Patient-Centered Care in Primary Public Healthcare Institution Reform: Does Physician-Patient Communication Improve Medical Service Quality? Postprint

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Abstract

Background “Patient-centered” care sets higher requirements for reconstructing doctor-patient communication patterns and doctor-patient relationships in primary public healthcare institutions. Objective To analyze the impact of patient-centered doctor-patient communication on healthcare service quality and to provide scientific evidence for promoting reforms in primary public healthcare institutions. Methods All public community health service centers providing basic medical services in the main urban area of a city in Inner Mongolia Autonomous Region were selected as the study site, and a field survey was conducted in 2021 using the standardized patient method. This survey included 118 doctor-patient communication records consisting of 26 medical institutions, 59 doctors, and 12 standardized patients. This study selected the common cold, asthma, and unstable angina as the disease types to be portrayed by standardized patients. Using multiple regression models and Probit models, the impact of patient-centered doctor-patient communication on healthcare service quality was evaluated. Results The results from the 118 doctor-patient communication records showed that the median compliance with recommended history-taking items was 17.6% (14.6%), and the median compliance with recommended examination items was 25.0% (40.0%); among them, 75 (63.5%) had correct diagnosis and 59 (50.0%) had correct treatment; the median total cost was 84.84 (130.44) yuan, and the median medication cost was 37.62 (47.38) yuan; 66 (55.9%) involved unnecessary medications and 71 (60.2%) involved unnecessary examinations; the median consultation time was 13.625 (10.850) minutes; the average score for patient-centered doctor-patient communication was $(26.712\$\pm10.658) points, with scores for the first, second, and third dimensions being (12.915\pm5.355), (7.492\pm2.8$ points, respectively. Results from the multiple linear regression model and Probit model showed that for each 1-point increase in the total score of

patient-centered doctor-patient communication, compliance with recommended history-taking items increased by 0.001 percentage points, compliance with recommended examinations increased by 0.001 percentage points, the rate of correct diagnosis increased by an average of 4.6 percentage points, the rate of correct treatment increased by 4.2 percentage points, total cost increased by 1.993 yuan, medication cost increased by 0.517 yuan, the proportion of unnecessary medications decreased by 3.4 percentage points, the proportion of unnecessary examinations increased by 0.2 percentage points, and consultation time decreased by 0.291 minutes. Conclusion Patient-centered doctor-patient communication increased the effectiveness and safety of healthcare services, but also increased medical costs. It is necessary to promote patient-centered doctor-patient communication through four aspects: resource endowment, salary incentives, doctor-patient relationships, and collaborative services, thereby improving healthcare service quality.

Full Text

"Patient-Centered" Care in Public Primary Health Care Institutions: Does Doctor-Patient Communication Improve the Quality of Primary Care Services?

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Abstract

Background: The concept of "patient-centered" care has presented higher requirements for doctor-patient communication and the reconstruction of doctor-patient relationships in public primary health care institutions.

Objective: To analyze the impact of "patient-centered" doctor-patient communication on the quality of primary care services and provide scientific evidence to promote reforms in public primary health care institutions.

Methods: All public community health centers providing primary care services in the main urban area of a city in Inner Mongolia Autonomous Region were selected as study sites for a field survey conducted in 2021 using the standardized patient method. The survey included 118 doctor-patient communication records involving 26 medical institutions, 59 doctors, and 12 standardized patients. Common cold, asthma, and unstable angina were selected as the disease types for standardized patients to portray. Multiple regression models and Probit

models were used to evaluate the impact of "patient-centered" doctor-patient communication on primary care quality.

Results: The 118 doctor-patient communication records revealed a median adherence rate of 17.6% (14.6%) for recommended consultation items and 25.0% (40.0%) for recommended examination items. Correct diagnosis occurred in 75 cases (63.5%), and correct treatment in 59 cases (50.0%). The median total cost was 84.84 yuan (130.44 yuan), and the median drug cost was 37.62 yuan (47.38 yuan). Unnecessary medications were prescribed in 66 cases (55.9%), and unnecessary examinations were ordered in 71 cases (60.2%). The median consultation time was 13.625 (10.850) minutes. The average score for "patient-centered" doctor-patient communication was $(26.712\$\pm10.658), with the first dimension scoring (12.915\pm5.355) points, the second dimension (7.492\pm2.867) po$ points. Multiple linear regression and Probit model results indicated that for every one-point increase in the total patient-centered communication score, adherence to recommended consultation items increased by 0.001 percentage points, adherence to recommended examinations increased by 0.001 percentage points, correct diagnosis rate increased by an average of 4.6 percentage points, correct treatment rate increased by 4.2 percentage points, total cost increased by 1.993 yuan, drug cost increased by 0.517 yuan, proportion of unnecessary medications decreased by 3.4 percentage points, proportion of unnecessary examinations increased by 0.2 percentage points, and consultation time decreased by 0.291 minutes.

