

The development and psychometric evaluation of a self-efficacy scale for practicing pelvic floor exercises

Cinara Sacomori, Fernando L. Cardoso, Isabela P. Porto, Nubia B. Negri

ABSTRACT | Background: Self-efficacy has been shown to be a predictor of many health-related behaviors, including the practice of pelvic floor exercises with a focus on prevention or cure. **Objectives:** To describe the process of construction and the psychometric properties of the scale of self-efficacy for the practice of pelvic floor exercises (EAPEAP). **Method:** A cross-sectional study of validation was carried out with 81 from community and 96 postpartum women, 54.8% of them complained of urinary leakage. An exploratory factor analysis and internal consistency analysis was performed. To check predictive capacity, we analyzed the adherence at 3 months post - intervention and compared the scores of self-efficacy between adherent and non-adherent women. Reliability was analyzed by split half procedure. **Results:** The instrument showed $\alpha=0.923$, and revealed three factors: performance expectation considering the action, performance expectation considering the preparation for action and outcome expectations. These factors accounted for 65.32% of the total variance. The instrument was able to differentiate between women who adhere and have not adhered to the exercises ($U=352$, $p=0.013$) and there was strong correlation between the two halves of the instrument ($\rho=0.889$, $p<0.001$). **Conclusion:** The scale is a valid and reliable tool to measure self-efficacy to practice pelvic floor exercises.

Keywords: self-efficacy; pelvic floor; movement; validation studies; adherence.

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● Introduction

This study focuses on adherence to physical therapy and professional instructions because many therapeutic results are compromised due to low adherence and poor active participation to restore the desired patient function¹. Similarly, adherence to exercise at home after physical therapy is essential to maintain results².

According to Bandura³, self-efficacy beliefs are required for people to actively care for their own health. Self-efficacy is defined as “people’s beliefs in their capability to exercise some measure of control over their own functioning and over environmental events”³. Thus, self-efficacy expectations eventually affect behavior. The environmental effects created by such behaviors also change self-efficacy beliefs³.

In the context of pelvic floor dysfunction (PFD), the exercises used to train the pelvic floor (PF) muscles are typically the first option in physical therapy. One systematic review indicated that physical therapy effectively reduces urinary symptoms in older women with urinary incontinence⁴. In addition, previous studies have suggested that a relationship exists

between high self-efficacy and positive adherence rates to these treatments for urinary incontinence⁵⁻¹⁰.

Existing scales to evaluate self-efficacy with regard to practicing PF exercises (PFEs) have been developed and validated in other countries (e.g., the US⁷, Taiwan¹¹, Canada¹², and Turkey¹³); however, none have been validated in Brazil. The present study evaluated the psychometric properties of the Self-Efficacy Scale for Practicing PFEs (SESPPFE).

● Method

The present study employed a cross-sectional validation design.

Participants

This study consisted of 177 women, including 81 women from the general population (with or without PFD symptoms) and 96 postpartum women (54.8% of whom complained of urinary leakage). The women from the general population were evaluated at the

Network of Women Against Cancer (Rede Feminina de Combate ao Câncer) in Florianópolis, SC, Brazil, between September 2011 and March 2012. These women underwent a functional assessment of the PF muscles via a digital vaginal exam and were then instructed on how to perform daily PFEs that were meant to be preventive or curative. The postpartum (puerperium) women were at the Maternity Carmela Dutra, Florianópolis, SC, Brazil and received instructions concerning practicing the exercises in the maternity ward; however, only verbal instructions were provided, and the exercises were visually inspected.

This study excluded women who did not show signs of visible or palpable PF muscle contractions during a physical examination, those who were functionally illiterate, or those who refused to participate in the study.

The ethics committee of the Universidade do Estado de Santa Catarina (UDESC), Florianópolis, SC, Brazil (175/2011) and the Maternity Carmela Dutra (CAE: 0010.0.233.269-11), Florianópolis, SC, Brazil evaluated and approved this project. Patients provided consent by signing the free and informed consent form established by the above committees.

