



# A survey based investigation into the figure of the digital physiotherapist in the COVID-19 era

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**Background:** The COVID-19 pandemic is proposing new models of care. The digital rehabilitation therapy used in remote rehabilitation, already used in the past, has been pushed forward. We focused on the physiotherapist and we had the idea of submitting a survey that would allow us to investigate: (I) the opinion of the physiotherapist who has already graduated and is undergoing training to be part of this new process of digitization of care; and (II) his or her perception of the degree of preparation in terms of training received to get an idea of preparedness.

**Methods:** To do this we have constructed a survey dedicated to this purpose and focused to the physiotherapist both in training and graduate. The survey was submitted electronically on two samples of participants with the needed background: the first group consisted of 112 students (57 males/55 females; minimum age 20; maximum age 35; averaged age 24.3). The second group consisted on 89 graduated in Physiotherapy of the last 8 years (45 males/44 females; minimum age 25; maximum age 40; averaged age 31.2).

**Results:** Results highlighted (I) the high perception on the degree of preparation and training towards the expanded role of the physiotherapist and therefore on the preparedness in terms of curriculum, (II) the clear indication of the complementarity and subordination of these new digital activities to the traditional ones.

**Conclusions:** From a general point of view, the study conducted in the field highlights the high acceptance and consensus of the interviewed subjects in regards to the evolution of his or her job description.

**Keywords:** Digital health; physiotherapist; mHealth; COVID-19; digital physiotherapist

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## Introduction

The COVID-19 pandemic has brought about the need for social distancing.

Consequently, many efforts have been made to ensure continuity of care in those in need.

Among the continuity of treatment, physical rehabilitation has also played an important role through consolidated and new models of remote rehabilitation (1).

This has led to a strong and growing use of technology for the provision of remote care and therapy using in particular:

❖ The mobile technology by means of the so called

mobile Health (mHealth) (2), based on smartphone and/or tablet dedicated medical Apps and, in some cases, specialized integrated sensors;

❖ The robotics, not only in telerehabilitation processes (3,4) but also with innovative approaches related to introduction of social robots (4).

The mHealth has allowed and allows to be followed remotely via videoconferencing apps and/or dedicated apps. Robotics has made it possible to introduce the social robot in remote rehabilitation even more vigorously in the care of the elderly both as a support and as a mediator (4).

It is natural that with this evolution it is important

to reflect on new professional figures or at least on the re-modelling of already existing professional figures.

One of the key figures in physical rehabilitation is that of the physiotherapist who stands between the physician of physical medicine and rehabilitation and the patient entering with greater contact with the same. It is evident that this figure must be rethought starting from the new interaction task that was COVID-19 with the looming social distancing.

It is evident that the physical and rehabilitative medicine sector is moving in this direction. For some years now, there has been talk of new forms of therapy delivery in this area in virtual mode through remote digital communication. We are talking about digital physiotherapy and new professional figures such as the digital physiotherapist. In this difficult time, these figures can make a great contribution. In the light of these considerations, in the study proposed by Lee (5): (I) starting from the critical issues highlighted in the current pandemics (6) and the previous pandemic experiences (7,8); (II) in consideration of the changes already requested by some key figures of the health system in relation to technologies (9,10) due to new intervention models (11-13) consolidated during the current epidemic (11); (III) some consensus studies on digital rehabilitation were analysed in particular focused around the new figure of the digital physiotherapist (14-19) without forgetting the ethical and curricular aspects (20). The author offers very precious indications for advancing digital practice and telemedicine in the physiotherapist profession due to the COVID-19 pandemic and to interact therefore with the above cited devices. We present the following article in accordance with the SURGE reporting checklist (available at <https://dx.doi.org/10.21037/jphe-21-25>).

### **Purpose**

Our study starts from the considerations of Lee (5) and from his collection of recommendations and useful indications for the consolidation of the figure of the digital physiotherapist and aims to investigate further important aspects related to the introduction of this figure.

When a new solution is introduced in the world in general and therefore in the world of medicine in particular, the problem of the availability/acceptance of those who will have a leading role in the solution and of the preparedness which in this case relies on training must be addressed.

