

**NATIONAL UNIVERSITY OF PHYSICAL EDUCATION AND SPORT
BUCHAREST**

DOCTORAL SCHOOL



ABSTRACT OF THE DOCTORAL THESIS

**Title of the doctoral thesis: THE ROLE OF PHYSIOTHERAPY
IN IMPROVING THE QUALITY OF LIFE OF WOMEN WITH
URINARY INCONTINENCE THROUGH PELVIC FLOOR
REHABILITATION METHODS**

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Keywords: *urinary and fecal incontinence; physiotherapy; biofeedback dynamic; young female athletes; pelvic floor muscle exercises; vaginismus; perineal rehabilitation.*

Introduction

Urinary incontinence has major impact in terms of quality of life, environmental, economic and health. Sometimes urinary incontinence can be associated with incontinence, urgent urination needs, prolapse or sexual dysfunction. In medical literature, intensive exercise is mentioned as a risk factor for urinary incontinence by loss of anticipated cushion contraction during physical exertion, impairment of pelvic muscle tone and strength, lack of pelvic floor muscle relaxation, which may lead to muscle exhaustion, all of this causing a lack of response during the rapid increase of intra-abdominal pressure.

Kinetic treatment consists in re-educating the pelvic floor - training the perineal muscles through specific physical exercises, endovaginal electrostimulation, biofeedback, transcutaneous electrical neurostimulation or detrusor inhibitory electrostimulation through tibialis posterior electrostimulation.

On one hand, urinary and fecal incontinence have a major impact from an ecological, economic, health point of view. Consequent reduced quality of life through urinary tract infections and skin conditions deeply affects the patient both psychologically and socially.

On the other hand, vaginismus has a significant impact on the quality of life from a psychological, social, couple life and fertility point of view. Vaginismus has been associated with high risk of marital relationship disruption, anxiety, depression, and low self-esteem.

Motivation and purpose

The main reason for selectig this topic is to highlight the importance of physical therapy in increasing the quality of life, improving or treating the symptoms of women with urinary incontinence through static and dynamic reeducation methods.

The first objective was to design a recovery protocol to reduce or eliminate symptoms of urinary incontinence in young female athletes affected by this condition through a complex approach to the rehabilitation of pelvic floor muscle tone and strength and specific training programmes.

The second objective was to describe the pelvic floor physiotherapy treatment in a complex case of a nulliparous young athlete who suffered of urinary and fecal incontinence after two hemorrhoidectomies.

The third objective was to highlight the favorable results of physiotherapy treatment in a case study of primary vaginismus present in a young woman following the failure of several other therapies.

Part I of the thesis

The theoretical background

Part I of the thesis includes *three chapters* in which we highlighted the importance of studies regarding urinary incontinence (UI) and to underline the most important aspects regarding perineal re-education and its impact on the quality of life of women with urinary incontinence.

In the first chapter, our objective was to highlight that urinary incontinence has a considerable impact on quality of life and, due to its high frequency in the general population, constitutes a major public health problem with a strong economic impact. Although it is such a common condition, many women suffer from urinary incontinence and hesitate to seek help from a specialist doctor. In the absence of adequate treatment, the patient limits her physical activities, social and professional life, and her sex life deteriorates. According to studies conducted by the International Continence Society, 5% of the general population suffers from urinary incontinence. The first attempts at perineal re-education were in the 1948s, thanks to the American gynecologist Arnold Kegel, whose aim was to restore and recover the tone and strength of the perineal muscles affected by pregnancy. In performance athletes, the risk of urinary incontinence appears to be approximately three times higher than in inactive women (Da Roza et al., 2015).

In the second chapter, we aimed to highlight the definition and classification of urinary incontinence. Urinary incontinence is sometimes associated with anal incontinence, which is defined by the International Continence Society as the involuntary loss of feces or gas. We also highlight the kinetic treatment regarding the re-education of the pelvic floor through specific physical exercises, like endovaginal electrostimulation, biofeedback, or detrusor inhibitory electrostimulation through tibialis posterior electrostimulation.

In the third chapter we highlighted the importance of perineal rehabilitation. Pelvic floor dysfunction includes "urinary incontinence, anal incontinence, pelvic organ prolapse, sensory and voiding abnormalities of the lower urinary tract, defecation dysfunction, sexual dysfunction, and several chronic pain syndromes" (Bump & Norton, 1998, p. 723). In the medical literature, vigorous exercise is a risk factor for urinary incontinence. Even if female athletes do not talk about this subject, several studies have estimated the presence of urinary incontinence between approximately 22% and 30% among them; 20% of female athletes stopped their sports activity due to urinary incontinence. Pelvic-perineal re-education can be defined as a set of specific non-surgical and non-pharmaceutical techniques aimed at treating pelvic static dysfunctions of the pelvic, urinary, digestive and sexual organs.

