

Factors influencing long-term adherence to pelvic floor exercises in women with urinary incontinence

Mónica Venegas¹  | Bernardita Carrasco² | Romina Casas-Cordero²

¹ Faculty of Medicine, Physical Therapy Department, Centro de Especialidades en Piso Pelviano, Las Condes Clinic, University of Chile, Las Condes Clinic; “Centro Integral de Reeducción de Piso Pélvico” (CIREP), Santiago de Chile, Chile

² Faculty of Medicine, Physical Therapy Department, University of Chile, Santiago, Chile

Correspondence

Mónica G. Venegas, Faculty of Medicine, Physical Therapy Department, University of Chile, Las Condes Clinic; “Centro Integral de Reeducción de Piso Pélvico” (CIREP), Apoquindo 3990, 704. Las Condes, Región Metropolitana, Chile.
Email: monvenegas@gmail.com

Background and Objectives: To ensure the effectiveness of Physical Therapy for urinary incontinence (UI), it is crucial that patients adhere to treatment in both the long and the short term. Treatment adherence may prevent symptom progression and the need for surgery, which is associated with higher costs and potential complications. Adherence is defined as carrying out a recommended behavioral modification or change. The World Health Organization (WHO) has established that adherence is a multifactorial phenomenon determined by the interaction of five dimensions, which include diverse factors that affect long-term adherence on many levels.

Aim: To identify the factors that influence long-term adherence to pelvic floor exercises in women with UI.

Methods: Observational, descriptive, cross-sectional study. The sample was recruited from the “Centro Integral de Reeducción de Piso Pélvico” (CIREP), and included 61 women treated for UI at the center in 2014 and 2015. Participants completed a self-administered, 28-item questionnaire developed for this study based on the WHO five dimensions. Data analysis was performed using STATA 13.0 software.

Results: Having performed pelvic floor home exercises after discharge from Physical Therapy was significantly associated with self-rated treatment adherence ($P < 0.001$). Patient-related factors were significantly associated with long-term adherence to the pelvic floor exercise program ($P < 0.001$).

Conclusion: Patient-related factors, exerted the strongest influence on long-term adherence to pelvic floor exercises in women with UI; forgetting to do the exercises and boredom with the exercises were the factors most strongly related to low treatment adherence, while motivation and commitment were associated with high adherence in this population.

KEYWORDS

pelvic floor exercises, physical therapy, urinary incontinence, WHO treatment adherence

Institution at which the work was performed: Centro Integral de Reeducción de piso pélvico (CIREP), Chile.

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1 | INTRODUCTION

The International Continence Society (ICS) defines urinary incontinence (UI) as involuntary leakage of urine. This problem is more common among women than men and may occur at any stage of the life cycle, although it is most prevalent during adulthood and old age.¹ Worldwide, it is estimated that 25-45% of women suffer from this condition. UI may lower quality of life as it affects social, emotional, and psychological aspects of life.² Treatment for UI should be multidisciplinary and based on two pillars: medical treatment and Physical Therapy (PT).³ PT is considered the first-line treatment for this condition and should be tried before medication or surgery. PT for UI involves training the pelvic floor muscles; therapeutic exercises are facilitated by muscular biofeedback, electrical stimulation, and behavioral therapy, and PT is therefore considered a multimodal treatment.⁴ The literature supports the efficacy of pelvic floor exercises (PFE) in treating UI. The key to the effectiveness of this strategy is adherence to the exercise program^{5,6} although improvements are not always sustained over the long term. Patients often stop performing their exercises, and when this occurs, the symptoms are likely to reappear.⁷

Treatment based on pelvic floor exercises has been shown to provide greater benefit than no treatment or placebo in patients with UI. This type of exercise is effective, reducing urinary tract, increasing the cross-sectional area of the urethral sphincter, and improving pelvic floor muscular strength in women with stress urinary incontinence (SUI), urge urinary incontinence (UUI), and mixed urinary incontinence. This type of therapy is low in cost and has minimal side effects yet is effective in reducing the frequency of incontinence episodes.⁸

