Research Paper: Measurement Properties of Physical Therapy Patient Satisfaction Questionnaire (PTP-SQ) in an Iranian Musculoskeletal Population

Mahboobeh Abdolalizadeh[1], Zahra Mosallanezhad[1,2*], Ahmad Saeedi[3], Maryam Ghodrati[4], Ali Rezaei Rayeni Nejad[5]

1. Department of Physical Therapy, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.
2. Research Center on Aging, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.
3. Department of Statistical Research and Information Technology, Institute for Research and Planning in Higher Education, Tehran, Iran.
4. Department of Health and Rehabilitation Sciences, University of Western Ontario, London, Canada.
5. Department of Civil Engineering, Besat University, Kerman, Iran.

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Citation Abdolalizadeh M, Mosallanezhad Z, Saeedi A, Ghodrati M. Rezaei Rayeni Nejad A. Measurement Properties of Physical Therapy Patient Satisfaction Questionnaire (PTPSQ) in an Iranian Musculoskeletal Population Physical Treatments. 2021; 11(2):121-130. http://dx.doi.org/10.32598/ptj.11.2.484.1

doi: http://dx.doi.org/10.32598/ptj.11.2.484.1

Article info:
Received: 28 Sep 2020
Accepted: 27 Dec 2020
Available Online: 01 Apr 2021

Keywords:
Patient satisfaction, Physiotherapy, Validity, Psychometric properties, Reliability

ABSTRACT

Purpose: A valid and reliable tool that could measure patient satisfaction with physical therapy care for Persian-speaking patients will improve communication and enhance the involvement of people in research on health care quality and disparities. We aimed to evaluate the psychometric properties of the Persian version Physical Therapy Patient Satisfaction Questionnaire (PTPSQ).

Methods: In this cross-sectional study, a prospective validation study design was adopted. In this methodological study, 297 patients from several physiotherapy centers in Kerman City, Iran, were evaluated using the PTPSQ. After the seventh session, a demographic questionnaire, visual analog scale, and the global rating of change were also answered by the participants (time point 1). The psychometric evaluation included factor analysis, divergent validity, convergent validity, and analysis of floor and ceiling effects. Reproducibility and internal consistency were investigated in this regard. To assess the test-retest reliability, 40 participants (randomly selected) completed the PTPSQ, again 24 to 48 hours later (time point 2). This research project was reviewed and approved by the Ethics Committee of the University of Social Welfare and Rehabilitation Sciences, Tehran, Iran. SPSS v. 24 was used for statistical analysis.

Results: The interclass correlation coefficient was in the range of 0.80-0.94 with the Cronbach alpha coefficient of 0.92. The standard error of measurement, minimal detectable change, and coefficient of variation for the questionnaire were 5.14, 14.39, and 0.21, respectively. Factor analysis revealed the 3-factor model. The relationship between the PTPSQ scores and the patient satisfaction index was relatively good (>0.40).

Conclusion: Our results showed strong psychometric properties of the PTPSQ. Thus, we recommended its use in the Persian-speaking population.

*** Corresponding Author:**
Zahra Mosallanezhad, PhD.
Address: *Department of Physiotherapy, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.*
Phone: *+98 (912) 0195010*
E-mail: *zmosallanezhad@yahoo.com*

Highlights

- The study evaluated the psychometric properties of the Persian PTPSQ.
- This instrument was valid to measure patient satisfaction with Physical Therapy.
- This instrument can be used in clinical setting and studies.

Plain Language Summary

A valid and reliable tool that could measure the satisfaction with physical therapy care for Persian-speaking patients will improve communication and enhance the involvement of people in research on health care quality and disparities. We aimed to evaluate the psychometric properties of the Persian version of the Physical Therapy Patient Satisfaction Questionnaire (PTPSQ). In this methodological study, 297 patients from Physiotherapy Centers in Kerman (Iran) were evaluated by using the PTPSQ questionnaire. The psychometric evaluation included factor analysis, divergent validity, and convergent validity and analysis of floor and ceiling effects. Reproducibility and internal consistency were investigated. The ICC was in the range of 0.80-0.94 with the Cronbach's alpha coefficient of 0.92. Standard Error of Measurement (SEM), Minimal Detectable Change (MDC) and Coefficient of Variation (CV) for the questionnaire were 5.14, 14.39 and 0.21, respectively. Factor analysis revealed the 3-factor model. The relationship between the PTPSQ scores and the patient satisfaction index was relatively good (>0.40). Our results showed strong psychometric properties of the PTPSQ and can be recommended to use in the Persian-speaking population.

