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ASSESSMENT OF SATISFACTION IN PERITONEAL EQUILIBRATION TEST: A STUDY ON THE VALIDITY AND RELIABILITY OF THE PERITONEAL EQUILIBRATION SATISFACTION SCALE

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ABSTRACT

Aim: This study has been designed to develop an assessment tool to be used in determining the patients' satisfaction level with the peritoneal equilibration test (PET) procedure. **Materials and Methods:** The development and validation of the peritoneal equilibration test Satisfaction Scale (PETSS) was completed in two phases. Phase I focused on instrument construction and included item development and establishment of concurrent validity. Phase II included the factor analysis and psychometric assessment of the scale. In statistical evaluation of the data descriptive statistics and non-paratmetric tests were used. **Results:** The first version of the scale that has 3.62 Content Validity Index value was composed of 20 items. It was found that the latest version of the scale that has 14 items explained 46% of the variance. It was found that the Cronbach alfa value of this scale, which has 0.52-0.89 coefficient of item-total correlation was 0.96. Psychometric assessment of the scale revealed that except for type of the PET application, none of the demographic and clinical characteristics effect patients level of satisfaction during the PET application. **Conclusion:** This preliminary study showed that PETSS was a valid and reliable scale that can be used for determining satisfaction level of patients during PET application.

INTRODUCTION

Healthcare costs have been gradually increasing. Depending on this phenomenon, the assessment of patient satisfaction acts as an indicative guide in the proper use of existing resources, determination of the inadequacies in the service quality and healthcare, and the fulfillment of such inadequacies.[1,2] Besides, it presents a competitive strategy that is of critical importance in increasing the profits.[3] The patient satisfaction biased approach should aim not only to control the disease, eliminate the symptoms and improve the functional capacity, but also to provide patient satisfaction with the procedures employed. In the present day, patients increasingly demand to participate in their own healthcare, learn about their medical condition and understand the diagnosis in the decision-making process. Therefore, the quality of the healthcare service provided is not considered to be limited to that aspect identified and determined by the healthcare team only.[4] Patients' involvement in the subjects related to their health and their desire to take part in decision-making bring satisfaction with the healthcare service even more to the forefront.

Administration of the peritoneal equilibration test (PET) is subject to standards and clinical protocols. A review of the literature reveals no study that examines satisfaction with the PET procedure. On the other hand, there are a large number of satisfaction studies which focus on peritoneal dialysis (PD) and which compare PD with other renal replacement therapies (RRT).[5,6,7,8] The variables used to assess patient satisfaction in these studies include customer services, solution delivery service, PD training, and the ease, flexibility and freeness level of the treatment, etc.
This study has been designed to develop an assessment tool to be used in determining the patients' satisfaction level with the PET procedure.

MATERIAL AND METHODS

Study design: In this experimental study the cross-over method was used.
Ethical approval: Human Rights Helsinki Declaration was abided by throughout the study. The sample group read the approval form prepared by the researchers and signed them before filling in the data collection forms.

The study was approved by the Research Ethics Board of the Istanbul Universtiy, where the reserchers were affiliated with and Istanbul City Health Administrative. Written informed consents of the Hospital Administration and the patients were also received.

Inclusion criteria: As it requires too much time to perform the parametric test results of the volunteers selected randomly and due to increase in the work load and high costs, 30 patients who were eligible for the tests were included in the study. The sample of the study included the patients who could speak and understand Turkish; who could communicate verbally; who were conscious; who were between the ages of 18-65 and ≥ 65; who had not dealt with the peritonitis at least three months before starting the peritoneal equilibration test; who did not have any problem during the filling and discharging and dialysis process (fibrin blockage, replacement of the catheter, subcutaneous leak etc.); and patients who were not planned to get intraperitoneal initiative and who did not get the intraperitoneal attempt (hernia operation etc.); and who were willing to participate in the research.

Sample size: 30 patients.

The development and validation of the PETSS was completed in two phases. Phase I focused on instrument construction and included item development, establishment of concurrent validity. Phase II included the factor analysis and psychometric assessment of the scale.