However, a major barrier to the success of this type of therapy is poor treatment adherence. If adherence is below 80%, the efficacy of therapy is diminished significantly.⁹ Adherence refers to the process of carrying out a recommended behavioral modification or change,¹⁰ and the World Health Organization (WHO) defines adherence as “the extent to which a person's behavior corresponds with agreed recommendations from a health care provider.” Is a complex, dynamic, and multifactorial phenomenon that relates to consumers, providers, health systems, and broader socio-economic and political contexts.⁵ According to the WHO, adherence is determined by the interplay of five dimensions: (I) Socio-demographic factors: age, education level, environment, and other variables that may influence therapeutic adherence in various ways depending on the condition and personal characteristics of the patient; (II) Healthcare team and system-related factors: elements associated with the patient-therapist relationship, the local health facility, and/or the health system as a whole; (III) Therapy-related factors: variables

associated with the treatment program, such as duration of treatment, previous treatment failures, frequent changes in treatment, treatment benefits, and side effects; (IV) Patient-related factors: the knowledge, attitudes, beliefs, perceptions, and expectations of the patient; and (V) Condition-related factors: elements associated with the specific illness that the patient is facing, such as symptom severity, degree of disability, rate of progression, seriousness of the illness, and availability of effective treatments.¹¹ Adherence is crucial for ensuring the effectiveness of treatment and therefore improving quality of life.¹² The literature suggests that in UI, there are different rates of short-term versus long-term PFE adherence, that is, a supervised program during treatment versus independent practice of a home exercise program after discharge. For PFE, long-term adherence refers to the period 6 months to 2 years after discharge from Physical Therapy. It is estimated that 64% of patients adhere to PFE programs in the short term but only 23% remain adherent over the long term.¹³

Predictors of PFE adherence include demographic variables (age and education level), general physical status, severity of UI, and self-efficacy for performing the PFE.¹⁴ Prior studies have shown that older age has a modest positive effect on adherence. Higher levels of education, the availability of social support, and self-care agency also positively influence adherence.¹⁰

Given the high prevalence of UI and the significant social burden associated with the condition, a better understanding of the factors that determine the long-term efficacy of pelvic floor rehabilitation would be valuable.¹⁵ Many of these elements have been analyzed in isolation in prior studies, especially patient-associated variables, such as motivation, perceived treatment benefits, self-efficacy, and memory impairment.¹⁰ However, these factors have not been assessed within the framework of the five dimensions proposed by the WHO, which would allow for an analysis of adherence on multiple levels. Therefore, the objective of this research was to identify the factors that affect long-term adherence to PFE in women with UI, using a self-administered questionnaire developed for this study based on the WHO dimensions. The purpose of the study is to leverage the use of the dimensions proposed by the WHO to identify patients at risk for low PFE adherence, in order to facilitate the selection of an intervention strategy that targets the dimension most affected.

2 | MATERIALS AND METHODS

This study was designed as a non-experimental, observational, descriptive, cross-sectional study. A non-probabilistic convenience sample was recruited. Inclusion criteria were as follows: women between the ages of 18 and 85 years; treated for urinary incontinence in “Centro Integral de Reeducción de Piso Pélvico” (CIREP) during 2014-2015; treated with

Physical Therapy based on pelvic floor muscle training; and discharged from Physical Therapy 6 months to 2 years prior to study enrollment. Women were excluded from the study if they had received treatment only with neuromodulation via posterior tibial nerve stimulation.

Data were collected using a self-administered, written questionnaire with 28 items, mainly yes/no questions, which took an average of about 10 min to complete. The questionnaire was developed by the study team. The first 26 items were based on the dimensions proposed by the WHO with a potential influence on long-term treatment adherence: sociodemographic factors, healthcare team and system-related factors, therapy-related factors, patient-related factors, and condition-related factors.¹¹ The last two items consisted of an adherence scale, developed based on recommendations in the literature⁹ (Table 1), and an open-ended question about adherence. The questionnaire was validated by methodological and statistical experts with over 20 years of experience in health research and by Physical Therapists who are experts in pelvic floor muscle training.

