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Nursing Communication Quality, Culturally Sensitive Communication, and Treatment Satisfaction among Patients: A Cross-Sectional Survey at an International Medical Centre

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Abstract: This study aimed to examine the effects of Nursing Communication Quality (NCQ) and Culturally Sensitive Communication (CSC) on Treatment Satisfaction (TS) among patients in an international medical centre, with particular attention to the mediating role of Patient Trust (PT) and the moderating role of Language Concordance (LC). A convenience sample of 453 patients was recruited from the international medical centre of a tertiary Grade A hospital in Guangzhou between March and May 2026. The results showed that NCQ (β = 0.292) and CSC (β = 0.168) positively predicted PT, while PT positively predicted TS (β = 0.388). PT partially mediated the relationship between NCQ and TS (indirect effect = 0.128, 95% CI [0.086, 0.175]) and fully mediated the relationship between CSC and TS (indirect effect = 0.113, 95% CI [0.075, 0.156]). LC directly predicted TS (β = 0.167) and positively moderated the effect of NCQ on PT (B = 0.196). These findings indicate that the 'communication–trust–satisfaction' mechanism is applicable to international healthcare settings, with CSC exerting its effect on TS fully through PT and LC functioning as a boundary condition. Healthcare organisations should strengthen cross-cultural communication training, enhance multilingual resource provision, and implement trust-oriented quality monitoring.

Keywords: Nursing Communication Quality; Culturally Sensitive Communication; Patient Trust; Language Concordance; Treatment Satisfaction

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1. Introduction

Against the backdrop of the continued expansion of global trade in healthcare services, international medical centres have become important platforms for meeting cross-border healthcare needs and demonstrating the international service capabilities of healthcare institutions. Accordingly, the quality of services provided by such centres has received increasing attention from both academic researchers and healthcare practitioners [1,2]. Unlike traditional healthcare institutions that primarily serve relatively homogeneous local populations, international medical centres accommodate patients with substantial heterogeneity in terms of nationality, linguistic background, cultural practices, and religious beliefs. Nursing

services therefore face distinctive dual barriers of "language and culture" in patient communication [3,4]. Previous studies have demonstrated that language barriers and ineffective communication are important sources of negative patient evaluations of healthcare services [5–7], suggesting that communication-related factors may have greater explanatory relevance in international healthcare settings.

Nurses constitute the professional group with whom patients have the most frequent and sustained contact during hospitalisation. The quality of nurse–patient communication has consequently received robust empirical support as a key antecedent of patient satisfaction [8,9]. Nevertheless, three gaps remain in the existing literature. First, at the mechanistic level, most studies have either treated communication quality as a direct antecedent of satisfaction or examined communication, trust, and satisfaction as parallel correlates, with limited systematic investigation of the psychological process through which communication is translated into satisfaction [10]. Second, at the construct level, empirical research on Culturally Sensitive Communication and cultural competence has predominantly focused on outcomes in educational settings [11,12]. Its independent effects and underlying pathways in relation to patient-level outcomes remain insufficiently understood. In particular, whether cultural sensitivity constitutes a distinct construct from general communication quality has yet to be adequately established using patient-reported data. Third, at the boundary-condition level, empirical evidence on Language Concordance has primarily originated from research on doctor–patient relationships [13,14]. Whether Language Concordance can amplify or constrain the effects of communication quality within nurse–patient relationships therefore warrants further investigation.

To address these gaps, this study focuses on patients receiving care at an international medical centre and integrates Peplau's Interpersonal Relations Theory [15] with the SERVQUAL service quality model [16]. A mediation model is developed in which Nursing Communication Quality (NCQ) and Culturally Sensitive Communication (CSC) predict Treatment Satisfaction (TS) through Patient Trust (PT). Language Concordance (LC) is incorporated as a boundary variable that not only directly affects TS but also moderates the "communication–trust" pathway, thereby forming a moderated mediation model for empirical examination. Theoretically, this study extends the applicability of two established theoretical frameworks to a highly heterogeneous healthcare service context, clarifies the status of Culturally Sensitive Communication as an independent construct, and provides an empirical examination of the moderating function of Language Concordance within the nurse–patient relationship. Practically, the findings provide an evidence base for designing competency frameworks, developing training systems, and allocating language resources for nursing teams in international medical centres.

