of what has been presented so far, the use of the questionnaire for data collection, and after uploading the data, we found the following results:

6.1. Results of the 1st section: the status-quo of the telerehabilitation technology for the older adults in Algeria

Table 1 shows the answers to the 1st section questions:

Statement	scale					Arithmetic mean	Standard deviation	orientation
	Strongly agree	agree	neutral	disagree	Strongly disagree			
I have the necessary knowledge and resources to use the telerehabilitation technology for the older adults	0	7 (23.3%)	12 (40%)	7 (23.3%)	04 (13.3%)	2.73	0.98	Neutral (average)
Telerehabilitation technology is compatible with the devices I use	0	05 (16.7%)	14 (46.7%)	6 (20%)	05 (16.7%)	0.63	0.96	Neutral (average)
the clinic where I work supports a system that allows using telerehabilitation	0	5 (16.7%)	10 (33.3%)	3 (10 %)	12 (40%)	2.27	1.172	Disagree (low)
The arithmetic mean and the balanced standard deviation of the statements related to the obstacles of application of telerehabilitation for the older adults in Algeria						2.54	1.03	Disagree (low)

Source: prepared by the author relying on the results of the statistical analysis

We see from table 1 that the statements of the 1st section are between a low to an average degree. The statement "I have the necessary knowledge and resources to use the telerehabilitation technology for the older adults" was number one with an arithmetic mean of (2.73) and a standard deviation of (0.89) with a average degree. The statement "the clinic where I work supports a system that allows using telerehabilitation" came the last with an arithmetic mean of (2.27) and a standard deviation of (1.172) with a low degree. On the other hand, all the other statements of the section had arithmetic means and standard deviation (2.54) and (1.03) with a low degree which indicate the disagreement.

6.2. Results of the 2nd section: The horizons of using telerehabilitation technology for the older adults in Algeria

Table 2 shows the answers to the questions of the 2nd section

Statement	scale					Arithmetic mean	Standard deviation	orientation
	Strongly agree	agree	neutral	disagree	Strongly disagree			
I think that the use of	0	05	13	08	04	2.63	0.928	Neutral

telerehabilitation will increase the effectiveness of the healthcare for the older adults during Covid-19 era and in the future		(16.7%)	(43.3%)	(26.7%)	(13.3%)			(averag e)
I think telerehabilitation technology is the trend that will impose itself in the future in the rehabilitation centers to face the changes imposed by Covid-19 in Algeria	0	05 (16.7%)	11 (36.7%)	7 (23.3%)	7 (23.3%)	0.47	1.04	Disagre e (low)
I plan to use telerehabilitation in my work during Covid-19 and I recommend its use in the future with the older adults	0	07 (23.3%)	9 (30%)	6 (20%)	08 (26.7%)	2.5	1.137	disagre e
The arithmetic mean and the balanced standard deviation of the statements related to the obstacles of application of telerehabilitation for the older adults in Algeria						2.53	1.035	Disagre e (low)

Source: prepared by the author relying on the results of the statistical analysis

We see from table 2 that most of the statements of the section had low degrees. The statement "I think that the use of telerehabilitation will increase the effectiveness of the healthcare for the older adults during Covid-19 era and in the future" was the first with an arithmetic mean of (2.63) and a standard deviation of (0.928) with an average degree. The statement "I think telerehabilitation technology is the trend that will impose itself in the future in the rehabilitation centers to face the changes imposed by Covid-19 in Algeria" came the last with an arithmetic mean of (2.47) and a standard deviation of (1.04) with a low degree. The rest of the statements had arithmetic means and standard deviations of (2.53) and (1.035) with a low degree, that expresses the disagreement.

6.3. Results of the 3rd section: obstacles of applying telerehabilitation for the older adults in Algeria

Table 3; shows the answers to the questions of the 3rd section:

Statement	**scale**					**Arithmetic mean**	**Standard deviation**	**orientation**
	Strongly agree	**agree**	**neutral**	**disagree**	**Strongly disagree**			
I think that the lack of the technical resources and low access to internet will be an obstacle to applying this technology	4 (13.3%)	16 (53.3%)	7 (23.3%)	3 (10%)	0 (0%)	3.70	0.83	Agree (strong)
I think that the fears about the security of the personal information of the physician and patient and their safety will hinder the application and adoption of telerehabilitation	2 (6.7%)	22 (73.3%)	4 (13.3%)	2 (6.7%)	0 (0%)	3.80	0.66	Agree (strong)
I think that the socio-cultural	05 (16.7%)	20 (66.7%)	2 (6.7 %)	1 (03.3%)	2 (6.7%)	3.83	0.99	Agree (strong)

heritage of the older adults will be an obstacle in accepting telerehabilitation								
The arithmetic mean and the balanced standard deviation of the statements related to the obstacles of application of telerehabilitation for the older adults in Algeria						3.78	0.83	agree