1. Introduction

Because of the increasing disabilities and the aging population, more people require rehabilitation services [1]. Physiotherapy is one of the most critical components of the rehabilitation team [2] and plays an essential role in prevention, treatment, and promoting the community's health [3]. In recent years and after increasing the number of physiotherapy centers, patients can choose between several centers. So, the competition between physiotherapists has increased. Achieving patient satisfaction and measuring its extent is a fundamental issue in this competitive market [4].

Patient satisfaction is an attitude and includes both cognitive and emotional aspects and can be related to the individual's expectations and experiences [5]. Satisfaction is not a concrete phenomenon. It is a judgment given by people based on their experiences over time [6, 7].

Measuring patient satisfaction is an indicator for assessing the quality of treatment, identifying the extent of achieving therapeutic goals for therapists, establishing rehabilitation services strategies, and policy-making of insurance companies. It is also used in business competitions and economic policies [8-11]. Patient satisfaction is a complex and multidimensional concept [12, 13]. There is no gold standard to measure patient satisfaction in the physical therapy field [14]. Examining different aspects of patient satisfaction has many benefits, such as cost reduction, predictability of treatment outcomes, and prioritization of treatment strategy. It increases the value of patients, health care providers, and customer loyalty [15]. Because the satisfaction cannot be directly evaluated, it is often assessed by indirect methods, such as patient's reports [4, 16]. Questionnaire is easy to use, has a low cost, and takes less time. So, many studies use it to assess patient satisfaction [10]. Patients evaluate their health care services and their attitude towards the received services by completing the satisfaction questionnaires [17].

The Physical Therapy Patient Satisfaction Questionnaire (PTPSQ) is one of the tools with 26 items that measure five dimensions (access, administrative technical management, clinical technical management, interpersonal management, and continuity of care) [18]. Another translated tool into Persian is the Physical Therapy Outpatient Satisfaction survey (PTOPS) [19]. It has 34 items with four subscales of enhancers, detractors, location, and cost, which all demonstrated the different domains of patient satisfaction [20, 21]. A 14-item questionnaire that was developed by Monnin and Perneger [22] is one of the other tools that was translated into Persian [23]. It assesses three aspects of treatment, admission, and logistics in different clinical settings [22]. Another patient satisfaction questionnaire in physical therapy is the Me-

dRisk tool for measuring patient satisfaction with physical therapy care (MRPS). It consists of 2 factors: one related to external factors, like the clinical environment, and the other related to the internal factors such as the patient-therapist interaction [4, 14]. The Persian version of 12-item MRPS is validated by Nakhostin Ansari et al. [14].

Few studies have been conducted on patient satisfaction in physical therapy [24, 25]. However, studies conducted in populations with different cultures and languages are increasing [26]. The process of cultural adaptation of the questionnaire will lead to creating a questionnaire specific to the language and culture of the studied population, thereby making it possible to compare the information between different countries and cultures [19]. Moreover, the educational level, patients' income, socioeconomic, and cultural factors affect satisfaction levels [27]. So far, some questionnaires have been used to assess patient satisfaction in the field of physiotherapy, among which the most widely used one is the PTPSQ [18].

Considering that the psychometric properties of the Persian version PTPSQ have not been assessed, a methodological study is necessary to evaluate the validity and reliability of the Persian version of this questionnaire for use in research and clinical practice.

