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The Reliability and Validity of the Physical Therapy Outpatient Satisfaction Survey: A Replication Study

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THE RELIABILITY AND VALIDITY OF THE PHYSICAL THERAPY OUTPATIENT SATISFACTION SURVEY: A REPLICATION STUDY

Abstract

Objective: The study re-examined the validity and reliability of the Physical Therapy Outpatient Satisfaction Survey (PTOPS) using a geographically different and larger patient population, random sampling, and mail survey methodology. **Background**: Measurement of patient satisfaction in physical therapy is in its infancy. Development and refinement of theory and measurement methodology are imperative. Replication of reliability and validity is an important component of questionnaire development. **Design**: This study used a methodological design with descriptive elements. It employed a survey of a random sampling of subjects from 20 outpatient clinics throughout the Gulf South United States. **Method**: 2,039 patients 21 years of age or older who lived in Mississippi, Alabama, Florida, and Louisiana were mailed the PTOPS questionnaire, yielding 1,175 usable responses and a 60% usable response rate. Principal components analysis explored the dimensions of satisfaction, and Cronbach alpha scores investigated inter-item reliability. Regression analysis investigated predictive validity. **Results**: The construct of four original dimensions found in the PTOPS (Enhancers, Detractors, Costs, Location) remained consistent with this sample and methodology. Cronbach alpha scores indicated high levels of inter-item reliability. Regression analysis suggested that all four dimensions were predictive of overall patient satisfaction. **Conclusion**: The PTOPS retained excellent reliability and validity when used in a different locale, with a mail survey methodology, and when using retrospective study techniques. [Scott C, Roush S, Drake M. The Reliability and Validity of the Physical Therapy Outpatient Satisfaction Survey: A Replication Study. *HPA Resource/HPA Journal* 2007; 7(2): J1 – J10.]

KEY WORDS: patient satisfaction, physical therapy, survey methodology

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Measurement of patient satisfaction with services is a long standing concept in health care. Bond and Thomas[1] identified patient satisfaction as the most widely used nonspecific measure of health care outcome. In independent reviews of the literature, Mahon[2] and Minick[3] identified Abdellah and Levine's[4] study of patient satisfaction with nursing care, which was published in the late 1950s, as among the earliest studies. Multiple studies in a variety of settings and by numerous professionals characterize treatment of the topic over the past fifty years. In a series of meta-analyses, Hall and Dornan[5-7] identified 221 studies of patient satisfaction with medical care. Bond and Thomas summarized 19 studies of patient satisfaction with nursing care in the United Kingdom between 1981 and 1994.[1, 8]

Patient satisfaction studies in physical therapy are less common than in other health professions. Many physical therapy clinics use survey instruments that are self developed and lack validity and reliability studies.[9] In 1998, Keith[10] identified eight studies that focus on measuring patient satisfaction in both inpatient and outpatient rehabilitation populations. In 2002, Scott found only eight studies specific to outpatient physical therapy that also provided psychometric analysis of the measurement instrument.[11,12] Physical therapists are still in the early stages of understanding the ways in which patient satisfaction manifests itself. We believe that physical therapists, as integral players in the health care arena, should seek accurate input from patients in order to gain and maintain credibility in an increasingly competitive market.

The eight studies identified by Scott that focus specifically on outpatient physical therapy[13-20] are summarized in Table 1. These studies demonstrate considerable diversity of construct and method. When compared to studies with other health care practitioners, those instruments reporting reliability and validity predominantly used convenience sampling strategies with a variety of constructs. With the exception of two studies,[16,19] sample sizes were modest at best. The need exists for further development and refinement of both theoretical construct and measurement methodology of a patient satisfaction instrument used in outpatient physical therapy practice.

Precision by replication is defined as "the stability of psychometric estimates for instrument reliability and validity over multiple studies".[21(p 170)] This concept is particularly applicable to survey research where instrument testing occurs in field conditions that may limit testing and interpretation of reliability and validity. Replication is an important step in the survey development process. No validity and reliability tests of the instruments used in the studies noted above have been replicated.

