A Comparative Study of the Effects of Outpatient Empirical Communication and GLTC Communication on Physicians' Emotional State: Postprint

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Abstract

Background Outpatient physicians are the primary providers of medical diagnosis and treatment activities in hospitals, and their emotional state serves as a guarantee for high-quality medical services, making the doctor-patient communication mode particularly crucial.

Objective From the perspective of physician emotional feedback, to compare the effects of experiential communication versus GLTC communication (Goodwill—physician demonstration of goodwill, Listening—physician listening, Talking—doctor-patient communication, Cooperation—doctor-patient cooperation) among outpatient physicians, identify the main communication details that influence physician emotion, and provide references for improving physician communication skills and emotional states in the future.

Methods From July 2021 to January 2022, an experimental study of the outpatient GLTC communication protocol was conducted across 24 departments in 4 tertiary general hospitals in Jiangsu Province, with relevant data analyzed using descriptive analysis, Mann-Whitney U test, multiple linear regression, and other statistical methods.

Results Following outpatient experiential communication, physicians' fatigue emotion increased significantly ($P<0.05$); after outpatient GLTC communication, no significant difference was observed in physicians' pre- and post-communication emotions ($P>0.05$); post-communication, the fatigue and confusion scores of physicians in the experiential group were higher than those in the GLTC group; within unit time, the completion rates of most related communication details in the GLTC group were significantly higher than those in the experiential group ($P<0.05$); multiple linear regression results indicated that communication details such as smiling, standing up, and plain-language explanation were the primary factors influencing physicians' overall emotion.

Conclusion Outpatient GLTC communication is more effective in alleviating physician fatigue; communication details such as physicians' smiling and friendly attitude are aspects that young and middle-aged outpatient physicians need to emphasize in the future, while the completion rates of these details require improvement.

Full Text

A Comparative Study on the Influence of Outpatient Experiential Communication and GLTC Communication on Doctors' Emotional State

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Abstract

Background: Outpatient doctors are the primary providers of hospital diagnosis and treatment services, and their emotional state is crucial for ensuring high-quality medical care. The method of doctor-patient communication plays a particularly important role in this context.

Objective: From the perspective of doctors'emotional feedback, this study compares the effects of outpatient experiential communication versus GLTC communication (Goodwill–Listening–Talking–Cooperation), identifies the specific communication details that primarily influence doctors' emotions, and provides references for improving doctors' communication skills and emotional states.

Methods: From July 2021 to January 2022, a pilot study of the outpatient GLTC communication protocol was conducted across 24 departments in four tertiary general hospitals in Jiangsu Province. Relevant data were analyzed using descriptive analysis, Mann-Whitney U tests, and multiple linear regression.

Results: After experiential communication, doctors' fatigue emotions increased significantly ($P<0.05$). After GLTC communication, no significant differences were observed in doctors' emotions before and after the consultation ($P>0.05$). Post-communication, the experiential group showed higher scores for emotional fatigue and confusion compared to the GLTC group. Within the same time unit, the GLTC group demonstrated significantly higher completion rates for most relevant communication details ($P<0.05$). Multiple linear regression results indicated that communication details such as smiling, standing up, and using plain language explanations were the main factors influencing doctors' overall emotions.

Conclusion: Outpatient GLTC communication is more effective at alleviating doctors' fatigue. Communication details such as doctors' smiles and friendly attitudes are important aspects that young and middle-aged outpatient doctors need to focus on in the future, though the completion rates of these details still require improvement.

Keywords: Doctor-patient communication; Outpatient care; Doctor' s emotions; Experimental research