2. Literature Review and Theoretical Framework

2.1 Nursing Communication Quality and Patient Trust

Peplau's (1997) [15] Interpersonal Relations Theory conceptualises the nurse–patient relationship as a professional interpersonal relationship progressively constructed through communication, with trust serving as a core mechanism through which the relationship transitions from the 'orientation phase' to the 'identification' and 'exploitation' phases. From this perspective, communication quality constitutes a proximal antecedent of trust. The clarity and timeliness of information reduce patients' cognitive burden when facing uncertainty surrounding illness and treatment [17]; the respect conveyed through listening and responsive communication fulfils patients' need to feel acknowledged and attended to; and an approachable attitude and proactive disclosure in unexpected situations provide patients with a sense of predictability and control. Collectively, these processes facilitate patients' dual judgements regarding nurses' professional competence and benevolence, thereby contributing to the formation of trust.

Empirical research provides preliminary support for this proposition. Bahari et al. (2024) [18] found a significant association between patients' trust in nurses and their perceptions of nursing quality. Zhang et al. (2025) [19], based on a survey conducted in tertiary public hospitals in China, demonstrated that the quality of nurse–patient relationships influences patient-level outcomes. Similarly, a multicentre study by Guo et al. (2023) [8] reported a significant positive association between the nurse–patient relationship and nursing satisfaction. Nevertheless, existing evidence has several limitations. First, measurement has predominantly relied on nurses' self-reports or third-party observations, with comparatively limited evidence from the patient-perception perspective. Second, communication has often been treated as a direct antecedent of satisfaction, while

its theoretical role as a means of relationship construction through which trust generates subsequent outcomes has not been sufficiently examined. The present study addresses these limitations by using patient-reported data. Accordingly, the following hypothesis is proposed:

H1: Nursing Communication Quality positively affects Patient Trust.

2.2 Culturally Sensitive Communication and Patient Trust

The SERVQUAL model identifies 'empathy' and 'assurance' as key dimensions through which service quality is distinguished from technical quality [16]. In the highly heterogeneous context of international healthcare, the core meaning of empathy lies in recognising and respecting patients' cultural practices, dietary restrictions, religious beliefs, and perceptions of privacy [20,21]. From a relationship-building perspective, the signals conveyed through Culturally Sensitive Communication extend beyond the informational level. Patients may use such communication to assess whether healthcare professionals acknowledge the legitimacy of their cultural identity. This sense of being recognised constitutes an important source of emotional security [22] and, in turn, facilitates the development of trust.

Notably, the existing literature exhibits a pronounced 'education-oriented bias'. Research on cultural competence has primarily examined changes in the knowledge, attitudes, and skills of nursing students and practising nurses [11,20], whereas empirical studies directly examining patient-level outcomes remain limited [12]. Moreover, existing findings have largely remained at the level of zero-order correlations. The discriminant validity between Culturally Sensitive Communication and general communication quality from the patient-perception perspective has also yet to be adequately examined. If the two constructs substantially overlap, 'cultural sensitivity' may merely represent a semantic restatement of communication quality, thereby raising questions regarding its construct distinctiveness. The present study therefore places Culturally Sensitive Communication alongside general Nursing Communication Quality within the same model and examines its construct validity through incremental predictive power. Accordingly, the following hypothesis is proposed:

H2: Culturally Sensitive Communication positively affects Patient Trust.

2.3 The Mediating Role of Patient Trust

Trust, as a psychological foundation of satisfaction formation, has received support from both the service marketing and healthcare literature [23,24]. Its underlying mechanism lies in the fact that trust enables patients to interpret ambiguous information in nursing interactions through a benevolent attributional framework, thereby reducing defensive processing during service evaluation. Trust also represents an accumulation of relational capital, allowing patients to generalise individual positive experiences to their evaluations of the treatment process as a whole [25].