Our study was designed to replicate the work of Roush and Sonstroem[17] who developed the PTOPS. Using a broader sampling frame, random sampling, and a mail survey methodology, we posed three research questions: (1) Do the dimensions of patient satisfaction outlined by Roush and Sonstroem[17] remain consistent when using a different patient sample, retrospective data collection techniques, and a mail survey methodology? (2) Does the PTOPS[17] demonstrate acceptable inter-item reliability in this new patient sample? (3) Does the PTOPS[17] display concurrent validity with a patient satisfaction index criterion collected from this new patient sample?

METHOD

Instrumentation

As stated above, the instrument used in this study was the Physical Therapy Outpatient Satisfaction Instrument (PTOPS).[17] In addition, we collected basic demographic data and responses to three new items related to overall satisfaction. These new items addressed intent to return, intent to recommend, and overall satisfaction with services.

The PTOPS instrument consists of thirty-four items that measure four dimensions of satisfaction. Each item is rated by the patient using a 5-point Likert-type scale anchored by Strongly Agree and Strongly Disagree. Using factor analysis, Roush and Sonstroem[17] identified four dimensions of patient satisfaction: Enhancers, Detractors, Cost, and Location. These factors accounted for 46.7% of the variability in response.[17] The authors defined Enhancers as factors that add value above and beyond basic satisfaction with therapy services, while Detractors were defined as basic expectations that may lead to disappointment in the encounter if they were not met. The Cost factor addressed the ease of paying for services, and the Location factor focused on the ease of getting to and from the clinic setting.

A three-stage development model, each with its own sample, was used in the Roush and Sonstroem[17] study. Their subjects included three separate samples of 177, 257, and 173 outpatients from 21 different outpatient facilities. All facilities were located in the southeastern New England area, and subjects were asked to complete the PTOPS at point of service before leaving the clinic at the close of treatment.

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This study was approved by the Institutional Review Board at the University of Mississippi Medical Center.

While the Roush and Sonstroem[17] study was methodologically sound, its sampling frame included a small geographic area, and they used a convenience sample of outpatient physical therapy clients. Thus, generalization to other geographic areas is compromised. In addition, they made little effort to question non-participants, some of whom may have been dissatisfied with services. It is possible that those who were disenchanted with physical therapy services may have had a different construct for expressing their opinions. Finally, the Roush and Sonstroem[17] study used a concurrent survey with direct interview of patients actively participating in treatment. Research shows that direct interview methods at point of service may result in positive response bias.[22-24] Our study was designed to address these limitations by enlarging the sampling frame, randomly selecting the participants, surveying patients many days after their therapy sessions had been completed, and using multiple follow-up techniques for non-respondents. In addition, we added 3 new items to examine concurrent validity. These items included intent to return for further services, intent to recommend to others, and an overall satisfaction rating. All of these items were rated on a five-point Likert-type scale, with choices ranging from Excellent to Poor. All three items are widely used as overall satisfaction survey items, and, in a pilot study that preceded the current study, had demonstrated high correlation with the PTOPS factor scores and with each other.

Participants

Using a cluster sampling technique, twenty outpatient clinics were recruited from a randomized list of clinics participating in the clinical education program at a physical therapist educational program. Clinics were randomized by state to insure adequate geographic distribution. Only adult outpatient clinics located in the Gulf South region of the United States (MS, AL, LA, FL) were used for purposes of this study. A list of up to 125 randomly selected patients was obtained from each clinic. To participate in this study, patients had to be 21 years of age or older and discharged (or became inactive) within the past 90 days. In consultation with the principal investigator, each clinic also selected patients randomly who met the criteria. In many instances, the sample included all of the patients seen by a clinic within the designated time period.

