Development and Preliminary Validation of a Chinese Physician-Patient Trust Scale

Authors: Lü Xiaokang, Mí Míngdí, Yu Huaran, Wang Hui, Jiang He, He Fei, Lü Xiaokang

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Abstract

To construct the China Doctor-Patient Trust Scale, the pilot test, through item analysis, exploratory factor analysis, and confirmatory factor analysis, established 9 items for the prescriptive trust subscale and 13 items for the realistic trust subscale within the patient trust scale, as well as 8 items for the doctor trust scale. An initial test was then conducted nationwide using convenience sampling on 2,658 valid patient participants and 1,229 valid doctor participants. Results from both the pilot test and the initial test indicated that the patient trust scale could only function as a unidimensional additive scale, whereas the doctor trust scale could be divided into two dimensions: "relationship perception"and "defensive mindset."The internal consistency coefficients for the patient prescriptive trust subscale, patient realistic trust subscale, and doctor trust scale were 0.71, 0.85, and 0.63, respectively; criterion validity and various parameters from the confirmatory factor analysis were all within acceptable ranges, and expert-rated validity was satisfactory. The patient prescriptive trust subscale can be used to understand patients' general trust level toward the physician group from an intergroup perspective; the realistic trust subscale can be used to understand patients' specific trust level toward individual doctors from an interpersonal perspective; the doctor trust scale can be used to evaluate physicians' trust in individual patients they encounter; and combining the three can assess the trust congruence between both doctor-patient parties.

Full Text

Preliminary Development and Reliability and Validity Testing of Chinese Doctor-Patient Trust Scales

Lyu Xiaokang[1], Mi Mingdi[2], Yu Huaran[3], Wang Hui , Jiang He , He Fei

Abstract: To develop the Chinese Doctor-Patient Trust Scales, item analysis, exploratory factor analysis, and confirmatory factor analysis were conducted on pre-test data, establishing 9 items for the Patients' Presupposed Trust Subscale, 13 items for the Patients'Realistic Trust Subscale, and 8 items for the Physicians' Trust Scale. These scales were then administered in a nationwide convenience sample of 2,658 patients and 1,229 physicians. Results from both pre-testing and formal testing indicated that the Patients' Trust Scale functions only as a single-dimensional summated scale, whereas the Physicians' Trust Scale can be divided into two dimensions: "relationship perception"and "defensive mentality." The internal consistency coefficients (Cronbach' s) were 0.71 for the Patients' Presupposed Trust Subscale, 0.85 for the Patients' Realistic Trust Subscale, and 0.63 for the Physicians' Trust Scale. All parameters for criterion validity and confirmatory factor analysis fell within acceptable ranges, and expert evaluation validity was satisfactory. The Patients' Presupposed Trust Subscale can be used to assess patients' general trust toward the physician community at the intergroup level, while the Realistic Trust Subscale can evaluate patients'specific trust in individual physicians at the interpersonal level. The Physicians' Trust Scale can assess physicians' trust in individual patients they treat. Combined use of the three scales can evaluate the trust matching between both parties.

Keywords: Chinese Doctor-Patient Trust Scales; doctor-patient trust; doctor-patient relationship; patients' trust; physicians' trust

1. Introduction and Literature Review

Doctor-patient trust represents a major social issue in contemporary China and constitutes one of the core characteristics of the doctor-patient relationship (Pearson & Raeke, 2000). As a crucial factor influencing doctor-patient relationships, doctor-patient trust has attracted widespread attention from scholars both domestically and internationally (Yin, Ma, Zhao, & Zhang, 2018; Shen, Wang, Li, & Zhao, 2017; Chen & Zhao, 2018; Chan et al., 2016; Namazi, Aramesh, & Larijani, 2016; He & Qian, 2016). Doctor-patient trust serves as an important variable affecting medical decision-making by both physicians and patients (Diamond-Brown, 2016). The vulnerability of doctor-patient trust fluctuates uncertainly within a risk society (Miao, Zhang, Wang, Liu, Liu, & Hao, 2016), posing challenges to medical practice. Therefore, developing a measurement tool for doctor-patient trust is necessary to evaluate its structure and level.

