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VALIDATION OF THE CHINESE PATIENT COMMITMENT SCALE: RELIABILITY, STRUCTURAL VALIDITY, AND CULTURAL ADAPTATION IN HEALTHCARE CONTEXTS

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Abstract
This study aimed to translate the Patient Commitment Scale developed by E. Torres into Chinese and test its reliability and validity among different patient populations in the Chinese cultural context. The goal was to provide support for the development of assessment tools tailored to Chinese patients, to evaluate patient treatment attitudes and behaviors and provide precise and personalized medical services more accurately. Through item analysis and exploratory factor analysis, the patient commitment items suitable for the Chinese context were validated. Confirmatory factor analysis was employed to further establish the structural validity, followed by reliability and validity tests. The Chinese version of the Patient Commitment Scale demonstrated good item discrimination, and the results of exploratory and confirmatory factor analyse（ χ^2=13.196, df=7,χ^2/df=1.885, CFI=0.997,RMSEA=0.042, TLI=0.994,SRMR=0.009）supported a single-factor construct, meet measurement requirements for reliability and validity. The translated Chinese version of the Patient Commitment Scale meets measurement standards, serving as a scientifically valid and effective measurement tool for patient commitment among Chinese study populations.

Keywords: Patient commitment, reliability, validity, translation adaptation

1.0 Introduction

Patient Commitment refers to the willingness of patients to consistently and repeatedly choose a specific healthcare provider or doctor due to their satisfaction with the quality of services received at the medical institution**Error! Reference source not found.**guyen et al.,20210. This commitment is demonstrated by patients actively spreading positive word-of-mouth about the institution and recommending it to others **Error! Reference source not found.**. It signifies a dedication to the service provider **Error! Reference source not found.**. For healthcare providers, patient commitment is crucial. It not only forms the foundation for the provider's continuous development but also serves as a key indicator of the hospital's overall competitiveness **Error! Reference source not found.**. Furthermore, it is one of the critical factors for success. As China's healthcare market diversifies and the medical system undergoes reforms, both public and private medical institutions strive to deliver high-quality services, enhance patient retention, and foster and maintain patient commitment. According to Huang et al. **Error! Reference source not found.** , the relationship between perceived value of medical services, emotional commitment to healthcare providers, and patient loyalty is explored through three stages of loyalty attitudes. Only when patients trust their healthcare providers will they perceive the value of medical services and

be willing to establish a long-term committed relationship. Similarly, Baker et al.0analyzed commitment from three perspectives: the desire to develop a stable relationship, the willingness to make small sacrifices to maintain it, and the desire to sustain trust in a stable relationship. Therefore, commitment represents a strong preference and ongoing support 0. Additionally, Pritchard et al.0argued that commitment is a prerequisite for the loyalty process; satisfied and loyal patients remain faithful to their providers and recommend them to others. Patawayati et al. found that patient commitment has a significant positive impact on loyalty ($\beta = 0.413$, $P < 0.05$)**Error! Reference source not found.** .Compared to patient loyalty, patient commitment is an extension of the path where trust enables loyalty to lead to commitment, not just reflecting patient satisfaction but more importantly their willingness to continuously choose and trust a specific medical institution or doctor. Patient commitment is also seen as a critical factor for successful healthcare delivery and patient health. Developing and maintaining patient loyalty can benefit both parties by improving health outcomes. Loyal patients continue to use healthcare services, adhere to prescribed treatment plans, and maintain relationships with specific providers **Error! Reference source not found.**. In the current competitive environment, the doctor-patient relationship is at the core of healthcare services. Understanding how to retain patients and ensure their loyalty to doctors is essential for the ongoing success of healthcare organizations. Healthcare managers should focus on enhancing patient loyalty, forming patient commitment to reduce attrition, and avoiding the costs associated with attracting new clients **Error! Reference source not found.**.

Reviewing previous studies reveals that patient loyalty may be a result of patient satisfaction. For instance, a study conducted on patients admitted to a private hospital in Taiwan reported that satisfaction might be a key pathway to enhancing patient loyalty0. Similarly, a comprehensive study in the United States evaluated the satisfaction of patients treated in public institutions and found that patient satisfaction significantly impacts patient loyalty0. Yu et al. **Error! Reference source not found.**confirmed through a survey of 469 Chinese residents that there is a positive correlation between the quality of medical services and patient loyalty. This suggests that high-quality medical services can promote repeat visits, as patients' unique medical needs are fully met0 , leading to a positive perception and evaluation of the hospital.Patient loyalty is also crucial when receiving treatment at the hospital. A study in Syria found that patient loyalty is an important criterion for doctors when prescribing medication **Error! Reference source not found.** . In another Syrian study, Firas AlOmari mentioned that reliability is the only dimension of service quality with a significant direct impact on patient satisfaction, loyalty, and medication adherence 0. Numerous empirical studies have demonstrated a positive correlation between perceived service quality, satisfaction, and loyalty. Providing high-quality pharmacy services can also enhance patient loyalty to the hospital **Error! Reference source not found.**rab et al.,2012;S0.Moreover, healthcare institutions with loyal patients can reduce costs and increase profitability (Mittal & Lassar, 1998; Chahal & Bala, 2012) . This underscores the vital role of patient loyalty in developing and maintaining successful healthcare services. Therefore, patient commitment is a crucial issue for healthcare managers and scholars in the healthcare field (Mittal & Lassar, 1998; Chahal & Bala, 2012).