The study procedures and the informed consent form were approved by the Ethics Committee of the University of Chile Faculty of Medicine, N° IRB 236-2015. Study candidates were contacted by telephone, and patients who agreed to participate were scheduled for a visit at their home, workplace, or other convenient location. The study was explained in detail, and written informed consent was obtained before proceeding with the questionnaire.

2.1 | Statistical analysis

Data analysis was performed using STATA 13.0 software for both descriptive and inferential statistics. Descriptive statistics were used to characterize the sociodemographic profile of the sample, the number and percentage of yes or no responses to each item, and the distribution of each variable according to the Shapiro-Wilks test. The “age” and “number of children” variables showed a normal distribution. The “education” and “paid work” variables did not show normal distributions. Inferential statistics included a nonparametric chi-square (χ^2) test to evaluate the associations between the dependent and independent variables, that is, the relationship between degree of treatment adherence and the factors proposed by the WHO. *P*-values <0.05 were considered statistically significant.

The internal consistency of the questionnaire was also assessed. The Cronbach's alpha test was used to measure the consistency of responses among items that were designed to measure the same construct or theoretical dimension. The general criteria provided by George and Mallery were used to evaluate the Cronbach's alpha coefficients, in which values above 0.7 are considered acceptable.¹⁶

3 | RESULTS

A total of 243 patients were treated at CIREP during 2014 and 2015. Of this total population, 33 patients were men, 68 were women with a pelvic floor condition other than UI, 17 were minors, and 35 were women who were still being treated for urinary incontinence. Of remaining 90 patients who met inclusion criteria: 18 did not want to participate in the study, 6 lived outside of Santiago, and 5 could not be located. Therefore, the final sample included 61 patients.

3.1 | Sociodemographic factors

The questionnaire included four sociodemographic items. The “age” and “number of children” variables showed a normal distribution, while “education level” and “paid work” were not distributed normally. The average age of the sample was 55.3 ± 15.2 years, and average number of children was 2 ± 1.3 . In terms of education level, 68.8% had at least a college degree, 18% had some college education, 11.4% had a high school degree, and 1.6% had completed elementary school. Moreover, 59% had a paid job, while 41% did not (Table 2).

3.2 | Factors associated with therapy, healthcare team, patient, and condition

The results indicate that performing the home exercise program after discharge from Physical Therapy was significantly associated with higher levels of treatment adherence as measured according to the self-rated adherence scale ($\chi^2 = 28.9914$, $P < 0.001$).

Of the five dimensions proposed by the World Health Organization (WHO) that are potentially associated with long-term treatment adherence, only the patient-related dimension was significantly associated with long-term adherence to the pelvic floor exercise program ($\chi^2 = 41.8630$, $P < 0.001$). The items within this dimension most strongly associated with low treatment adherence were forgetting to do the exercises ($\chi^2 = 11.9121$, $P = 0.003$) and boredom with the exercises ($\chi^2 = 7.1019$, $P = 0.029$). On the other hand, feeling motivated ($\chi^2 = 17.1261$, $P < 0.001$) and committed ($\chi^2 = 10.0674$, $P = 0.007$) doing the exercises was strongly associated with high treatment adherence. The other variables assessed were not significantly associated with treatment adherence (Table 3).

3.3 | Treatment adherence

Of the total sample, 33% categorized their treatment adherence as low (rating of 0-2), 47% as moderate (rating of 3-7), and 20% as high (rating of 8-10). Reasons provided by patients to explain