Given the complex stakeholders involved in doctor-patient relationships, existing scales with different stakeholders as measurement objects are more common in foreign research. A review follows: The Trust in Physician Scale (TPS) (Anderson & Dedrick, 1990), measuring physicians as objects, primarily assesses interpersonal trust of patients in individual doctors. The Patient Trust Questionnaire (PTS) (Kao, Green, Zaslavsky, Koplan, & Cleary, 1998) comprises 10 items administered via telephone survey. The Patient Trust in the Physician Scale (PTTPS) (Leisen & Hyman, 2001) includes 2 primary dimensions (benev-

olence and technical competence) and 10 secondary dimensions with 51 items total. The Trust in Medical Profession Scale (TMP) (Hall, Camacho, Dugan, & Balkrishnan, 2002), measuring the medical profession as object, demonstrates good internal reliability and significant correlation with other indicators such as patient trust and satisfaction. The Trust in Medical Researchers Scales TMR1 and TMR2 (Mainous, Smith, Geesey, & Tilley, 2006; Hall, Camacho, Lawlor, DePuy, Sugarman, & Weinfurt, 2006), measuring medical researchers as objects, include subscales for participant deception and researcher honesty, reflecting that individuals with high trust in medical researchers are more likely to express interest in future participation in medical research. The Public Trust in Health Care Scale (PTHC) (Straten, Friele, & Groenewegen, 2002), measuring the health care system as object, covers 6 dimensions with 37 items. The Primary Care Assessment Survey (PCAS) (Safran, Kosinski, Tarlov, Rogers, Taira, Lieberman, & Ware, 1998) measures 7 domains of care through 11 summary scales with good reliability. The Health Insurance Trust Scale (HITS) (Zheng, Hall, Dugan, Kidd, & Levine, 2002), measuring insurance institutions as objects, reflects trust in insurance organizations through loyalty, competence, honesty, and confidentiality components, showing good internal reliability and high two-month test-retest reliability.

Regarding the development of doctor-patient trust scales, the Wake Forest Physician Trust Scale (WFPTS) developed by Hall et al. in 2002 has been widely applied. This scale was designed against the background of the capitation-based family doctor healthcare system in the United States, whereas China employs a fee-for-service model where patients can freely choose hospitals and physicians. Considering these systemic differences, domestic scholars Dong and Bao (2012) revised it into a Chinese version. The scale comprises 2 dimensions (“benevolence” and “technical competence”) with 10 items to measure patients’ trust in physicians. Although this scale demonstrates good reliability and validity, its sample consisted exclusively of patients from tertiary hospitals with a small sample size, and over 60% had received higher education, which does not reflect China’ s higher education population structure (Wang, 2017). Therefore, sample size needs expansion to construct a doctor-patient trust scale suitable for most Chinese people. Meanwhile, Dong and Bao (2016) established a patient trust evaluation indicator system based on medical quality management through expert consultation, including 6 dimensions (responsiveness, technical competence, benevolence, diagnosis and treatment quality, communication ability, and overall trust) with 24 items, elaborating on factors influencing trust in medical services from a macro perspective. Additionally, Dong and Chang (2016) translated and revised Thom’ s 2011 Physician Trust in Patient Scale (PTPS), which includes 2 dimensions (“patient role” and “respect for interpersonal relationships”). However, due to the limited sampling scope and lack of criterion-related validity testing, its reliability and validity require further consideration. Lyu et al. (2019) compiled a doctor-patient trust subscale under the doctor-patient social cognition questionnaire in the patient volume of the *Chinese Doctor-Patient Social Mentality Questionnaire*, but it only measures

patients' trust in physicians with few items and no further dimensional division. In summary, China currently lacks an authoritative doctor-patient trust scale with consistent recognition (Wang & Wang, 2016). Therefore, this development process will integrate existing research to comprehensively construct a relevant scale based on doctor-patient trust characteristics.

Regarding the structural features of doctor-patient trust, most current research has expanded the subjects of trust to include both physicians and patients. Wang (2017) argues that doctor-patient trust, as a trust relationship emerging from social interaction processes, must be bidirectional, possessing a dual-subject structure of physicians' trust and patients' trust. That is, doctor-patient trust includes not only patients' trust in physicians but also physicians' trust in patients (Wang, Wang, & Lyu, 2016). Here, "physicians"include medical workers, medical institutions, and medical educators, while "patients" include patients, their family members, and friends as stakeholders (Ministry of Health Statistics and Information Center, 2010). In view of this, the scale developed in this study will focus on the trust relationship between physicians and patients where current conflicts are prominent. To balance universality and specificity in concrete construction, the approach involves developing subscales with physicians and patients as different measurement objects. Considering measurement convenience, the number of scale items will be controlled, especially for physicians' trust items, to enable physician respondents to answer conveniently and efficiently during their heavy daily work schedules. The "patients" in the Patients' Trust Scale adopt the aforementioned broad definition, while the Physicians' Trust Scale only involves physicians rather than other medical workers.