The participating clinics were provided with extensive patient privacy procedures during the recruitment phase. These procedures included coding the surveys with unique identifiers to protect personal information and destroying all contact information at the conclusion of data collection. Data collection was complete by June 2002, prior to the October 2002 deadline for implementation of patient privacy standards under the Health Insurance Privacy and Accountability Act of 1996 (Public Law 104-191).[25]

Procedure

All participants received the PTOPS survey in the mail. Since mail surveys are often plagued with low response rates, which has implications for sampling error and may result in questionable validity of the study,[26] we used elements of Dillman's Tailored Design Methodology[27, 28] to enhance the number of surveys returned. Use of this method, which is based on social exchange theory, has garnered average response rates between fifty and eighty-five percent.[29, 30] Social exchange theory is based on increasing rewards for responding, decreasing the costs of responding, and encouraging trust on the part of the participants. In this study, the methodology was accomplished by personalizing all communications, minimizing numbers of survey items, and sending the survey out from a reputable source.[27,28] Also, in accordance with this methodology, up to five contacts with each participant were made. An introductory letter was sent initially, with the survey, cover letter, and prepaid return envelope mailed approximately one week later. One week after the survey was mailed, a follow-up post card was sent encouraging participation. Three weeks after the initial survey was mailed, a second copy of the survey was sent to those who had not responded. This was followed a week later by a phone call to encourage response. In addition, a small incentive, a post-it note® pad with physical therapy insignia, was mailed in the initial survey packet. Participants were informed in the cover letter that return of the questionnaire constituted consent for participation.

Data Analysis

Like the Roush and Sonstroem[17] study, principal components analysis was used to explore the dimensions of patient satisfaction in our sample. This type of factor analysis is used to identify underlying, unobservable relationships between a group of variables.[31] For purposes of replication, a confirmatory factor analysis using an *a priori* criterion of four factors was the first analysis employed.[31] This is consistent with the four factors demonstrated in the Roush and Sonstroem[17] study. However, the criterion for inclusion of a factor based on factor loading scores was lowered from 0.4 to a 0.3 or greater factor loading. This lower criterion is considered an appropriate significance level for sample sizes numbering 350 or greater, or those with a large number of individual items.[31] Items that loaded on more than one factor were allocated to the factor with the larger loading value. Similar to Roush and Sontroem,[17] we used Oblique rotation methods for final factor analysis. This type of analysis is recommended for developing theoretically meaningful constructs. It is accomplished by rotating factor scores about a non-rigid axis to determine more meaningful factor relationships.[31] After completing the *a priori* analysis, an exploratory analysis was performed to identify alternate factor structures that may have additional explanatory value in this sample. An exploratory analysis does not specify the number of factors to be extracted.

Cronbach alpha inter-item reliability coefficients were calculated to examine the internal reliability properties of the instrument. This type of reliability analysis is derived from the average correlations of the items on the scale. Scores range from 0 to 1, with higher scores indicating higher reliability.[31]

Finally, ordinal logistic regression was used to compare factor scores with an overall patient satisfaction index. This outcome

Table 1. Outpatient Physical Therapy Patient Satisfaction Studies with Psychometric Data as Identified by Scott[10,11]