However, two issues warrant consideration. First, a theoretically plausible reverse causal pathway exists between trust and satisfaction: a satisfactory healthcare experience may subsequently shape patients' judgements of trust. Accordingly, the causal direction of a cross-sectional mediation model depends on theoretical reasoning rather than statistical results alone. Second, not all studies have observed a significant association between trust and patient-reported outcomes. İspir Demir et al. (2023) [26], for example, reported a non-significant association between trust and satisfaction in a study of structural empowerment, suggesting that the role of trust may depend on boundary conditions that have yet to be fully identified. This provides an additional rationale for incorporating Language Concordance into the present model: the integrity of the 'encoding–decoding' process in communication may constitute a prerequisite for trust formation. Accordingly, the following hypothesis is proposed:

H3: Patient Trust mediates the relationships of Nursing Communication Quality and Culturally Sensitive Communication with Treatment Satisfaction.

2.4 Language Concordance and Treatment Satisfaction

Language Concordance refers to the extent to which nurses and patients are able to communicate fluently using a language familiar to both parties, such as the patient's native language or a shared working language. Empirical evidence regarding linguistic concordance exhibits two notable characteristics. First, the overall direction of the effect is relatively consistent: language concordance has been found to improve patient experiences, satisfaction, and adherence [5,13,27], and has also been associated with better clinical outcomes [14,28]. Second, the magnitude and generalisability of these effects remain subject to

debate. Some studies conducted in specific clinical settings have not observed consistent associations between linguistic concordance and patient outcomes, while the effects of language concordance have often been difficult to disentangle from those of racial or cultural concordance [29].

These debates indicate that the independent effect of Language Concordance should be identified while controlling for relevant cultural-background variables. This constitutes a distinctive empirical opportunity afforded by the international medical centre setting. In institutions characterised by substantial nationality heterogeneity and English as the primary working language, examining the predictive effect of Language Concordance on Treatment Satisfaction while controlling for nationality may provide a more construct-specific assessment. Accordingly, the following hypothesis is proposed:

H4: Language Concordance positively affects Treatment Satisfaction.

2.5 The Moderating Role of Language Concordance

The influence of Language Concordance on Treatment Satisfaction may be reflected not only in a shift in mean levels but also in the structure of effects. From an information-processing perspective, language serves as the medium through which communicative intentions are encoded and decoded. When Language Concordance is low, even when nurses possess adequate communicative intentions and skills, distortion during information transmission may impair patients' quality of information reception and consequently inhibit the development of trust. Conversely, high Language Concordance provides a more complete pathway through which communication quality can operate, allowing communication efforts to be more fully translated into trust outcomes [4,6].

Existing research on linguistic concordance has focused predominantly on testing main effects, while empirical investigation of its moderating mechanisms remains limited. Likewise, research on communication effectiveness has rarely incorporated language ability as a boundary condition. These two strands of literature have therefore remained largely disconnected. The present study directly examines the proposition that Language Concordance moderates the pathway from Nursing Communication Quality to Patient Trust within the nurse–patient relationship framework. Accordingly, the following hypothesis is proposed:

H5: Language Concordance positively moderates the effect of Nursing Communication Quality on Patient Trust, such that the positive effect is stronger when Language Concordance is higher.

3. Methods

3.1 Study Design and Participants

A cross-sectional questionnaire survey was conducted. Several procedural measures were adopted to reduce common method bias, including anonymous responses and non-identifiable coding. Between March and May 2026, convenience sampling was used to recruit inpatients and outpatients receiving care at the international medical centre of a tertiary Grade A hospital in Guangzhou. The inclusion criteria were: (1) aged 18 years or above; (2) conscious and cognitively able to complete the questionnaire; and (3) voluntary participation. Patients receiving emergency resuscitation or intensive care and those with cognitive impairment were excluded.

A total of 520 questionnaires were distributed, of which 453 valid questionnaires were returned, yielding a valid response rate of 87.1%. The demographic characteristics of the sample are presented in Table 1.

Table 1. Demographic Characteristics of the Participants (N = 453)

Variable	Category	n	%
Gender	Male	203	44.8
	Female	250	55.2
Age group	18–25 years	161	35.5
	26–30 years	79	17.4
	31–35 years	79	17.4
	36–40 years	55	12.1
	≥41 years	79	17.4

Variable	Category	n	%
Nationality	Chinese	256	56.5
	Foreign	197	43.5
Length of hospital stay	1–7 days	133	29.4
	8–14 days	195	43.0
	15–21 days	79	17.4
	≥22 days	46	10.2
Disease severity	Mild	194	42.8
	Moderate	180	39.7
	Severe	79	17.4
Educational level	High school or below	70	15.5
	Junior college	136	30.0
	Bachelor's degree	162	35.8
	Master's degree or above	85	18.8

Note. n = number of participants; % = percentage.

