Reliability and Validity Assessment of the Subscales of the Chinese Doctor-Patient Social Mentality Questionnaire

Authors: Wang Xinjian, I need the complete text you wish to translate. Please provide the full document containing the ···paragraph tags, LaTeX formulas, and citations that require translation.

If you only need the name "刘颖" translated, it would be "Liu Ying" in English (surname Liu, given name Ying). However, based on your detailed instructions, you appear to need a full academic paper translation. Please share the complete source text., Zhang Zirui, Zhang Huijuan, Zhang Yao

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Abstract

This study analyzed 2,909 patient-side data and 1,555 physician-side data collected nationwide, and found that for several sub-questionnaires of the Chinese Doctor-Patient Social Mentality Questionnaire—including doctor-patient sense of security (physician version/patient version), doctor-patient satisfaction 1 (physician version/patient version), doctor-patient satisfaction 2 (patient version), doctor-patient tolerance (physician version/patient version), and doctor-patient attribution style (physician version/patient version) from the "doctor-patient social cognition" module, as well as health perspective (physician version/patient version) and disease perspective (physician version) from the "doctor-patient social values" module—the cumulative variance contribution rate was above 50%, the internal consistency coefficient ranged from 0.642 to 0.929, 2/df ranged from 1.614 to 3.257, GFI was greater than 0.9, and RMSEA was less than 0.7, indicating that these sub-questionnaires possess good reliability and validity and can be used separately or in combination. Additionally, this study found that doctor and patient groups exhibited obvious differences in the dimensional structure of the same sub-questionnaires; except for the doctor-patient attribution style sub-questionnaire, the two groups demonstrated significant differences in the dimensional structure of all sub-questionnaires, reflecting the distinct characteristics of each group.

Full Text

Reliability and Validity Test of Sub-questionnaires of the Chinese Doctor-Patient Social Mentality Questionnaire

Wang Xinjian[1], Liu Ying[2], Zhang Zirui[3], Zhang Huijuan[4], Zhang Yao[5]

Abstract: This study analyzed 2,909 patient responses and 1,555 physician responses collected nationwide. The results revealed that the cumulative variance contribution rates of several sub-questionnaires exceeded 50%, including Doctor-Patient Security (physician/patient versions), Doctor-Patient Satisfaction 1 (physician/patient versions), Doctor-Patient Satisfaction 2 (patient version), Doctor-Patient Tolerance (physician/patient versions), and Doctor-Patient Attribution Style (physician/patient versions) from the "Doctor-Patient Social Cognition" module, as well as Health Concept (physician/patient versions) and Disease Concept (physician version) from the "Doctor-Patient Social Values" module. Internal consistency coefficients ranged from 0.642 to 0.929, ^{2}/df ratios ranged from 1.614 to 3.257, GFI values exceeded 0.9, and RMSEA values were below 0.07, indicating good reliability and validity for these sub-questionnaires, which can be used either independently or in combination. Additionally, the study found significant differences between physician and patient groups in the dimensional structure of the same sub-questionnaires. Except for the Doctor-Patient Attribution Style sub-questionnaire, significant differences emerged in the dimensional divisions across all sub-questionnaires, reflecting the distinct characteristics of each group.

Keywords: doctor-patient relationship; doctor-patient social mentality; doctor-patient social cognition; doctor-patient satisfaction; doctor-patient tolerance

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1. Research Methods

(1) Research Approach The Chinese Doctor-Patient Social Mentality Questionnaire comprises two versions—one for physicians and one for patients

—both sharing the same structure with four primary dimensions, each containing several secondary indicators. These include the Doctor-Patient Social Emotion sub-questionnaire, Doctor-Patient Social Cognition sub-questionnaire, Doctor-Patient Social Values sub-questionnaire, and Doctor-Patient Behavioral Tendency sub-questionnaire. The Doctor-Patient Social Cognition sub-questionnaire encompasses six secondary measurement indicators: doctor-patient security, doctor-patient trust, doctor-patient justice, doctor-patient satisfaction, doctor-patient tolerance, and doctor-patient attribution style. The Doctor-Patient Social Values sub-questionnaire includes four secondary indicators: health concept, disease concept, medical concept, and justice concept.