2. Development Process and Dimensional Concepts

2.1 Overall Process

Since January 2016, based on domestic and foreign literature on doctor-patient trust and doctor-patient relationships (Gao et al., 2016; Sun, 2018; Li et al., 2015; Dang, Westbrook, Njue, & Giordano, 2017; Lee King et al., 2015; Mikesell, 2013), a preliminary doctor-patient trust scale was developed through semi-structured interviews and expert consultation. The scale primarily comprised three sections: general views about physicians, specific views about concrete medical treatment processes, and personal information. After small-scale pilot testing with convenience samples, group discussions, and expert critique and revision, a pre-test scale containing 43 items was formed. Subsequently, trained student investigators used convenience sampling nationwide to collect 450 valid responses, which were processed using SPSS software, ultimately retaining 22 items. After further discussion and summarization of issues in the pre-testing process, some ambiguous items were revised and corrected, followed by large-scale formal testing that collected 2,658 valid responses, forming the basis for reliability and validity verification of the Patients' Trust Scale.

The development process for the Physicians' Trust Scale was basically similar.

Through semi-structured interviews, group discussions, item compilation, and expert critique and revision, a pre-test scale with 13 items was formed. After collecting 492 valid responses for data processing, 8 items were retained. Following revision, formal testing collected 1,229 valid responses, forming the basis for reliability and validity verification of the Physicians' Trust Scale.

2.2 Dimensional Conceptualization of the Patients' Trust Scale

In the initial scale development, we planned to examine patients' trust levels in physicians and the medical system from two dimensions: "presupposed trust" and "realistic trust." This distinction has some basis in domestic and foreign literature. Presupposed trust refers to a priori assumptions that parties in interpersonal communication make about each other's trustworthiness without actual effective communication and information exchange, without verification through understanding, recognition, and direct interaction practice. Instead, trustworthiness is inferred through analysis of the other' s region, family background, education, social identity and status, professional role and ethics, interest relationships, and social reputation (Li & Lu, 2011; Wang, Lan, & Zhao, 2015; Zheng, Zhao, Chen, Ma, Zhu, & Sheng, 2018; Zheng, Zhao, Chen, Chen, Liang, & Chen, 2019). Realistic trust refers to patients' trust in specific attending or chief physicians during actual medical treatment processes (Hu & Yang, 2016; Krot & Rudawska, 2016). This distinction was made because patients' trust can typically be divided into two stages according to the treatment timeline: First, before consultation, patients already possess general trust in the medical profession and healthcare system, which influences their trust in individual physicians. Second, after consultation, when treatment interaction occurs with specific physicians, patients develop specific trust in individual doctors and accordingly revise their original general trust. In short, the presupposed trust subscale aims to measure general trust levels toward the physician community at the intergroup level without requiring recent actual medical visits, focusing on measuring existing trust "stock." The realistic trust subscale aims to measure specific trust in individual physicians at the interpersonal level.

Meanwhile, within both presupposed and realistic trust levels, we planned to divide them into two dimensions: "trust in medical skills" (trust in physicians' ability to diagnose and treat diseases) and "trust in medical ethics" (patients' belief that physicians can prioritize patient interests and maximize patient health benefits), aiming to distinguish between patients' technical trust and moral trust in physicians (Lyu et al., 2017) and explore the content structure of patients' trust.

Thus, the Patients' Trust Scale was divided into two subscales: (1) the "Presupposed Trust" subscale with 17 items in pre-testing, reduced to 9 items in the formal scale; (2) the "Realistic Trust" subscale with 26 items in pre-testing, reduced to 13 items in the formal scale. Both subscales use a 5-point scoring system from "strongly disagree" to "strongly agree," with higher scores indicating greater agreement. Since the two subscales serve different functions, they are

scored separately without calculating a total score.

The criterion scale for the Realistic Trust subscale adopted the Chinese version of the "Patient Trust Behavior and Attitude Scale (PTBAS)" translated and revised by Dong and Bao (2012), comprising 5 items, and the "Wake Forest Physician Trust Scale (WFPTS)"with 10 items. Both scales use a 5-point scoring system from "strongly disagree" to "strongly agree," with the mean calculated from the sum of all items, where higher scores indicate higher patient trust in physicians. The Presupposed Trust subscale used the doctor-patient trust subscale from the doctor-patient social cognition questionnaire in the patient volume of the *Chinese Doctor-Patient Social Mentality Questionnaire* previously compiled by our research group (Lyu, Wang, Zhang, Liu, Zhang, & Wang, 2019) as the criterion scale.