3.2 Measures

The questionnaire items were adapted from established instruments or developed specifically for this study to meet the research requirements. All items were rated on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Items measuring the predictor variables (X1, X2, and W) and outcome variables (M and Y) were organised into separate sections. Items within each section were presented in random order to reduce response-set bias.

Nursing Communication Quality (NCQ). NCQ was adapted from the SERVQUAL scale [16] and comprised six items. The Cronbach's α coefficient in the present study was 0.841.

Culturally Sensitive Communication (CSC). CSC was adapted from the Cultural Competence Assessment Instrument [11] and comprised five items, with a Cronbach's α coefficient of 0.823.

Patient Trust (PT). PT was adapted from the Trust in Physician Scale [30] and comprised five items. The Cronbach's α coefficient was 0.820.

Language Concordance (LC). LC was measured using a single item developed specifically for the present study.

Treatment Satisfaction (TS). TS was adapted from the Patient Satisfaction Questionnaire [31] and comprised six items, with a Cronbach's α coefficient of 0.853.

The control variables included gender, age group, nationality, length-of-stay group, and disease severity. Categorical control variables were entered into the regression models using dummy coding.

3.3 Statistical Analysis

Statistical analyses were conducted using SPSS 22.0 and PROCESS v4.1. Maximum-likelihood confirmatory factor analysis (ML-CFA) was conducted to assess the measurement model. Common method bias was examined using three complementary approaches: Harman's single-factor test, comparison with a single-factor confirmatory factor analysis model, and Kock's full-collinearity variance inflation factor (VIF) test. Reliability was assessed using Cronbach's α and composite reliability (CR), while convergent and discriminant validity were evaluated using the average variance extracted (AVE) and the Fornell–Larcker criterion, respectively.

Independent-samples t-tests and one-way analyses of variance (ANOVAs) were conducted to examine demographic differences. Pearson correlation analysis was used to assess associations among the study variables. Hierarchical regression analyses were conducted to test the main effects specified in H1, H2, and H4, with variance inflation factors (VIFs) examined to assess potential multicollinearity. PROCESS Model 4 with 5,000 bias-corrected bootstrap resamples was used to test the mediation hypothesis (H3). PROCESS Model 1 was used to examine the moderating effect specified in H5, with simple-slope

analyses conducted at ±1 standard deviation (SD) of Language Concordance. Statistical significance was assessed at α = 0.05 using two-tailed tests.

4. Results

4.1 Common Method Bias

Common method bias was controlled through both procedural and statistical approaches. Procedurally, anonymous responses were adopted, predictor and outcome items were organised into separate sections, and items within each section were presented in random order. Statistically, three complementary tests were conducted. First, Harman's single-factor test showed that the first unrotated factor accounted for 31.00% of the total variance, below the 40% threshold. Second, confirmatory factor analysis model comparisons (Table 2) showed that the five-factor model demonstrated excellent fit (= 214.6, df = 220, CFI = 1.000, TLI = 1.000, RMSEA = 0.000), whereas the single-factor model showed poor fit (= 1490.8, df = 230, CFI = 0.661, TLI = 0.620, RMSEA = 0.110). The difference between the two models was statistically significant ((10) = 1276.2, p < 0.001), indicating that a single common method factor could not adequately account for the associations among the constructs. Third, Kock's full-collinearity test showed that the VIFs for all constructs ranged from 1.06 to 1.69, all below the critical value of 3.3. Collectively, these three sources of evidence indicate that common method bias did not constitute a serious threat to the conclusions of the present study.

Table 2. Confirmatory Factor Analysis Model Comparisons for Common Method Bias (N = 453)

Model	χ^2	*df*	CFI	TLI	RMSEA	Model comparison
Five-factor model	214.6	220	1.000	1.000	0.000	—
Single-factor model	1490.8	230	0.661	0.620	0.110	(10) =1276.2***

Note. p < 0.05; *p < 0.01; **p < 0.001. In the five-factor model, the 23 items were loaded onto five factors representing Nursing Communication Quality (NCQ), Culturally Sensitive Communication (CSC), Patient Trust (PT), Language Concordance (LC), and Treatment Satisfaction (TS), with the factors allowed to correlate. In the single-factor model, all items were loaded onto a single common factor.