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Medical disputes have consistently been a major social concern. The recently released *2021 National Big Data Report on Medical Malpractice Liability Cases* shows that outpatient and emergency cases accounted for the highest number at 465 cases (24.17% of the total). Among the reasons for hospitals losing lawsuits, failure to fulfill duty of care and delayed treatment accounted for the most cases at 42%, followed by failure to fulfill informed consent obligations at 22% [**?**]. Bai Yanjun also found in a survey that among outpatient complaints leading to medical disputes, service attitude and communication issues accounted for 32.73%, with doctors primarily exhibiting behaviors such as failing to explain patiently and thoroughly, showing indifference toward patients, and working with negative emotions [**?**]. Overall, outpatient departments are key areas where medical disputes occur, and doctors' communication methods play a critical role. Patients' emotions during consultations are influenced by communication styles and their own medical conditions, while doctors' emotions are affected by feedback from patients. In this sense, doctors' communication methods serve as a guarantee for their own positive emotions. Meanwhile, in high-pressure outpatient settings, senior doctors with rich clinical experience can often communicate effectively with patients, whereas young doctors require continuous learning and trial-and-error before accumulating sufficient experience. During this process, they may pay opportunity costs such as medical disputes. The GLTC doctor-patient communication model includes Goodwill, Listening,

Talking, and Cooperation [**?**], has been incorporated into the national planning textbook *Doctor-Patient Communication*, and has been applied in relevant clinical practices [**?**]. This study uses the GLTC doctor-patient communication model as its core to develop an outpatient GLTC communication protocol, focusing on young doctors and comparing outpatient experiential versus GLTC communication effects from the doctors' emotional perspective. By thoroughly examining specific communication details, this research aims to improve young doctors' outpatient communication skills, safeguard doctors' positive emotions, and reduce the incidence of doctor-patient disputes.

1.1 Study Subjects

Four tertiary general hospitals in Jiangsu Province were randomly selected, primarily including internal medicine, surgery, and ENT departments. Six departments were chosen from each hospital, and one responsible doctor was randomly selected from each department according to requirements, totaling 24 doctors. Before and after the application of the outpatient GLTC doctor-patient communication protocol, approximately 15-25 outpatient patients under each doctor' s care were selected as study subjects.

1.2 Literature Review

Domestic and international literature was reviewed to understand relevant emotional scales. The Hamilton Anxiety Scale [**?**] and Hamilton Depression Scale [**?**] are primarily used to evaluate patient anxiety and depression, while more comprehensive emotional evaluation scales include the Positive and Negative Affect Schedule [**?**] and the Brief Profile of Mood States (BPOMS) [**?**]. Given its instantaneous characteristics, the BPOMS was deemed more suitable for this study. Additionally, the GLTC doctor-patient communication model integrates medical and humanistic elements effectively and demonstrates good adaptability to China' s medical environment compared to other major communication models [**?**]. Based on this foundation, the outpatient GLTC doctor-patient communication method was developed.

1.3 Expert Consultation

Following preliminary literature research, the outpatient GLTC doctor-patient communication method was developed, consisting of six stages: reception, history taking, physical examination, laboratory testing, diagnosis and communication, and conclusion and instructions. Specific requirements for communication details at each stage were established (see Section 1.4.2). In the first round, questionnaires were distributed to 12 experts, with 12 valid responses recovered. In the second round, 13 experts received questionnaires, with 13 valid responses recovered, achieving a 100% recovery rate for both rounds. The expert authority coefficients for the first round were: academic level (q) = 0.983, judgment basis (Cs) = 0.883, and familiarity (Ca) = 0.966. After modifications based on first-round expert feedback, the second-round coefficients were: academic level

(q) = 0.985, judgment basis (Cs) = 0.885, and familiarity (Ca) = 0.985, all exceeding 0.7, indicating good results. For the importance assessment of the six communication stages, Kendall' s coefficients were 0.190 and 0.231 for the first and second rounds respectively (P<0.05), both meeting statistical significance.

1.4 Experimental Study

Based on preliminary research and expert opinions, a clinical trial comparative study was conducted. The first batch used personal experiential communication, while the second batch used the GLTC outpatient communication method.

1.4.1 Inclusion Criteria for Doctors and Patients Doctors were required to: hold independent outpatient qualifications, be under 40 years old, hold attending or associate chief physician titles, have never participated in relevant doctor-patient communication skills training, rely entirely on personal experience for communication, have never studied the GLTC model, and have considerable room for improvement in communication skills. Patients were required to be conscious outpatient visitors, not merely seeking prescription refills, and capable of adequate verbal expression.