We therefore focused on the figure of the physiotherapist and we had the idea of preparing a survey that would allow

us to investigate:

- ❖ The opinion of the physiotherapist who has already graduated and is undergoing training to be part of this new process of digitization of care; and
- ❖ His or her perception of the degree of preparation in terms of training received to get an idea of preparedness.

To do this we have prepared a questionnaire dedicated to the purpose for the figure of the physiotherapist both in training and graduate.

## **Methods**

### ***The survey***

The survey undoubtedly represents a powerful tool for investigating many scientific problems, and, as such, is a valuable, if not fundamental apparatus for addressing the issues mentioned in this study, in which remotely gathering information/opinion from the actors involved in this field is essential. A problem that immediately emerges is that of administration and data collection, given that in complex administrations and/or when large numbers are managed, the management of the process becomes laborious and complicated. In particular, when using paper-based tools, the following difficulties appear: complexity in reaching all the actors, complexity in collecting paper feedback, difficulty and tediousness in manually inserting the data from paper into appropriate databases for analysis (such as Excel) with the possibility of error.

To overcome these difficulties, electronic surveys (eS)s can be used to provide the following advantages:

- ❖ Easy administration: it is possible to send an Internet link through the most common web communication tools (e-mail, messenger);
- ❖ Automatic data storing in the cloud: the recipients, once the link has been selected, can access the survey online, fill it in, and complete it by means of an automatic entry of data into the appropriate databases (without manual operation). Once the interested parties complete the questionnaire, the data entered are automatically loaded into a database.

The giants of computer science, like Microsoft and Google, have made several eS applications available. We decided to use Microsoft Forms, it is a commercial tool provided by the Microsoft Corporation (USA) as we have yet used it and tested with success in other applications (21).



**Figure 1** The Quick Response code of the eS. eS, electronic survey.

### *The statistical analysis*

The tools available within Microsoft forms allow the creation of automatic reports including statistical analysis. Further statistical analyses were added in our study.

Our study envisaged:

- ❖ A statistical analysis of the failure rate relating to the operation of the survey before the sub-division;
- ❖ An integration about the output of the questionnaire administration with some targeted statistical analyses;
- ❖ A statistical analysis based on the Student's *t*-test related to the two groups selected (described in the following). It was chosen as reference a P value >0.1 (higher than the conventional 0.05) to indicate no significance in the difference between the two considered averaged values.

It was chosen as reference a P value <0.01 to indicate a high significance in the difference between the two considered values.

### *Ethical statement*

The study was not an experimental study conducted on humans or animals (furthermore anonymous); for this reason it was not necessary a formal consent during the involvement; however, even if not necessary, we have provided for the first question (see in the supplement material) a form of electronic informed consent with the

possibility of leaving the survey.

The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

### **Results**

The first result is represented by the environment with the core element eS.

*Figure 1* shows the Quick Response code related to the eS with the following link: [https://forms.office.com/Pages/ResponsePage.aspx?id=\\_ccwzxZmYkutg7V0sn1ZEvPNtNcI4kVMpoVUouuzQ3tUNjJPU1kwS01XMVVYVEJCRlI4VUpFQU5VTS4u](https://forms.office.com/Pages/ResponsePage.aspx?id=_ccwzxZmYkutg7V0sn1ZEvPNtNcI4kVMpoVUouuzQ3tUNjJPU1kwS01XMVVYVEJCRlI4VUpFQU5VTS4u)

The printout of the survey is shown as [Appendix 1](#).

Before the official submission we tested the survey among our-self assuring the trial of all the ramifications. We tested it 150 times with 0% of failures.

We organized the survey with all obligatory questions, except for the final facultative question (“final comment/observation”). This avoided:

- ❖ Partial completions;
- ❖ The need of handling item missing data provided;

We submitted the survey to two independent samples who met the inclusion criteria.

The survey was disseminated both through websites and Facebook and other multimedia tools (messenger and twitter).

It was anonymous. The subjects were free to adhere.

We assessed the rate of participation on the basis of:

- ❖ The first question (The data will be used anonymously for a study on this issue. Agree to participate?) A negative response forced to stop and exit the survey;
- ❖ The second question giving the requirement for the participation of being a physiotherapist graduated or during the study.

