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# FUNCTIONAL DIAGNOSIS OF THE PELVIC FLOOR MUSCLES BASED ON THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF).

Hypothesis / aims of study

The ICF is a classification of human functionning and disability that gives standard operational definitions to the health and health-related domains[1]. The standardization of terminology of the pelvic floor muscle (PFM) function and dysfunction has been reported by the pelvic floor clinical assessment group of the ICS[2]. However, the multidisciplinary approach necessary to treat individuals with pelvic floor dysfunctions demands a common language permitting communication about health and health care professionals across the world in various disciplines and sciences[1]. The diagnosis of the PFM function is mandatory for an effective physiotherapy treatment, specially for patients who can not contract the PFM. Therefore, the aim of this study was to develop a functional diagnosis of the PFM, based on the ICF.

Study design, materials and methods

The PFM functions were identified from the ICF book[1]. Selection criteria were: 1) muscular function should be relevant to the physical therapy treatment of individuals with pelvic floor dysfunction; 2) function must be testable in the PFM; 3) function must be approved by an interdisciplinary, expert *panel of specialists* on pelvic floor dysfunction composed by pelvic floor physical therapists, urogynecologists and a physical therapist expert on the ICF model.

After PFM functions were selected, literature search was performed to identify instruments that could be used to measure the PFM functions selected. Selection criteria were: having validity and reliability tested. Itens related with the activity and participation ICF components were also considered. In order to validate the PFM functions selected, the PFM diagnosis was applied in women with urinary incontinence by physical therapists experts in pelvic floor but who did not participate to the panel of experts[3].

Results

The panel of specialists have selected the following muscular functions to be considered in the diagnosis of the PFM function: 1) *sensitivity* (b2700) in order to certify that patient perceives the vaginal wall and surrounding areas. It is important to discriminate among PFM denervation, impairment in the capacity to contract the PFM and cognitive impairment. 2) and *sensation of pain (b2801)* to identify trigger points and painful scar. 3) *motor reflex (b750)* for women who can not contract the PFM, in order to investigate denervation/neuro-degenerative process. 4) *Muscle tone (b735)* to identify impairment in PFM tension. 5) *Control of voluntary movements (b760)* to identify the capacity of contraction and relaxation of the PFM according to verbal command. 6) *Coordination of voluntary muscles (b7602)* to identify the capacity to contract the pelvic floor muscles prioritaly, without excessive activation of sinergistic muscles such as gluteus and abdominals. 7) *Muscle power (b730)* to identify the capacity of the PFM to generate force. 8) Muscle endurance (b740) to identify the capacity of the PFM to sustain the contraction as required by a specific function. The measurements selected to evaluate each PFM function as well as its psychometric properties are presented in Table 1. Some of the PFM function were tested in a sample composed by 86 women with urinary incontinence (UI) and 75 women without UI, paired by age and hormonal status [3]. Results indicated that women with UI present impairment in the PFM tonus, control, coordination, power and endurance when compared to women without UI [3].

Given the diversity of possible combinations of *limitations and restrictions* of individuals with pelvic floor dysfunctions, the panel of experts suggested to not identify *a priori* items from these domains, but investigate these components through open interview, according to the health condition and functionality fo each patient. Itens that should be considered are in the chapters 4 to 9 of the domain Activity and Participation of the ICF. For example, limitations to lift objects (d4300) and to jump (d4553), restriction to help others in self care (d6600) or participate in religious ceremonies (d9300) are common limitations and resctrictions observed in women with urinary incontinence. These domains should be evaluated using the *Patient Specific Funcional Scale* by Stratford & Westaway, 1995.

Table 1. Measurement scales and respective psychometric properties for diagnosis of pelvic floor muscle functions.

| Pelvic floor muscle functions | Measurement | Psychometric properties |
|---|---|---|
| 1,2) Sensitivity and Sensation of pain | (bi)digital palpation as asking about the sensation of the patient. | |
| 3) Motor reflex | cutaneo-anal and bulbocavernosus reflexes. | |
| 4) Muscle tone | puborectal resting tonus scale by Dietz & Shek, 2008. | interexaminer reliability (weighted kappa of 0.55) |
| 5) Control of voluntary movements | (bi)digital palpation while asking to contract PFM as holding urine and then to relax. | interexaminer reliability (weighted kappa of 0.61) |
| 6) Coordination of voluntary muscles | (bi)digital palpation while asking to contract PFM as holding urine, observe activation of synergistic muscles. | interexaminer reliability (weighted kappa of 1.0) |

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|---|---|---|
| 7) Muscle power | modified Oxford scale and/or Peritron®. | strong reliability between these two measurement scales (r=0.887) [3] |
| 8) Muscle endurance | (bi)digital palpation counting in seconds the patient hability to hold the PFM contraction. | (ICC of 0.63; 95%CI of 0.48 to 0.90) |

Interpretation of results

The ICS allowed the construction of a comprehensive functional diagnosis of the PFM. Some of the functions selected have been widely used by physicaltherapists in clinical practice and research such as muscle power and endurance, but others are new, such as control of voluntary movements. Control and coordination come from the same root definition in the ICF, and might be considered redundant. It is important to note that these investigate different aspects of the PFM function that are important in the rehabilitation process, specially for patients who can not contract the PFM, which comprises about 30% of the general population of women. Although the pelvic floor muscle training has been proved effective to treat UI symtpoms, its applicability is limited to women who can not contract PFM. Therefore, evaluation of the capacity of contraction of the PFM by the control function, and its treatment should be incorporated in the physiotherapy treatment. One aspect of that function, the hyperactivity of the pelvic floor, has been previously suggested as relevant [2], but other aspects of the PFM control function, such as the capacity and how long does it take to contract the PFM according to command. We could not find in the literature valid and reliable measurements for all the PFM function selected. Therefore, adequate instruments should be developed in future studies. However, the investigation of the selected functions 4 to 8 were reliable in the evaluation of women with and without UI [3]. By using the PFMdiagnosis we might stablish funciotnal cutoff points that could be used to prognosis and treatment of women with pelvic floor dysfunctions. In fact, in a previous study by Baracho et al, 2012, we did find a cutoff point of 35.5cm$H_2O$ in the power of the PFM that predicted UI in primiparous women, 6 month after vaginal delivery.

Concluding message

The PFMdiagnosis presented here could be used to investigate the relation between PFM function and pelvic floor dysfunctions, the effectiveness of physiotherapy intervention for patients with PFM impairments and pelvic floor dysfunctions, and could be used as an important tool in the comprehensive communication among health care professionals. Mainly, it might support improvement in the knowledge of PFM function and the pelvic floor dysfuntions.

Keywords: Physiotherapy, pelvic floor, incontinence.

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