Physical Therapy Patient Satisfaction Questionnaire (PTPSQ)

PTPSQ is a self-report questionnaire that is an evolving model of a questionnaire provided by Nelson to assess the satisfaction of outpatient physiotherapy patients in 1990 [4]. For the first time, Goldstein et al. examined the validity and reliability of this questionnaire [18]. The questionnaire consists of 26 items with two parts: the first part consists of 6 items related to the patient's demographic information, and the second part contains 20 questions about patient satisfaction. The patient chooses one of the five options: strongly agree (5 points), agree (4 points), neither agree nor disagree (3 points), disagree (2 points), and strongly disagree (1 point) for each phrase [18]. The level of patient satisfaction is obtained by the average scores in each domain [18]. This questionnaire has been translated into Italian [27, 28]. It is assumed that this questionnaire assesses patient's satisfaction in five areas: access, administrative, technical management, clinical, technical management, interpersonal management, and continuity of care [27].

This questionnaire is scored by the sum of all items' scores and then divided by the maximum score that a person can have (given the number of questions answered). The number of answered items is multiplied by 5; then, this ratio is converted to a percentage [27]. The average score obtained in each domain indicates the level of satisfaction of each patient within that domain [27].

2. Materials and Methods

This study evaluates the psychometric properties of the Persian version of the PTPSQ.

Translation and cross-cultural adaptation

The guidelines for the process of cross-cultural adaptation of self-report measures were used in this study [29]. To study the linguistic validity, two translators separately translated the questionnaire into Persian through a forward translation method. They were fluent in English and Persian. Then, a group of Physiotherapy and English language professors edited and approved the translated version. Next, two individual translators performed the backward translation from Persian into English. They were was fluent in English and Persian, too. The translators did not inform about the original version of the questionnaire. Finally, in a group meeting of Physiotherapists and English professors, the Persian translated texts were compared to the original version for the relevance of the questions and their conceptual conjunction.

In the next stage, 30 subjects were selected for the pilot study [30] to assess the face validity of the questionnaire. They were asked to report any difficulty understanding each question of the questionnaire. In the interviews with these people, there was no difficulty understanding the questions, so the final version was prepared.

Study participants

A total of 297 patients with musculoskeletal disorders who attended the outpatient departments of physical therapy in Kerman City, Iran, by simple non-probability sampling were selected for this study. The sample size in this research was calculated based on ten samples for each variable [17]. They completed demographic information such as age, sex, level of education, and occupation.

In addition to PTPSQ, the participants completed the Visual Analog Scale (VAS) and the Global Rating of Change (GRC) scale, as well as the patient satisfaction index after the seventh session. At this point, most patients have most probably had adequate therapeutic experiences to base their satisfaction rating. All respondents were over 18 years old and could read and write

in Persian. Since one of the exclusion criteria was having cognitive problems, a Mini-Mental State Examination (MMSE) was used for assessment [31]. People who scored less than 23 on the MMES test were excluded [32]. All patients signed the consent form and could, at any stage of the study, leave the study. At the second time point, 24 to 48 hours later, 40 patients were selected randomly and completed the PTPSQ survey again to determine test-retest reliability. The 24- to 48-hour interval was chosen because any clinical changes after this time point would not be significant enough to change the patient's answers [33].

Ethical principles

The whole process of this study was reviewed and approved by the Ethics Committee of the University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.

Statistical analysis

The SPSS v. 24 was used for statistical analysis.

Reliability

To examine the reliability, 40 patients were selected randomly [34] to complete the Persian version of the questionnaires [33]. Intraclass Correlation Coefficient (ICC), Standard Error of Measurement (SEM), Minimal Detectable Change (MDC), and Coefficient of Variation (CV) indices between two measurements, indicated relative and absolute repeatability.

An ICC value less than 0.4 refers to low repeatability. A coefficient ranging from 0.4 to 0.75 denotes moderate repeatability. A coefficient ranging from 0.75 to 0.9 refers to significant repeatability. Finally, a coefficient greater than 0.9 denotes excellent repeatability [33]. SEM shows the error rate of the tool. The SEM was calculated by using the formula SD√(1- Cronbach α [35]. The MDC represents the minimum change between the test and the retest. It is required to remove the marginal errors with a predefined level of confidence. The MDC was calculated using the formula 1.9 SEM and CV was calculated using the formula [36].

