

Factor Structure of a Korean-Language Version of the Patient Satisfaction with Procedural Aspects of Physical Therapy Instrument.

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Purpose: The aim of the study was to survey satisfaction with physical therapy.

Methods: After the physical therapy consultation, patients filled in a Korean-language version of the 20-item version of the MedRisk Instrument developed for measuring Patient Satisfaction with physical therapy. Items are scored on a five-point Likert scale ranging from strongly disagree to strongly agree. The last two items are general satisfaction and future return to the clinic. Age and gender information was also collected anonymously. Exploratory factor analysis based on principal components analysis with varimax rotation was performed on the first 18 items of the MedRisk Instrument using SPSS v.20.

Results: Four factors emerged with eigenvalues greater than 1, and these cumulatively explained 55% of the total variance in item scores. The factors were labelled: Internal, External Positives, External Negatives, and Clinic Presentation. Correlations of the factor scores with the two global items ranged from 0.29 to 0.70 (both $p < 0.001$). Gender differences were only found on the last factor, with male Korean patients rating Clinic Presentation significantly higher than females ($p = 0.001$).

Conclusion: Using factor analysis, the proposed factor structure was revealed using the positive and negative components of the external aspects of the physical therapy and by identifying a clinic presentation which contributes to patients' satisfaction. The largest proportion of the variance in Patient Satisfaction was related to clinicians' attention and behaviour. The results of the analysis provide guidelines as to the dimensions of professional physical therapy care and the implications for service delivery and patient experience.

Keywords: Patient satisfaction, Physical therapy services, Factor analysis

1. Introduction

Patient satisfaction with care is regarded as an important variable for assessing care quality.^{1,2} Clinicians can optimize their services, improve outcomes of treatments and enhance patients' experiences by understanding the factors that contribute to delivery of physical therapy services.³ Its measurement allows clinicians to examine the extent to which their services are meeting patient's needs. Thus the

importance of patient-centred care has been recognized in physical therapy along with general medicine, nursing and other allied health professions.⁴⁻⁶ In clinical decision making process, patient satisfaction should be considered. Patient satisfaction surveys provide benefits for healthcare professional. They can be used to measure the success of delivering information, and to predict patient re-attendance and compliance with treatment. Measures of patient satisfaction have been used as a benchmark upon which to assess market competitiveness. Although patient satisfaction is an important aspect of physiotherapy services, many studies regarding physiotherapy process still have omitted related data.⁷⁻¹¹

Many studies have been published to report patient satisfaction.¹²⁻¹⁹ The factors that result in high patient

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satisfaction have been reported in several countries. Effective therapist–patient communication is one of key factors related to high satisfaction in Europe, North America, the United Kingdom, and Australia.³ Whereas factors about the process of care, such as convenient clinic hours and parking, waiting room comfort and clinic cleanliness were highly correlated with patient satisfaction in the United only.²⁰ Therefore, it can be suggested that interpersonal features of musculoskeletal physical therapy care may be universal determinants of high patient satisfaction, whereas other factors may be different between countries.

Several measures used to assess patient satisfaction with physical therapy care.^{21–24} Most of measures were developed in English and existing information on patient satisfaction with physical therapy care is based on US data, further there are differences in healthcare systems between countries that make international comparisons difficult, so data from Korea is needed. The MedRisk Instrument has been reported reliable and valid for measuring patient satisfaction and most widely used.²⁵ Therefore, the aim of this study was to conduct a survey on satisfaction with physical therapy care in a Korean patient population using the MedRisk Patient Satisfaction instrument.

II. Methods

1. Instrument Development

Getting Korean–language version of the MedRisk (*KMedRisk*) instrument requires a process of translation, back translation and checking to ensure that the meaning and intent of the original items have been satisfactorily captured in idiomatic Korean–language. The process of cross cultural adaptation followed the guidelines proposed by Beaton et al. (2000),²⁶ along with test–retest reliability on the *KMedRisk* instrument.

1) Subjects for test–retest reliability test

30 subjects whose mother tongue was Korean volunteered. Exclusion criteria were defined as anyone who was seeking treatment during the test period, or anyone who was illiterate.