4.2 Reliability and Validity

The Cronbach's α coefficients of the multi-item scales ranged from 0.820 to 0.853 (Table 3), while composite reliability (CR) ranged from 0.874 to 0.891, all exceeding the acceptable threshold of 0.70. The average variance extracted (AVE) ranged from 0.558 to 0.586, with all values exceeding the recommended threshold of 0.50, indicating good internal consistency and convergent validity.

Regarding discriminant validity (Table 4), the square root of the AVE for each construct was greater than its correlations with the other constructs, satisfying the Fornell–Larcker criterion. This indicates that the five constructs were empirically distinguishable in patients' perceptions and supports the construct distinctiveness of Culturally Sensitive Communication from general Nursing Communication Quality. In addition, the VIFs for all predictors in the main regression models ranged from 1.16 to 1.48, well below the critical value of 10, indicating no serious multicollinearity.

Table 3. Reliability and Convergent Validity of the Scales (N = 453)

Variable	Items	Cronbach's α	CR	AVE	$\sqrt{AVE}$
NCQ	6	0.841	0.883	0.558	0.747
CSC	5	0.823	0.876	0.586	0.766
PT	5	0.820	0.874	0.582	0.763
TS	6	0.853	0.891	0.576	0.759
LC	1	—	—	—	—

Note. CR = composite reliability; AVE = average variance extracted; = square root of AVE. LC was measured using a single item; therefore, internal consistency, composite reliability, and AVE were not calculated. NCQ = Nursing Communication Quality; CSC = Culturally Sensitive Communication; PT = Patient Trust; TS = Treatment Satisfaction，LC = Language Concordance

Table 4. Fornell–Larcker Discriminant Validity Test (N = 453)

Construct	NCQ	CSC	PT	TS
NCQ	0.747			
CSC	0.399	0.766		
PT	0.473	0.452	0.763	
TS	0.377	0.298	0.501	0.759

Note. NCQ = Nursing Communication Quality; CSC = Culturally Sensitive Communication; PT = Patient Trust; TS = Treatment Satisfaction. Diagonal values represent the square root of the AVE for each construct.

4.3 Demographic Differences

The independent-samples t-test showed that foreign patients reported significantly higher Treatment Satisfaction (M = 3.96, SD = 0.55) than Chinese patients (M = 3.81, SD = 0.58), t(451) = 2.719, p = 0.007, with a small effect size (Cohen's d = 0.258). No statistically significant gender difference was observed (t = 0.866, p = 0.387). One-way ANOVAs indicated no statistically significant differences in Treatment Satisfaction across age groups (F = 0.805, p = 0.522) or length-of-stay groups (F = 2.093, p = 0.100), as shown in Table 5.

Table 5. Demographic Differences in Treatment Satisfaction (N = 453)

Variable	Statistic	*p*	Effect size
Gender (female vs. male)	t (451) =0.866	0.387	—
Nationality (foreign vs. Chinese)	t (451) =2.719	0.007	d=0.258
Age group (5 groups)	F (4,448) =0.805	0.522	—
Length-of-stay group (4 groups)	F (3,449) =2.093	0.100	—

4.4 Correlation Analysis

The correlation analysis results are presented in Table 6. Nursing Communication Quality, Culturally Sensitive Communication, Patient Trust, and Language Concordance were positively associated with Treatment Satisfaction (r = 0.192–0.501, p < 0.001) , whereas the zero-order correlation between LC and TS was not significant (r = 0.027, p > 0.05). Nursing Communication Quality and Culturally Sensitive Communication were also significantly and positively associated with Patient Trust (r = 0.473 and 0.452, respectively; p < 0.001), providing a basis for the subsequent regression analyses.