The Phase 1. Scale Construction

Item Development: This scale was organized by the researchers drawing from the literature to define the satisfaction level of the patients who receives the PET application. The scale (with a total of 20 items) was reviewed by a linguist who is native language is Turkish to check its grammaticality and by experts who work in the relevant areas (nephrologists, expert nurses, nurse lecturers) in order to check its content and determine whether it covers the target of the study. Some changes were made in the scale items in accordance with the suggestions of the experts. The percentages of the points given to the scale items were calculated by the experts. Scale items were given points over 4 in the assessment of the scale items by experts. The content validity index (CVI) was calculated as 3.62. It was seen that the Turkish expressions have been selected in accordance with the subject matter and they are in conformity with the Turkish grammar rules.

Content Validity: As part of the item construction and prior to full-scale testing of the measure, content validity was assessed by 10 peritoneal dialysis patients. Each patient was interviewed and asked to comment on the comprehensiveness and clarity of the items and the degree of difficulty encountered in answering the questionnaires.

Phase II: Factor Analysis and Psychometric Assessment of the Scale

Research Setting and Samples: This study was conducted with the participation of 30 patients selected by the random method from the Peritoneal Dialysis Units of Istanbul University Cerrahpaşa Faculty of Medicine and TR Ministry of Health Okmeydanı Training and Research Hospital, by utilizing the cross-match approach. The first group was administered Fast PET in the first week and Standard PET in the second week while the second group was administered Standard PET in the first week and Fast PET in the second week. The patient PETSS (Max:56 min:14 point) was applied after both of the test methods. A total of 60 assessments from 30 patients were made by using the satisfaction scale.

Data Collection

In this research, Patient Identification Form, PET Registration Form and PET Satisfaction Scale were utilized for gathering data.

Patient Descriptive Form: This form has been prepared by the researchers drawing from the relevant literature to define the demographic information of the patients and their disease condition characteristics. The form includes 19 questions about the demographics of the patients who receive peritoneal dialysis such as age, gender, marital status, current location, educational level, working situation, job and about the duration of their disease.

Pet Registration Form: It is the form where the PET data of the patients is written and only used by the researchers.

PETSS: This scale was prepared by the researchers drawing from the literature to define the satisfaction level of the patients whom the PET is applied to. There are 14 items on the scale. Furthermore, patients were asked by one item whether they prefer Fast PET or Standard PET in the next PET method.

The first part of the scale includes the questions that measure the satisfaction level of the patients regarding the process and the second part includes the questions that measure the personal satisfaction of the patients.

In the first part, there are 12 questions in the four point likert type and in the second part there are 8 questions in the four point likert type. The first part of the scale was scored as follows: “I’m satisfied” option was given “4” points; “Sometimes I am satisfied” was given “3” points; “Sometimes I am not satisfied” was given “2” points; “I am not satisfied” was given “1” point. The scoring of the second part of the scale was as follows: “No” was pointed as “1”; “sometimes no” was pointed as “2”; “sometimes yes” was pointed as “3”; and “yes” was pointed as “4”. The maximum point is 56 and the minimum point is 14 in the scale. When the point taken from the scale raises the level of satisfaction increases. Statistical Analysis: While assessing the findings of the study, SPSS Windows 17.0 program was used for the statistical analysis. When performing factor analysis, the Varimax (maximum of the variations) method was used. By using Rotated Component Matrix, the factors were defined by taking the factor load into consideration. By applying reliable analysis to the current factors, the questions that affect the internal consistency negatively were eliminated. When evaluating the study data, the descriptive statistical methods (Frequency, percentage, average, standard deviation), Kruskal Wallis test, Mann Whitney U test, Spearman Correlation analysis were used. The results were evaluated in the 95% confidence interval and the significance was assessed as bidirectional at the level of $p<0.05$.