2) Procedure for the pilot test

The instrument was collected twice from each subject, and this was done on two different occasions for test–retest reliability. After completing a questionnaire on the first occasion, subjects were asked to fill in again within seven days depending on subject availability. Each subject made comments if there is any trouble to understand, if there is ambiguous wordings etc.

2. Validity tests of the *KMedRisk*

1) Subjects

Volunteers were recruited from patients who were more than 18 years of age with musculoskeletal problems referred for physical therapy services at 40 private clinics from nine provinces included five metropolitan cities in Korea. Patients were excluded if they have any health problems that might affect their understanding, or if they are having inpatient services. Patient consent was obtained prior to collecting data. Any information including names which could identify patients were not included in the collected data.

2) Procedure

Subjects were asked to complete the *KMedRisk* on their last treatment day. The *KMedRisk* constructed 2 sections; one is composed of information regarding general characteristics, age, gender, treatment site and duration of treatment and the other includes 20 items of patient satisfaction with global perceived effect scale. Subjects were instructed to place the completed instrument sealed individually in a collecting box in their waiting room. Minimum of 30 questionnaires were collected.

3. Data Analysis

Subjects whose completed the *KMedRisk* contained missing item responses were not included in the analysis. Descriptive statistics were calculated. The presence of gender–based differences in age and in the mean scores for each of the 20 items was assessed using an independent t test.

1) Factor structure

An inter–item correlation matrix was generated to determine the correlation of each of the 18 items to the 2 global measures. Only items which were significantly correlated

to both of the global items were used for further analysis. An exploratory factor analysis, using principal components analysis (PCA) with varimax rotation, was then performed using those items that remained in the data set. The number of potential factors was suggested by the number of eigenvalues that were >1.0 . Items on the rotated solution that loaded >0.32 were retained.

2) Reliability

Reliability of measurements was examined in 2 ways. Group-level reliability was addressed by calculating a Cronbach alpha for each factor that was proposed by PCA. Individual-level reliability was tested by calculating the standard error of the measure (SEM) for the mean score of each factor proposed by PCA. 95% confidence interval of the SEM was calculated by adding and subtracting $1.96 \times \text{SEM}$ to the observed scores. This 95% confidence interval is useful to determine the range of measures between which the true score is likely to be.

3) Criterion-Referenced Validity

Criterion-referenced validity was addressed by determining the correlation between individual item scores and mean scores for factors with the two global measures of satisfaction. All calculations were performed using SPSS version 20.0.

III. Results

Total of 1,363 patients participated. Missing item responses were not included for the analysis. Of the total number of subjects, 573 were female and 790 were male. The mean age for female subjects was 43.6 years ($SD=15.12$) whereas 46.2 years ($SD=15.39$) for male subjects ($P<0.01$). Mean scores for individual items were graded from 1 to 5 (1=strongly disagree, 5=strongly agree) and ranged from 3.22 ($SD=1.70$) for "I did not wait too long" to 4.80 ($SD=0.62$) for "My therapist treated me respectfully". There were gender-based differences in the mean scores individual items (Table 1).

1) Factor Structure

Principal components analysis showed 4 eigenvalues greater than 1.0, loading 54.9% of the cumulative variance. Following varimax rotation, 6 items loaded on the first factor with loadings ranging from 0.68 to 0.76. This factor named "Respect & Attention". 5 items loaded on the second factor with loadings ranging from 0.35 to 0.77. This factor labelled "3Cs (Courtesy, Comfort, & Convenient)". 4 items loaded on the third factor with loading ranging from 0.57 to 0.74. This factor labelled "Perceived Negative Time Trade-off". The remaining of 3 items was labelled "Shine" with loading ranging from 0.56 to 0.75. (Table 2)

2) Reliability

For the respect & attention, the Cronbach alpha was 0.86 and the SEM of the mean score was 0.27. The Cronbach alpha for the 3 Cs was 0.64, and the SEM of the mean scores was 0.43. For perceived negative time tradeoff, the Cronbach alpha was 0.63, and the SEM of the mean scores was 0.42. The Cronbach alpha for the shine was 0.53, and the SEM of the mean scores was 0.55.