Author	Date	Patient population	Sample Size	Sample Strategy	Dimensions Studied	Significant Dimensions	Validity Analysis	Reliability Analysis
Winter and Keith[13]	1988	Occupational and Physical therapy patients	151	Purposive	Accessibility Scheduling Miles traveled Transportation expense Waiting times Art of care Technical competence Effectiveness of care	Cost Expectations Exposure	Factor Analysis	None
Roush[14]	1995	Multiple sclerosis physical therapy and occupational therapy patients	81	Convenience	Art of care Quality of care	Art of care Quality of care	Factor Analysis	Chronbach Alpha
Taylor and May[15]	1995	Physical therapy sports medicine patients	160	Not stated	Cognitive Affective Behavioral	Perceived empathy Information giving Competence Information x gender Information x importance Date of onset x empathy	Factor Analysis	Chronbach Alpha
Elliot-Burke and Pothast[16]	1997	Orthopedic physical therapy patients	19,835	Random	Overall satisfaction Therapist interaction Center operations Facility Billing	Personal attention Continuity of care Clinician knowledge Amount of patient input	Regression Analysis	None
Roush and Sonstroem[17]	1999	Physical therapy patients	177 257 173	Convenience	Provider conduct Accessibility/convenience Cost Physical environment Expectations	Enhancers Detractors Location Cost	Factor Analysis	Chronbach Alpha
Goldstein and Guccione[18]	2000	Orthopedic Physical therapy	289	Convenience	Treatment Privacy Convenience	Unidimensional construct	Factor Analysis	Chronbach Alpha

Table 1. continued

		patients			Cost Billing Ease of scheduling Scheduling Wait time Courteous staff Courteous therapist Overall satisfaction			
Beattie and Pinto[19]	2002	Occupation related physical therapy conditions	1868	Not stated	Personal aspects System aspects	Personal aspects System aspects Convenience	Factor Analysis	Chronbach Alpha
Monin and Perneger[20]	2002	Physical Therapy patients	528	Convenience	24 individual items	Treatment subscale Admission subscale Logistic subscale	Factor Analysis	None

Table 2. Participant Demographic Data as Compared to the Roush and Sonstroem Study

Variable	Current Study	Roush and Sontroem[17]
N	1175	607
<u>Age</u>		
Mean/Median	51-55(Median)	49.4 (Mean)
Range	21-86	18-87
<u>Sex (%)</u>		
Male	35.4	36
Female	64.6	64
<u>Diagnostic Category (%)</u>		
Orthopedic/Musculoskeletal	83.2	60.2
Neurological/Neuromuscular	9.6	36.4
Other	7.1	3.5

variable, developed by the authors, was a summed score of three commonly used overall patient satisfaction measures: overall satisfaction, intent to return, and intent to recommend. The range of scores for each measure was 1 to 5, so the maximum range of the summed scores of the three measures would be between 3 and 15. Collected along with the PTOPS variables, these three outcome variables were found to be highly correlated and therefore suitable for use as an index. Once the summed scores were derived, the sample was then divided into three categories of patients: those who rated their clinic as excellent or very good (summed score of 13-15), those who rated their clinic as good (summed score of 9-12), and those who rated their satisfaction levels as fair or poor (summed score of 8 or less). These divisions were relevant to the data distribution and intuitive in nature. All calculations were performed using version 10.1 Statistical Package for the Social Sciences.*

RESULTS

Participants

The randomized sample included 2,039 names and addresses to which surveys were mailed. Of these, 91 were returned by the postal service with wrong addresses, leaving 1,948 total participants receiving the questionnaire. Of those asked to participate, 1,199 returned the survey, resulting in a 62% total return rate. During the data recording stage, 24 surveys were discarded because less than two thirds of the questions were answered. The final sample size included 1,175 respondents for a 60% usable response rate.

The typical respondent was Caucasian (79.8%), married (65.5%), and had completed 12.8 years of education. A comparison of demographic characteristics with those of the Roush and Sonstroem[17] study appears in Table 2. Remarkable similarities occurred in the age and sex categories. Diagnostic categories displayed only moderate congruity between the two studies.

Construct Validity

Confirmatory factor analysis results, using the *a priori* criteria of four factors, are found in Table 3. The fundamental factor structure found in Roush and Sonstroem's original study[17] appears to hold true in our patient population. However, two minor departures are apparent in the structure. Notable is item #16, "I had to wait too long between appointments," that appeared as an Enhancer in the original study, but loaded in the Detractor category in this study. In addition, item #33, "My therapist should have listened more carefully to what I told him/her," switched from the Detractor to the Enhancer dimension. Our four-factor model explained 51% of the total variance in the data, a modest, but adequate amount.[31,32] The Detractors dimension was most explanatory, accounting for 32% of the variability in the data, followed by Location (7.9%), Cost (6.2%), and Enhancers (4.9%) .