While the overall structure is identical for both versions, certain differences exist due to the distinct target populations. Specifically, differences manifest in two aspects: First, considering that physicians may experience both roles when seeking medical care themselves, the physician version of the Doctor-Patient Security sub-questionnaire includes additional items addressing physicians'security experiences as patients, enabling comparison with patient group results. Second, regarding doctor-patient satisfaction, the patient satisfaction sub-questionnaire contains two parts: Part 1 aligns with the physician version, evaluating satisfaction with the medical environment, while Part 2 assesses satisfaction with encountered physicians and nurses—an evaluation scale absent from the physician version. Beyond these differences, the two versions of the Doctor-Patient Social Mentality Questionnaire are consistent. Notably, the Social Emotion sub-questionnaire only requires respondents to select three emotion words for rating, necessitating no factor analysis. The Social Behavioral Tendency sub-questionnaire' s secondary indicators are primarily measured through scenario tests and single or multiple-choice items, which prior research identified as unsuitable for scale use, thus precluding further factor analysis (Lü et al., 2019).

Consequently, this study conducted factor analysis on the secondary indicators within the Doctor-Patient Social Cognition and Doctor-Patient Social Values sub-questionnaires to validate their structural validity, facilitating their use as independent measurement scales in future research.

(2) Participants This study administered the Chinese Doctor-Patient Social Mentality Questionnaire nationwide to both physician and patient populations. The validation utilized 2,909 patient responses and 1,555 physician responses. Each group' s data were randomly split: 1,454 patient responses were used for exploratory factor analysis (EFA) and 1,455 for confirmatory factor analysis (CFA); 777 physician responses were used for EFA and 778 for CFA. Table 1 presents the basic demographic information of the participants.

(3) Data Processing This study employed R software' s psych and lavaan packages for data organization and exploratory factor analysis, and Amos 17.0 software for confirmatory factor analysis.

2. Results and Analysis

(1) Feasibility Test for Exploratory Factor Analysis Feasibility tests for exploratory factor analysis were conducted on six secondary indicator questionnaires under the doctor-patient social cognition dimension and four under the doctor-patient social values dimension for both physician and patient versions. The results are presented in Table 2 . The findings indicate that while Bartlett' s sphericity tests were significant for physician and patient versions of Doctor-Patient Justice and Medical Concept, as well as the physician version of Doctor-Patient Trust and patient version of Disease Concept, their KMO values fell below 0.7, rendering them unsuitable for further factor analysis. All other sub-questionnaires passed Bartlett' s sphericity test with KMO values exceeding 0.7, qualifying them for exploratory factor analysis.

(2) Exploratory Factor Analysis Principal component analysis with varimax oblique rotation was applied to each sub-questionnaire. Factor extraction was deemed appropriate when: eigenvalues exceeded 1, communalities surpassed 0.3, factor loadings were no lower than 0.4, and each factor contained at least three items. Based on these criteria, the physician and patient versions of Justice Concept and the patient version of Doctor-Patient Trust were excluded from further analysis due to insufficient items per factor after extraction.

The sub-questionnaires that underwent exploratory factor analysis included: Doctor-Patient Security (both versions), Doctor-Patient Satisfaction 1 (both versions), Doctor-Patient Tolerance (both versions), Doctor-Patient Attribution Style (both versions), Health Concept (both versions), Doctor-Patient Satisfaction 2 (patient version), and Disease Concept (physician version).

1. Doctor-Patient Security Sub-questionnaire The Doctor-Patient Security sub-questionnaire includes distinct physician and patient versions, analyzed separately. The physician version eliminated three items with communalities below 0.3 or factor loadings below 0.4, retaining 12 items that yielded two factors: Factor 1 comprised 8 items explaining 39.8% of variance, and Factor 2 comprised 4 items explaining 24.5% of variance, with a cumulative variance explanation of 64.3%. Factor 1 primarily addressed physicians' security experiences when seeking care as patients, designated as *Physician Medical-Seeking Security*; Factor 2 addressed physicians' security experiences in their professional practice, designated as *Physician Practice Security* (Table 3).

The patient version eliminated three items, retaining 9 items that yielded two factors: Factor 1 comprised 4 items explaining 26.6% of variance, and Factor 2 comprised 5 items explaining 22.8% of variance, with a cumulative variance explanation of 49.4%. Factor 1 primarily addressed patients' evaluations of unsafe factors confronting medical staff, designated as *Patient Evaluation of*

Physician Security; Factor 2 addressed patients' security experiences during medical treatment, designated as *Patient Medical-Seeking Security* (Table 4).

2. Doctor-Patient Satisfaction Sub-questionnaire The Doctor-Patient Satisfaction sub-questionnaire comprises two parts: Doctor-Patient Satisfaction 1 (both versions) and Doctor-Patient Satisfaction 2 (patient version only). Exploratory factor analysis was conducted separately for each version of Doctor-Patient Satisfaction 1, revealing distinct factor structures between physicians and patients.

