Impact of verbal instructions on pelvic floor contraction in the immediate postpartum

Impacto das instruções verbais na contração do assoalho pélvico no puerpério imediato

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Date of first submission: July 30, 2021
Last received: February 9, 2022
Accepted: February 21, 2022
Associate editor: Maria Augusta Heim

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Abstract

Introduction: Pregnancy predisposes the emergence of pelvic floor dysfunctions (PFD), postpartum being the opportune moment to assess these muscles. **Objective:** To investigate the effect of instructions and verbal feedback on the contraction capacity of pelvic floor muscles (PFM) in postpartum women. **Methods:** Quasi-experimental study with 109 women in the immediate vaginal postpartum at a reference maternity hospital in Fortaleza, Ceará state, Brazil. PFM were visually inspected using the visual contraction scale (0 = no visible contraction; 1 = weak visible contraction; 2 = visible contraction with perineal elevation), in addition to observing the use of accessory muscles and movements. Assessments occurred in consecutive moments: 1 – PFM contraction at a verbal command; 2 – contraction after instructions on structure, function and correct contraction; and 3 – contraction after feedback on the use of accessory muscles and reinforcement of correct contraction. Cochran's Q test and a 5% significance level were used to compare the outcomes between different moments. **Results:** At the first assessment, 15.6% of the postpartum women did not exhibit visible PFM contraction (grade 0). Of these, 70.5% changed their contraction grade after instructions and feedback. At the end, 45.9% of women correctly contracted their PFM with perineal elevation (grade 2) ($p < 000.1$). The use of accessory muscles (abductors, abdominals and gluteal) declined after instructions and feedback ($p < 000.1$). Perineal trauma, forceps delivery, previous information and fear of feeling pain were not associated with contraction grade. **Conclusion:** Instructions and verbal feedback are useful tools for correct PMF contraction in the immediate postpartum.

Keywords: Instructions. Pelvic floor. Physiotherapy. Postpartum period. Women's health.

Resumo

Introdução: *A gestação predispõe o surgimento de disfunções do assoalho pélvico (DAP), sendo o pós-parto momento oportuno para avaliar essa musculatura.* ***Objetivo:*** *Investigar o efeito das instruções e feedback verbais na capacidade de contração dos músculos do assoalho pélvico (MAP) em puérperas.* ***Métodos:*** *Estudo quase-experimental com 109 mulheres no pós-parto vaginal imediato em uma maternidade de referência em Fortaleza, Ceará. Realizou-se inspeção visual dos MAP pela escala visual de contração (0 = nenhuma contração visível; 1 = contração visível fraca; 2 = contração visível com elevação perineal), além de observação da utilização de musculatura e movimentos acessórios. As avaliações foram em momentos consecutivos: 1 - contração dos MAP ao comando verbal; 2 - contração após instruções sobre estrutura, função e correta contração; e 3 - contração após feedback sobre a utilização de musculatura acessória e reforço da correta contração. Para comparação dos desfechos entre os momentos foi utilizado o teste Q de Cochran e significância de 5%.* ***Resultados:*** *No primeiro momento, 15,6% das puérperas não apresentaram contração visível dos MAP (grau 0). Dessas, 70,5% modificaram o grau de contração após instruções e feedback. Ao final, 45,9% das mulheres contraíram corretamente os MAP com elevação perineal (grau 2) (p < 000,1). A utilização de músculos acessórios (adutores, abdominais e glúteos) diminuiu após instruções e feedback (p < 000,1). Trauma perineal, parto a fórceps, informações prévias e medo de sentir dor não se associaram ao grau de contração.* ***Conclusão:*** *Instruções e feedback verbais são ferramentas úteis para contração correta dos MAP no pós-parto imediato.*

Palavras-chave: *Instruções. Assoalho pélvico. Fisioterapia. Período pós-parto. Saúde da mulher.*