Next, an explanatory analysis was completed in which no *a priori* factors were specified. The initial solution revealed six factors with eigenvalues of 1.0 or greater, a standard criteria for retaining factors.[31] Most of the variance (51%) is explained in the initial 4 factors, with only minor additional explanation in the remaining 2 factors. Based on this information, additional *a priori* analyses of three-factor and five-factor solutions were pursued.

The three-factor solution was based on the criterion to disregard any factors that contributed less than 5% of the variance of the model.[31] Although this solution explained less variance than the four-factor model (46.1%), it was thought to be more conceptually sound because all of the items measuring professional behavior loaded on to the first factor, accounting for 32.1% of the variance. The location and cost factors remained intact. This model is conceptually more consistent with previous literature, in which professional demeanor plays a large role in satisfaction with nurse and physician services.[33, 34]

The five-factor solution was also found to be adequate because all items loaded on one of the five factors. It was remarkably similar to the four-factor solution, except that three items related to quietness, crowdedness, and parking loaded into a separate factor. These items were previously included in the Enhancers or Detractors factor, but had little to do with provider conduct. Again, the categories were conceptually clearer in this model, with professional behaviors aligning with Enhancers and Detractors, and adding a separate category related to facility amenities. This model explained 54% of the total variance of the data.

Inter-Item Reliability

In order to assess the inter-item reliability of the PTOPS dimensions, Cronbach alpha statistics were calculated for the four-factor confirmatory solution. The coefficients for the four-factor model were .80, .85, .89, and .89, all exceeding the standard guideline that coefficients greater than 0.70 constitute adequate reliability.[31] The coefficients for the three-factor exploratory model were .80, .85, and .88, not quite as high as the four-factor model. The five-factor exploratory model, on the other hand, was abandoned since some of its factors had Cronbach alpha scores below .70. These results led us to conclude that the four-factor model was the superior model.

Predictive/Criterion Validity

Once the four-factor structure was validated and found to have the best inter-item reliability, the factor scores from each of the factors were entered into an ordinal logistic regression equation to determine whether they were predictive of an ordinal outcome "Overall Satisfaction Index." Ordinal logistic regression analysis revealed that all four dimension factor scores contributed significantly to the model, with an overall R^2 value of 0.47. This result indicates that the four-factor scores predict

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approximately 47% of the variability in the overall satisfaction index, which is considered adequate explanatory value in regression models.[35] Odds ratio calculations from the regression analysis indicated that individuals who had high factor scores in the Enhancers dimension were over 6 times more likely to have overall satisfaction scores in the excellent category. Patients who had high scores in the Detractors scale were 65% less likely to have high overall satisfaction index scores. Individuals with high factor scores in the Location dimension were 23% less likely to have excellent overall index scores, and patients with high factor scores in the Cost dimension were 58% less likely to score their overall satisfaction as excellent.

DISCUSSION

The PTOPS had been previously demonstrated as reliable and valid in outpatient settings in Southeastern New England using concurrent data collection by direct interview.[17] However, the methodology used in the Roush and Sonstroem study[17] differed from our study's approach in several ways. First, we used a broader geographic base for its sampling frame, improving on potential generalizability. Second, we used random rather than convenience sampling to improve the rigor of the study. Third, we made multiple attempts to contact patients who had been discharged or discontinued from therapy and obtained a respectable usable response rate (60%), which resulted in nearly twice the sample size of the Roush and Sonstroem study.[17] An additional difference was that of using mail survey, rather than direct interview method, which potentially minimized positive response bias. Finally, our study demonstrated the concurrent validity of the PTOPS when compared to a patient satisfaction index.