Regarding the measurement of patient commitment, there have been no relevant studies reported in China. However, in other countries, there have been several detailed discussions and explorations. For instance, E. Torres and colleagues0 collected data using structured questionnaires from a sample of hospitalized patients in large cities in South America. Their findings indicated that patients who displayed a high level of loyalty to their doctors also exhibited

high loyalty to the hospital, leading to higher patient commitment.Huang et al. **Error! Reference source not found.** distributed 254 valid questionnaires to individuals with medical experience and referenced Smith's scale to construct the trust and commitment items. The unique aspect of this scale is that trust and commitment are each measured by three items, designed to assess the quality of the relationship between individuals and healthcare providers. The study results showed a significant mediating effect between patients' perceived value of medical services, commitment to the doctor-patient relationship, and loyalty. When patients exhibit higher levels of trust in their healthcare providers, the relationships among perceived value, commitment, and patient loyalty are further strengthened. DiMatteo and colleagues **Error! Reference source not found.**conducted brief interviews with 342 hospitalized and outpatient patients and found that patients' perceptions of certain aspects of their doctor's treatment were reflected in their responses to questions, as well as in their commitment to the doctor-patient relationship. This indicates that the strength of the relationship between these perceptions and patient commitment can be assessed. These research findings provide valuable references for further understanding and exploring issues related to the measurement of patient commitment.

Considering that a patient commitment scale has not yet been introduced in China, this situation hinders the development of medical research domestically and makes it challenging to conduct cross-cultural comparisons on a global scale. The patient commitment scale is significantly valuable in assessing treatment adherence, predicting disease progression, and evaluating the quality of healthcare services. Therefore, exploring the factor structure and applicability of the patient commitment scale within the Chinese cultural context is especially important. This not only has substantial implications for advancing medical development in China but also provides valuable insights for cross-cultural healthcare research.

This study aims to formally introduce E. Torres' patient commitment scale to China and extensively test its applicability across different groups within the country. This requires not only translating and localizing the scale but also conducting substantial empirical research to verify its validity and reliability in the Chinese cultural context. Additionally, by comparing and analyzing this scale with similar scales domestically and internationally, we can gain a deeper understanding of the structure of patient commitment across different cultural backgrounds. This will provide robust support for developing an assessment tool suitable for Chinese patients. We aim to develop a patient commitment scale that aligns with the characteristics of Chinese culture while maintaining international comparability. This will enable us to more accurately assess patients' treatment attitudes and behaviors, thereby providing more precise and personalized medical services.

2.0 Methodology

This study collected a total of 1500 samples from various regions of China through the Questionnaire Star platform, with 1092 samples deemed valid. Employing a multi-stage sampling method, we recruited at least one group for questionnaire collection in provinces and cities such as Anhui, Zhejiang, and Jiangsu. The data were designed by the researchers based on literature review and included six demographic items: gender, age, education level, occupation, type of medical insurance, and household registration. Using SPSS 27.0, we eliminated data with questionnaire response lengths shorter than one-fourth of the total, inconsistent logical checks, incomplete information, repeated entries, and data with similar or patterned response options.

Sample 1 was utilized for item analysis and exploratory factor analysis, employing cluster sampling to select respondents from various regions of China. A total of 683 questionnaires were distributed, with 600 valid responses received, resulting in an effective response rate of 87.8%. Of these, there were 276 males and 324 females, predominantly aged 31-50 years, with 43% having a bachelor's degree, and a majority being employed as corporate workers or students. Urban employee medical insurance accounted for 42%, slightly lower than rural household registration at 51.5%.

Sample 2 was used for confirmatory factor analysis, employing cluster sampling to select respondents from grassroots hospitals in various locations. A total of 575 questionnaires were distributed, with 492 valid responses received, resulting in an effective response rate of 85.6%. Of these, there were 225 males and 267 females, predominantly young adults with educational levels below a bachelor's degree, mostly self-employed or farmers, with 35.6% covered by urban employee medical insurance, and 56.9% originating from rural areas.