The physician version eliminated three items, retaining 16 items that yielded three factors: Factor 1 (9 items) explained 24.3% of variance, Factor 2 (4 items) explained 14.7%, and Factor 3 (3 items) explained 14.2%, with total variance explanation of 53.2%. Factor 1 addressed hospital environment, medication variety, and treatment costs, reflecting physical and organizational healthcare infrastructure, designated as *Physician Medical Environment Satisfaction*. Factor 2 addressed doctor-patient communication time and attitudes, designated as *Physician Medical Service Satisfaction*. Factor 3 addressed medical information disclosure and personal information protection, designated as *Physician Medical Information Satisfaction* (Table 5).

The patient version retained all 19 items, yielding three factors: Factor 1 (13 items) explained 29.7% of variance, Factor 2 (3 items) explained 11.2%, and Factor 3 (3 items) explained 10.0%, with total variance explanation of 50.9%. Factor 1 addressed medical environment and services, designated as *Patient Medical Service Satisfaction*. Factor 2 addressed medication and medical project costs, designated as *Patient Medical Cost Satisfaction*. Factor 3 reflected medical insurance-related content, designated as *Patient Medical Insurance Satisfaction* (Table 6).

Doctor-Patient Satisfaction 2 (patient version only) retained all 7 items, yielding two factors: Factor 1 (4 items) explained 29.8% of variance, and Factor 2 (3 items) explained 24.9%, with total variance explanation of 54.6%. Factor 1 addressed satisfaction with directly-contacted medical staff, designated as *Patient Medical Staff Satisfaction*. Factor 2 addressed satisfaction with technical and administrative personnel providing indirect services, designated as *Patient Medical Technical Staff Satisfaction* (Table 7).

3. Doctor-Patient Tolerance Sub-questionnaire The Doctor-Patient Tolerance sub-questionnaire includes physician and patient versions, analyzed separately. The physician version retained all 12 items, yielding three factors: Factor 1 (6 items) explained 20.5% of variance, Factor 2 (3 items) explained 14.6%, and Factor 3 (3 items) explained 11.3%, with total variance explanation of 46.3%. Factor 1 addressed patients' understanding and forgiveness toward physicians when medical issues occur, reflecting patient-to-physician tolerance, designated as *Physician-Perceived Patient Tolerance*. Factor 2 addressed physicians' understanding and forgiveness toward patients when patients offend physi-

cians, reflecting physician-to-patient tolerance, designated as *Physician Tolerance Toward Patients*. Factor 3 addressed appropriate behaviors and attitudes for both parties in a medical relationship, designated as *Physician-Patient Mutual Understanding* (Table 8).

The patient version eliminated three items, retaining 9 items that yielded two factors: Factor 1 (6 items) explained 34.5% of variance, and Factor 2 (3 items) explained 16.1%, with total variance explanation of 50.6%. Factor 1 addressed physicians' understanding and forgiveness toward patients when patients offend physicians, or physicians' expected tolerance toward patients, designated as *Patient-Perceived Patient Tolerance*. Factor 2 addressed patients' understanding and forgiveness toward physicians when medical issues occur, designated as *Patient Tolerance Toward Physicians* (Table 9).

4. Doctor-Patient Attribution Style Sub-questionnaire The Doctor-Patient Attribution Style sub-questionnaire includes physician and patient versions, both retaining all 12 items without elimination. Both versions yielded three factors with four items each, showing consistent factor extraction and item composition across versions. For the physician version, Factor 1 explained 23.2% of variance, Factor 2 explained 19.9%, and Factor 3 explained 17.4%, with total variance explanation of 60.5%. For the patient version, Factor 1 explained 21.6% of variance, Factor 2 explained 18.0%, and Factor 3 explained 13.9%, with total variance explanation of 53.4%.

Factor 1 comprised items attributing responsibility to medical personnel' s competence, designated as *Physician Attribution* (higher scores indicate greater attribution of responsibility to physicians). Factor 2 comprised items attributing responsibility to social environment or media factors external to the doctor-patient relationship, designated as *External Attribution* (higher scores indicate greater external attribution). Factor 3 comprised items attributing responsibility to patient factors including communication ability or psychological expectations, designated as *Patient Attribution* (higher scores indicate greater attribution of responsibility to patients). Version-specific prefixes were added to identically named dimensions (Table 10).

5. Health Concept Sub-questionnaire The Health Concept sub-questionnaire includes physician and patient versions, both retaining all 7 items without elimination, yielding two factors with some version differences. The physician version yielded Factor 1 (4 items) explaining 40.6% of variance and Factor 2 (3 items) explaining 25.1%, with total variance explanation of 65.8%. The patient version yielded Factor 1 (3 items) explaining 31.6% of variance and Factor 2 (4 items) explaining 35.3%, with total variance explanation of 66.9%. The dimensional structure differed on Item 4, which loaded on Factor 1 in the physician version and Factor 2 in the patient version.