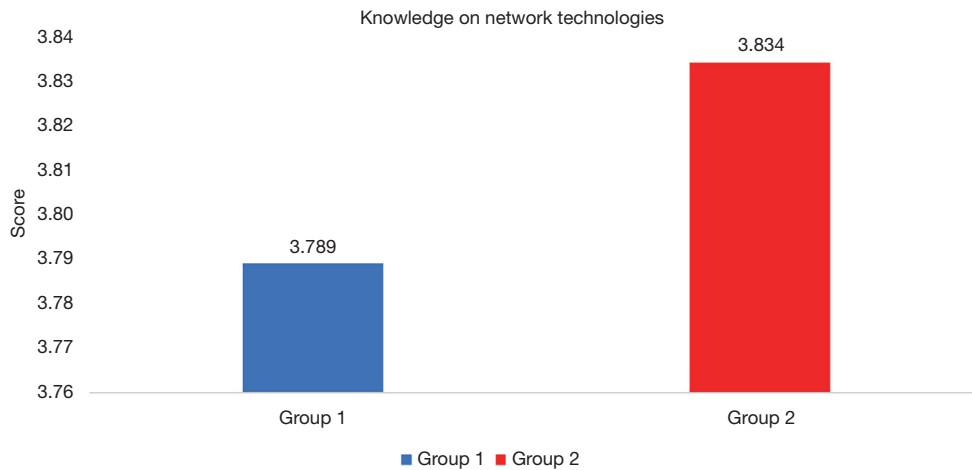
To minimize any but unlikely bias due to the digital divide, it was however necessary to invite the receivers to spread it and to support the less capable with digital technology.

- (I) We have recruited students (*Table 1*) of the degree course in physiotherapy\*—in all 112 (among 118 submissions) participants (group 1);
- (II) We have re-proposed the survey to graduates of the last 8 years (*Table 1*) in different locations\*—in all 89 (among 103 submissions) participants (group 2).

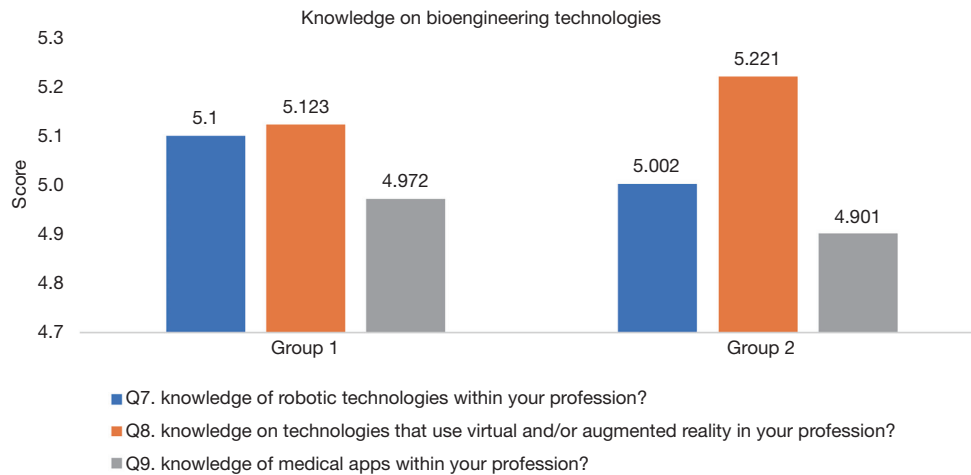
\* The original submitted survey in Italian had a filter for this. Both the two groups adhered to the s.

**Table 1** Characteristics of the participants of the two groups

Submission	Number invited	Participants	Males/females	Min age/max age	Mean age	Notes
Group 1	118	112	57/55	20/35	24.3	No anomalies
Group 2	103	89	45/44	25/40	31.2	No anomalies



**Figure 2** Knowledge on the network technologies.



**Figure 3** Knowledge on the bioengineering technologies.

To question Q5 on the possession of the smartphone in the two groups they all answered yes (100%).

Figure 2 shows the outcome for the Question Q6 “What are your knowledge of network technologies (internet, mobile technology, etc.)” focalized on the knowledge on the network technologies.

The value for the two samples was a little above the

threshold of 3.5 (between more “no” than “yes” and more “yes” than “no”) indicating more yes than no.