RESULTS

Patients' Demographic and Clinical Characteristics: The age median value of research subjects was 47.3±10.3 (the range 25–72); 56.7% of the patients (n=17) were male; 46.7% of the patients (n=14) were primary school graduates; 90% were married (n=27); 40% (n=12) had 2-3 children. In addition, 86.7% of the patients (n=26) were resided in Istanbul; 93.3% (n=28) had an average income and 100% of the patients (n=30) had social security; 73% were retired (n=22) and 90% of the patients (n=27) were not working (Table 1).

Table: 1. The distribution of the patients in accordance with the demographic specification of the patients (n=30)

Variables	Specifications	n	%
Gender	Female	13	43,3
	Male	17	56,7
Education	Literate	4	13,3
	Primary School	14	46,7
	Intermediate and high school	12	40,0
Marital Status	Married	27	90,0
	Single	3	10,0
Number of Children	None	7	23,3
	1	3	10,0
	2-3	12	40,0
	4 and more than 4	8	26,7
Settlement	Inside Istanbul	26	86,7
	Out of Istanbul	4	13,3
Occupation	Housewife	8	26,7
	Retired	22	73,3
Working Condition	Worker	3	10,0
	Unemployed	27	90,0
Income Level	Medium	28	93,3
	Poor	2	6,7
Social Security	Yes	30	100,0

50% of the patients who participated in the research (n=15) were treated in Istanbul University, Cerrahpaşa Faculty of Medicine and 50% (n=15) of them were treated in Turkish Republic Ministry of Health Okmeydanı Training and Research Hospital. The peritoneal dialysis method of 30% of the patients (n=9) was automated peritoneal dialysis (APD) while continuous ambulatory peritoneal dialysis (CAPD) was used for the 70% of the patients (n=21). 53.3% of the patients (n=16) told that they had not had any peritonitis and 80% of the patients (n=24) told that they did not know their peritoneal permeability. The median disease time was 38.5 months (range 4-360 months) and the application time for peritoneal dialysis was about 26.5 months (range 3-108). The median surface area was 1.8±0.2 (range 1.41-2.27) (Table 2).

Factor Analysis: In order to define if the items on the scale have specifications that could be added to the scale or not; the assessment was made for 30 patients after both Fast PET and Standard PET applications. By using the results of total 60 evaluations, the factor analysis was conducted on the scale. While conducting the factor analysis, the Varimax (the maximum of the variances) method was used. The factors were defined by considering the factor load via Rotated Component Matrix. By applying reliable analysis to the current factors, the questions that negatively affected the internal consistency were removed.

Table : 2. Distribution of the patients in accordance with the disease control (n=30)

Variables	Specifications			n	%
Hospitals	İstanbul University, Faculty of Cerrahpaşa Medicine			15	50,0
	Okmeydanı Education and Research Center of the T.R: Ministry of Finance.			15	50,0
Peritoneal Dialysis Method	APD			9	30,0
	CAPD			21	70,0
Another chronic diseases	Yes			23	76,7
	No			7	23,3
Last peritonitis time	Never			16	53,3
	Before 3 months or more 3.			14	46,7
Peritoneal membrane knowledge	Fast Average			2	6,7
	Low Average			2	6,7
	Low			2	6,7
	No idea			24	80,0
n=30	$\bar{x}$	±sd	Median	Minimum	Max
Disease Time (moths)	81,6	101,6	38,5	4	360
Peritoneal Dialysis Application Time (moths)	31,6	22,8	26,5	3	108
Body Surface Area (m^2)	1,8	0,2	1,8	1,41	2,27

The scale items were collected in a unique factor. Three items whose factor load was less than 0.40 were removed from both the first and the second parts of the scale (3 items from each part and 6 items in total). The items removed from the first part: 10th item: Are you satisfied that you have been informed about the results of the peritoneal equilibration test?; 11th item: Are you satisfied about the time passing until the next test in the peritoneal equilibration test?; 12th item; Are you satisfied with proceeding to the instrumental dialysis according to the result of peritoneal equilibration test? The items removed from second part: 4th item; Did you have any nausea during the peritoneal equilibration test?; 5th item;

Did you have perspiration and dizziness during the peritoneal equilibration test?; 8th item; In accordance with the results of peritoneal equilibration test, do you think if the appropriate prescription has written? After eliminating the six items, the factor analysis was repeated for the remaining 14 items on the scale. The scale items have been collected in a single factor and the scale has completed by a total of 14 items. The proficiency scale of Kaiser-Meyer-Olkin samples was calculated as 0.81 (very good).[10] This value showed that the sample size is sufficient for the factor analysis.