Introduction

During pregnancy, hormonal and biomechanical changes, such as a gain in body mass and enlarged uterus, raise the pressure on pelvic floor muscles (PFM). Especially in primiparous women, there is an increase in urethral mobility, changes in muscle tone and activity, heightening the risk of pelvic floor dysfunctions (PFD), such as urinary incontinence (UI) and pelvic organ prolapse.[1,2]

As described in the literature, approximately 30% of women have difficulty in perceiving and activating these muscles when asked for the first time during a physical examination of PFM.[3,4] Given that changes in PFM strength and function occur during the gestational period, and that the perineal region in the postpartum is in a congestive and edematous state, this difficulty may be exacerbated. Pelvic floor muscle training (PFMT) is recommended as first-line treatment, but also as a preventive strategy for UI, thus it is important to assess these muscles correctly.[5]

Assessment and subsequent PFMT after delivery may result in a faster and more effective recovery in preventing and treating PFD.[6] Correct PFM contraction is defined as an approximation between the vagina and anus, with cranial displacement of the central tendon of the perineum, without using the accessory muscles. Due to pain and/or vaginal bleeding, vaginal palpation and manometry may be uncomfortable in the immediate postpartum.[7] In addition to these methods, visual inspection is one of the ways to conduct this assessment. The perineal region can be observed to determine the contraction or not of PFM, as well as the use of accessory muscles and movements.[8]

Although there are literature studies such as that carried out by Assis et al.,[9] showing that verbal instructions on anatomy, PFM functions and correct PFM contraction benefit the function of these muscles and urinary symptoms, it involved multiparous women, not in the context of the immediate postpartum. There is a gap in the literature on the effects of techniques for teaching women correct PFM contraction in the immediate postpartum. As such, this study emphasizes the importance of verbal instructions. Given that PMFT is recommended in the postpartum and that verbal instructions are classic strategies for guiding correct PFM contraction,[7] it is essential to know the difficulties involved in movement, in addition to assessing how this group of women perform these contractions after receiving instructions. Thus, the aim of this study was to investigate the effect of instructions and verbal feedback on the PFM contraction capacity of women in the immediate postpartum.

Methods

This is a quasi-experimental study with a pre and post-test design, conducted with 109 vaginal postpartum women at a reference maternity hospital in Fortaleza, Brazil, between July and September 2018, after approval by the Research Ethics Committee (CAAEE number 88395018.4.0000.5050).

Included were postpartum women with vaginal delivery at 34 weeks or later, between 12 and 72 hours postpartum, and excluded were women using an indwelling urinary catheter, who exhibited cognitive impairment and were hospitalized in an intensive care unit. Non-probability, consecutive or convenience sampling was used and data collection occurred after participants and/or their legal representatives provided written informed consent. The instruments used for data collection were the visual pelvic muscle contraction scale and medical charts.

The pelvic floor muscle contraction scale uses visual inspection to classify perineal contraction movement into three grades: 0 = no visually observed contraction; 1 = weak contraction; and 2 = visualized contraction with perineal elevation and movement in the cranial direction. This scale was developed by Belgian researchers in a study involving 958 postpartum women, exhibiting high interrater reliability (k = 0.832).[7]

The use of accessory muscles and movements was also assessed by visual inspection and characterized as a visible contraction or movement of adductor, gluteal, and abdominal muscles, or apnea, Valsalva maneuver (such as expiration with glottic closure) or pelvic movement (ante and retroversion).

The following variables were extracted from the medical charts: age, schooling, gestational age, parity, use of forceps, episiotomy, laceration occurrence and grade. In addition, the subjects were asked about the presence and fear of perineal pain and whether they had previous information on PFM and PFMT.

Visual inspection of PFM contraction was performed in the gynecology examination room, preserving the women's privacy. The postpartum women were placed on an examination table in dorsal decubitus, with their hips and knees flexed and feet at the trunk level. Data collection followed three consecutive steps (Figure 1):

Assessment 1: PFM contraction at a standardized verbal command ("contract your vagina as if you were trying to hold your urine"). This verbal command was used to facilitate understanding of PFM contraction, using simple language. Contraction was classified by the visual contraction scale and the use or not of accessory muscles and movements were recorded alone or simultaneously (adductor, abdominal and gluteal muscle, apnea, Valsalva maneuver and pelvic movements).

