

# Physical therapists' opinion regarding the creation of a new virtual game to treat pelvic floor muscles dysfunction amongst children of school age

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## ABSTRACT

The study aimed to investigate physical therapists' feedback regarding important points that should be added to a new virtual game application which will treat lower urinary tract dysfunction among children. This study used a questionnaire answered by ten physiotherapists, where the majority (80%) considered positively the idea of creating an application, while only 40% use technological devices in rehabilitation. With regards to observing patients progress, the majority (70%) reported a lack of tools that motivate the patient was the biggest problem. Based on that, we concluded that motivating tools are necessary to assist in pelvic floor treatment.

## 1. INTRODUCTION

Children with functional urinary disorders are those who have intermittent and involuntary contraction, or difficulty to relax the muscles of the urethral sphincter during voiding and may be associated with urgency, increased urinary frequency, recurrent urinary tract infection and vesicourethral reflux (Ladi Seyedian et al, 2014).

The treatment is based on pathophysiology and is initially focused on drug administration, education programs, hydration, constipation treatment, exercises for the pelvic floor muscles and biofeedback (Ballek & Mckenna, 2010). Biofeedback is an established therapeutic modality treatment of lower urinary tract dysfunction to be considered as a treatment choice (Schulman et al, 2001). Studies from the American Association International of Urology and Continence Society in children emphasize the importance of therapy expansion with the use of biofeedback (Koenig & Mckenna, 2011). However, the success of therapy with biofeedback depends on the motivation and dedication to the program, since it is based on repetitive exercises that need to be performed daily. In addition, children are not usually concerned about their urinary changes, and in addition they have trouble to focus on a specific activity (Mckenna et al, 1999).

Thus, the use of games becomes an important ally to rehab promoting a more interactive therapy and, consequently, a greater chance of adherence to treatment (Mckenna et al, 1999). One study shows that the use of biofeedback associated with the games demonstrated improved incontinence in 87% of children (Herndon, Decambre & Mckenna, 2001).

However, games should be designed in order to motivate the child to perform the therapy and promote the rehabilitation of the pelvic muscles. In this context, developing games that simulate certain activities can create a motivating environment for the rehabilitation process.

A physical therapy practice and rehabilitation in general has been strongly influenced by technological advances that society has experienced. However, even with this advent and the various discoveries in health care, much of the technological resources are not accessible to the entire community. Thus, it is important to consider devices that have a lower cost, greater accessibility and thus able to benefit a majority of the population.

Devices that start to be more widespread on the rehabilitation setting are Smartphones. They allow the creation of applications that are easy to implementation various activities, including in the home rehabilitation, and create animations and environments that can be more motivating for users (Chan et al, 2011). Moreover, they are already fully integrated in daily life, being accessible, portable and allow that data be transferred to professionals involved in rehabilitation, which can customize the exercises for each patient, as well as assess their progress in the activities (Franco et al., 2013).

However, the use of these tools needs to be designed according to the population that will be benefitted. It is important to understand which device will be used, how old is the person using the app, their living context, among other factors.

Thereby, the purpose of this research was to survey a range of physical therapists that will identify the need of applications to assist during their treatment of schoolchildren with lower urinary tract dysfunction. A subsequent purpose of the study is to create software (virtual game application) to train pelvic floor muscle among schoolchildren.

## 2. MATERIALS AND METHODS

This study used a questionnaire to understand physical therapists views on which aspects they consider relevant for further development of a game.

The study population consisted of physical therapists involved in the uropediatric area that works in different places. The proposal was to create an evaluation committee consisting of ten physiotherapists' judges. There is no consensus in the literature on the number of experts to be consulted. It is suggested a minimum of five and a maximum of ten specialists (POLIT, 2004).

Physical therapists were chosen because they are the professionals' who will work directly with this population. Only uropediatric physiotherapists were selected and they had at least a specialization course and had a minimum of two years of experience.

The questionnaire was designed specifically for this study. It consists of 22 questions with information about the use of technological resources in the service, what difficulties and strategies adopted to motivate the child during treatment, if the clients perform activities at home, how they evaluated whether the activity was done correctly, what are the treatment protocols they used and what suggestions they made for this virtual game.

The study was approved by the Ethics Committee from the Integral Medicine Professor Fernando Figueira Institute – IMIP was received. The survey was distributed by email. Prior to the study beginning participants were presented to the survey with an information sheet.

To evaluate the questionnaires we used descriptive statistics such as frequencies and percentages. All statistical analyses were performed using Statistical Package for the social sciences (SPSS Inc. Version 20).

## 3. RESULTS

Twelve participants agreed to participate on the study and 10 of these participants (83.4%) completed the survey. The characteristics for the 10 participants are reported in Table 1.