After the items with factor loads under 0.40 were omitted which correspond to the items 10, 11, 12, 4, 5 and 8- a final scale of 14 items was generated from the first scale which initially consisted of 20 items. The items in the scale reflect 46% of variance.

3.3. Internal Consistency: Cronbach's Alpha

The PETSS of fourteen items was assessed in terms of internal consistency, items' total score correlation and Cronbach's alpha reliability coefficient. The acceptable value for the internal consistency of the scale was determined to be 0.70. Items' total score correlation was in the range 0.51-0.89. The internal consistency of the scale (Cronbach's alfa value) was 0.96. This value demonstrates the highly reliable nature of the scale (Table 3).

Table: 3. PETSS factor load and total point-item point correlation coefficient and Cronbach's ~ value (n=30)

	Factor load	r_s	p
1.Are you satisfied with the preparation period of Peritoneal equilibration test at home ?	0.56	0.52	0.0001
2. Are you satisfied with the procedures that you apply in the preparation process of Peritoneal equilibration test at home?	0.52	0.51	0.0001
3. Are you satisfied with the process time of the peritoneal equilibration test in the clinic?	0.88	0.89	0.0001
4. Are you satisfied with the procedures of peritoneal equilibration test applied in the clinic?	0.87	0.87	0.0001
5. Are you satisfied with the easiness of the peritoneal equilibration test?	0.84	0.84	0.0001
6. Are you satisfied with the effect of the peritoneal equilibration test on your daily life?	0.91	0.87	0.0001
7. Are you satisfied with the effect of peritoneal equilibration test on your family life?	0.91	0.87	0.0001
8. Are you satisfied with the effect of peritoneal equilibration test on your social life?	0.92	0.88	0.0001
9. Are you satisfied with the effect of peritoneal equilibration test on your overall health?	0.55	0.58	0.0001
10. Do you think the peritoneal equilibration test is boring?	0.85	0.86	0.0001
11. Did you get tired when peritoneal equilibration test was performed?	0.74	0.71	0.0001
12. Do you think the peritoneal equilibration test cause waste of time?	0.88	0.84	0.0001
13. Do you feel uncomfortable when the peritoneal equilibration test will be performed?	0.82	0.81	0.0001
14. Do you feel down when peritoneal equilibration test is performed?	0.80	0.81	0.0001
Cronbach's ~	0.96		

Table: 4. PET total satisfaction point (n=30)

	}x	ïsd	Minimum	Max
1.Are you satisfied with the preparation period of Peritoneal equilibration test at home ?	3.61	4.00	1.00	4.00
2. Are you satisfied with the procedures that you apply in the preparation process of Peritoneal equilibration test at home?	3.70	4.00	1.00	4.00
3. Are you satisfied with the process time of the peritoneal equilibration test in the clinic?	2.61	3.00	1.00	4.00
4. Are you satisfied with the procedures of peritoneal equilibration test applied in the clinic?	2.68	3.50	1.00	4.00
5. Are you satisfied with the easiness of the peritoneal equilibration test?	3.15	4.00	1.00	4.00
6. Are you satisfied with the effect of the peritoneal equilibration test on your daily life?	2.98	4.00	1.00	4.00
7. Are you satisfied with the effect of peritoneal equilibration test on your family life?	3.01	4.00	1.00	4.00
8. Are you satisfied with the effect of peritoneal equilibration test on your social life?	3.01	4.00	1.00	4.00
9. Are you satisfied with the effect of peritoneal equilibration test on your overall health?	3.53	4.00	1.00	4.00
10. Do you think the peritoneal equilibration test is boring?	2.68	3.50	1.00	4.00
11. Did you get tired when peritoneal equilibration test was performed?	3.15	4.00	1.00	4.00
12. Do you think the peritoneal equilibration test cause waste of time?	2.90	4.00	1.00	4.00
13. Do you feel uncomfortable when the peritoneal equilibration test will be performed?	2.85	4.00	1.00	4.00
14. Do you feel down when peritoneal equilibration test is performed?	2.86	4.00	1.00	4.00
Total Satisfaction	3.05	3.35	1.14	4.00