Assessment 2: Next, the postpartum women were instructed about the PFM, their anatomical location and functions by presenting a figure of the genital region. During the explanation, simple language was used with examples of the women's daily situations ("urge to urinate" and "fallen bladder", for example). The participant was then asked to "contract their vagina muscles, pulling inward and upward". Next, the women were asked to contract again, performing three rapid consecutive contractions, and were then reassessed using the visual scale. In order to classify the contraction grade, the last contraction was considered, taking the effect of learning the movement into account.

Assessment 3: Individualized feedback was provided on the use of accessory muscles and movements. Next, they were asked to perform another contraction, which was then classified.

The three assessments were conducted at the same meeting, one after the other. In the present study, grade 2 was considered a correct PFM contraction, visualizing the approximation between the vagina and anus, with cranial displacement of the central tendon of the perineum, without using accessory muscles.

Verbal feedback consisted of specific individualized instructions according to the contraction quality observed in visual inspection. If the adductors were used during PFM contraction, the women were instructed not to try and squeeze their legs together; if they performed expiratory apnea, they could continue breathing normally. At the end of assessment, all the women were asked about the presence of pain and fear of feeling pain when contracting their PFM.[10]

The dependent variables were the visual pelvic floor muscle contraction scale and the use of accessory muscles and movements. The independent variables were the instruction regarding correct PFM contraction and feedback on the use of accessory muscles and movements. The covariables were pain and fear of feeling perineal pain, laceration, episiotomy, forceps delivery and previous information on PFM.

Data collection was carried out by a single examiner, a physiotherapist with experience in the area and at the maternity hospital, who conducted a pilot test before the study. The pilot test was performed with ten women by two researchers, the examiner and a supervisor with extensive experience in women's health physiotherapy. The researchers simultaneously assessed the pilot test participants until they reached agreement on the contraction grade and use of accessory movements. These subjects were not included in the research sample.

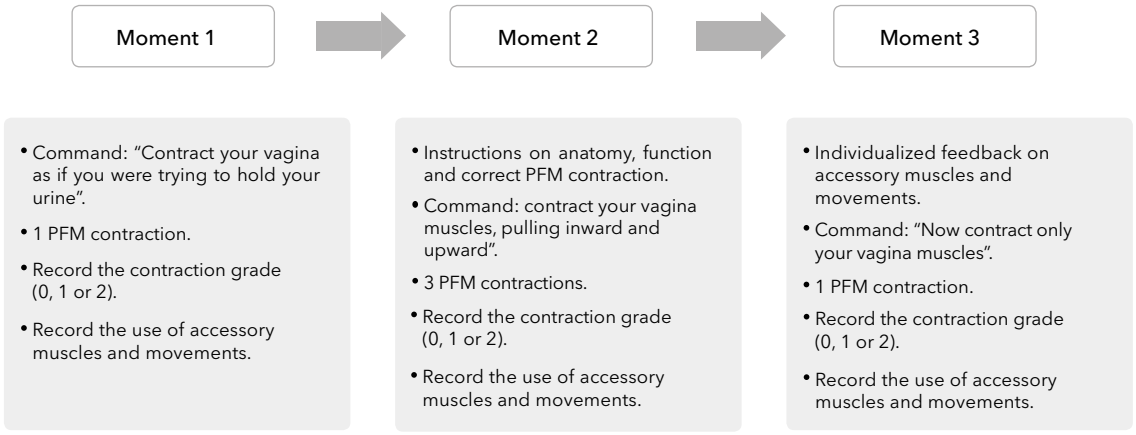

Figure 1 - Data collection flowchart.

Note: PFM = pelvic floor muscles.

With respect to statistical analysis, the data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 20.0 (USA). Descriptive analysis was presented through central tendency and dispersion, using means and standard deviations for the qualitative variables and absolute and relative frequencies for their categorical counterparts. Pearson's chi-squared and Fisher's exact tests were applied to analyze the factors (categorical variables) associated with contraction grades (at moment 1).