TABLE 1 Questionnaire

Dimension	Response										
(I) Social and demographic factors											
1) How old are you?											
2) What is the highest level of education that you completed?											
3) How many children do you have?											
4) Do you have a paid job?											
(II) Therapy-related factors											
5) After 10 sessions of physical therapy, did your urinary incontinence symptoms decrease?	Yes	No									
6) Was the home exercise program difficult to follow?	Yes	No									
7) Was the home exercise program easy to follow?	Yes	No									
8) Did it take a long time to perform the home exercises?	Yes	No									
9) If you received prior treatment for urinary incontinence other than the exercise program, was this treatment effective? (If no prior treatment was received, leave blank.)	Yes	No									
(III) Healthcare team and system-related factors (physical therapists)											
10) Did you have a good relationship with your physical therapist during treatment?	Yes	No									
11) Were you given information about the consequences of performing and not performing the home exercises?	Yes	No									
12) Were the instructions that your physical therapist gave you about your home exercises clear and explicit?	Yes	No									
(IV) Patient-related factors											
13) Did the Physical Therapy that you received for urinary incontinence meet your expectations (10 sessions)?	Yes	No									
14) Did you understand the instructions about your home exercises that your treating physical therapist gave you?	Yes	No									
15) Do you think that pelvic floor exercises are important?	Yes	No									
16) Did you perform the home exercises after you completed your physical therapy treatment?	Yes	No									
17) Did you have time to perform your home exercises?	Yes	No									
18) Did you forget to do your home exercises?	Yes	No									
19) Did you use any strategies to remind yourself when to do your home exercises? If yes, what strategies did you use?	Yes	No									
20) Did you feel motivated to do your home exercises?	Yes	No									
21) Did you feel committed to doing your home exercises?	Yes	No									
22) Was performing your home exercises bothersome in any way?	Yes	No									
23) Did you find your home exercises boring?	Yes	No									
(V) Condition-related factors											
24) Since the time that you completed therapy, have your symptoms improved?	Yes	No									
25) Since the time that you completed therapy, have your symptoms worsened?	Yes	No									
26) Does urinary incontinence affect your quality of life?	Yes	No									
Treatment adherence											
27) On the scale below, mark an "X" over the number from 0 to 10 that represents how well you followed the home exercise program that your physical therapist gave you. (Type of exercise, daily and weekly frequency of exercise, number of repetitions).											
	Low			Moderate				High			
	0	1	2	3	4	5	6	7	8	9	10
28) If your adherence was low or moderate, what do you think was the main reason for this? (Respond only if there is a reason not mentioned elsewhere in the questionnaire).											

TABLE 2 Sociodemographic characteristics: Age, number of children, education level, and work

	<i>n</i>	Minimum	Maximum	Average	SD
Age (years)	61	25	82	55.2	15.2
Number of children	61	0	5	2.0	1.3
Education level	<i>n</i>	%			
Some elementary school	0	0			
Completed elementary school	1	1.6			
Some high school	0	0			
Completed high school	7	11.4			
Some college	11	18			
Completed college or higher	42	68.8			
Paid employment					
Yes	36	59			
No	25	41			

TABLE 3 Summary of responses to yes/no items and significance of association with treatment adherence

	YES (%)	NO (%)	<i>P</i>
Therapy-related factors			
After 10 sessions of physical therapy, did your urinary incontinence symptoms decrease?	86.8	13.1	0.062
Was the home exercise program difficult to follow?	9.8	90.1	0.429
Was the home exercise program easy to follow?	86.9	13.1	0.928
Did it take a long time to perform the home exercise program?	6.6	93.4	0.58
If you received prior treatment for urinary incontinence other than the exercise program, was this treatment effective? (If no prior treatment was received, leave blank)	26.6	73.4	0.85
Healthcare team and system-related factors			
Did you have a good relationship with your physical therapist during treatment?	100	0	N/A
Were you given information about the consequences of performing and not performing the home exercises?	93.4	6.6	0.872
Were the instructions that your physical therapist gave you about your home exercises clear and explicit?	100	0	N/A
Patient-related factors			
Did the physical therapy that you received for urinary incontinence meet your expectations (10 sessions)?	83.6	16.4	0.218
Did you understand the instructions about your home exercises that your treating physical therapist gave you?	100	0	N/A
Do you think that pelvic floor exercises are important?	98.4	1.6	0.353
Did you perform the home exercises after you completed your physical therapy treatment?	41	59	0*
Did you have time to perform your home exercises?	77	23	0.244
Did you forget to do your home exercises?	57	43	0.003*
Did you use any strategies to remind yourself when to do your home exercises?	20	80	0.621
Did you feel motivated to do your home exercises?	47.5	52.5	0*
Did you feel committed to doing your home exercises?	39.3	60.7	0.007*
Was performing your home exercises bothersome in any way?	13.1	86.9	0.116
Did you find your home exercises boring?	47.5	52.5	0.029*
Condition-related factors			
Since the time that you completed therapy, have your symptoms improved?	59	41	0.074
Since the time that you completed therapy, have your symptoms worsened?	20	80	0.998
Does urinary incontinence affect your quality of life?	82	18	0.06

**P* < 0.05 is statistically significant.

low or moderate adherence included laziness, lack of discipline, UI symptom improvement or maintenance, fatigue, lack of time, poor attention span, lack of perseverance or commitment, and lack of feedback regarding the exercises (Table 4).