Conclusion: "Patient-centered" doctor-patient communication enhances the effectiveness and safety of medical services but also increases medical costs. It is necessary to promote "patient-centered" doctor-patient communication through resource endowment, salary incentives, doctor-patient relationships, and collaborative services to improve primary care quality.

Keywords: Health care quality, access, and evaluation; Quality improvement; Patient-centered; Doctor-patient communication; Primary health care institutions; Standardized patient approach

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Introduction

The World Health Organization states that 80% of health problems can be resolved at the primary health care level. In 2021, primary health care institutions in China provided 4.25 billion outpatient visits, accounting for 50.17% of the nation's total annual visits. Primary care serves as the first line of defense for residents' health and constitutes a vital component of China's health service system construction. Therefore, how to effectively improve medical service quality and fully leverage the "gatekeeper" role of primary health care institutions warrants urgent attention. To improve service quality, the "Opinions of the Central Committee of the Communist Party of China and the State Council on Deepening the Reform of the Medical and Health System" proposed advancing public

hospital management system reform, adhering to a patient-centered approach, optimizing service processes, and standardizing medication, examination, and medical practices. The "patient-centered" concept has placed higher demands on public primary health care institution reforms, particularly in doctor-patient communication modalities and relationship reconstruction.

Previous studies have examined influencing factors, practical value, and pathways of doctor-patient communication and patient-centered care. Physicians' perception of doctor-patient relationships affects job performance, and patient-centered medical services represent the reform direction for public and primary hospitals. However, whether patient-centered doctor-patient communication actually improves medical service quality lacks analysis, and its effectiveness in primary health care institutions requires evaluation. This study employs the standardized patient method, where healthy individuals without medical training portray specific disease symptoms and signs after instruction, simulate patient visits, and record physicians' diagnostic and treatment processes to evaluate service quality.

Methods

1.1 Study Subjects All public community health centers providing basic medical services in the main urban area of a city in Inner Mongolia Autonomous Region were selected as study sites. A field survey was conducted in 2021 using the standardized patient method, yielding 118 doctor-patient communication records from 26 medical institutions, 59 doctors, and 12 standardized patients. Common cold, asthma, and unstable angina were selected as the disease types for standardized patients to portray, primarily because: (1) these three diseases have high incidence rates and represent common problems in primary health care institutions—data show that in 2021, influenza ranked among the top five nationally reported Class C infectious diseases; asthma prevalence among Chinese adults aged 20+ reached 4.2% with 45.7 million patients, far exceeding estimates; and unstable angina is among the most common cardiovascular diseases, with the "China Cardiovascular Health and Disease Report 2021" estimating 330 million current cardiovascular disease patients; and (2) diagnosis and treatment of these diseases do not require extensive equipment, making them suitable for primary care physicians and easier for standardized patients to simulate. This study was approved by the Ethics Committee of Xi'an Jiaotong University (Approval No. 2021-1516).

1.2 Variables 1.2.1 Dependent Variables: The dependent variable was medical service quality. Following the Institute of Medicine's quality dimensions, we measured primary care quality from four aspects: effectiveness, economy, safety, and timeliness. Effectiveness included: (1) adherence to diagnostic protocols—whether physicians followed disease-specific diagnostic and examination guidelines (consultation and examination checklists), including adherence to recommended consultation and examination items; (2) diagnostic accuracy—

correct diagnoses included common cold, upper respiratory infection, etc. for cold cases; angina, unstable angina, or coronary heart disease for unstable angina cases; and asthma or allergic asthma for asthma cases; and (3) treatment correctness—judged by prescribed medications or prescriptions. Economy included: (1) total cost and (2) drug cost. Safety included: (1) proportion of unnecessary examinations and (2) proportion of unnecessary medications. Timeliness was measured by consultation duration.

1.2.2 Independent Variable: The independent variable was "patient-centered" doctor-patient communication, measured using the "Patient Perspective on Patient-Centeredness in Healthcare Quality Assessment Scale (PPPC-RC)." This 18-item scale has a total score of 54 points and comprises three dimensions: the first dimension—exploring health, disease, and illness experience + enhancing relationship (8 items, 24 points); the second dimension—understanding the whole person (5 items, 15 points); and the third dimension—finding common ground (5 items, 15 points). Reliability and validity analysis showed a Cronbach's α coefficient of 0.943 and KMO value of 0.922, indicating high scale reliability and validity.

1.2.3 Control Variables: Based on previous research, we controlled for physician gender, standardized patient gender, physician age, medical consortium participation, gift-giving, disease type, and regional fixed effects.

1.3 Quality Control Community health center directors were notified three months before the survey that a standardized patient investigation would be conducted, but the specific timing was not disclosed to prevent physicians from altering their behavior upon learning of the survey. After each visit, investigators distributed questionnaires to standardized patients to complete immediately, with items such as the patient-centered communication score measured on-site. Completed questionnaires were collected and considered valid if responses were complete, logical, and free of false or patterned answers (e.g., selecting the same option throughout).