2.3 Dimensional Conceptualization of the Physicians' Trust Scale

Initially, the Physicians' Trust Scale was designed to examine trust levels in patients from two dimensions: (1) "relationship perception," reflecting physicians' trust perception during doctor-patient communication, primarily including judgments about patients' expression ability, compliance, and trust in physicians; (2) "defensive mentality," mainly including physicians' defensive psychology and behavior during treatment processes, used to measure physicians' practice security as a sub-dimension of physicians' trust. The purpose of distinguishing these two dimensions was the anticipation that although physicians might trust a specific patient during concrete communication, considerations of occupational safety and perceptions of the overall doctor-patient relationship atmosphere might still lead them to adopt defensive treatment behaviors. Thus, trust in individual patients cannot compensate for distrust in the patient population as a whole.

After face-to-face interviews and questionnaire surveys with multiple physicians from various regions, the pilot Physicians' Trust Scale comprised 13 items, including 7 on interpersonal communication and 6 on defensive mentality. Using a 5-point scoring system from "strongly disagree" to "strongly agree," higher scores indicate greater agreement, with the mean calculated. The scale' s criterion adopted the Chinese version of the "Physician Trust in Patient Scale (PTPS)" translated and revised by Dong and Chang (2016), comprising 12 items using a 5-point Likert scoring method.

3. Pre-Test Scale Development and Psychometric Properties

3.1 Sample Description

The pre-test version of the Chinese Doctor-Patient Trust Scale (Patients' Trust Scale) was administered to 540 participants in Beijing, Tianjin, Shanghai, Zhejiang, Shenzhen, Guizhou, Shaanxi, Xinjiang, and other regions, yielding 450

valid responses, with participants over 30 years old accounting for 82%. Although the two subscales of the Patients' Trust Scale will be applied to different populations in future applications, they were administered simultaneously to the same participants during pre-testing for comparison purposes. Therefore, participants were uniformly required to have had medical visits or accompanied important others (limited to parents, children, and siblings) for medical visits within the past two weeks. In the Patients' Realistic Trust subscale, the "physician" was limited to the outpatient doctor or inpatient attending physician from the most recent visit or accompaniment within the past month.

The pre-test version of the Chinese Doctor-Patient Trust Scale (Physicians'Trust Scale) was primarily administered to 540 physicians at various levels of hospitals in Beijing, Tianjin, Shanghai, and Zhejiang, yielding 492 valid responses, with participants over 30 years old accounting for 66%. Additional details are shown in Table 1 . Statistical analysis was conducted using SPSS 25.0 and AMOS 24.0 software.

3.2 Item Analysis

Item analysis was conducted on the 17 original items of the Patients' Presupposed Trust subscale and the 26 original items of the Realistic Trust subscale, calculating linear correlation coefficients and their significance between each item score and its corresponding subscale total score. Results showed that in the presupposed subscale, 8 items had correlation coefficients below 0.4 or significance levels above 0.05; in the realistic trust subscale, 13 items had correlation coefficients below 0.4 or significance levels above 0.05. These items were deleted, and reliability and validity verification was conducted on the remaining 9 and 13 items, respectively.

Similarly, linear correlation coefficients were calculated between each of the 13 items in the Physicians' Trust Scale and the total score, revealing that 4 items had correlation coefficients below 0.4 and were therefore deleted. Reliability and validity verification was then conducted on the remaining 9 items.

3.3 Reliability Testing

The homogeneity reliability coefficients (Cronbach' s) for both subscales of the Patients' Trust Scale and the Physicians' Trust Scale were above 0.7, indicating good internal consistency and stability of the Chinese Doctor-Patient Trust Scale (Table 2).

3.4 Validity Testing

3.4.1 Criterion-Related Validity The revised Patients' Realistic Trust subscale ($n = 450$) showed a correlation coefficient of 0.73 ($p < 0.01$) with the Wake Forest Physician Trust Scale and 0.50 ($p < 0.01$) with the Chinese version of the Patient Trust Behavior and Attitude Scale. The Presupposed Trust subscale ($n = 450$) showed a correlation coefficient of 0.64 ($p < 0.01$) with the doctor-patient

trust subscale from the *Chinese Doctor-Patient Social Mentality Questionnaire* (Patient Volume). The Physicians' Trust Scale (n = 492) showed a correlation coefficient of 0.60 ($p < 0.01$) with the Chinese version of the Physician Trust in Patient Scale. Overall, the criterion validity of the Chinese Doctor-Patient Trust Scale was within acceptable ranges, showing significant moderate correlations with existing relevant indicators, suggesting reasonable content selection for questionnaire items.