Sample 3 was designated for retest reliability and criterion-related validity testing. After a 4-week interval, 242 respondents were randomly selected from Sample 2 to complete a second administration of the Chinese Patient Commitment Scale and undergo criterion-related questionnaire testing, resulting in 200 pairs of valid questionnaires. Of these, there were 90 males and 110 females, predominantly aged 31-40 years, with 28% having attained education levels of junior high school or a bachelor's degree, 22% being self-employed, 45% covered by urban employee medical insurance, and 57.5% originating from rural areas.

The Chinese version of the Patient Commitment Scale, revised by Eduardo Torres in 2009, comprises six items. The total score of all items represents the patient's commitment score, with higher scores indicating a higher level of commitment to health provider. We invited two doctoral students specializing in psychology and English to translate the original scale into Chinese, which underwent multiple back-translations to ensure accuracy. Subsequently, two psychology experts and two English experts were invited to assess the translated Chinese scale for clarity and professional knowledge, ensuring its accuracy and comprehensibility. Ultimately, we successfully constructed a measurement tool with the same number of items as the original scale. This tool adopts a five-point scoring method (1 representing "completely disagree" and 5 representing "completely agree") to measure and evaluate the relevant psychological states of the respondents more accurately.

2.1Criterion-Related Questionnaire

Professional Ethics

Adapted from Chai Huangyangzi (2016), comprising five items, using a Likert 5-point scoring method (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). The total score of all items represents the satisfaction score of patients with the medical ethics and conduct of medical personnel, with higher scores indicating greater satisfaction. The Cronbach's α coefficient for this survey was 0.963.

Patient Satisfaction

Adapted from Mao et al.(2020), comprising five items, using a Likert 5-point scoring method (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). The total score of all

items represents the satisfaction score of patients with the quality of medical services, with higher scores indicating greater satisfaction. The Cronbach's α coefficient for this survey was 0.918.

Service Quality

Adapted from Parasuraman et al.,(1985), comprising 22 items, using a Likert 5-point scoring method (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). The total score of all items represents the satisfaction score of patients with the service quality of medical personnel, with higher scores indicating greater satisfaction. The Cronbach's α coefficient for this survey was 0.985.

2.2 Statistical Methods

This study conducted preliminary data processing and analysis using SPSS 27.0, including descriptive statistical analysis to grasp the overall situation of the items by calculating means, standard deviations, etc. Additionally, correlation analysis was performed to explore the relationship between various indicators within the items, providing a basis for subsequent exploratory factor analysis. For the assessment of reliability and validity, we calculated the Cronbach's Alpha coefficient for each questionnaire to evaluate its internal consistency. Furthermore, we conducted confirmatory factor analysis using AMOS to further validate and optimize the structure of the questionnaire. This analysis not only helped us to better understand the inherent structure of the questionnaire but also provided important references for its future application and expansion.

3.0 Results

The correlation coefficients between the scores of the 6 items on the Chinese Patient Commitment Scale and the total score ranged from 0.90 to 0.94. Further, we divided the total scores into high and low groups based on the top and bottom 27%, respectively, and conducted independent sample t-tests to analyze the differences in the 6 items between the two groups. The results showed that the differences in all items between the high and low groups were extremely significant (P<0.01), indicating good discrimination of the 6 items on the scale.

Table 1 Chinese Patient Commitment Scale Item Analysis Results（n=1092）

Items and Content	r	t
I want to maintain continuous contact with my doctor in the future	0.91**	-10.26**
I am very loyal to my current doctor.	0.93**	-14.31**
The relationship between my doctor andme is worth my full com mitment to maintain.	0.93**	-13.45**
Even if I have new options, I will not give up seeing this doctor.	0.94**	-19.25**
If someone criticizes my doctor, I will emphasize his strengths.	0.90**	-13.59**
Even if this doctor makes minor mistakes, I will not give up his se rvice.	0.90**	-11.43**

**P<0.01

Exploratory factor analysis of patient commitment was conducted using data from Sample 1. The results showed that the Kaiser-Meyer-Olkin (KMO) measure was 0.920,and Bartlett's test of sphericity was significant (χ^2=2884.370, df=15, P<0.01), indicating the suitability of the data for exploratory factor analysis. Using principal component analysis with Promax rotation, one factor with an eigenvalue greater than 1 was extracted, with an eigenvalue of 4.551 and a cumulative variance contribution rate of 75.853%. The factor loadings of the items ranged from 0.853 to 0.877.

Table2 Results of Exploratory Factor Analysis of Patient Commitment（n=600）

Item	Factor loading	Communality
1	0.875**	0.766
2	0.877**	0.769
3	0.853**	0.728
4	0.876**	0.767
5	0.872**	0.760
6	0.872**	0.760

**P<0.01

Using data from Sample 2, we conducted confirmatory factor analysis of the Patient Commitment Scale. The results revealed that the fit indices of the single-factor model (χ^2=13.196,df=7,χ^2/df=1.885, CFI=0.997, RMSEA=0.042, TLI=0.994, SRMR=0.009) were satisfactory (Figure 1), meeting the standards of model fit in psychometric measurement.