Figure 3 shows the results for the knowledge on the bioengineering technologies proposed with the questions:

Q7 “What is your knowledge of robotic technologies within your profession”

Q8 “What are your knowledge on technologies that use virtual

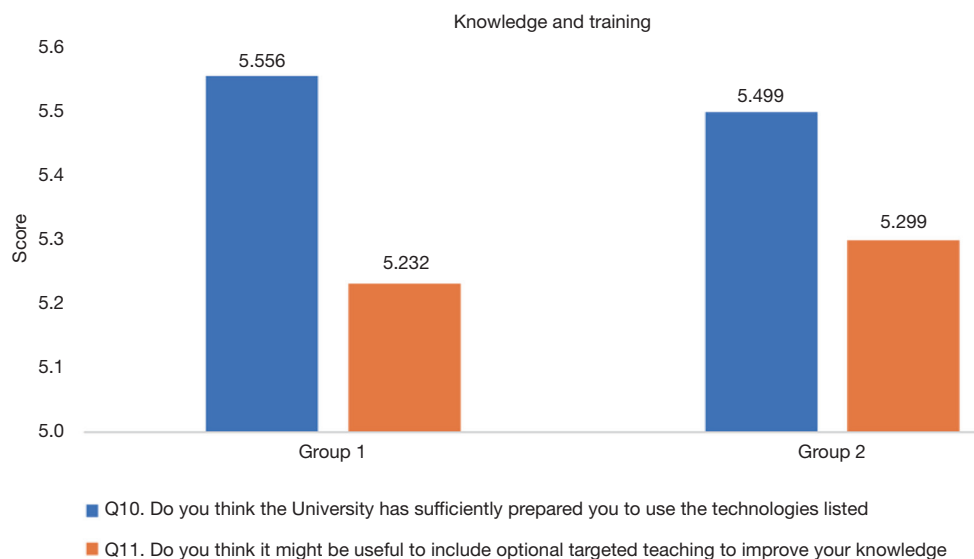


Figure 4 Knowledge and training desire.

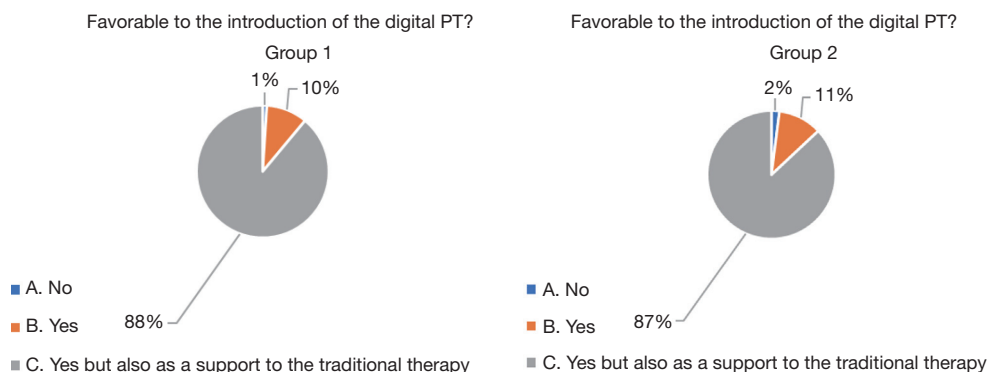


Figure 5 Opinion on the introduction of the digital therapist (Group 1) and (Group 2). The percentages of those ones that disagree [A], agree [B], agree but as a support of the traditional therapy [C] are reported.

and/or augmented reality in your profession?”

Q9 “What is your knowledge of medical apps within your profession?”

Results shows an extremely high value of self-perception.

Figure 4 shows the results focused to the training:

Q10 “Do you think the University has sufficiently prepared you to use the technologies listed in points 6 to 9?”

Q11 “Do you think it might be useful to include optional targeted teaching to improve your knowledge of points 6 to 9?”

The perception also here was high for the received training. However, it is also high the desire of expanding the training.

Also as regards the question Q12 on having heard of the

figure of the increased physiotherapist, the two samples report similar results: the first confirms an average value of 88.321 percent and the second an average value of 87.875 percent.