3.4.2 Structural Validity Feasibility tests for exploratory factor analysis were first conducted, with results showing significant Bartlett's test of sphericity and KMO values above 0.7 (Table 3), indicating suitability for exploratory factor analysis.

Exploratory factor analysis was performed on randomly split pre-test sample data (n = 225) from the Patients' Trust Scale, analyzing the 9 retained items of the Presupposed Trust subscale and the 13 items of the Realistic Trust subscale. Using principal component factor analysis with oblique rotation and the criterion of eigenvalues greater than 1, the Presupposed Trust subscale extracted 3 factors with a cumulative variance contribution rate of 61%; the Realistic Trust subscale extracted 2 factors with a cumulative variance contribution rate of 59% (Table 4). However, the items under the two extracted factors did not completely match the originally hypothesized dimensional assignments. After attempting to delete items with factor loadings below 0.5 and those with multiple loadings, exploratory factor analysis was repeated, but the hypothesized dimensional structure still failed to emerge. This indicates that the medical ethics-medical skills two-factor structure was not well supported in either subscale.

Exploratory factor analysis was conducted on randomly split pre-test sample data (n = 246) from the Physicians' Trust Scale, analyzing the 9 retained items. Using principal component factor analysis with oblique rotation and the criterion of eigenvalues greater than 1, 2 factors were extracted, but 1 item had double loadings. After deleting this item and repeating the analysis, 2 factors were extracted with a cumulative variance contribution rate of 59% (Table 4), and the items under each factor were consistent with the preconceived dimensions.

Confirmatory factor analysis was performed on the other half of the randomly split data for both Patients' Trust subscales (n = 225) and the Physicians' Trust Scale (n = 246). Based on the original theoretical framework, single-factor models were first tested. Then, for the Patients' Trust Scale, two-factor models were tested with medical ethics trust and medical skills trust as dimensions under each subscale, using retained items as observed variables.

Results (Table 5) showed that for the Patients' Trust Scale, the confirmatory factor analysis results for single-factor and two-factor models of both the Presupposed Trust and Realistic Trust subscales were similar, failing to demonstrate

that the two-factor model provided better explanation than the single-factor model. Similarly, after testing the single-factor model, the two-factor model of relationship perception-defensive mentality for the Physicians' Trust Scale was tested.

Results (Table 6) showed that compared with the single-factor model, the two-factor model of the Physicians' Trust Scale demonstrated better values for ^{2}/df, five fit indices, and RMSEA. This indicates that the two-factor structure of physicians' trust can be established.

3.5 Summary

Comprehensive results from exploratory and confirmatory factor analyses revealed that doctor-patient trust does not support the previously hypothesized dual structure of medical ethics trust and medical skills trust. Regardless of item deletion, exploratory factor analysis could not extract item groupings completely consistent with theoretical conceptualization, and confirmatory factor analysis failed to achieve adequate fit values. This prompted the research team to further reflect on the inherent rationality of the original two-factor model of patients' trust. Although medical ethics and medical skills can theoretically be independently defined, patients' actual medical experiences did not sufficiently support this distinction. Two possible reasons may explain this. First, in Chinese cognitive processes, there may be a characteristic mixing of evaluative and descriptive elements—that is, cognition of an individual or group is not entirely objective description but tends to involve simultaneous evaluation. This cognitive strategy "emphasizes judgment and evaluation, making analysis of objective events or phenomena difficult to be 'objective' " (Wang & Cui, 2008), rendering factual or technical judgments detached from moral evaluation almost non-existent. Second, since ancient times, China has idealized physicians (and indeed all exemplary figures) as requiring "virtue and artistry in harmony," "possessing both moral integrity and professional competence," and "the benevolent heart of a healer," reflecting high moral demands that even treat moral level as an organic component of medical competence. In Chinese patients' eyes, a physician with only technical skills but no benevolent heart cannot be considered a qualified doctor. Therefore, when patients project this psychology onto physicians they encounter in reality, they also find it difficult to analyze physicians' treatment levels from a purely rational perspective without speculating about their motivations and medical ethics. This may explain why patients' trust failed to validate the independence of the medical ethics-medical skills dimensions.