3) Criterion-Referenced Validity

The mean score of the 6 items in the respect and attention factor was 0.48 ($SD=0.51$). This was significantly correlated with both global measures ($r=0.70$ for "Overall, I am completely satisfied with my care" and $r=0.62$ for "I would return in the future") ($P<0.01$).

The mean score of the 5 items in the 3Cs factor was 4.64 ($SD=0.59$). This score also was significantly correlated with the global measures ($r=0.47$ for "Overall, I am completely satisfied with by care" and $r=0.48$ for "I would return in the future") ($p<0.01$). The mean score of the 4 items in the negative time trade-off factor was 4.64 ($SD=0.59$). This score also was significantly correlated with the global measures ($r=0.29$ for "Overall, I am completely satisfied with by care" and $r=0.26$ for "I would return in the future") ($p<0.01$). The mean score of the 3 items in the shine factor was 4.64 ($SD=0.59$). This score also was significantly correlated with the global measures ($r=0.40$ for "Overall, I am completely satisfied with by care" and $r=0.38$ for "I would return in the future") ($p<0.01$).

Table 1. Means and SDs of the individual items and their global measures

	Male	Female	P vale
Item 1	4.06 (0.90)	4.00 (0.84)	< 0.01
Item 2	4.01 (0.92)	3.91 (0.83)	0.16
Item 3	3.83 (0.90)	3.83 (1.66)	0.99
Item 4	2.68 (1.04)	2.71 (1.07)	0.31
Item 5	2.77 (1.39)	2.56 (1.42)	0.11
Item 6	2.79 (1.08)	2.93 (1.09)	0.38
Item 7	3.64 (0.95)	3.58 (0.92)	0.73
Item 8	2.31 (1.00)	2.44 (1.02)	0.34
Item 9	3.88 (0.96)	3.84 (0.90)	0.22
Item 10	4.06 (0.86)	4.04 (0.78)	0.03
Item 11	4.01 (0.86)	3.97 (0.82)	0.53
Item 12	3.72 (1.30)	3.63 (1.36)	0.41
Item 13	2.16 (1.00)	2.20 (0.96)	0.36
Item 14	4.02 (0.89)	3.98 (0.84)	0.24
Item 15	3.82 (0.97)	3.74 (0.97)	0.49
Item 16	3.85 (0.90)	3.66 (0.93)	0.03
Item 17	3.43 (1.07)	3.39 (1.02)	0.18
Item 18	3.50 (1.14)	3.47 (1.10)	0.67
Item 19	3.94 (0.90)	3.97 (0.80)	0.02
Item 20	4.02 (0.87)	4.03 (0.80)	0.08

Table 2. Factor loadings for the items on each factor

Factor 1: Respect & Attention	Loadings	Factor 2: 3 'C's	Loadings	Factor 3: Perceived Negative Tradeoff	Loadings	Factor 4: Shine	Loadings
My therapist explained the treatment (s).	0.76	The office receptionist was courteous.	0.75	The office location was not convenient.	0.66	The office and its facilities were clean.	0.67
My therapist treated me respectfully.	0.76	The registration process was appropriate.	0.77	My therapist did not spend enough time with me.	0.74	The office used up-to-date equipment.	0.75
The office staff was respectful.	0.69	The waiting area was comfortable (lighting, temperature, furnishings).	0.54	My therapist did not listen to my concerns.	0.67	This office provided convenient parking.	0.56
My therapist answered all my questions.	0.68	The office hours were convenient for me.	0.48	I waited too long to see my therapist.	0.57		
My therapist advised me on ways to avoid future problems.	0.75	The assistant/aide was respectful	0.35				
My therapist gave me detailed instructions regarding my home program.	0.69						

IV. Discussion

In this study, the 20-item version of the Beattie et al (2002)²² Patient Satisfaction with Outpatient Physical Therapy instrument was employed, with 18 specific questions followed by 2 global measures that assess the extent to which a patient was completely satisfied with their care, and whether they would return in future. This version of the instrument has recently been translated into Spanish, and its factor structure, reliability and validity evaluated with 203 Spanish-speaking patients attending outpatient physical therapy care.²⁷

In the current work, the same 20-item instrument was translated into the Korean language, and completed by 1,343 physical therapy patients who were seeking treatment for musculoskeletal problems. All items were significantly correlated with both global measures. Correlation ranged from 0.29 to 0.70.