Part II of the thesis

Part II of the thesis comprises four studies with the common objective of highlighting the importance of physical therapy in increasing the quality of life of women with pelvic-perineal pathologies.

Study on the importance of physical therapy in increasing the quality of life of women with urinary incontinence through static and dynamic reeducation methods

The purpose of the study is to highlight the importance of physical therapy in increasing the quality of life, improving or treating symptoms of women with urinary incontinence through static and dynamic reeducation methods. Biofeedback, electrostimulation and physical exercises are used to re-educate the pelvic floor muscles and help patients, by visualizing the perineal contraction on the screen, become aware of perineal muscle contraction and relaxation. They learn to control/train their corresponding muscle groups through increased awareness.

The research addressed a number of **64 patients** diagnosed with urinary incontinence (UI), respectively stress urinary incontinence (IUM), emergency urinary incontinence (IUU) or mixed urinary incontinence (IUM), sometimes associated with problems of pelvic statics (prolapsus), with faecal anal incontinence or gas. The patients presented this condition as a result of a vaginal birth, as a result of intense sports, due to hormonal deficiency during the peri-menopause period, multiple vaginal births, etc. The research participants were divided into 2 groups: 32 patients in the static group and 32 patients in the dynamic group.

The criteria for the inclusion of patients in the research aimed at: women with urinary incontinence with medical prescription for perineal re-education; patients who have given their consent for participation and data collection; patients who have completed at least 8 sessions; the meetings were held within a maximum interval of 12 months; the patients who completed the initial balance and the final balance.

The study was structured on several levels, materialized by using research tools meant to provide a comprehensive perspective on urinary incontinence, focusing on the analysis of the impact of this phenomenon on the symptomatology and quality of life before and after physiotherapy treatment. The study uses the *longitudinal method*, providing a temporal image of this pathology, being applied research tools that allow the comparison of data, before and after performing kinetotherapy procedures.

Results

The type of physical activity was analyzed according to the symptoms, so the respondents have a series of varied activities, most of them being oriented towards walking, biking, fitness, running and tennis. However, we notice that 33% of patients do not practice any physical activity and represent the highest share in terms of symptoms. It appears, however, that cycling has a major impact on urinary incontinence associated with gas incontinence. We notice that the number of births also influences the symptomatology, the highest values in terms of symptoms, presenting patients who gave birth to 3 children.

The results presented above show that urinary incontinence significantly reduce the quality of life and show that kinetic treatment helps increase perineal muscle strength, increasing the quality of life and improving or even disappearing urinary incontinence.

We notice that the two groups have similar results, but the static group has had slightly better results, which can conclude that an effective kinetic treatment consists in static reeducation of the patient in the first phase for a better awareness of the perineal contraction and the transition to dynamic reeducation only when urinary incontinence improves significantly or disappears and the muscle strength improvement is stabilized. We can also conclude that physical activities should be reduced in the first phase of reeducation.

The patient's physical or health condition does not always allow dynamic reeducation. It would be interesting to perform a long-term analysis and on a higher number of patients.

Study regarding the Physiotherapy exercise protocol of pelvic floor muscles for young female athletes with urinary incontinence

The purpose of this study is to design a recovery protocol to reduce or eliminate symptoms of urinary incontinence in young female athletes affected by this condition through a complex approach to the rehabilitation of pelvic floor muscle tone and strength and specific training programmes to create a “perineal blockage”, the automatic contraction of pelvic floor muscles during physical exertion and relaxation at rest, the correction of both lumbar posture and muscle imbalance in the abdominal-lumbo-pelvic (core) area. The methods used were: literature review, observation, questionnaire survey (Contilife questionnaire), graphical method, mathematical and statistical method.

The case studies included *two patients*, young female athletes aged 15 and 20, suffering from urinary incontinence. The two patients benefited from 15 physiotherapy rehabilitation sessions and a home exercise protocol. They were very motivated to engage in the rehabilitation programme because urine leakage had a social, psychological and intimate impact on their lives (Table 1). During the rehabilitation programme, only the physical exercise method was used. Given their age, a non-invasive method was recommended. Biofeedback or electrostimulation (which is an intravaginal method) can be uncomfortable or harmful for young patients.

In the first part of recovery, which includes exercises for pelvic floor strengthening, no materials are needed (a floor mat is enough). The patient is advised to do the protocol at home for 30 minutes per day, three times a week. In the middle part of recovery, some dynamic exercises are added, such as using a fit ball or different walking, running, cycling or stepper exercises. The patient has to combine long and short contractions during dynamic exercises. The final part of recovery includes high-impact ground exercises, trampoline, skipping rope and some exercises from the patient's training that cause urine leakage.

Results

Results showed a decreased impact of urinary incontinence on patients' lives and an improvement in their quality of life. After rehabilitation, in the first subject we noticed the disappearance of urinary leakage and a complete improvement of the of UI life impact from a social and intimate point of view. On the other hand, from a psychological point of view, the impact decreased from 66% to 33%, the patient stating that there was still a fear that this problem may be recurrent. We also noticed an improvement in the quality of life.