Conversely, among physicians who have undergone long-term medical training, the physician group can better distinguish between specific trust in particular individuals and general trust in the broad patient population. Considering their own practice security, even if a physician has high recognition of an unfamiliar patient and is satisfied with their compliance and treatment cooperation, this does not mean they will completely abandon anticipation of possible medical

accidents or potential "post-treatment disputes" from the patient. Therefore, it may be unrealistic to expect individual physicians to completely abandon defensive mentality. Only when facing strong-relationship individuals such as close family members or friends can physicians completely let down their guard. Thus, the emergence of a relatively clear dual structure of relationship perception and defensive mentality in physicians' trust is more consistent with the actual situation of doctor-patient relationships in contemporary China.

Consequently, after group discussion, the original structural conception of the Patients' Trust Scale was adjusted. The two subscales of presupposed trust and realistic trust in the Patients' Trust Scale remained unchanged in form but were no longer further divided into dimensions, instead being treated only as single-dimensional summated scales. The Physicians' Trust Scale maintained its original two-dimensional theoretical framework. Combined with item discrimination, factor loadings, and dimensional 归属, the final Patients' Presupposed Trust subscale was reduced to 9 items, the Realistic Trust subscale to 13 items, and the Physicians' Trust Scale retained only 8 items. Additionally, based on feedback from some pre-test participants and expert opinions, retained items were revised textually to form the final items of the Chinese Doctor-Patient Trust Scale (see Appendices A and B).

4. Formal Scale Reliability and Validity Testing

4.1 Sample Description

The formal test version of the Chinese Doctor-Patient Trust Scale (Patients' Trust Scale) was administered to 2,832 participants across all provinces, municipalities, and autonomous regions in mainland China using convenience sampling, yielding 2,658 valid responses, with participants over 30 years old accounting for 86%. Participant requirements were the same as in pre-testing.

Additionally, 500 participants completed not only the Patients' Trust Scale but also the Chinese version of the Wake Forest Physician Trust Scale, the Patient Trust Behavior and Attitude Scale, and the doctor-patient trust subscale from the *Chinese Doctor-Patient Social Mentality Questionnaire* (Patient Volume) for criterion-related validity calculation. The Presupposed Trust subscale yielded 473 valid responses, and the Realistic Trust subscale yielded 466 valid responses. Remaining participants only completed the Patients' Trust Scale developed in this study.

The formal test version of the Chinese Doctor-Patient Trust Scale (Physicians' Trust Scale) was administered to 1,363 physicians at hospitals at various levels in 15 provincial administrative units including Beijing, Tianjin, Shanghai, Chongqing, Guangdong, Zhejiang, Heilongjiang, Liaoning, Hebei, Shandong, Shanxi, Inner Mongolia, Gansu, Shaanxi, and Guizhou, yielding 1,229 valid responses, with participants over 30 years old accounting for 66%. Among these, 500 physicians simultaneously completed the Chinese version of the "Physician

Trust in Patient Scale" for criterion-related validity calculation, yielding 487 valid responses.

Additional basic participant information is shown in Table 7 .

4.2 Reliability Testing

4.2.1 Internal Consistency Reliability The homogeneity reliability coefficients (Cronbach' s) for both subscales of the Patients' Trust Scale were above 0.7, indicating good internal consistency and stability for the Chinese Doctor-Patient Trust Scale (Patients' Trust Scale). The homogeneity reliability coefficient (Cronbach' s) for the Physicians' Trust Scale was 0.63, indicating moderate internal consistency that requires improvement (Table 8). This is also related to the Physicians' Trust Scale having only 8 items, a compromise adopted to consider measurement convenience.

4.2.2 Test-Retest Reliability During formal scale testing, 150 patient participants and physician participants were invited for retesting after a two-week interval, with actual retest completion times of 14-18 days. For the Patients' Trust Scale, patient participants who had additional medical visits or accompaniment experiences between the two tests were excluded to ensure their responses were not influenced by intervening medical experiences and to replicate the original measurement context as closely as possible. For the Physicians' Trust Scale, physician participants who experienced new medical disputes or major medical accidents during the two-week retest period were excluded. Based on these criteria and actual response patterns, valid retest questionnaires were screened, with 139 valid patient responses and 145 valid physician responses recovered, forming the basis for calculating two-week test-retest reliability.

Results showed two-week test-retest reliability of 0.72 for the Patients' Presupposed Trust subscale, 0.69 for the Patients' Realistic Trust subscale, and 0.73 for the Physicians' Trust Scale. Physicians' trust demonstrated stronger stability than patients' trust, consistent with previous findings regarding the stability trends of overall doctor-patient social mentality from both parties (Lyu, Wang, Zhang, Liu, Zhang, & Wang, 2019).