From principal component analysis, 4 eigenvalues greater than 1.0 were extracted, which together explained a cumulative 54.9% of the variance in item scores.

From the rotated component matrix obtained after varimax rotation, 6 items loaded on the first factor (range 0.69 to 0.76), five on the second (range 0.35 to 0.77), 4 on the third (range 0.57 to 0.74) and 3 on the fourth (range 0.56 to 0.75). After consideration of the items loading on the factor, they were named Respect and Attention-factor 1, Comfortable, Courteous, Convenient-factor 2, Perceived Negative Time Trade-Off-factor 3, and Shine-factor 4.

For data analysis, the responses to the four negative items were initially subtracted from 6 so as to recode them to be positive. However, when all four items (4, 6, 8, and 13) were found to load on Factor 3, the analysis was repeated with the original scores. Only the signs of the correlation coefficients were affected by this change, but it had the benefit of reflecting the direction of the original questions in the factor name. Thus patients scored high on this factor if they agreed that they had come to an office that was not conveniently located, waiting too long before seeking the therapist, who they perceived them did not spend enough time with them or listen to their concerns. Thus their large time investment was repaid with a small amount of time spent, and this perceived mismatch was then reflected

as a high score on the factor. Using the rule that only items with loadings >0.32 be included²⁸ all items loaded on one of the four factors.

31% of the total variance was explained by a factor that loaded on questions related to the therapist spending time to explain, answer and advise the patient, in a respectful manner. We named this factor 'Respect and Attention' and this outcome is consistent with several previous studies.^{23,29}

The second factor extracted, that accumulated for an additional 10% of the total variance, was named after terms, all beginning with the letter C, that characterized the questions loading on it – courteous, comfortable and convenient clinic times. Although the term in question 12 was 'respectful', because this item related to the assistant/aide rather than the therapist, it has been interpreted as being closer to courtesy, and thus consistent with the factor name. Patients in busy clinic, where most of participated clinics in the study, may spend a long time before getting their treatment that clinic atmosphere and registration process with related staff members can influence patients' satisfaction.

Examination of the item loading on the third factor showed them all to be couched in the negative. Three items contained a 'not' and the remaining item related to 'waiting too long' ie not being seen quickly enough. Considered in a temporal sequence, these items relate to having to spend time to get to the clinic location, more time than the patient felt was appropriate to see the therapist, then to find that the therapist did not spend enough time with the patient, or listen adequately to their concerns. Looked at in this way, the picture emerges of a perceived negative time trade off. That is, the patient already felt by the time the consultation began that they had invested a considerable amount of time in seeking therapy. When they then perceived the time they were allocated to be insufficient, this compounded to give a sense of poor return for time investment. Hence, those factor name 'Perceived negative time trade off'. To avoid this perception, getting the receptionist to record arrival time on the patient file could alert the therapist that a sense of time investment had been created. Similar findings have been reported in other countries.^{13,19,23}

The final factor that emerged loaded on convenience of

parking for patients driving to the clinic, and the perceived cleanliness and up-to-date-ness of equipment at the clinic. Because the factor satisfaction with physical therapy, ie being scrupulous in maintaining a clean presentation, we have named the factor 'shine'. 45% of variance in Patient Satisfaction scores is not related to the items. Presumably, this is where perceived outcome (eg having less pain, more range or greater ease of movement) come in as determines of patient satisfaction with physical therapy.

In conclusion, the factors extracted from this analysis provide clear directions as to the dimensions of professional physical therapy care and their associated implications for service delivery and patient experience. Consideration of the nature of the items loading on the factors has immediate relevance for clinicians as regards features that need to be part of the professional behaviour of the physical therapist, as well as those that should be avoided in the presentation of a physical therapy clinic. This study was designed only for musculoskeletal physiotherapy service in Korea, therefore, it is hard for those results to imply as a general physiotherapy service. Future study may be needed in related matter.

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