1.4.2 Instruments, Protocols, and Questionnaires (1) Brief Profile of Mood States (BPOMS)
This study selected the Brief Profile of Mood States (BPOMS), which Chi Song et al. simplified based on the 1971 Profile of Mood States developed by McNair, Albrecht, and colleagues [**?**], adapting it to China' s actual conditions. The scale contains 30 items across six dimensions: Tension (T), Anger (A), Depression (D), Fatigue (F), Vigor (V), and Confusion (C), with five items per dimension. Response options range from "not at all" to "extremely" on a 5-point scale (0-4). Each dimension' s score is the sum of its five items, with higher scores indicating worse mood. In this study, the scale' s Cronbach' s α coefficient was 0.902, demonstrating high reliability. Factor analysis yielded a KMO value of 0.913, with Bartlett' s test of sphericity P<0.001, meeting factor analysis criteria, and a cumulative variance contribution rate of 60.82%, indicating good validity.

(2) Outpatient GLTC Communication Protocol and Evaluation Questionnaire
The outpatient GLTC communication protocol was developed based on the GLTC doctor-patient communication model [**?**]. Centered on the GLTC model, it integrates humanistic elements such as goodwill and listening into various outpatient communication stages, divided into six phases: reception, history taking, physical examination, laboratory testing, diagnosis and communication, and conclusion and instructions. Specific requirements include: during reception, doctors should stand up, smile kindly, assist patients to sit if needed, and offer comforting words; during history taking, they should introduce themselves, inquire about medical history without interrupting patients, respond appropri-

ately, and maintain necessary records; during physical examination, they should wash hands with disinfectant, warm cold hands, perform gentle movements, and provide verbal communication or reassurance; during laboratory testing, they should inform patients about relevant examinations based on condition and answer questions patiently; during diagnosis and communication, they should propose treatment plans based on diagnostic results, solicit patient opinions, answer questions patiently in plain language, and provide appropriate verbal comfort; during conclusion and instructions, they should remind patients of precautions, respond kindly if time is insufficient and patients repeatedly ask the same question, explain they will provide detailed explanations next time while emphasizing important points, write down key points on paper if necessary, and finally bid patients farewell with polite language.

The communication details evaluation questionnaire corresponded to each stage, with each detail having two options: "completed" and "not completed," scored as 1 and 0 respectively. The questionnaire' s Cronbach' s α coefficient was 0.774, indicating good reliability. Factor analysis yielded a KMO value of 0.790, with Bartlett' s test $P<0.001$, meeting factor analysis criteria. Analysis of 19 items showed a cumulative variance contribution rate of 64.21%, demonstrating good validity.

1.4.3 Formal Experiment (1) Outpatient Doctor Experiential Communication Phase

Before the trial, investigators communicated with doctors in advance. In this phase, doctors conducted outpatient doctor-patient communication entirely according to their personal habits and normal styles, without being informed about the specific details of the subsequent intervention training. Outpatient duration was unrestricted. Doctors completed the mood scale once at the beginning and once at the end of their outpatient shift. For each doctor-patient communication, an investigator observed in the consultation room as a medical student intern, timed each interaction, and conducted real-time evaluations using relevant scales.

(2) Outpatient GLTC Doctor-Patient Communication Protocol Training

After doctors completed communication using their personal experience, investigators introduced the outpatient GLTC protocol and conducted relevant training, including explaining the specific procedures, training content, and related matters. Doctors then self-studied using the GLTC outpatient communication protocol training manual and instructional videos, and practiced with investigators through simulation exercises to ensure mastery before applying it in subsequent outpatient communications.

(3) Outpatient Doctor GLTC Communication Phase

After training, doctors conducted communication with patients using the outpatient GLTC method, with all other procedures identical to the experiential communication phase. See Table 1 and Figure 1 [Figure 1: see original paper].

Table 1 Program Schedule
Phase	Activity
Experiential Communication	First mood assessment → Experiential communication → Second mood assessment
GLTC Training Period	Outpatient GLTC doctor-patient communication training
GLTC Communication	First mood assessment → GLTC communication → Second mood assessment

Figure 1 Overview of Outpatient Communication [Figure 1: see original paper]

1.5 Quality Control

(1) Investigators were trained before the survey to standardize procedures, criteria, and completion methods, with timely discussions of encountered problems.