Finally, Cochran's Q test was used to determine whether there was a difference in contraction grades between the three assessments, as well as the accessory muscles and movements. This test makes it possible to observe if there is a difference in dichotomous variables between the three assessments, as well as compare the pairs to identify the specific significant difference between assessments. In order to analyze the difference in contraction grades between the assessments, Cochran's test considers only two categories, namely contraction grades 0 and 1, which were compiled into a single category and compared against grade 2. A 5% significance level ($p < 0.05$) was established for all the tests.

Results

Most of the 109 women included (n = 48) were aged between 18 and 25 years, with an average of 24.3 years (minimum of 14 and maximum of 42 years). The other characteristics are described in Table 1.

PFM contraction grade at the first assessment showed that 17 (15.6%) postpartum women did not exhibit visible contraction (grade 0), 56.9% grade 1 and 27.5% grade 2. Among those who obtained grade 0, 70.5% (n =12) changed their contraction grade at the second assessment, and only three women were still unable to contract PFM at the third. At the end of assessment, 45.9% (n = 50) of the women performed contraction with approximation between the vagina and anus and cranial displacement of the central tendon of the perineum, achieving correct PFM contraction (grade 2) ($p < 0.001$).

The adductor, abdominal and gluteal muscles were the most recruited during PFM contractions, but instructions and mainly verbal feedback at assessment 2 resulted in decreased use of all the accessory muscles and movements evaluated ($p < 0.001$) (Table 2). At assessment 1, only three (2.7%) women obtained grade 2 and did not use any accessory muscle or movement, while in the second and third assessments, these numbers were four (3.6%) and 29 (26.6%) women, respectively (data not presented in the tables).

There was no association between episiotomy, use of forceps, previous information on PFM and fear of feeling pain during contraction and contraction grade according to the scale applied at assessment 1 (Table 3). It is important to note that no adverse event occurred during or after assessments.

Table 1 - Clinical and sociodemographic characteristics of the participants (n = 109)

Variables	n	%	Mean ± SD
Age			24.3 ± 6.9
Pregnancies			
1 pregnancy	53	48.6	
2 pregnancies	27	24.7	2.0 ± 1.4
> 3 pregnancies	29	26.6	
Gestational age at delivery			
34-36 weeks	16	14.6	
37-40 weeks	82	75.2	38.0 ± 3.7
41- 42 weeks	11	10.0	
Parity			
Primiparous	56	51.3	-
Multiparous	53	48.6	
Use of forceps			
Yes	3	2.7	-
No	106	97.2	
Episiotomy			
Yes	7	6.4	-
No	102	93.6	
Laceration			
Yes	73	66.9	-
No	36	33.0	
Laceration grade*			
1	34	46.5	
2	29	39.7	-
3	4	5.4	
Schooling			
Elementary	34	31.1	
Secondary	56	51.3	-
University	7	6.4	
Unknown	12	11.0	

Note: *Unavailable data (n = 6); SD = standard deviation.

Table 2 - Comparison between the use of accessory muscles and movements (AAM) and contraction grades during the assessment period (n = 109)

AMM	A1 n (%)	A2 n (%)	A3 n (%)	p-value
Adductor	62 (56.8)	59 (54.1)	28 (25.6)	< 0.0100*[a]
Abdominal	55 (50.4)	51 (46.7)	23 (21.1)	< 0.0100*[a]
Gluteal	47 (43.1)	34 (31.1)	14 (12.8)	< 0.0100*[a]
Apnea	36 (33.0)	31 (28.4)	7 (6.4)	< 0.0100*[a]
Pelvic mov.	22 (20.1)	8 (7.3)	2 (1.8)	< 0.0100*[b]
Valsalva	9 (8.2)	5 (4.5)	2 (1.8)	0.0100*[c]
Contraction grades**				
0	17 (15.6)	5 (4.6)	3 (2.7)	
1	62 (56.9)	56 (51.4)	56 (51.4)	< 0.0001*[b]
2	30 (27.5)	48 (44.0)	50 (45.9)	

Note: A = assessment; [a]Accessory muscles (adductors, abdominals and gluteal) and apnea: A1 vs. A3;A2 vs. A3. [b]Pelvic movement and contraction grades: A1 vs. A2; A1 vs. A3. [c]Valsalva: A1 vs. A3. *Cochran's test. **Cochran's test considers only two categories (for this test grades 0 and 1 were compiled into a single category, which was compared to grade 2) to analyze the difference in contraction grades between the assessments. Pelvic mov. = pelvic movement.