Table 6. Descriptive Statistics and Correlation Matrix of the Study Variables (N = 453)

Variable	NCQ	CSC	LC	PT	TS
NCQ	1				
CSC	0.501***	1			
LC	0.192***	-0.022	1		
PT	0.298***	0.452***	0.022	1	
TS	0.377***	0.473***	0.027	0.399***	1

Note. p < 0.05; *p < 0.01; ***p < 0.001. NCQ = Nursing Communication Quality; CSC = Culturally Sensitive Communication; LC = Language Concordance; PT = Patient Trust; TS = Treatment Satisfaction.

4.5 Main and Mediation Effects

Table 7. Hierarchical Regression Analysis of Treatment Satisfaction (N = 453)

Variable	Model 1 B (SE)	Model 1 β	Model 1 *t*	Model 2 B (SE)	Model 2 β	Model 2 *t*
NCQ	0.290 (0.046)	0.292***	6.34***	0.159 (0.046)	0.159***	3.48***
CSC	0.164 (0.045)	0.168***	3.66***	0.047 (0.044)	0.048	1.06
LC	0.123 (0.033)	0.167***	3.74***	0.137 (0.031)	0.186***	4.45***
PT	—	—	—	0.383 (0.047)	0.388***	8.20***
Control variables	Controlled		Controlled			
R^2	0.240		0.342			
ΔR^2			0.101			

Note. *p < 0.05; **p < 0.01; **p < 0.001. NCQ = Nursing Communication Quality; CSC = Culturally Sensitive Communication; LC = Language Concordance; PT = Patient Trust The dependent variable was Treatment Satisfaction. B = unstandardised regression coefficient; SE = standard error; β = standardised regression coefficient. VIFs for all predictors ranged from 1.16 to 1.48. Control variables included gender, age group, nationality, length-of-stay group, and disease severity.

In Model 1, Nursing Communication Quality (β = 0.292***), Culturally Sensitive Communication (β = 0.168***), and Language Concordance (β = 0.167***) were all significant positive predictors of Treatment Satisfaction. After Patient Trust was entered into the model, the explanatory power increased significantly ($\Delta R^2 = 0.101$), and Patient Trust significantly and positively predicted Treatment Satisfaction (β = 0.388***), providing support for H4. Indirect effects were tested using 5,000 bias-corrected bootstrap resamples. The 95% confidence intervals for the indirect effects did not include zero, indicating significant mediation effects and providing support for H3.

Table 8. Mediation Effects of Patient Trust (Bootstrap = 5,000; N = 453)

Path	B (SE)	*β*	*t*	Conclusion
NCQ → PT (a_1)	0.343 (0.044)	0.340***	7.85***	H1 supported
CSC → PT (a_2)	0.305 (0.043)	0.308***	7.13***	H2 supported
PT → TS (b)	0.372 (0.048)	0.376***	7.81***	—
NCQ → TS direct effect	0.159 (0.046)	—	3.48***	Partial mediation (44.1%)
NCQ → TS indirect effect	0.128	—	—	95% CI [0.086, 0.175]
CSC → TS direct effect	0.047 (0.044)	—	1.06 (ns)	Full mediation (68.9%)
CSC → TS indirect effect	0.113	—	—	95% CI [0.075, 0.156]

Note. *p < 0.05; **p < 0.01; **p < 0.001.NCQ = Nursing Communication Quality; CSC = Culturally Sensitive Communication; PT = Patient Trust; TS = Treatment Satisfaction. B = unstandardised coefficient; SE = standard error; β = standardised coefficient; CI = confidence interval; ns = not significant.

4.6 Moderating Effect of Language Concordance

With Patient Trust as the dependent variable, the main effects and the X1 × W interaction term were entered into the regression model. The interaction term was statistically significant (B = 0.196, SE = 0.049, t = 4.03, p < 0.001), and the model explained 35.0% of the variance ($R^2 = 0.350$), as shown in Table 9. Simple-slope analysis (Table 10) showed that, at low Language Concordance (−1 SD), the effect of Nursing Communication Quality on Patient Trust was 0.960 (t = 6.04, p < 0.001, 95% CI [0.648, 1.272]); at the mean level of Language Concordance, the effect was 1.113 (t = 5.69, p < 0.001); and at high Language Concordance (+1 SD), the effect was 1.265 (t = 5.44, p < 0.001, 95% CI [0.808, 1.723]). The effect therefore exhibited a clear increasing pattern, providing support for H5.