3.4 | Internal consistency of questionnaire

The internal consistency analysis used to validate the dimensions proposed in the questionnaire indicated that the Cronbach's alpha was acceptable for Dimension III: Patient-related factors ($\alpha = 0.7059$) when administered alone, reflecting the relationship among the items within the dimension.

4 | DISCUSSION

Few studies have addressed the factors that may impact long-term adherence to pelvic floor exercises in women with urinary incontinence. However, one study of women who had UI after giving birth concluded that the most common reasons provided for not performing the exercises, or stopping the exercise program within six months after giving birth, included: feeling that the exercises were unnecessary if symptoms were no longer present; forgetting to do the exercises; being too busy to do the exercises; feeling that the exercises were not important; not understanding how to do exercises; or experiencing pain when performing the exercises.¹⁷ Other study, factors associated with poor adherence to pelvic floor exercises in women with UUI included insufficient time or trouble remembering to do the exercises.¹⁸

Our study assessed four sociodemographic variables with a potential influence on long-term adherence to pelvic floor exercise in women with UI. The literature suggests that older age and higher education level are factors that improve adherence treatment.^{14,19–21} In our sample, the average age was 55.3 ± 15.2 years. In other words, our patients were in the 40-70-year-old age group, which is the population segment most commonly affected by UI symptoms; interestingly, the severity and frequency of symptoms is another factor that affects the commitment and motivation of the patient to adhere to treatment recommendations. Our patients also tended to have university degrees, which may have positively

influenced their adherence. A third variable assessed was parity. A greater number of births is often associated with greater damage to the pelvic floor tissues, which in turn may cause more severe symptoms and influence the efficacy of the exercises. The last factor was the occupational status, as this variable may affect the time available to perform the exercises. None of these factors was significantly correlated with adherence to the PFE program.

In terms of the WHO second dimension, treatment-related factors, patients reported that the exercises were not difficult and did not take too much time and that the exercises were effective with an immediate positive effect in reducing UI symptoms. This finding suggests that the characteristics of the therapy itself is not the major contributing factor to long-term adherence, but rather the effectiveness of a program in sustaining these benefits over time.

Unlike previous studies,²² variables in the healthcare team-related dimension were consistent across the entire patient sample. This suggests that the role of the Physical Therapist is crucial in determining the efficacy of therapy. Supervision of the pelvic floor exercises by a well-trained, Physical Therapist can reinforce the information and education provided during therapy, in terms of the expected effects of the treatment, the importance of performing the exercises, and the consequences of poor adherence.⁵ The questions in this section received uniformly favorable responses by all study participants in this sample. All respondents indicated that they had a good relationship with their Physical Therapist throughout their treatment and that their instructions for home exercises were clear and easy to understand. Moreover, all of the women responded that they understood the home exercise instructions provided by their treating Physical Therapist. Therefore, the healthcare team-related dimension is not a relevant factor in long-term treatment adherence in this group.

The results of the present study indicate that the patient-related factors (fourth dimension), was most strongly associated with long-term adherence to pelvic floor home exercises, including personal traits and circumstances. Personal factors associated with low adherence included forgetting to do the exercises, which is consistent with results from prior studies,¹⁴ and finding the exercises boring. The majority of patients in our sample did not use aids as

TABLE 4 Association between five dimensions proposed by the World Health Organization (WHO) and long-term treatment adherence