(2) Before the survey, contact was established with each hospital to identify doctors, who received unified training (using training manuals) to facilitate subsequent learning and clinical application of the GLTC outpatient communication protocol.

(3) An investigator was present during each doctor-patient communication to assist with questionnaire completion, ensure protocol effectiveness, and remind doctors throughout the communication process.

1.6 Data Processing

Data were double-entered using EpiData 3.1 with logical error checking. SPSS 21.0 was used for data organization, descriptive analysis, Mann-Whitney U tests, ^{2} tests, and multiple linear regression analysis. Count data were expressed as rates, and measurement data as median (P25, P75). $P<0.05$ was considered statistically significant.

2.1 Basic Information

Doctors in this study were distributed across general practice, internal medicine, surgery, dermatology, ENT, and other routine outpatient departments. Two batches of doctor-patient communication were conducted: the first using personal experiential communication and the second using GLTC communication. A total of 24 doctors participated, with the same individuals in both batches. Doctor ages were concentrated between 31-40 years; 13 were attending physicians (54.17%) and 11 were associate chief physicians (45.83%); 14 were male (58.33%) and 10 were female (41.67%). In the patient population, the experiential communication group included 339 individuals (167 males [49.26%] and 172 females [50.74%]), while the GLTC communication group included 464 individuals (200 males [43.10%] and 264 females [56.90%]).

2.2 Comparison of Self-Assessed Emotions Before and After Experiential Communication

Due to heavy outpatient workloads, doctors completed the Brief Profile of Mood States only once at the beginning and once at the end of their shift. However, third-party evaluators assessed doctors' emotions on-site during each doctor-patient interaction. This study included 48 doctor self-assessments (24 in the experiential group and 24 in the GLTC group) and 803 third-party evaluations (339 in the experiential group and 464 in the GLTC group). In experiential communication, comparisons of doctors' self-assessed emotional scores across dimensions before and after communication showed statistically significant differences in the fatigue dimension (Z=-3.000, P<0.05), with post-communication scores higher than pre-communication scores. See Table 2 .

Table 2 Comparison of Doctors' Emotions Before and After Experiential Communication

Dimension	Pre-Communication	Post-Communication
Tension	0(0,1)	0(0,0)
Anger	2(0,3)	8(4.25,12.75)
Depression	2(0.25,3.75)	0(0,1)
Fatigue	0(0,1)	0(0,0.75)
Vigor	4(2,7.75)	10(6.25,11.75)
Confusion	2(1,3)	0(0,0)

Values expressed as median (P25, P75)

2.3 Comparison of Self-Assessed Emotions Before and After GLTC Communication

In GLTC communication, comparisons of doctors' emotional scores across dimensions before and after communication showed no statistically significant differences in any of the six dimensions (tension, anger, etc.) (P>0.05). See Table 3 .

Table 3 Comparison of Doctors' Emotions Before and After GLTC Communication

Dimension	Pre-Communication	Post-Communication
Tension	0(0,0)	0(0,0)
Anger	2(0,3)	10(5.25,11)
Depression	2(1,2)	0(0,0)
Fatigue	0(0,0)	0(0,0)
Vigor	1(0,3.75)	8.5(5,11.75)
Confusion	1(0,2)	0(0,0)

Values expressed as median (P25, P75)

2.4 Comparison of Post-Communication Emotions Between Groups

Mann-Whitney U tests on pre-communication emotional scores across six dimensions showed no statistically significant differences between groups (P>0.05), indicating comparable baseline emotions. Post-communication comparisons revealed significant differences between the experiential and GLTC groups in fatigue and confusion dimensions (P<0.05), with the GLTC group showing lower score distributions. See Table 4 .