Overall, Factor 1 comprised items addressing physiological aspects of health concepts, designated as *Physical Health Concept*, while Factor 2 comprised items

addressing psychological aspects, designated as *Mental Health Concept*. Version-specific prefixes were added accordingly. The controversial Item 4 regarding "good adaptability" was grouped with physiological factors like physical health in the physician version, but with mental health-related factors such as social interaction, emotional life, and moral standards in the patient version, reflecting divergent health perspectives between the two groups (Table 11).

6. Disease Concept Sub-questionnaire The Disease Concept sub-questionnaire includes both physician and patient versions, but only the physician version proved suitable for factor analysis. The physician version retained all 7 items, yielding two factors: Factor 1 (4 items) explained 28.1% of variance, and Factor 2 (3 items) explained 24.0%, with total variance explanation of 52.1%. Factor 1 comprised items addressing disease treatment content, designated as *Physician Disease Treatment Concept*. Factor 2 comprised items addressing disease responsibility, including accountability for illness, designated as *Physician Disease Responsibility Concept* (Table 12).

(3) Reliability Test Prior research found that internal consistency reliability of the Chinese Doctor-Patient Social Mentality Questionnaire sub-questionnaires ranged from 0.757 to 0.932, with two-week test-retest reliability between 0.632 and 0.759 (Lü et al., 2019). This study conducted Cronbach' s α internal consistency tests for the involved sub-questionnaires, with results shown in Table 13 . α coefficients ranged from 0.642 to 0.929, indicating good overall internal consistency reliability, though the reliability of the physician Disease Concept sub-questionnaire requires improvement.

(4) Common Method Bias Test Given the extensive questionnaire content, common method bias testing was necessary (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This study employed Harman' s single-factor test (Zhou & Long, 2004) to examine common method bias. The results revealed 18 unrotated factors with eigenvalues greater than 1 for the physician sample and 17 for the patient sample, with the largest factor explaining 14% of variance in both cases—well below the conventional 40% threshold, satisfying common method bias test requirements.

(5) Confirmatory Factor Analysis Based on exploratory factor analysis results, confirmatory factor analysis was conducted using Amos 17.0. Models were fitted and modified according to modification indices. The final model fit indices for the sub-questionnaires are presented in Table 14 . The results demonstrate satisfactory fit indices for the modified models across all sub-questionnaires, validating the proposed factor structures.

3. Current State of Doctor-Patient Social Mentality

Based on the study' s findings, dimensional statistics and analyses were performed for the social cognition and social values sub-questionnaires, with between-group comparisons conducted for total scores, as shown in Table 15 .

Statistical analysis of physician and patient responses revealed no significant differences in Doctor-Patient Trust and Doctor-Patient Satisfaction, but significant differences emerged across other measures.

Regarding doctor-patient social cognition, physicians reported relatively high overall security ($M = 3.05$, $SD = 0.62$), particularly high security when seeking care as patients ($M = 3.57$, $SD = 0.75$), but notably low security in their professional practice ($M = 0.001$). Conversely, patients reported low evaluation of physician security ($M = 2.80$, $SD = 0.70$) and low personal security during medical encounters ($M = 2.64$, $SD = 0.86$). Both groups reported low justice perceptions, with physicians scoring significantly lower than patients ($t = -8.965$, $p < 0.001$). Tolerance analysis indicated physicians demonstrated significantly higher tolerance than patients ($t = 5.660$, $p < 0.001$), with higher scores on both tolerance toward physicians ($M = 3.14 > 2.68$, $SD = 0.35$) and tolerance toward patients. Additionally, the physician version yielded a unique factor, Physician-Patient Mutual Understanding, with relatively lower scores ($M = 2.55$, $SD = 0.41$). Attribution style analyses revealed consistent factor structures across versions, with physicians scoring lower on physician attribution ($M = 2.76 < 3.11$, $SD = 0.98$) but higher on external attribution ($M = 3.65 > 3.36$, $SD = 0.85$) and patient attribution ($M = 4.15 > 4.04$, $SD = 0.75$) than patients.