Also, the Cronbach alpha coefficients for the first stage evaluation indicated the internal consistency of the questionnaire ($0.7< \alpha <0.8$=acceptable, $0.8< \alpha <0.9$=good, $\alpha>0.9$=excellent) [17, 33].

Validity

Factor structure

Construct validity was evaluated through exploratory factor analysis of principal components, choosing factors with eigenvalues <1 and correlation coefficient< 0.05 using the varimax method for matrix rotation [33].

Divergent validity

To assess the divergent validity of the Persian version of the PTPSQ, 297 Iranian physiotherapy patients completed the questionnaire. Besides, the patients completed the VAS and GRC, and their results were compared with the Persian version of the PTPSQ [37]. However, VAS is a single-dimensional tool that measures the level of individual perception of pain while considering its physical, psychological, and cultural aspects [27]. This tool is easy and fast to be completed, and its validity is supported. The VAS is based on a 10-cm line that the patient reports pain in a range of 0 to 10 [27]. The GRC measures the change in the patient's status after the treatment [38]. We chose the GRC because it has a wide range of response choices that would allow a precise estimate of the change in health status that is independent of satisfaction with care [39]. Also, this scale has been used in other clinical research studies [38, 40]. GRC score 0 indicates the better condition of the patient, while GRC score 9 means the worsened status of the patient[39]. It seems that this tool could reliably measure the perceived improvements at the time of administration [27].

Convergent validity

This index is investigated by determining the correlation between the measures from an tool with a variable of a similar category [8]. To evaluate the convergent validity of the Persian version of PTPSQ, we calculated the relationship between the PTPSQ score and the patient's satisfaction index. The satisfaction index was based on two questions. One is the overall satisfaction, and the second about returning to the health center in the future; the range of questions scores was from 1 to 5 (1 as the minimum and five as the maximum scores) [27]. This index has been used in other clinical research studies [10, 19, 41]. The correlation coefficient of 0.81-1 was considered excellent, 0.61-0.80 very good, 0.41-0.60 good, 0.21-0.40 acceptable, and 0.00-0.20 was considered weak [26].

Ceiling and floor effects

The floor and ceiling effect of the overall score of the questionnaire and its subscales were examined. If this percentage was more than 15%, at a maximum or minimum score, it was considered either a ceiling or floor effect, respectively [36].

3. Results

Our qualitative variables were gender, employment status, educational level, and treated area. The quantitative variables were age, duration of disease, the severity of pain, weight, and PTPSQ score. The PTPSQ forms contained missing responses that were not included in the statistical analysis [35]. During the face validity, we did not deal with a question or phrase that was not comprehensible for participants, and the Persian translation of this questionnaire was made without changing the original format of the questions.

Summary of item responses

A total of 297 questionnaires were completed. The Mean±SD age of the patients was 38.73 years, and 54.2% of the patients were female. About 57% of subjects referred for the first time to the physiotherapy treatment, and 64.6% of the patients visited for the first time to a special physiotherapy center. About 37.3% of subjects were referred by the physician to the physiotherapy center, and 29.5% were referred to the centers by their friends. Descriptive information has been reported in Table 1 and Table 2.

Around 86.9% of participants in the study had a PTPSQ score of 70 and above. For some reasons, such as changing the patient's condition, incomplete questionnaires, and changing the patient's opinion about re-filling the questionnaire, 40 participants participated in the test-retest phase. Regarding the test-retest data from 40 participants in the study, the total PTPSQ score's Mean±SD was 83.01±11.38 in the first time and 82.38±12.37 in the retest. According to the central limited theorem, since the sample size is over 30, the sampling distribution considered approximately normal. Thus, we used parametric tests in this study.

Reliability

The ICC range for the total PTPSQ score was 0.80-0.94. Therefore, the PTPSQ score has high consistency. The SEM, MDC, and CV for the PTPSQ were 5.14, 14.39, and 0.21, respectively. The Cronbach alpha coefficient for the PTPSQ total score was 0.92, and the items in this questionnaire had an acceptable internal consistency.