Source: prepared by the author relying on the results of the statistical analysis

Table 3 shows that the statements of the section had strong degrees.Thestatement "I think that the socio-cultural heritage of the older adults will be an obstacle in accepting telerehabilitation" came the first with an arithmetic mean of (3.83) and a standard deviation of (0.99) with a strong degree. The statement "I think that the lack of the technical resources and low access to internet will be an obstacle to applying this technology" came the last with an arithmetic mean of (3.70) and a standard deviation of (0.83) with a strong degree. The rest of the statement had arithmetic means and standard deviations of (3.78) and (0.83) with a strong degree which shows the agreement.

7. Discussion

We deduce from the results of sections 1 and 2 that the status-quo and horizons of telerehabilitation for the older adults in Algeria are very negative. Results of section 3 show that the refusal by this technology is due to many obstacles about the lack of the necessary knowledge and the weakness of the material resources and the suitable environment such as the quality of the internet and the necessary devices, the fears of the patients concerning the information security and personal details of the physician and the patients' safety, and the absence of the legal frames and a protection system from the accidents of this new style on the international, local, and national levels. This goes with whatnoted**(28)**. Furthermore, there are psychological and socio-cultural reasons that hinder the application of this technology because the mentality of the Algerian older adults is not renewable from one side, and does not master the modern technologies from another side as proved by**(29)**.

8. Conclusion

In this study, we managed to know the status-quo of the telerehabilitation and find the human, regulatory, and technical challenges that may be applicable to all the countries that have limited resource.

As for the limitations of the study, we could have carried out a more inclusive study through covering a sample that represents more the society. Despite the fact that we tried to control this limitation through using an electronic questionnaire, the percentage of the reactivity of the informants was low. Moreover, we noticed a bias towards a specific specialty which is rehabilitation and the exclusion of the other medical specialties whose experiences can be rich sources of information about the status-quo of the distant health care. However, we tried to handle this limitation through deep readings in the literature and previous studies. From this point, the findings of this paper are insufficient to generalize and to make absolute judgments. Thus, we recommend making future analytical descriptive studies on a large scale.

Despite the limitation previously mentioned, the theoretical literature available in this study may add new knowledge to the students and enrich the Arabic library with a new theoretical frame on the technology of telerehabilitation in emergency cases such as Covid-19. The previous studies that have been translated in this study may benefit those interested in telerehabilitation and the results of its application worldwide. Moreover, it may benefit the health organizations and higher education institutions in improving the performance of the rehabilitation of the older adults an orient the human cadres, the material potentials, and the health orientations in choosing new styles of telemedicine in general and telerehabilitation in particular, and in establishing future plans to shift towards this style as an alternative to the traditional style. The study tool may help in the researches made in universities and research institutions. This paper draws its importance from the fact that it is during Covid-19 era and its results may be beneficial in similar cases such as in wars and crises.

Recommendations

In times of uncertainty and absence of solutions, telerehabilitation reaches new horizons in the developed world because it provides an ideal model to support the continuity of the treatment in this period mainly for the most vulnerable. However, we do not recommend rushing to applying this model in our country and overcoming the necessary steps because we need research, carefulness, training, and skills before launching such services. Neglecting these steps may lead to poor care, unsustainability, the increase of the fears of its use by the patients, and the absence of trust between the physicians.

In front of these truths, we strongly recommend

- Consulting the experts prior to starting the service and providing the material support for the health organizations, experts of rehabilitation, and researchers to develop digital platforms and data that support this promising style.
- Making training sessions for the researchers in this domain, patients, and experts to keep up in pace with the developments in the technology of telerehabilitation.
- Due to the existence of negatives and obstacles that hinder the telerehabilitation, it must be used as an auxiliary treatment to the traditional one, not as an alternative.
- The researchers in universities and specialized research centers must publish their researches in the international databases and journals.

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