Regarding doctor-patient social values, physicians scored significantly higher than patients on health concept ($t = 5.096$, $p < 0.001$), attributing greater importance to both physical health ($M = 4.33 > 4.31$, $SD = 0.62$) and mental health ($M = 3.51 > 3.18$, $SD = 0.68$). Conversely, physicians scored significantly lower than patients on disease concept ($t = -3.692$, $p < 0.001$). The physician version yielded two factors: on Disease Treatment Concept, physicians more strongly endorsed biopsychosocial influences, individual conditions, medical resources, and daily maintenance; on Disease Responsibility Concept, they were less likely to attribute disease responsibility to attending physicians or society. Physicians also scored significantly higher than patients on Medical Concept ($t = 4.958$, $p < 0.001$) and Justice Concept ($t = 2.087$, $p < 0.05$).

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4. Summary and Discussion

(1) Research Conclusions Through exploratory and confirmatory factor analysis, this study demonstrated that the Doctor-Patient Social Cognition and Doctor-Patient Social Values sub-questionnaires of the Chinese Doctor-Patient Social Mentality Questionnaire possess good structural validity, providing a foundation for flexible sub-questionnaire use. Descriptive statistical

comparisons further revealed significant differences between physician and patient groups in social cognition and values.

Specifically, the Doctor-Patient Security (physician/patient versions), Doctor-Patient Satisfaction 1 (physician/patient versions), Doctor-Patient Satisfaction 2 (patient version), Doctor-Patient Tolerance (physician/patient versions), Doctor-Patient Attribution Style (physician/patient versions), Health Concept (physician/patient versions), and Disease Concept (physician version) sub-questionnaires can be interpreted dimensionally as scales, while other sub-questionnaires should be treated as unidimensional measures.

The factor extraction results revealed differences between physician and patient groups in factor structures for the same sub-questionnaires, particularly in Doctor-Patient Security, Doctor-Patient Satisfaction, Doctor-Patient Tolerance, Health Concept, and Disease Concept, indicating divergent perceptions and evaluations of identical issues and highlighting inter-group differences. Nevertheless, similarities emerged in that, despite different item distributions, the dimensional divisions and primary content showed considerable consistency, especially for the Doctor-Patient Attribution Style sub-questionnaire, where factor structures and item compositions were identical across versions.

Descriptive statistics and difference tests demonstrated significant between-group differences across most scales. These divergences in social cognition and values may partially explain inter-group conflicts and inform doctor-patient relationship management. Security findings indicated physicians experience strong insecurity in practice but high security when seeking care as patients, whereas patients feel substantial insecurity, perceiving risks to both their own safety and physicians' practice safety. The convergent perception of physicians' practice insecurity suggests potential for mutual understanding. Regarding justice, physicians perceived greater injustice than patients, likely stemming from multi-source pressures (patients, organizations, society) and perceived income-work intensity mismatches. Tolerance results showed physicians were significantly more tolerant than patients toward both in-group and out-group members, possibly due to greater knowledge resources enabling rational analysis of medical incidents. Attribution patterns revealed both groups' reluctance to self-attribute responsibility, a primary source of disputes. Health concept results indicated physicians valued physical and mental health more than patients. Disease concept findings showed physicians were less likely to attribute disease responsibility to attending physicians or society. Higher physician scores on Medical Concept and Justice Concept scales further demonstrated stronger endorsement of related values. These similarities and differences provide valuable insights for exploring doctor-patient conflict origins.

(2) Research Significance and Limitations This study analyzed the Doctor-Patient Social Cognition and Doctor-Patient Social Values modules using nationwide data, confirming that sub-questionnaires support flexible independent or combined use, demonstrating practical utility. However, several

limitations remain.

Current domestic research on doctor-patient social mentality either examines it as a facet of general social mentality (Wang & Pan, 2013) or lacks operationalized measurement and rigorous validity testing (Miao et al., 2016). International research focuses primarily on doctor-patient communication or trust (Thom et al., 2011; Paternotte et al., 2015), yielding relatively narrow content under the doctor-patient social mentality umbrella without comprehensive investigation. The Chinese Doctor-Patient Social Mentality Questionnaire, in contrast, aims to develop a large-scale social survey instrument, employing indicator construction methods to build modules with secondary indicators, and has validated the questionnaire' s reliability and validity (Lü et al., 2019). This study further refines the secondary indicator subscales, clarifying which can function as independent scales and their factor structures. This addresses the current lack of comprehensive doctor-patient social mentality research domestically and internationally while providing empirical support for flexible sub-questionnaire application.

Nevertheless, limitations persist. First, some sub-questionnaires contained too few items for factor extraction, precluding further analysis. Second, the extensive content limited competitive model comparisons during factor extraction, requiring improvement in future research. Finally, between-group comparisons employed only simple overall difference tests; future studies should explore relationships among different content areas to further advance understanding of doctor-patient relationships.

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