Validity

In factor analysis, three factors were extracted with a total variance of 66.32%. Table 3 shows the factor loadings. The items that cluster on the same factor suggest that factor 1 represents the "behavior of the therapist", which explained 38.30% of the variance (including items 7, 8, 9, 11, 13, 16, 17, 19, 20, 21, 22, 23, 24, and 26), factor 2 represents "organization and facilities" that explained 16.70% of the variance (including items 10, 12, 14, 15, and 18) and factor 3 the "satisfaction" which explained 11.13% of the variance (including items 22 and 25). The alpha coefficient of the three factors was 0.94, 0.73, and 0.50, respectively. The factors' names have been chosen according to the content of the questions of each category.

Divergent validity

To assess the divergent validity, the Pearson correlation test was used to calculate the correlation between the scores of the Persian version of the PTPSQ, VAS

Table 1. Descriptive information of quantitative variables

Variables	Mean±SD
Age (y)	38.75±14.62
Weight (kg)	73.66±15.74
Duration of disease (mon)	27.98±60.89
VAS (visual analog scale) (0-10)	4.03±1.34
Score of Physical Therapy Patient Satisfaction Questionnaire (PTPSQ)	79.78±17.53
GRC (Global Rating of Change) (1-9)	2.88±1.11

Table 2. Characteristics of the study participants (qualitative variables)

Variables		No (%)
sex	Man	133 (45)
	Femail	164 (55)
Employment status	Employed	137 (50)
	Unemployed	5 (2)
	Housekeeper	102 (36)
	Student	11 (4)
	Retier	25 (9)
Education status	Undergradguate	102 (35)
	Diploma	105 (36)
	University educated	87 (30)
Location of symptoms	Neck	36 (13)
	Back	76 (27)
	Arm	16 (6)
	Foot	56 (20)
	Ankle	19 (7)
	Hand/wrist	23 (8)
	Knee	40 (14)
	Other	16 (6)

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score, and 9-point GRC. The correlation coefficients were -0.18 (P=0.002) and -0.12 (P=0.03), respectively. The results of this test show a significant negative relationship between PTPSQ total score, the severity of pain, and overall patient change after treatment. Thus, the higher the score for the PTPSQ satisfaction scale is, the severity of pain and the rate of overall patient change will decrease and vice versa.

Convergent validity

The Pearson correlation coefficient was used to calculate the correlation between the score of the PTPSQ and the patient's satisfaction index, which resulted in a fairly good relationship. The correlation coefficient of PTPSQ with the satisfaction index is presented in Table 4.

Ceiling and floor effects

In examining the ceiling and floor effects, the results showed that among items of the questionnaire, item 18 had a floor effect and all other items had a ceiling effect. The correlation coefficient between PTPSQ total score and age, weight, and disease duration did not show a significant relationship.

4. Discussion

We translated and evaluated the psychometric properties of a questionnaire to measure the satisfaction of physiotherapy patients. In this study, 76.9% of the subjects had a score of 70 and above in the level of satisfaction, which was also high in the study of Costa [33] and Scott [42]. In most studies, the level of satisfaction is high [16, 37]. Higher satisfaction can indicate the tool's ability to distinguish satisfied patients from dissatisfied ones [16].

Table 3. Principle component analysis of Persian version of PTPSQ

Items	Components		
	1	2	3
7	0.665	0.238	0.014
8	0.860	0.111	-0.041
9	0.788	0.238	-0.060
10	0.505	0.617	0.076
11	0.739	0.372	0.020
12	0.369	0.715	-0.005
13	0.721	0.474	0.008
14	0.275	0.789	0.188
15	0.286	0.600	0.247
16	0.614	0.430	0.124
17	0.749	0.226	0.198
18	-0.205	0.617	0.517
19	0.724	0.195	0.419
20	0.654	0.280	0.462
21	0.731	0.226	0.396
22	0.602	0.092	0.547
23	0.718	0.286	0.402
24	0.693	0.211	0.325
25	0.027	0.100	0.681
26	0.646	0.220	0.476
Component variance	38.30	16.70	11.31

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Reliability

In the present study, the ICC was found 0.89, similar to the reported value in the Vanti study [27]. The results of our study showed that the PTPSQ has good repeatability. The Cronbach alpha coefficient was well received in this study, consistent with Goldstein's [18] and Vanti's [27, 28] studies. Hence this tool has an excellent internal consistency. However, the SEM, MDC, CV have not been reported in other studies. Thus it is not possible to compare these indices with other studies.