4.2.3 Split-Half Reliability Spearman-Brown split-half reliability coefficients were calculated for each subscale of the Chinese Doctor-Patient Trust Scale. Results showed split-half reliability of 0.76 for the Patients' Presupposed Trust subscale, 0.85 for the Patients' Realistic Trust subscale, and 0.66 for the Physicians' Trust Scale. The split-half reliability of the Patients' Trust Scale was above 0.7 and higher than that of the Physicians' Trust Scale, whose split-half reliability requires improvement, similar to the internal consistency reliability results.

4.3 Validity Testing

4.3.1 Criterion-Related Validity The Patients' Realistic Trust subscale (n = 473) showed correlation coefficients of 0.71 ($p < 0.01$) with the Wake Forest Physician Trust Scale and 0.54 ($p < 0.01$) with the Chinese version of the Patient Trust Behavior and Attitude Scale. The Presupposed Trust subscale (n = 466) showed a correlation coefficient of 0.59 ($p < 0.01$) with the doctor-patient trust subscale from the *Chinese Doctor-Patient Social Mentality Questionnaire* (Patient Volume). The Physicians' Trust Scale (n = 487) showed a correlation coefficient of 0.62 ($p < 0.01$) with the Chinese version of the Physician Trust in Patient Scale. The criterion validity of each scale was within acceptable ranges and remained basically consistent with pre-test results.

4.3.2 Content Validity The expert evaluation method was employed, hiring six experts including two chief physicians, one head nurse, one hospital administrator, one psychology professor, and one sociology professor to rate the overall structure and specific items of the formal scale on a 4-point scale (1 = very inappropriate; 2 = relatively inappropriate; 3 = basically appropriate; 4 = very appropriate), with results recorded in the *Questionnaire Validity Expert Evaluation Form.* Two rounds of evaluation were conducted. Based on data from the evaluation form, "very inappropriate" and "relatively inappropriate" were coded as 0, while "basically appropriate" and "very appropriate" were coded as 1. The final Kendall' s coefficient of concordance was 0.77 for the Patients' Presupposed Trust subscale, 0.81 for the Patients' Realistic Trust subscale, and 0.79 for the Physicians' Trust Scale.

4.3.3 Structural Validity As previously explained, the two subscales of the Patients' Trust Scale no longer distinguish dimensions and are used only as single-dimensional summated scales. To further verify this, confirmatory factor analysis was conducted according to the previous theoretical framework. Using the 2,658 responses from the formal Patients' Trust Scale, most indices exceeded corresponding critical values, further indicating that the medical ethics-medical skills two-factor structure is difficult to establish and that both subscales should remain single-dimensional scales (Table 9).

Confirmatory factor analysis was performed on the 1,229 responses from the formal Physicians' Trust Scale, with four observed variables set under each of the two dimensions of relationship perception and defensive mentality for model testing.

Results showed that for the Physicians' Trust Scale, the single-factor model fit indices were below 0.7 for four of the five indices (except GFI = 0.81), with RMSEA at 0.19. In contrast, the two-factor model' s five fit indices were above 0.9 for four indices (except TLI = 0.88), with RMSEA at 0.08 (Table 10), meeting relevant critical value requirements. This indicates that the two-factor model provides better explanation for the Physicians' Trust Scale, consistent

with pre-test results and further confirming that the two-factor structure of physicians' trust can be established.

5. Summary and Discussion

The Chinese Doctor-Patient Trust Scale, including both the Patients' Trust Scale and Physicians' Trust Scale, demonstrates good overall reliability and validity and can serve as an effective tool for assessing trust levels between both parties. The "Presupposed Trust" subscale of the Patients' Trust Scale can measure doctor-patient trust levels at the intergroup level among the broadest possible patient population (regardless of recent medical visits), thereby establishing a "Doctor-Patient Trust Index" for Chinese society to track long-term changes in doctor-patient trust and regional differences. The "Realistic Trust" subscale can evaluate patients' trust levels in individual physicians encountered during recent direct medical visits (or accompaniment visits), enabling horizontal comparison of medical trust levels across medical institutions or departments within the same institution, as well as historical development assessment of patients' own doctor-patient trust levels. The Physicians' Trust Scale can assess physicians' trust in individual patients they treat. Combined use of the three scales can evaluate trust matching between both parties.