3.4. Patient Satisfaction and the Factors Which Affect Satisfaction

The assessment revealed that the patients had quite a high level of satisfaction with a score of 3.35 (Table 4) and the method of PET administration was the only variable which affected patient satisfaction ($p<0.05$) (Table 5). It has been determined that the factors such as age, gender, number of children, level of education, working status, occupation, place of residence, duration of disease, duration of peritoneal dialysis administration, body surface area, the method of PD and the condition of

having any other chronic diseases or not did not affect patient satisfaction (p>0.05).

Table: 5. Effect of fast PET and standard PET processes to the patient satisfaction

	n	X	SD	$Z_{wilcoxon}$	p
Fast PET	30	3.88	0.25	-4.78	0.0001
Standard PET	30	2.22	0.72		

Table: 6. The peritoneal specification in accordance with 4th hour D/P_{cr} and 4th hour D/P_{urea} values for fast PET (n=30)

Peritoneal permeability	PET	n	$\bar{x}$	±SD	Wilcoxon	p
4th hour D/ P_{Cr} value	Fast PET	30	0.68	0.13	-1.71	0.08
	Standard PET	30	0.70	0.13		
4th hour D/ P_{urea} value	Fast PET	30	0.91	0.05	-0.50	0.61
	Standard PET	30	0.91	0.06		

In addition, the research has revealed that the patients preferred Fast PET procedure to Standard PET procedure for the next administration (n=30). It has been observed that the patients' permeability levels did not demonstrate any difference in Fast PET and Standard PET procedures and they had a similar rate of $D/P_{Creatine}$ and D/P_{Urea} (Table 6).

DISCUSSION

A number of studies have been conducted for assessing the factors which affect patients' satisfaction with the PET administration. In the literature, the factors which affect satisfaction change depending on the patients' individual and disease-specific characteristics, the providers of healthcare, and the ambient and institutional properties. It is a peculiar phenomenon that no studies were conducted which focused on the procedures administered to the patients.

The studies which evaluated the satisfaction level with PD therapy focused on different subjects which may affect patient satisfaction, such as family life, religion/spirituality, quality of life, energy levels, stress levels, social life, entertainment, perception of body, delivery of solutions, disease burden, depression, PD training, the level of information provided by the healthcare personnel, the personal atmosphere in the PD center, efficiency in the delivery of dialysis equipment and the attendance of the primary nurse.[8,9,11,12] However, there are no studies which assess the efficiency of dialysis in PD patients or which evaluate the patients' satisfaction with the PET procedure which has a primary significance in deciding the dialysis prescription. Besides, it is stated that PET should be administered on a regular basis in order to improve the quality of life for PD patients[12]. A study which compares the PET and the Dialysis Adequacy and Transport Test (DATT) reveals that while the patients experienced different levels of physical pain and discomfort in both of the test methods, they preferred DATT to PET. The same study observes that Standard PET, Fast PET and DATT methods may have advantages and disadvantages over each other, but no data is found in literature regarding the preference of patients between Fast PET and Standard PET[13]. This study reveals that the patients' average overall satisfaction scores were lower in Standard PET and they preferred Fast PET to Standard PET for the comfort and shortened procedure time it provides. A long waiting time in the clinic for the treatment has a negative impact on satisfaction.[14]

A study which examines the effect of urinary system ultrasonography (USG) on patient satisfaction with patients from urology clinic demonstrates that there is no significant difference in the effect of sociodemographic attributes and the relationship of physician and nurse with the patient on the satisfaction level, while there is a significant difference between the patients who receive USG and who do not receive USG in terms of trusting the treatment and diagnosis.[15] As is seen, assessment of satisfaction specifically for the procedure results in a higher level of trust to the diagnosis. Considering the changing and improving living conditions and technological advances, the procedures employed should be included among the criteria for assessing satisfaction which is already a complicated and difficult task and new satisfaction scales should be generated specifically for the procedure.