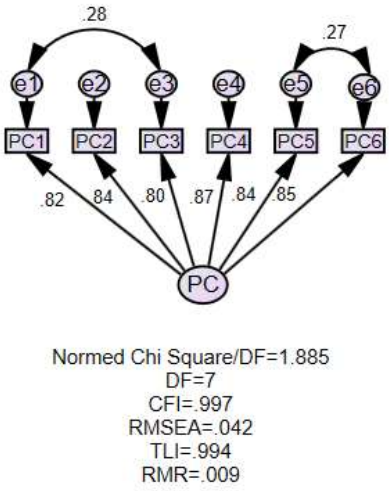

Figure 1 CFA for Patient Commitment

This study calculated the Average Variance Extracted (AVE) and Composite Reliability (CR) of the Chinese version of the Patient Commitment Scale based on the path coefficients of the single-

factor model. The results indicated that AVE=0.758 (>0.5) for all items, and CR=0.9496(>0.7). This suggests good convergent validity of the Chinese version of the Patient Commitment Scale.

Using Sample 3, we selected the Medical Ethics and Conduct Scale, Patient Satisfaction Scale, and Service Quality Scale as criterion questionnaires to test the criterion-related validity of the sample. The results showed a significant positive correlation between patient commitment and medical ethics and conduct, patient satisfaction, and service quality. Refer to Table 3 for details.

Table 3 : Criterion-Related Validity

	Professional ethics	Patient Satisfaction	Service Quality
Patient Commitment	0.611**	0.594**	0.450**

**P<0.01

Reliability testing was conducted on 1092 valid data from Sample 1 and Sample 2. The internal consistency coefficient of the Chinese version of the Patient Commitment Scale was 0.937, and the split-half reliability was 0.914. After a one-month interval, test-retest reliability was conducted on 200 valid data from Sample 3, yielding a correlation coefficient of 0.942 for the total scores of the Chinese Patient Commitment Scale before and after. All these coefficients met the criteria of P<0.001, indicating good internal consistency and temporal stability of the Chinese version of the Patient Commitment Scale.

4.0 Findings and Discussion

Through rigorous scientific methods and processes, this study successfully revised the Chinese version of the Patient Commitment Scale and rigorously tested its reliability and validity. The completion of this work not only fills a gap in this field in China but also provides new tools and perspectives for Chinese medical institutions in patient management and service quality improvement.

The research conducted readability testing on the scale, ensuring the accuracy of the translation while effectively avoiding the generation of ambiguous sentences, thus ensuring the content validity of the Chinese version of the scale. Through in-depth item analysis, we found a significant positive correlation between each item and the total score of the scale, indicating good homogeneity and item discriminability of the Chinese version of the Patient Commitment Scale. Furthermore, exploratory factor analysis successfully extracted one key factor. Subsequent confirmatory factor analysis showed that the fit indices of the single-factor model were ideal, further validating the structural validity of the scale. Additionally, by calculating AVE and CR, ideal convergent validity was obtained, further confirming the effectiveness of the single-dimensional structure of patient commitment. We fully considered the actual situation and cultural background of Chinese medical institutions, making it more consistent with the cognitive and behavioral characteristics of Chinese patients. At the same time, we also emphasized maintaining the scientific accuracy of the scale to ensure that the translated Chinese version of the scale can accurately reflect the level of patient commitment.

In terms of reliability and validity testing, we used a variety of statistical methods and analysis techniques to comprehensively evaluate the scale. The Cronbach's α coefficient of the Patient Commitment Scale reached 0.937, and the split-half reliability was 0.914, while the test-retest reliability after a four-week interval was as high as 0.942. These indicators fully met the standard requirements of psychometrics, indicating excellent performance of the scale in terms of internal consistency and stability. The results showed that the translated Chinese version of the scale has good reliability and validity, can measure the level of patient commitment stably and reliably, and also has high discrimination and predictive power, providing valuable reference information for medical institutions. Through the revision and testing work of this study, we further understand the application potential of the Patient Commitment Scale in Chinese medical institutions. In the future, we will continue to conduct in-depth research on related issues of patient commitment, explore its specific application and effectiveness evaluation in medical practice, and make greater contributions to improving patient satisfaction and the quality of medical services. Based on the findings of this study, the Chinese version of the Patient Commitment Scale not only has good reliability and validity but also is easy to operate and implement. Therefore, it can be used as a scientific measurement tool for Chinese participant groups and widely applied in related research fields.

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