Research instrument: Scale development

The SESPPFE (Appendix 1) was developed specifically for this study based on the instructions provided by Bandura¹⁴. Other instruments in this field have been validated in other countries^{7,15}. The barriers previously described for practicing unsupervised PFEs were also considered. Forgetfulness, a lack of time, the uncertainty of performing the exercises correctly, the perception that the exercises do not help, and the idea that PFEs were only important during pregnancy and postpartum¹⁶ were the major reasons that women provided to explain their low treatment adherence, their lack of interest or discipline with regard to performing the exercises, and their difficulties in integrating the exercises into their daily activities^{5, 16-17}.

The majority of scales tested in other countries were directed at women with PFD^{7,11-13}. Thus, a new scale was developed rather than validating a scale that was previously described in the literature because the goals of the current study were to develop a scale that could be applied to women with or without incontinence and to identify their adherence to PFEs.

According to Bandura¹⁴, self-efficacy is composed of two dimensions: expected performance and expected results. The first refers to the judgments that one makes regarding an individual's behavior. The

second addresses judgments regarding the possible outcomes of certain behaviors, both positive and negative¹⁸.

From this theoretical assumption, a pool of 16 items was prepared. The participants responded to these items on a scale ranging from 0 to 100. Twelve items assessed expected performance, and four evaluated the expected results. The points allocated for each item were summed to calculate the self-efficacy score for practicing PFEs.

Content analysis

Four reviewers who are experts in female PFD or self-efficacy evaluated the scale. These reviewers validated the content of the instrument and offered suggestions to improve the phrasing of the items. Two reviewers requested that the following item be included: "How confident do you feel that you contracted PF to prevent leakage before coughing, sneezing, or strongly laughing." Therefore, the final scale included 17 items.

Predictive ability

To verify the scale's predictive ability, phone interviews were conducted with 89 women (48 from the general population and 41 postpartum women). This sample only includes the women who were successfully contacted via telephone approximately 3 months after the intervention. These women were asked whether they had performed PFEs in recent weeks.

Internal consistency and dimensionality

To evaluate specific psychometric qualities of the instrument, internal consistency and dimensionality analyses of the construct were performed using an exploratory factor analysis.

Reliability

Test-retest reliability was not assessed because self-efficacy changes with domain experience¹⁹. Thus, the understanding gained during PFEs should increase the self-efficacy beliefs of study participants. As an alternative to test-retest reliability, we performed the split-half technique in which the assessment is split in half and where one half is composed of the sum of the even items, and the other half is composed of the sum of the odd items.

Data analyses

The data were analyzed using descriptive statistics (frequency distributions, means, medians,

and standard deviations). To analyze the predictive ability of the instrument, the Mann Whitney U test was used given the non-normal distribution of the data. Internal consistency was assessed using Cronbach’s alpha coefficient, and the dimensionality of the construct was assessed using an exploratory factor analysis (i.e., principal component analysis, Varimax rotation). A significance threshold of $p < 0.05$ was adopted. Spearman’s correlation was performed to infer the reliability of the test and ascertain the strength of the relationship between the two test halves.

● Results

Characterization of the participants

In general, the study participants were white, lived with their partners, had received a primary to secondary level of education, and multiparous (Table 1). The average age of the women was 35.6 years (SD=13.9); the average age of the women in the general population was 45.8 years (SD=13.7), and the average age of the postpartum women was 27 years (SD=6.3).

Internal consistency and dimensionality of the scale

An exploratory factor analysis was performed to extract the principal components using Varimax rotation (Table 2). This analysis generated three factors that accounted for 65.32% of the total variance. The first factor (expected performance regarding an action) consisted of eight items that accounted for 48.25% of the total variance. The second factor (expected performance regarding action preparation) consisted of five items that accounted for 10.25% of the total variance. Finally, the third factor (expected results) consisted of four items that accounted for 6.81% of the total variance. The Cronbach’s alpha coefficient for the scale was $\alpha = 0.923$ ($\alpha = 0.840$, $\alpha = 0.889$, and $\alpha = 0.862$ for Factors 1, 2, and 3, respectively).