Table 3 - Assessment of the association between factors that could interfere in contraction quality at moment 1

Reasons for interference	Grade 0 n (%)	Grade 1 n (%)	Grade 2 n (%)	p-value
Previous information (n = 34)	7 (20.5)	15 (44.1)	12 (35.2)	0.19*
Presence of pain (n = 20)	6 (30.0)	7 (35.0)	7 (35.0)	0.05*
Fear of pain (n = 27)	2 (5.4)	14 (37.8)	11 (29.7)	0.13*
Schooling (n = 97)				
Elementary (n = 34)	5 (14.7)	18 (52.9)	11 (32.4)	
Secondary (n = 56)	7 (12.5)	34 (60.7)	15 (26.8)	0.42**
University (n = 7)	1 (14.3)	3 (42.9)	3 (42.9)	
Procedures				
Episiotomy (n = 7)	3 (42.9)	3 (42.9)	1 (14.3)	0.11**
Forceps (n = 3)	2 (66.7)	1 (33.3)	0 (0.0)	0.11**
Laceration (n = 73)	11 (15.1)	43 (58.9)	19 (26.0)	0.76*

Note: *Pearson's chi-squared test. **Fisher's test.

Discussion

Most of the women in the immediate postpartum exhibited difficulty in correctly contracting their PFM when asked to do so without adequate guidance. However, with standardized instructions and individualized feedback, there was a change in PFM contraction grade (assessment 1 versus 2) and decreased use of accessory muscles and movements (assessment 2 versus 3), determined by visual inspection during the three assessments. This result reflects the importance of physiotherapists' recognizing impaired muscle functions and adjusting the verbal command, given that at assessment 2 verbal instructions on anatomy, function and correct PFM contraction favored PFM contraction, while at assessment 3, feedback focused on accessory muscles and movements, enhancing PFM contraction coordination and specificity.

PFMT is one of the main approaches to prevent and treat PFD during the gestational period and after delivery, contributing to the recovery of PFM function, altered by physiological and biomechanical changes inherent to pregnancy and delivery.[11,12] Saboia et al.[13] found that all the studies they assessed used PFMT as the main prevention strategy for urinary incontinence (UI) in the postpartum and that, compared to routine care, PFMT is effective in preventing UI in the immediate and late postpartum.

In this respect, given that PFMT is essential in preventing and treating PFD, it is important that women learn to perform correct perineal contractions to enable adequate PFMT after delivery. In the present study, 72.5% of the women (n = 79) were unable to correctly contract their PFM at assessment 1. This finding corroborates the pioneering study by Bø et al.,[14] where up to 30% of the women could not perform a correct contraction on the first attempt. In addition to difficulties with body perception and fear of perineal pain, the present study was conducted in a public hospital and most participants did not receive prenatal physiotherapy, with the assessments conducted here being the first contact with the PFM topic for 75% of the women. However, even at this single contact, the women were able to understand the instructions and achieve better PFM results, that is, to learn or improve contraction. The fact that 70.5% of women that could not contract their PFM changed their contraction grade after instructions and feedback confirms the findings of Hay-Smith et al.[15] on the importance and effectiveness of verbal instructions in PMFT. Thus, physiotherapy instructions in the immediate postpartum are relevant and may be potential modifiers of contraction capacity and PFM coordination.