Factor structure

In our study, factor analysis revealed the three factors, and the total variance was above 50%. Vanti's study [27]

Table 4. Pearson correlation coefficients between PTPSQ questionnaire and patient satisfaction index

Tool	index	Overall, I am completely satisfied with the services I received	I would return to this office for future care
Physical Therapy Patient Satisfaction Questionnaire (PTPSQ) score	r (P)	0.41 (P<0.0001)	0.45 (P<0.0001)

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had similar results in obtaining three factors in factor analysis. However, in Goldstein's [18] and Vanti's [28] studies, one factor had been extracted. In the studies of Monin and Pernege [22] and Oliveira [33], the concept of satisfaction was recognized as multidimensional through factor analysis. By considering the results of other studies, satisfaction is a multidimensional concept influenced by the social and cultural context of the studied community. Therefore, the factor structure will be different among different populations [8].

Divergent validity

In the present study, the relationships between satisfaction scores and VAS and GRC scores were poor and negative. Our results are similar to the Vanti study [27, 28]. George and Hirsh [43] also confirmed this weak relationship in their study. The results of the studies show that patient's satisfaction with health care is different from the patient's satisfaction with treatment outcomes [33, 38]. In terms of the concept, service satisfaction is related to the patient's services during treatment, while satisfaction with the treatment outcomes relates to the effects of treatment on the patient's health [33]. Although these two concepts are potentially interrelated, they should be evaluated separately by appropriate tools [8].

Convergent validity

To assess the convergent validity, we calculated the correlation of the PTPSQ questionnaire with the patient satisfaction scale, and these correlations were relatively good. Our results are in line with previous studies [4, 18] that examine the relationship between the patient satisfaction index and the patient satisfaction questionnaire. Therefore, this questionnaire could evaluate satisfaction.

Ceiling and floor effects

In our study, among the items in the questionnaire, all items except item 18 had a ceiling effect. While, in the study of Oliveira [33], no floor effect was observed, but they reported a high ceiling effect. The ceiling effect could be important because the scale can measure the number of respondents who have reached the maximum score [19, 33]. This finding is essential in studies about the satisfaction which most people have a maximum score in their choices. One of the problems with the ceiling effect is that people have a high score despite having different levels of satisfaction [19].

5. Conclusion:

This study showed that researchers and physiotherapists could use PTPSQ as a valid and reliable tool to measure patient satisfaction. Comparing with the original version of this questionnaire, this Persian version is similar in terms of psychometric properties.

The present study was conducted in public and outpatient clinics. Therefore, assessing satisfaction in private clinics and hospitalized patients are recommended. Because patients with musculoskeletal disorders participated in this study, the patients with other problems need to be investigated to generalize the results of this study.

Ethical Considerations

Compliance with ethical guidelines

All participants read and signed a written informed consent before completing the questionnaire. The participants were informed about the purpose of the research and its procedure. They were also assured about the confidentiality of their information. Moreover, they were allowed to discontinue participation in the study as desired. Finally, if desired, the results of the research would be available to them. The whole process of this study was reviewed and approved by the Ethics Committee of the University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors' contributions

Investigation, Data collection, Data analysis, and Writing – Original Draft Preparation: Mahboobeh Abdolalizadeh, Ali Rezaie Rayeni Nejad; Writing – Review & Editing: Zahra Mosallanezhad; Maryam Ghodrati: Investigation, Resources, Data Curation: Ahmad Saeedidata.

Conflict of interest

The authors declared no conflict of interest.

Acknowledgments

The authors express their appreciation to the Emam Hosein Hospital, Seyyedoshohada Hospital, Mahmoudi Charity Clinic, Payambar Aazam Hospital, Red Cres-

cent, and the Center of the Sacred Warriors, Shahid Bahonar Hospital, and other university hospitals in Kerman City, Iran, for providing data.

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