Dimension	Chi-square (χ^2)	P
(I) Social and demographic factors	-	-
(II) Therapy-related factors	51 085	053
(III) Healthcare team and system-related factors (Physical Therapists)	02 732	0872
(IV) Patient-related factors	41 863	0*
(V) Condition-related factors	74 932	0112

reminders to perform the home exercises. Those that did rely on aids, however, reported that they used the exercise calendar provided by their Physical Therapist a cell phone alarm, and/or written reminders left in various locations in their house. This finding suggests that strategies involving reminders to perform the exercises may be useful for some patients. These strategies may include personalized exercise calendars in easy-to follow, written form; audio or video recordings of instructions; and/or periodic progress visits every 3-6 months. Such strategies may also alleviate the boredom that sometimes interferes with performing the home program.^{22,23}

On the other hand, feeling motivated and feeling committed to performing the exercises were factors associated with a high degree of adherence. This result is consistent with previous findings that motivation is a predictor of the success of exercise-based pelvic floor therapy, as a positive attitude towards conservative treatments, which require effort on the part of the patient, is significantly correlated with treatment adherence.²⁴

Results for the fifth dimension, condition-related factors, indicated that the majority of patients did not experience worsening of their symptoms. It is likely that many patients felt that the exercises were unnecessary if they were not suffering from any symptoms. If the symptoms reappeared, patients would likely resume the exercises, as most of the patients in the sample reported that the symptoms affected their quality of life. This suggests that the manifestation of symptoms is a determining factor in awareness of the condition, directly affecting adherence.

A major strength of this study is the development of a new instrument for evaluating factors affecting long-term adherence to pelvic floor exercises that is based on the five dimensions proposed by the WHO. This approach allows for a global and holistic vision of long-term treatment adherence in women urinary incontinence. Weaknesses of the study include the characteristics of the patient sample. Only women who had completed their Physical Therapy treatment were enrolled, which is a select group within the universe of possible participants, resulting in a small sample size. Furthermore, the women had similar social, educational, and economic backgrounds and were treated in the same private health center. Therefore, many of the health-care team- and therapy-related factors showed little variability within the sample. These factors merit further consideration as they may show a relationship with treatment adherence in a population with different social, educational, and economic characteristics or in a group of patients treated in a public health facility. It would be helpful to apply this methodology in a sample with different and more varied characteristics to assess the relevance of additional factors.

Finally, the methodology used is limited in that the instrument only addressed the perceptions of the patient. Complementing a subjective instrument with more objective evaluations to measure improvement, such as a symptom-tracking tool, may provide valuable findings.²³

Approaches to long-term treatment should address the reasons cited by patients for not performing their home exercises. It would be interesting to test the efficacy of technological tools, such as apps, videos, or other audiovisual aids. These tools could be used to remind women to perform their exercises and to make treatment more engaging. This approach may be effective, as forgetting to do the exercises and finding the exercises boring were major reasons reported for not performing the program. During treatment, it is also important to emphasize the positive elements associated with high adherence, such as motivation and commitment. While these are personal characteristics that are unique to each patient, the Physical Therapist can provide encouragement and address the importance of these factors.²⁵ Another approach to explore is extending the follow-up period so that patients receive more feedback on the results of the home exercise program.

5 | CONCLUSION AND CLINICAL IMPLICATIONS

The results of this study indicate that the patient-related factors, corresponding to the fourth dimension proposed by the WHO, exerted the strongest influence on long-term adherence to home exercises in a sample of women with urinary incontinence treated in “Centro Integral de Reeduación de Piso Pélvico” (CIREP) during 2014-2015. Forgetting to do the exercises and boredom with the exercises were the factors most strongly related to low treatment adherence, while motivation and commitment were associated with high adherence in this population.

The clinical implications of this study provide guidance for the health care team, especially during the planning stage of the intervention. These findings underscore the importance of assessing the behavior and attitude of patients towards pelvic floor exercises, selecting effective strategies to facilitate the patient's intention to adhere to the program, helping patients to perceive the benefits of the exercises and to manage their expectations, and simplifying integration of the exercises into the patient's daily life. Future studies are needed to determine the specific and personalized strategies that have the greatest effect on long-term adherence.

ORCID

Mónica Venegas  <http://orcid.org/0000-0001-6368-5041>

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