Construct Validity

This study provides strong support for the construct validity of the PTOPS. The four dimensions of the instrument remained essentially true with our patient population and with our retrospective methodology. The minor departures seen with two of the items may be attributable to the imprecise nature of interpreting the principal components analysis. Alternatively, the patients' views on those items may have legitimately differed in this study.

The ability of the instrument dimensions to explain 51% of the variance in this sample provides additional strength to the construct validity of the PTOPS. This variance is considered an adequate amount of explanatory ability[35] and is slightly higher than in the Roush and Sonstroem[17] study. Although basic science experiments, which are often performed under more controlled conditions, traditionally garner higher explanatory values, explanatory values of less than 60% are not uncommon in social and behavioral experimentation.[35] The variability is also consistent with other studies of physical therapy patient satisfaction in outpatient settings, which ranged from 51% to 57% in other studies where this type of analysis was used.[17, 19, 20] Our results suggest that clinicians should feel confident using the PTOPS to measure patient satisfaction in outpatient settings.

We found that the Detractors dimension explained the most variability in this data set, which suggests that patients' views are more affected by negative therapist behaviors than all other factors combined. However, other factors that we did not measure, such as patient demographics, clinical, and treatment-related variables, may have provided additional explanatory value. In addition, we believe that item wording may have affected the results. For example, the Detractor items are worded predominantly negatively, while Enhancer items are worded positively. The Cost and Location items, by contrast, have both positive and negative wording. Further study is needed to determine the impact of item wording on the reliability and validity of the PTOPS instrument. Finally, although the Cost dimension of the PTOPS has adequate statistical explanatory value, it remains problematic because 7% of the subjects declined to answer questions related to costs. Respondents' written comments indicated that a substantial number of the patients had not received adequate billing information on which to base their perceptions. This may limit the practical usefulness of the Cost portion of the PTOPS, especially when used in clinics with long billing cycles.

Reliability

Inter-item reliability remained remarkably consistent in our sample of patients when compared to the original study.[17] The Cronbach alpha score for each of the four dimensions was well above the 0.70 standard, and the four-factor model rendered the best scores among the models considered. This result provides strong evidence for the continued internal reliability of the PTOPS when used with a different sample and with a mail survey methodology.

Predictive/Criterion Validity

The results of the ordinal logistic regression analysis indicate that the factor scores from the principal component analysis may predict up to 47% of a patient's overall satisfaction with outpatient therapy services. This result is considered an "adequate" or "better" explanatory value in studies using regression techniques. In addition, each factor contributed significantly to the predictive value of the instrument. The results of the regression analysis suggest that the Enhancers dimension has the most predictive value, followed by Detractors, then Cost, and finally Location. This result is consistent with the idea that therapist behaviors, both positive and negative, are more predictive of patient satisfaction than cost or location and convenience. The attentiveness to the patient, the willingness of the practitioner to listen to patient concerns, and personal interactions in general appear to have the greatest influence in improving patient satisfaction with physical therapy services. Physical therapy practice managers may be able coach practice associates to improve interpersonal relationships with patients and each other to increase patient satisfaction with their services.

Limitations

Limitations to this study are consistent with limitations of general survey research. The sampling frame potentially limits the

Table 3. Factor Loading Values of Physical Therapy Outpatient Satisfaction Items Derived from a Confirmatory Principal Component Analysis