Table 4 Comparison of Emotions Between Two Groups of Doctors After Consultation

Dimension	Experiential Group	GLTC Group
Tension	0(0,1)	0(0,0)
Anger	0(0,0)	0(0,0)
Depression	2(0,3)	2(0,3)
Fatigue	8(4.25,12.75)	10(5.25,11)
Vigor	2(0.25,3.75)	2(1,2)
Confusion	0(0,1)	0(0,0)
Tension	0(0,0.75)	0(0,0)
Anger	4(2,7.75)	1(0,3.75)
Depression	10(6.25,11.75)	8.5(5,11.75)
Fatigue	2(1,3)	1(0,2)
Vigor	0(0,0)	0(0,0)

Values expressed as median (P25, P75)

2.5 Detailed Comparison of Communication Skills Between Groups

The average communication duration was 247 seconds in the experiential group and 230 seconds in the GLTC group, with no statistically significant overall difference (P>0.05), ensuring comparability of communication details. Based on 803 observed doctor-patient communications, the completion rate for "smiling" during the reception phase was 34.51% in the experiential group versus 69.61% in the GLTC group, a statistically significant difference (P<0.05). Additionally, most completion rates for different key points across stages differed significantly between groups (P<0.05), with the GLTC group showing higher percentages. See Table 5 .

Table 5 Detailed Comparison of Communication Skills Between Groups

Stage	Communication Detail	Experiential Group	GLTC Group	P-value
Reception	(1) Standing up	6.49%	89.09%	<0.001
	(2) Kind gaze	89.09%	98.92%	<0.001
	(3) Polite language	9.05%	99.57%	<0.001
	(4) Smiling	34.51%	69.61%	<0.001
History Taking	(1) Not interrupting patients	95.58%	98.71%	<0.001
	(2) Nodding responsively	92.04%	100.00%	<0.001
Physical Exam	(1) Gentle movements	87.14%	95.90%	<0.001
	(2) Reassurance	53.98%	55.39%	0.693
Lab Testing	(1) Informing necessity	67.14%	85.07%	<0.001
	(2) Patience	41.59%	49.14%	0.034
Diagnosis & Communication	(1) Soliciting patient opinions	92.63%	98.06%	<0.001
	(2) Patience	92.33%	95.91%	<0.001
	(3) Plain language explanation	94.40%	100.00%	<0.001
	(4) Verbal comfort	90.27%	94.40%	<0.001
Conclusion & Instructions	(1) Friendly attitude	94.40%	100.00%	<0.001
	(2) Standing up	73.16%	95.47%	<0.001
	(3) Kind gaze	97.05%	99.57%	<0.001
	(4) Polite language	2.36%	7.11%	<0.001
	(5) Smiling	86.73%	99.78%	<0.001

2.6 Multiple Linear Regression Analysis of Factors Influencing Doctors' Overall Emotions

The six dimension scores from third-party evaluations were summed for each doctor-patient interaction, with the total emotional score serving as the dependent variable. Nineteen communication details across six stages were entered as independent variables in a multiple linear regression analysis. Results showed that communication details including smiling, nodding responsively, using plain language explanations, and standing up had statistically significant effects on doctors' overall emotions ($P<0.05$). When doctors successfully implemented

these behaviors, corresponding emotional scores were lower than when they did not. See Table 6 .

Table 6 Multiple Linear Regression Analysis of Factors Influencing Doctors' Overall Mood

Variable	B	95% CI	P-value
Reception-Standing up	-4.794	(-7.524, -2.064)	<0.001
Reception-Kind gaze	-3.450	(-6.156, -0.744)	0.001
Reception-Polite language	-8.052	(-11.284, -4.819)	<0.001
Reception-Smiling	-6.407	(-9.836, -2.978)	<0.001
History Taking-Not interrupting patients	-6.304	(-10.344, -2.264)	<0.001
History Taking-Nodding responsively	1.985	(0.068, 3.902)	0.034
Physical Exam-Gentle movements	-1.515	(-2.447, -0.583)	0.002
Physical Exam-Reassurance	—	—	—
Lab Testing-Patience	—	—	—
Diagnosis & Communication-Soliciting patient opinions	—	—	—
Diagnosis & Communication-Patience	—	—	—
Diagnosis & Communication-Plain language explanation	-6.407	(-9.836, -2.978)	<0.001
Diagnosis & Communication-Verbal comfort	—	—	—
Conclusion & Instructions-Friendly attitude	-4.794	(-7.524, -2.064)	<0.001
Conclusion & Instructions-Standing up	-3.450	(-6.156, -0.744)	0.001
Conclusion & Instructions-Kind gaze	—	—	—
Conclusion & Instructions-Polite language	—	—	—

Variable	B	95% CI	P-value
Conclusion & Instructions-Smiling	1.985	(0.068, 3.902)	0.034

Note: "—" indicates the variable was not included in the final model. "a" indicates P<0.05.