**Table 1.** *Participants' characteristics.*

<b>Variables</b>		<b>N</b>	<b>(%)</b>
<b>Experience</b>	Physical Therapist	5-10 years	(100)
<b>Degree</b>	Specialist	5	(50)
	Master	4	(40)
	Doctorate	1	(10)

According to the questionnaires analysed, 80% of professionals consider positively the idea of creating an app, but only 40% use some kind of technological device in your care and 10% justifies the non-use of technologies, arguing is unnecessary.

With regards to the difficulty in the progress of patients, the majority (70%) reported that the lack of tools that motivate the patient is the biggest problem, while 20% reported participants' indifference and 20% difficult in understanding the activity. In addition, 10% reports the behaviour of children and the immediacy of results required by parents. This item allows the marking of more than one option. Twenty per cent said they did not have trouble in treatment progress.

When asked about the strategies used during treatment to motivate, 60% reported to use recreational games and activities as strategies during rehabilitation. Ninety per cent considered homework important and 100% advise their patients to perform these activities. When asked how this activity is oriented, in 60% reported to

orient by demonstration, 60% by verbal instruction, 70% by parental guidance, 70% by printed material and 20% in writing.

To investigate if the homework is being performed correctly, 10% reported to observe patient and exercise evolution satisfaction, 20% use biofeedback, 10% use daily micturition and urinary losses maps, 50% ask the patient to repeat activity in the office, 20% only question whether the patient is doing the activity and 10% consider the report of parents.

When analysing the number of repetitions, movement speed, number of series, phasic and tonic fibers contraction there was no consensus among participants. Sixty per cent reported that they would depend on the clinical status of each patient. Usually 80% of patients are satisfied with did their activities at home and 80% of physiotherapists reported that the patients almost always realize homework activity, while 20% reported that they rarely do. Ninety per cent of physiotherapists consider that the activity is the most important if done correctly and 10% did not express their opinion.

#### 4. DISCUSSION

This is a pioneering research aimed to understand the needs of applications that will assist treatment of schoolchildren with lower urinary tract dysfunction to create a virtual game application for schoolchildren to train pelvic floor muscle. Questionnaires have shown the interest of these professional in applications for rehabilitation and the need for strategies to improve the patient's motivation to perform the therapy. However, despite the interest in the use of technological resources it is still not inserted in clinical practice.

One of the tools used in urogynecological therapy is biofeedback. When compared to, conventional biofeedback with one that presents activities like games, it is observed that despite the two methods are effective, when associated with the use of games they show faster results (Kaye & Palmer, 2008). The biofeedback associated with games is the preferred method in the institutions, because the child is more engaged in carrying out the activity and promotes more opportunities to get to the expected results. In addition, it enables the child to keep partially clothed during therapy, allowing for more comfort (Koenig & Mckenna, 2011; Palmer, 2010).

Besides the use of games as an alternative to a more motivating therapy, it is suggested that biofeedback could be designed to allow the treatment in the home environment, being more accessible to patients who live far from treatment centres' and it would also allow more intensive therapy (Koenig & Mckenna, 2011).

Moreover, one aspect of the questionnaire pointed out was a difficulty to prove if the exercise has been done correctly. Only biofeedback can guarantee that the contraction is correct. As an alternative to do this, there is a terehabilitation which is the possibility to conduct a therapy or an assessment outside the clinical setting (Mccue, Fraiman & Pramuka, 2010). It can assist the home treatment of patients (Durfee et al., 2009), since, in addition to improving motivation and engagement in the performance of activities, could allow home therapy without clinical supervision, reducing costs and facilitating access to services (Levac & Galvin, 2013).

However, there is a great difficulty in accessing these virtual reality devices at home as a way to improve therapy. A device that starts to be more widespread for rehabilitation are Smartphones. They enable the creation of applications that facilitate the implementation of various activities, including rehabilitation in the home environment, and create animations and environments that can be more motivating for users (Chan et al., 2011). Moreover, they are already fully integrated in daily life, being accessible, portable and allow that data be transferred for professionals involved in rehabilitation, which can customize the exercises for each patient, as well as assess their progress in the activities (Franco et al., 2013).

Another important point is the relative difficulty to standardize treatment protocols. Therefore, it is interesting that the virtual game allows adjustments of repetitions, contraction time, speed of movement and contractions of tonic and phasic fiber.

This study had some limitations such as not using a previously validated questionnaire. It was searched in databases and nothing specific could be found. Furthermore, the possibility of physical therapists suggestions allows for a better understanding of the app proposal. However, the involvement of professionals from other areas for better understanding of the concept of the virtual game is needed. To accomplish that, another study is undergoing to engage teachers and web designers for a better device design.

#### 5. CONCLUSIONS

Based on the information collected in this study it was possible to understand the need of motivating tools to assist the treatment of pelvic floor. One of established therapies is biofeedback. However, it is important to think

of easy access and low cost devices to promote rehabilitation, allowing the use of both in the home and clinical environment.

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