The results show that the symptoms of involuntary urine leakage have disappeared from the physiotherapy treatment of patients and their quality of life has increased. However, it is recommended that this exercise protocol be continued at home or introduced to sports training at least once a week to maintain the outcome and prevent recurrence.

Study regarding Physiotherapy Management of Urinary and Fecal Incontinence in a Nulliparous Young Athlete Treatment. A Case Report

The purpose of this study was to describe the pelvic floor physiotherapy treatment in a difficult case of a nulliparous young athlete who complained of urine and fecal incontinence following two hemorrhoidectomies. We intend to test if physiotherapy is an efficient treatment for urine and fecal incontinence for a nulliparous young athlete.

This study is a qualitative observational study of *a 32-year-old female athlete* with urinary and fecal incontinence associated with a prolapse occurred in 2018 following hemorrhoid surgery. The patient had already had a similar operation in 2015, but without secondary incontinence or prolapse. The study was carried out in Mions (France), between September 2021 and April 2022.

Given that urinary and fecal urges had the most important impact on the patient, she started in both vaginal and anal recoveries with programs to improve bladder hyperactivity, anal urges and slow-tonic fiber training. The patient states that the urges were so important that she could not get from the sofa to the toilet. The second stage of the recovery was to continue training the slow fibers but also adding the tonic-phasic and phasic fiber training programs.

The sessions took place at a frequency of 1, 2 times a week in the office and approximately 2 sessions of physical exercises at home. The pelvic floor muscle training with or without biofeedback or electrostimulation is reducing urinary incontinence and improve pelvic floor muscle contraction. The pelvic floor muscle training with behavioral therapy and lifestyle modifications are effective first line treatments.

Results

Following the physiotherapy treatment, the symptoms were significantly reduced, the perineal muscle contraction force increased and the patient's quality of life increased. However, the patient maintains a rather high anxiety related to urinary and fecal incontinence through the fear of having a job, being still unemployed, the fear of participating in certain activities, during sexual acts and especially the fear that the incontinence urine and faeces may return with the same intensity as at the beginning. In the long term, there is a risk of relapse, that is why I recommend the patient to continue the pelvic and abdominal floor training exercises at least twice a week, so as to perform an annual medical check-up and possibly perform a series of 10 annual electrostimulation and biofeedback sessions for prevention relapses.

In conclusion physiotherapy is an efficient treatment for urinary and fecal incontinence for a nulliparous young athlete and it should be one of the first treatment intentions.

Study regarding vaginismus and perineal rehabilitation

The purpose of the study was to increase the quality of the intimate life of a woman diagnosed with grade 4 primary vaginismus, by reducing pelvic muscle spasms, thus allowing the start of sexual life.

A 27-year-old patient comes to the office with a medical prescription for perineal rehabilitation in the context of vaginismus. The patient discovered vaginismus after her marriage in 2015, as the patient had never had sex before. Sexuality for her is a delicate subject, firstly because of her religion and because of a history of sexual touching on another member of her family in her childhood, which had disturbed her psychologically.

It was first necessary to create a ground of trust with the patient and to explain to her the anatomy and physiopathology of the perineum. Different physiotherapy means of perineal rehabilitation have been used: electrotherapy to relax and analgic the spastic muscles of the pelvis, stretching and softening of the tendino-muscular complex of the pelvis and lower limbs; then a progressive vaginal approach with perineal manual therapy, dilators, electrotherapy and positive biofeedback (vaginal probe) and especially negative biofeedback for awareness of muscle relaxation; the technique contract / release with breathing.

Hypothesis: Physiotherapy treatment has favorable results in a case study of primary vaginismus present in a 27-year-old young woman following the failure of several other therapies.

Results

The intimate and psychological quality of life has been improved by fewer vaginal spasms, she easily accepts perineal re-education through the vagina and the introduction of objects such as the vaginal probe, the therapist's fingers, or dilators. The patient was able to start her sex life with vaginal penetration, sometimes with some difficulty, but her life as in the couple has clearly improved, as well as her psychological anguish in relation to her sex life and the worry about having children.

The patient began to have intercourse with vaginal penetration positively impacting her quality of life and the couple's quality of life improved.

Personal contributions

The doctoral thesis " *THE ROLE OF PHYSIOTHERAPY IN IMPROVING THE QUALITY OF LIFE OF WOMEN WITH URINARY INCONTINENCE THROUGH PELVIC FLOOR REHABILITATION METHODS*" represents a new approach in pelvic floor rehabilitation in which complex techniques are chosen and adapted according to each patient,

pathology and lifestyle. Dynamic rehabilitation by associating physical exercises with electrostimulation and biofeedback allows a re-education especially among active women and athletes, by putting the patients in a real situation during efforts by re-automating the anticipatory perineal reflex to effort.