The two pie diagrams (Figure 5A, 5B) report the opinion on the introduction of the figure of the digital physiotherapist. Showing a prevalence for both groups of the desire to maintain the traditional role and to leave the role of the digital physiotherapist to complementary roles.

Now we are also analysing the open answers (comments and observations).

We used the student T test between each couple of the parameters assessed in the two groups, we used as

reference a P value  $>0.1$  (higher than the conventional 0.05) to indicate no significance in the differences between the two considered averaged values. Results showed coherence in the results and no recorded significant differences between each one of the couples of the values for all the questions (in *Figure 5A, 5B* the decimal are not indicated).

## Discussion

Our study focused on the actors of the new digital rehabilitation processes emerging due to the COVID-19 pandemic, the physiotherapists, and investigated their opinion on the new figure of the digital therapist in terms of acceptance and preparedness. From a general point of view our study is complementary to Lee's study (5). Adam Lee has analyzed current literature (6-13) and studies on consensus around the figure of the digital physiotherapist (14-20). In particular he highlighted: (I) activities of important international working groups, in particular the World Confederation for Physical Therapy (WCPT) and the International Network of Physiotherapy Regulatory Authorities (INPTRA) which together they developed recommendations that gave rise, among other things, to the conclusion of important initiatives in this direction during the first wave of the pandemic; (II) the clear identification of the significant role and tasks that the digital physiotherapist must have in society, without forgetting any action limits; (III) the ethical and curricular impact.

## Conclusions

Our study starts from this figure of the digital physiotherapist and deals with important aspects of acceptance and preparedness in terms of training and curriculum in the field.

The electronic submission, the design of the study and some described solutions allowed a strong minimization of the bias and the elimination of the phenomenon of partial/incomplete answers.

From a general point of view, our study has the value of being the first field study in this field conducted through a national survey.

In particular:

- ❖ As a *first added value* we find the tool, which has allowed the collection of data while maintaining social distancing in the pandemic period and which will also be useful in future monitoring activities;

- ❖ As a *second added value*, we find that of the high perception on the degree of preparation and training towards the expanded role of the physiotherapist and therefore on the preparedness in terms of curriculum;
- ❖ As a *third added value* there is a clear indication of the complementarity and subordination of these new activities to the traditional ones;
- ❖ As a *fourth added value* there is a power of generalization of the validity of the results thanks to the properly designed statistics based on a double approach on two samples and a proper comparison using the Student's *t*-test.

This study supports and strengthens the recommendations regarding the new figure of the digital physiotherapist recalled also by Lee (5,14) recommending in details methods of interaction, duties and ethical professional behaviors.

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## Footnote

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*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related



to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was not an experimental study conducted on humans or animals (furthermore anonymous); for this reason it was not necessary a formal consent during the involvement; however, even if not necessary, we have provided for the first question (see in the supplement material) a form of electronic informed consent with the possibility of leaving the survey. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

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## Survey on the figure of the digital physiotherapist in the Covid-19 era

1. The data will be used anonymously for a study on this issue. Agree to participate \*

No

Yes

2. This survey is dedicated to Physiotherapy students / graduates: agree to continue \*

No I am not in these requirements

Yes I continue as a student

Yes I continue as a graduated

3. Sex \*

Male

Female

4. Age \*

5. Do you have a smartphone \*

Yes

No

6. What are your knowledge of network technologies (internet, mobile technology, etc.) \*

*1 star = Min ; Six stars=Max*



7. What is your knowledge of robotic technologies within your profession? \*



8. What are your knowledge on technologies that use virtual and / or augmented reality in your profession? \*



9. What is your knowledge of medical apps within your profession? \*



10. Do you think the University has sufficiently prepared you to use the technologies listed in points 6 to 9? \*



11. Do you think it might be useful to include optional targeted teaching to improve your knowledge of points 6 to 9? \*



12. Have you heard of the new figure of the digital physiotherapist that is spoken of especially in the Anglo-Saxon world since the explosion of the Covid-19 pandemic? \*

*This figure should use the technologies described in points 6 to 9 and, on occasion, even remotely to maintain social distancing*

Yes

No

13. Are you in favor of introducing the figure of the digital physiotherapist? \*

Yes

no

Yes, but also as a support to the traditional therapy

14. Insert here observations or comments