Predictive ability

Women who continued performing the exercises 3 months after the intervention had significantly higher self-efficacy scores than those who did not perform PFEs during the same period ($U = 352$; $p = 0.013$; $Md^{adherent\ women} = 1,430$ and $Md^{nonadherent\ women} = 1,160$).

Table 1. Characterization of the participants.

	All (n=177)		Community women (n=81)		Postpartum women (n=96)	
	n	%	n	%	n	%
Marital Status						
Single	27	15.3	20	24.7	7	7.4
Married/stable Relationship	133	75.3	48	59.1	85	89.5
Divorced	12	6.8	9	11.1	3	3.2
Widowed	4	2.3	4	4.9	0	0
Level of Education						
Elementary	74	42	45	56.3	29	30.3
Some high school	91	51.7	29	35.3	62	64.6
Graduation	11	6.3	6	7.4	5	5.2
Ethnicity						
Caucasian	157	89.2	69	85.2	88	92.6
Black/mulatto	18	10.2	11	13.6	7	7.4
Asian	1	0.6	1	1.2	0	0
Parity						
Nulliparous	12	6.8	12	14.8	0	0
Primiparous	43	24.3	11	13.6	32	33.3
Multiparous	122	68.9	58	71.6	64	66.7

Table 2. Factor analysis of the SESPPFE.

Item	Factor 1	Factor 2	Factor 3
Perform PFEs by yourself		0.483	
Remember to perform the exercises everyday		0.792	
Perform the exercises at least three times a week		0.826	
Include PFEs in your daily routine		0.697	
Continue the exercises even when they do not show any noticeable results		0.661	
Continue the exercises during vacation or travelling	0.646		
Perform the exercises in the sitting position	0.410		
Perform the exercises while standing	0.565		
Contract your PF muscles before coughing, sneezing, or strong laughing to prevent urinary leakage	0.637		
Continue the exercises even when your familial and personal responsibilities increase more than usual	0.850		
Continue the exercises even when you have more activities to perform than usual	0.821		
Continue the exercises even when another, more urgent, health problem exists	0.761		
Perform the exercises even when another person says that it is not necessary (e.g., a family member or friend)	0.609		
PFEs will prevent or improve health problems such as urinary leakage or bladder/uterine prolapse			0.781
PFEs will improve your sexual life			0.829
PFEs will improve your bodily perception			0.804
PFEs will benefit your health and well-being			0.777
α for each factor	0.840	0.889	0.862

KMO=0.900. Bartlett's sphericity test $p<0.001$.

Only 16 women (18%) did not adhere to the exercises until the interview date; of these women, nine were from the general population, and seven were from the postpartum population.

The women from the general population had self-efficacy scores similar to those of the postpartum women ($U=3740$; $p=0.663$; $Md^{\text{women in general}}=1,330$, $Md^{\text{postpartum}}=1,370$).

The two halves of the instrument were strongly correlated ($\rho=0.889$, $p<0.001$), which denotes an acceptable reliability.

● Discussion

According to Bandura¹⁴, self-efficacy has two dimensions: expected performance and expected results. The three factors determined in the current analysis coincide with Bandura's¹⁴ theoretical proposal. However, the scale in this study divided expected performance into two components: the

action itself and its preparation. Zengin and Pinar¹³ translated and validated a Japanese scale in Turkey and found the same three factors.

However, Broome⁷ found only two factors in the US, which matches Bandura's¹⁴ initial proposal. Chen¹¹ also found two factors in Taiwan, called belief in the performance and muscle benefits of PFEs and belief in performing the recommended PFEs despite barriers. This differentiation suggests that Brazilian women might make a greater distinction between an action and the preparation to act (i.e., between predisposition and the desire to act).