The adductors were the most widely used accessory muscles, followed by the abdominals and gluteals. This is similar to the results of a Belgian study conducted by Neels et al.,[7] where the accessory muscles most widely used by the postpartum women were the abdominals, followed by apnea and gluteal movement. However, Sapsford et al.[16] found that abdominal muscle activity results from maximum PFM activation. Thus, when asked to perform PFM contractions, the postpartum women contracted their abdominal muscles in order to better execute the perineal movement. In our study, only rapid PFM contractions were used, with no orientation for sustained contractions, which could increase the use of accessory muscles or cause muscle fatigue.

Kruger et al.[17] found that abdominal and hip rotator muscle contraction does not activate PFM enough to provide a training effect, given that the pressures generated on the PFM were greater during isolated PFM contraction, which should continue to be recommended, following the principle of specificity for muscle strengthening. In the present study, verbal feedback aimed at isolated PFM contraction, resulting in 45.8% of the women achieving correct contraction (grade 2). These data corroborate Vermandel et al.,[18] who studied 958 postpartum women, where verbal instruction was also confirmed as an effective tool for guiding PFM contraction.

Recent studies demonstrate that postpartum perineal pain is frequent between 70 and 90% of women.[19,20] The low incidence of perineal pain (18.3%, n = 20) found in the present study may be related to the low indices of severe lacerations (5.4%) and episiotomy (6.4%) in our sample, as well as in a study conducted in São Paulo by Francisco et al.,[21] who reported that 18.5% complained of this pain.

In contrast to what was expected, forceps delivery and episiotomy exhibited no relationship with contraction grade or the findings reported by Vermandel et al.[18] Nor were previous information on PFM and schooling associated. These results demystify the reluctance to guide PFMT for women who suffered from perineal trauma and the notion that low schooling would be a limitation for understanding correct PFM contractions. Nevertheless, only educational strategies may not be enough to strengthen PFM and, for this reason, new postpartum PFMT strategies should be stimulated.[22]

Although vaginal palpation and manometry are widely used by physiotherapists to assess PFM function and strength,[8] in the present study visual PFM inspection can be considered a limitation. However, this is the first study on Brazilians in the immediate vaginal postpartum, given that this period exhibits a limitation in the use of intravaginal methods due to vulvar and perineal edema, pain, discomfort, lochia, sutures and increased risk of infection. On the other hand, the postpartum period is opportune for instructing women on the benefits of PFMT in the treatment and prevention of dysfunctions.

The results should be interpreted with caution because of the limitations inherent to a quasi-experimental design, such as the absence of a control group, randomization and the lack of rater blinding. However, since the assessments were performed at

consecutive moments, it is believed that the effect observed is due to the instructions and feedback provided. Another limitation is subjective assessment; however, a scale with high interrater reliability was used (k = 0.832),[7] which can be applied in different environments by different professionals, in addition to being a simple low-cost assessment method.

We highlight the originality and contribution of this study, which allows broadening the approaches in the immediate postpartum and facilitating the clinical practice of physiotherapists in maternity hospitals. In addition, a number of factors contributed to uniform collection and better internal validity, such as a standardized verbal command for PFM contraction, examiner training, data collection pilot test and assessments on the first three days postpartum.

Finally, although the study was carried out in women with low socioeconomic conditions, 1/3 with low schooling and only 30% with previous information on PFM, verbal instructions improved the women's capacity to perform a correct contraction in the immediate postpartum.

Conclusion

Most of the women in the immediate postpartum had difficulty in correctly contracting and coordinating PFM. The verbal instructions and feedback were useful in promoting correct PFM contraction and decreasing the use of accessory muscles and movements. Moreover, the visual inspection used is a simple, noninvasive and low-cost method that physiotherapists can perform in maternity hospitals in the immediate postpartum, thereby providing better quality care. In order to assess contraction capacity over time, longitudinal studies and randomized clinical trials are recommended.

Authors´ contributions

ASA, IRPF e SLN were responsible for the project development; ASA, IRPF and GNDO, for the data collection; and ASA, MAM and SLN, for the data analysis. The manuscript was written by ASA, IRPF, ACL, GNDO and SLN, and edited by ASA, IRPF, ACL, MAM and SLN. All authors approved the final version.

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