This study did not find a two-factor structure of medical ethics trust and medical skills trust in patients' trust, indicating that the two patients' trust subscales can only be used as single-dimensional summated scales. However, a relatively clear two-factor structure was found in physicians' trust: relationship perception and defensive mentality. This suggests that patients'trust is more of a comprehensive experience, making it difficult to distinguish its components, whereas physicians can relatively clearly differentiate between trust in specific individuals and general trust in the patient population. The Physicians' Trust Scale showed stronger effective recovery rates, cooperation levels, and reliability coefficients than the Patients' Trust Scale, partly benefiting from physicians' professional quality and high organizational characteristics. Surveys of patients are more uncontrollable, with greater response randomness than physicians, requiring improvements in measurement tools, methods, and environments for assessing patients' trust.

Naturally, due to researchers' subjective factors and the limitations of questionnaire methodology during scale development, some validity indicators and factor analysis results of the Chinese Doctor-Patient Trust Scale require further improvement. More scientifically reasonable sampling designs covering broader participant groups and medical institution types are also needed to further validate the current scale' s reliability and validity.

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Chinese Doctor-Patient Trust Scale (Patients' Trust Scale)

Hello! The purpose of this survey is to understand your views about physicians. This scale is only for research to collect authentic data. This survey is anonymous and will not disclose your personal information. Thank you for your support.

Instructions: Please check "√" in the corresponding column for the provided scores, where 1 = strongly disagree, 2 = relatively disagree, 3 = generally agree, 4 = relatively agree, and 5 = strongly agree.

A. Your General Views about the Physician Profession (Presupposed Trust Subscale)

1. Physicians with good medical ethics will treat all patients equally
2. Many physicians' practices are to avoid taking responsibility*
3. Even in reputable hospitals, physicians are not necessarily dedicated*
4. Physicians will be more diligent with acquaintances*
5. If treatment problems occur, hospitals will definitely favor physicians*
6. Many physicians are only money-oriented*
7. Ordinary people cannot judge whether physicians are trying their best during treatment*
8. Physicians will do their utmost to treat patients
9. Being familiar with physicians can obtain better medical care*

Note: * indicates reverse-scored items.

B. Your Specific Views about Relevant Physicians and Hospitals during Concrete Medical Treatment Processes (Realistic Trust Subscale)

1. The physician can promptly inquire about the patient' s condition
2. I feel the physician genuinely cares about patients
3. The physician' s treatment effect is better than I expected
4. This hospital' s procedures are efficient
5. I believe the physician treats all patients equally
6. The physician can promptly answer my questions
7. I will continue to see this physician in the future
8. I feel the physician won' t communicate patiently with me even when they have time*
9. The physician' s treatment process is similar to what I expected
10. I will recommend this physician to my friends and family
11. I believe the physician will provide personalized services when I need them
12. I am satisfied with the physician treating the patient
13. The physician can do their best for patient treatment

Note: * indicates reverse-scored items.

Participant Requirements: The Presupposed Trust subscale can be used for all adult mainland Chinese residents (over 18 years old). The Realistic Trust subscale is suitable for adult mainland Chinese residents (over 18 years old) who have had medical visits or accompanied important others (limited to parents, children, and siblings) for medical visits within the past two weeks. Additionally, the "physician" in the specific medical treatment process items refers to the outpatient physician or inpatient attending physician from the most recent visit or accompaniment within the past two weeks.

Chinese Doctor-Patient Trust Scale (Physicians' Trust Scale)

Hello! The purpose of this survey is to understand your views about patients. This scale is only for research to collect authentic data. This survey is anonymous and will not disclose your personal information. Thank you for your support.

Instructions: Please check "√" in the corresponding column for the provided scores, where 1 = strongly disagree, 2 = relatively disagree, 3 = generally agree, 4 = relatively agree, and 5 = strongly agree.

1. I communicate well with patients
2. Patients recognize me
3. I have good relationships with patients
4. I am confident patients can cooperate with treatment
5. Some patients or their families cannot correctly face treatment risks*
6. Without cautious behavior, one will inevitably encounter difficult patients*
7. I worry about personal attacks from patients or their families during work*
8. Taking some measures to avoid medical risks with patients is necessary*

Note: * indicates reverse-scored items.

Participant Requirements: Professional medical personnel who have obtained physician or assistant physician qualification in mainland China and are registered to practice in medical, preventive, or health care institutions, including practicing physicians and assistant physicians.

Note: Figure translations are in progress. See original paper for figures.