Table 9. Regression Analysis of the Moderating Effect of Language Concordance on Patient Trust (N = 453)

Variable	*B (SE)*	*β*	*t*
NCQ	0.357 (0.043)	0.355***	8.29***
CSC	0.315 (0.042)	0.319***	7.50***
LC	−0.028 (0.031)	−0.038	−0.92
NCQ × LC	0.196 (0.049)	0.158***	4.03***
Control variables	Controlled	—	Controlled
R^2	0.350	—	—

Note. *p < 0.05; **p < 0.01; **p < 0.001.NCQ = Nursing Communication Quality; CSC = Culturally Sensitive Communication; LC = Language Concordance. B = unstandardised coefficient; SE = standard error; β = standardised coefficient.

Table 10. Simple-Slope Analysis of the Effect of Nursing Communication Quality on Patient Trust at Different Levels of Language Concordance

Language Concordance level	B	SE	t	p	95%CI
Low (−1 SD)	0.960	0.159	6.04	<0.001	[0.648, 1.272]
Mean	1.113	0.196	5.69	<0.001	[0.728, 1.497]
High (+1 SD)	1.265	0.233	5.44	<0.001	[0.808, 1.723]

5. Discussion

5.1 Theoretical Interpretation of the Main Findings

5.1.1 The Dual Mediating Pathways of Trust: Distinguishing Partial and Full Mediation

The most theoretically significant finding of this study is that Patient Trust exhibits different forms of mediation across the two antecedent pathways. The effect of Nursing Communication Quality on Treatment Satisfaction is partially mediated by Patient Trust: even after controlling for trust, communication quality retains a significant direct effect (B = 0.159, p < 0.01). This finding suggests that informational communication fulfils both a 'relational function' and an 'instrumental function'. The former operates through trust, whereas the latter influences satisfaction evaluations by directly reducing patients' informational uncertainty and mitigating their perceived loss of control during the treatment process [9,17].

In contrast, the effect of Culturally Sensitive Communication on Treatment Satisfaction disappears entirely after Patient Trust is included in the model, as its direct effect becomes non-significant, indicating full mediation. This suggests that patients do not necessarily report higher satisfaction simply because nurses 'respect their culture'. Rather, the value of cultural respect must first be consolidated into trust in nurses and subsequently translated into satisfaction through trust as an evaluative framework. This finding provides a qualification to the cultural competence literature: the direct pathway from 'cultural sensitivity → patient satisfaction', which has often been implicitly assumed in education-oriented research, was not supported. Instead, the patient-level benefits of Culturally Sensitive Communication appear to be indirect and relational rather than immediate and transactional [11,12,32]. At the same time, the Fornell–Larcker criterion supports the view that Culturally Sensitive Communication constitutes a distinct construct from general communication quality in patients' perceptions, addressing concerns regarding construct validity in this area.

5.1.2 The Dual Role of Language Concordance: Integrating Main and Moderating Effects

Language Concordance fulfils two functions simultaneously in the present model. As a main-effect variable, it significantly predicts Treatment Satisfaction even after controlling for nationality (β = 0.167, p < 0.001), supporting the conceptual distinction between the effect of Language Concordance and that of racial or cultural concordance [5,29]. More importantly, its moderating effect provides an additional contribution: the interaction term is significantly positive, and the simple slopes exhibit a clear gradient (0.960 → 1.113 → 1.265), indicating that Language Concordance functions as an efficiency parameter

governing the extent to which communication quality translates into trust.

This finding provides a point of integration between two previously disconnected strands of research. Research on language concordance has primarily explained 'how language affects satisfaction', but has provided limited explanation of 'when the effect of language is stronger'. Conversely, research on communication effectiveness has demonstrated how communication generates trust but has generally assumed that communicative intentions can be fully received. The present study suggests that Language Concordance functions as a boundary condition that facilitates the translation of Nursing Communication Quality into Patient Trust. Under conditions of lower Language Concordance, the positive association between Nursing Communication Quality and Patient Trust is weaker, whereas higher Language Concordance strengthens this association. This provides a direct quantitative basis for language-resource allocation in international medical centres.