An examination of the affect of the order of Fast PET and Standard PET procedures on patient satisfaction reveals that the order of procedures was significant for these two test methods. With the patients who received Fast PET procedure in the first week, a lower satisfaction level was observed in the second week with the administration of Standard PET. The patients who received Standard PET procedure in the first week demonstrated a higher satisfaction level in the second week with the administration of Fast PET. These were anticipated results. Patients' choice of Fast PET as the method for the next test supported this finding.

The study revealed that age did not affect satisfaction, which was an unanticipated result. A lower satisfaction score was anticipated with the young and middle-age group because of the extended period of time they would spend in the hospital, which would disrupt their daily chores, prevent them from fulfilling their responsibilities and have a negative impact on their work life. These results may have originated from such factors that most of the patients were retired, their children were old enough to look after themselves and they had kith and kin to provide support at home. On the other hand, it was anticipated that older individuals would get bored and tired during the time they would spend in the hospital. The results may be attributed to the fact that the older individuals came to the hospital with a companion. The study conducted by Wasserfallen et al.[11] with dialysis patients reveals that young patients had a higher level of satisfaction compared to older patients in terms of issues related to the frequency of medical visits, ease of access

to medical advice, protection of privacy regarding their health and getting informed about costs. Another study conducted with dialysis patients states that age is a factor which has an impact on satisfaction.[6]

It has been determined that the variable of gender did not have an impact on satisfaction with the PET procedure. A study which examines the satisfaction levels of dialysis patients reveals that gender is not an effective variable on satisfaction[6]. However, there are some other studies which demonstrate the affect of gender on satisfaction levels. In one of these studies, it is stated that female patients have a significantly higher level of satisfaction compared to male patients in terms of tolerance to dialysis sessions (p=0.034), knowledge about dialysis sessions (p=0.041) and recommending the same center to their kin (p=0.035).[11]

It has been observed that the factors of working status, occupation and the number of children did not affect the patients' satisfaction with the PET procedure. This has been an unanticipated result in the study because as the PET procedure starts in the morning and continues until the afternoon, it was considered that the procedure would affect the patients' work life and their daily responsibilities in the family. This result may originate from specific properties of the group of patients such that they are mostly retired people or housewives, they have kith and kin to watch the children they must look after, and most of the patients' children are adults and capable of looking after themselves. There are other studies in the literature which revealed similar results.[6,16,17]. The HD and PD patients who have a job and who are working revealed a higher satisfaction level compared to those who have lost their jobs and who do not work.[7]

It has been determined that the patients' place of residence did not have an impact on satisfaction with PET procedure. This may result from the fact that most of the patients live in the central parts of the city and they did not make any mistakes in the steps of the procedure. A lower satisfaction level was anticipated for the patients who lived in the peripheral parts of the city. It has been thought that their PETSS scores would be lower because they have to be in the clinic at a very early hour for the PET procedure, they may have transportation problems (not being able to arrive at the required time and transportation expenses) and the test will be cancelled as a result of any possible mistakes made during the steps of the procedure. A study reveals that the patients who lived at a minimum distance of 48 km to the dialysis centre were more likely to rate the care they received as excellent compared to those who lived less than 48 km away (75% and 63% respectively).[18]

In the study, it was observed that the duration of peritoneal dialysis administration did not have an impact on satisfaction with the PET procedure. Juergensen et al.[6] observed that the duration of dialysis administration did not affect satisfaction either for PD or HD patients.

CONCLUSION

Depending on these findings, we suggest that PETSS scale can be utilized in the assessment of satisfaction with the PET procedure. The results should be tested against a larger patient group.

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