3 Discussion and Analysis

3.1 Outpatient GLTC Communication Better Alleviates Doctor Fatigue As shown in Table 3, doctors' fatigue scores after experiential communication were significantly higher than before communication, indicating that without systematic communication training, reliance on personal experience alone can easily lead to professional burnout. Inadequate doctor-patient communication readily causes tense relationships, and Liu Luning et al. have proposed that doctors' fatigue levels increase with the severity of doctor-patient relationship tension [**?**]. In this study, young doctors' outpatient experiential communication still has room for improvement in alleviating burnout. Tables 4 and 5 show that after GLTC communication, doctors' emotional distributions across dimensions showed no significant differences from pre-communication levels. Comparing post-communication emotions between groups, the experiential group showed significantly higher fatigue scores than the GLTC group. Thus, while experiential communication increased doctors' fatigue, GLTC communication better preserved doctors'vitality and reduced fatigue. The outpatient GLTC protocol fully integrates medical and humanistic elements such as goodwill and listening, enabling doctors to achieve effective doctor-patient communication within the same time unit. When communication is effective, patients demonstrate better compliance, and doctors receive positive feedback that improves their own emotions. Most young doctors lack sufficient interpersonal communication experience [**?**] and particularly need learning templates like the outpatient GLTC protocol to compensate for experiential deficiencies. Therefore, the outpatient GLTC doctor-patient communication protocol holds important reference value for future outpatient communication, especially for young doctors.

3.2 Communication Details Influence Doctors' Overall Emotions According to the BPOMS scoring rules, higher total scores indicate worse emotional states. Combined with the multiple linear regression analysis of doctors' overall emotions in Table 6, key influencing factors include polite language during reception, not interrupting patients and nodding responsively during history taking, using plain language explanations during diagnosis and communication, and friendly attitude, standing up, and smiling during conclusion and instructions. In actual clinical practice, doctors' full application of these details helps patients feel attended to, improving their emotions and satisfaction, which in

turn provides positive feedback to doctors, thereby improving doctors' emotions. Doctors' outpatient communication methods indirectly influence their overall emotional state. Tang Kai et al. have also proposed in their research that managing doctors' emotions is crucial for hospital survival and development, as positive emotions can stimulate greater creativity and contribution, while negative emotions may lead to medical disputes or accidents [**?**]. With proper organizational management, doctors' expression of positive emotional states can regulate patients to positive states and promote their physical and mental health. The outpatient GLTC protocol in this study covers all these communication details, providing important reference value for future hospital training of young doctors in outpatient communication and reducing doctor-patient dispute rates.

3.3 Completion Rates of Communication Details Such as Smiling Require Improvement Table 5 shows that after GLTC communication training, doctors' completion rates for communication details across six stages improved significantly, with most rates exceeding 85%. However, substantial improvement is still needed for details such as standing up and smiling, which were identified as important influencing factors in the multiple linear regression analysis. Regarding doctors' smiling service, Wang Xinjian et al. have proposed that "smiling service" reflects the broad application of emotional strategies in social affairs, using positive emotions to input benign emotional experiences into adverse social events and effectively improve public satisfaction [**?**]. Doctors' smiles not only enhance patient satisfaction but also positively influence doctors' own emotions through patient feedback. Only when doctor-patient psychological order reaches a harmonious state can the ideal state of doctor-patient community construction be achieved. Additionally, the humanization and emotionalization embedded in other communication details enable genuine person-to-person communication between doctors and patients, rather than a "doctor-patient communication" process in biomedical scenarios involving person-to-disease, person-to-biochemical terminology, or person-to-modern-electronic-instrument interactions [**?**]. Regarding standing up, some doctors reported insufficient working time to normalize this behavior. However, the two groups showed no significant difference in actual communication duration, with the experiential group averaging 247 seconds versus 230 seconds for the GLTC group. Therefore, how to flexibly promote the teaching of communication methods in future practical applications [**?**] and improve completion rates for details like smiling and standing up according to communication needs represents a key direction for future research.

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Conflict of Interest: The authors declare no conflict of interest.

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