5.1.3 Interpreting the Higher Satisfaction among Foreign Patients with Caution

Foreign patients reported significantly higher Treatment Satisfaction than Chinese patients ($d = 0.258$). Several plausible explanations may account for this difference. First, One possible explanation is that international medical centres may provide more extensive multilingual services and international patient-oriented procedures for foreign patients. Second, foreign patients may differ from Chinese patients in socioeconomic background, healthcare-seeking motivations, and prior healthcare experiences, although these factors were not directly measured in the present study. Their expectations of healthcare may therefore be more closely aligned with the service positioning of international medical centres, while their reference points may be their home-country healthcare systems rather than local standards [1,3]. Although the effect size is relatively small, this difference suggests that improvements in service quality at international medical centres should not overlook the relative gap experienced by domestic patients simply because overall satisfaction levels are relatively high.

5.2 Theoretical Contributions

First, with respect to Peplau's Interpersonal Relations Theory, this study replicates and further specifies its core proposition of 'communication → trust → outcomes' within a highly heterogeneous service context. Moreover, by distinguishing the forms of mediation across the two pathways (partial versus full mediation), the study reveals different transmission mechanisms through which distinct relational elements contribute to outcomes.

Second, with respect to the SERVQUAL model, this study extends the application of the empathy-related dimension of SERVQUAL to culturally heterogeneous healthcare settings by operationalising patients' perceptions of culturally sensitive communication. This supports the dimensional applicability of the model in cross-cultural service contexts [33,34].

Third, regarding research on language concordance, this study reconceptualises Language Concordance from a 'main-effect variable' to a 'boundary-condition variable', thereby addressing a key gap concerning its moderating mechanism [13,14].

5.3 Practical Implications

For nursing managers: Communication quality should be incorporated as a core dimension of nursing competency frameworks, with tiered training and assessment systems covering information clarity, responsiveness, listening, and empathy [17,35]. Patient Trust should also be incorporated into routine quality-monitoring indicators and used as an upstream warning indicator of Treatment Satisfaction [23,36].

For nursing educators: Cultural sensitivity training should move beyond knowledge transmission towards contextualised behavioural training, with simulation-based instruction centred on common scenarios involving dietary restrictions, religious practices, and perceptions of privacy [11,20]. Evaluation of training effectiveness should extend to patient-level trust and satisfaction indicators rather than stopping at trainees' knowledge assessments.

For clinical practice: The findings suggest that investments in language resources may generate benefits beyond their direct association with Treatment Satisfaction. Because Language Concordance amplifies the effect of communication, investments in multilingual nurse staffing, professional interpreting services, and translation-assisted tools should be evaluated in terms of both their 'direct effects' and their 'amplifying effects' [4,6,37].

5.4 Limitations and Future Research

First, the cross-sectional self-report design cannot establish causal direction. Theoretically, reciprocal pathways may exist among communication, trust, and satisfaction; therefore, the causal claims of this study rely on theoretical reasoning rather

than being guaranteed by the research design. Although procedural controls and three complementary statistical tests (Harman's single-factor test, comparison of CFA models, and the full-collinearity VIF test) collectively suggest that common method bias is unlikely to account for the observed relationships substantially, the inherent biases associated with self-reported data cannot be completely eliminated. Future research could employ randomised controlled trials of communication training or longitudinal cross-lagged designs to further test these relationships.

Second, the single-centre sample limits external validity. Whether the findings can be generalised across international medical institutions with different national compositions and degrees of cultural distance requires investigation through multicentre comparative studies.

Third, Language Concordance was measured using a single self-developed item. Future research should develop a multi-item Language Concordance scale and systematically examine its reliability and validity.

Fourth, differences in patients' reference frames for evaluating healthcare were not directly measured, which may confound the interpretation of between-group differences. Future research could incorporate individual-level variables such as migration expectations and healthcare-seeking motivations as control variables.

6. Conclusion

Nursing Communication Quality and Culturally Sensitive Communication were positively associated with Treatment Satisfaction among patients in international medical centres through Patient Trust, with trust functioning as a partial mediator in the former pathway and a full mediator in the latter. Language Concordance was positively associated with Treatment Satisfaction and positively moderated the relationship between Nursing Communication Quality and Patient Trust. Nursing workforce development in international medical centres should therefore adopt an integrated strategy centred on 'communication as the foundation, culture as the basis for trust, and language as an enabler'.

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