No international consensus exists concerning a particular self-efficacy assessment, which complicates the study of cultural differences with regard to PFE adherence.

The current instrument achieved an acceptable level of internal consistency. Our scale differs from similar instruments^{7, 11-13} because it was tested among a heterogeneous sample (women with or without urinary leakage and those in postpartum). Therefore,

this instrument is also applicable for women who do not have PFD symptoms but for whom exercises are suggested as a preventive measure. This area of practice is new for physical therapists who are part of multidisciplinary teams focusing on prevention and health promotion.

Self-efficacy is used to decide which actions are possible to perform while anticipating positive or negative results. Establishing a basis for action is important⁹. The current instrument differentiated between women who did or did not adhere to PFEs; therefore, it has an adequate predictive ability because theory suggests that self-efficacy beliefs are an important predictor of adherence to health-related behaviors^{5-10,19-21}.

Physical therapists often use health education strategies to change certain patient habits. The study of the issues that interfere with treatment adherence (e.g., a fear of falling among elderly patients²², the use of biomechanical insoles²³, or practicing PFEs⁵⁻¹⁰) is becoming increasingly important.

Alewijnse et al.⁵ argued that a major predictor of PFE adherence is intention, a motive shaped by social influences, expectations, personal attitudes, and external variables. The present questionnaire addressed these items to determine its effect on treatment adherence. Thus, higher expectations regarding treatment should predict stronger motivations to adhere to treatment⁵. The application of this questionnaire (to treat or prevent urinary incontinence) provides information for the therapist regarding patients' levels of self-efficacy and motivation to perform the recommended therapy. This information is clinically relevant because it allows therapists to identify people with low self-efficacy and use strategies to improve a person's confidence with regard to the benefits of treatment.

The present study represents the first attempt to develop a scientific instrument to assess self-efficacy with regard to practicing PFEs in Brazil. Its application has the potential to improve its validity and reliability across different social and cultural contexts. Its use is also important with regard to planning and monitoring intervention projects of this nature, while avoiding high levels of participant evasion.

In conclusion, the SESPPFE is a viable and reliable measurement of the construct in question. This study is limited by its heterogeneous sample and the fact that only one group of women was evaluated using a digital vaginal exam. Therefore, we suggest that this scale is used and tested in future experiments.

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Correspondence

Cinara Sacomori

LAGESC

Rua Pascoal Simone, 358, Coqueiros

CEP 88080-350, Florianópolis, SC, Brasil

e-mail: csacomori@yahoo.com.br

Appendix 1. Self-Efficacy Scale for Practicing PFEs (SESPPFE).

Respond using the scale:

0	10	20	30	40	50	60	70	80	90	100
Cannot under any circumstance			Moderately certain that I can				Highly certain that I can			

How confident do you feel that you can...

Confidence

- Perform PFEs on your own.
- Remember to perform the exercises every day.
- Perform the exercises at least three times a week.
- Include PFEs in your daily routine.
- Continue performing the exercises even when they do not show any noticeable results.
- Perform the exercises during vacation and while traveling.
- Perform the exercises in the sitting position.
- Perform the exercises in the standing position.
- Contract PF before coughing, sneezing, or strongly laughing to prevent leakage.
- Continue performing the exercises even when your personal and familial responsibilities are more demanding than usual.
- Continue performing the exercises even when you have more activities to do than usual.
- Continue performing the exercises even when you have another health problem that is more urgent.
- Perform the exercises even when other people say they are unnecessary (e.g., family and friends).

Now we would like to know how confident you are that...

Confidence

- PFEs will prevent or ameliorate problems such as leakage or prolapsed bladder/uterus.
- PFEs will improve your sex life.
- PFEs will improve your bodily perceptions.
- PFEs will benefit your health and well-being.