PTOPS Number	Questionnaire Item	Factor 1 (Detractor)	Factor 2 (Location)	Factor 3 (Cost)	Factor 4 (Enhancer)	Roush and Sonstroem[17] Designation
15	My therapist could have communicated with me more.	.605				Detractor
13	My therapist acted like he/she was doing me a big favor by treating me.	.581				Detractor
6	I expected my therapist to spend more time with me than he/she did.	.553				Detractor
27	My therapist didn't give me a chance to say what is on my mind.	.545				Detractor
31	My therapist could have been more thorough in my treatment.	.524				Detractor
16	I had to wait too long between appointments.	.490				Enhancer
23	I didn't really enjoy talking to my therapist.	.443				Detractor
3	I expected the facility to be quieter than it was.	.434				Detractor
20	The facility was too crowded.	.433				Detractor
8	It was difficult for me to get into the facility from the parking lot.	.382				Detractor
21	I had to travel too far to receive my treatment.		.816			Location
10	This facility could have been more conveniently located for me.		.763			Location
28	I should not have to travel this far for therapy.		.753			Location
32	The physical therapy facility was conveniently located for me.		-.746			Location
19	It was somewhat difficult for me to reach this PT facility.		.738			Location
5	The distance required for me to get to this facility was acceptable to me.		-.717			Location
14	The facility was in a desirable location.		-.612			Location
9	I was charged a reasonable amount for my therapy.			.808		Cost
11	I felt my therapist overcharged me.			-.759		Cost
1	The cost of treatment was more than I expected.			-.720		Cost
17	The quality of care I received was not compatible with the cost			-.620		Cost

Table 3. continued

4	The facility was flexible about payment options.	.547				Cost
30	It could have been easier to make the arrangements to pay for my therapy.	-.508				Cost
25	My therapist did not expect me to pay significantly more that what my insurance covers.	.473				Cost
2	I enjoyed listening to my therapist.			.707		Enhancer
24	My therapist seemed to have a genuine interest in me as a person.			.705		Enhancer
34	I got along well with everyone at this physical therapy facility.			.628		Enhancer
18	This facility was a nice place to get my therapy.			.607		Enhancer
29	This facility appreciated my business.			.581		Enhancer
12	The office staff was attentive to my needs.			.575		Enhancer
33	My therapist should have listened more carefully to what I told him/her.			-.510		Detractor
7	I was given privacy when I needed it.			.507		Enhancer
22	I could get around easily inside of the facility.			.470		Enhancer
26	I anticipated my questions would be answered easily.			.392		Enhancer

ability of this research to be generalized to other patient populations. The willingness of the subjects to respond at all, or respond in a forthright manner, can affect the results of the study in the form of non-response and response bias. In addition, although the methodology allowed individuals who had voluntarily discontinued physical therapy due to dissatisfaction to be included, there was no measurement to identify patients who might fall into this category. Finally, the self-report format of the questionnaire presents a limitation. No opportunity existed to validate the information presented by the respondents by chart reviews or other methods.

In summary, this study was designed to replicate and further the research based on the PTOPS instrument by Roush and Sonstroem[17] and to determine whether the reliability and validity of the instrument remained consistent in a different sample and using a different methodology. The construct validity of the instrument was shown to be adequate in this study, being consistent with the factor analysis in the original study. Instrument inter-item reliability was also found to be good to excellent in this sample. Finally, ordinal logistic regression analysis suggests that the PTOPS may have adequate degrees of predictive validity in illuminating overall patient satisfaction.

It should be noted that the participants often lamented the length of the survey and redundancy of the items, as well as "trickiness" of questions. Further analysis of individual items themselves appears to be needed in order to choose the most predictive ones. If the number of items on the survey could be reduced, then this may have a positive impact on response rates. Further, alternative item wording should also be investigated to minimize the perceived difficulty of negative questioning. Continued investigation of the survey items that decreased scale reliability could lead to more reliable dimension scales. Much work remains to be done in both qualitative and quantitative venues to further clarify the determinants of patient satisfaction in outpatient physical therapy.

CONCLUSION

The findings of this study provide support for the continued use of the PTOPS survey instrument when investigating patient satisfaction in outpatient physical therapy practice. The PTOPS appears to be both reliable and valid when using either a mail survey or on-site interview methodology as well as with convenience or random sampling protocols. It also retains consistency in different geographic locations and with all racial, marital, educational, and adult age groups.

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