1.4 Statistical Methods Statistical analysis was performed using Stata 15.1 software. Normally distributed continuous data were expressed as mean ± standard deviation ($\bar{x}\pm s$), while non-normally distributed data were presented as median (interquartile range) [M(QR)]. Categorical data were expressed as frequency and percentage. Multiple linear regression was used for numerical dependent variables, and Probit regression for binary dependent variables. $P<0.05$ was considered statistically significant.

Results

2.1 Sample Characteristics Among the 59 physicians, 31 (52.5%) were male. Age distribution was: <30 years (4, 6.8%), 30-39 years (19, 32.2%), 40-49 years (15, 25.4%), and $ $50 years (21, 35.6\pm10.658)$, $with first dimension scoring (12.915\pm5.355)$, $second dimensi

2.2 Impact of Patient-Centered Doctor-Patient Communication on Quality of Public Primary Care Services Using adherence to recommended consultation items (actual values), adherence to recommended examination items (actual values), diagnostic correctness (incorrect=0, correct=1), treatment correctness (incorrect=0, correct=1), total cost (actual values), drug cost (actual values), unnecessary medication (none=0, present=1), unnecessary examination (none=0, present=1), and consultation time (actual values) as dependent variables, we analyzed the impact of communication on service quality. Independent variables included total patient-centered communication score and each dimension score (actual values), with controls for physician gender and age, standardized patient gender, medical consortium participation, gift-giving, and fixed effects for disease type and region.

2.2.1 Total Score Impact: Results showed that each one-point increase in total patient-centered communication score increased adherence to recommended consultation items by 0.001 percentage points, adherence to recommended examinations by 0.001 percentage points, correct diagnosis rate by 4.6 percentage points, correct treatment rate by 4.2 percentage points, total cost by 1.993 yuan, drug cost by 0.517 yuan, decreased unnecessary medication proportion by 3.4 percentage points, increased unnecessary examination proportion by 0.2 percentage points, and reduced consultation time by 0.291 minutes .

2.2.2 First Dimension Impact: Each one-point increase in the first dimension score increased adherence to recommended consultation items by 0.004 percentage points, correct diagnosis rate by 12.1 percentage points, correct treatment rate by 9.4 percentage points, total cost by 4.498 yuan, drug cost by 1.542 yuan, decreased unnecessary medication proportion by 7.7 percentage points, increased unnecessary examination proportion by 0.3 percentage points, and reduced consultation time by 0.558 minutes .

2.2.3 Second Dimension Impact: Each one-point increase in the second dimension score increased adherence to recommended consultation items by 0.004 percentage points, decreased adherence to recommended examinations by 0.004 percentage points, increased correct diagnosis rate by 12.2 percentage points, increased correct treatment rate by 16.0 percentage points, increased total cost by 8.192 yuan, increased drug cost by 1.956 yuan, decreased unnecessary medication proportion by 14.9 percentage points, increased unnecessary examination proportion by 0.8 percentage points, and reduced consultation time by 1.353 minutes .

2.2.4 Third Dimension Impact: Each one-point increase in the third dimension score increased adherence to recommended examinations by 0.008 percentage points, increased correct diagnosis rate by 6.7 percentage points, increased correct treatment rate by 10.8 percentage points, increased total cost by 4.540 yuan, increased drug cost by 0.717 yuan, decreased unnecessary medication proportion by 8.8 percentage points, increased unnecessary examination proportion by 0.6 percentage points, and reduced consultation time by 0.419 minutes .

Discussion

3.1 Methodological Considerations This study employed the standardized patient method. First, with ethical approval and informed consent, we audio-recorded medical service processes to effectively avoid the Hawthorne effect. Second, using recording devices throughout consultations preserved medical details without recall bias. Additionally, standardized patient case scripts presented consistent conditions, effectively reflecting quality differences across consultations and enabling comparisons between different types and locations of medical institutions.

3.2 Insufficient Patient-Centered Communication and Low Service Quality Our results show the average patient-centered communication score was approximately 27 points, relatively low and consistent with previous research. Prior studies indicate that physicians' awareness of doctor-patient communication needs strengthening, and negative or defensive attitudes toward doctor-patient relationships hinder communication quality. Average scores across all three dimensions were around 50%, with even lower scores for understanding the whole person and reaching common ground, aligning with previous findings that heavy workloads and patient volume in Chinese primary care limit communication to disease-specific topics, reducing scores in understanding patients' broader circumstances.

Regarding service quality adherence, physicians' compliance with recommended consultation and examination items was 17.6% (14.6%) and 25.0% (40.0%) respectively—overall low adherence, consistent with previous Xi'an-based research. Treatment correctness (50.0%) was also relatively low, likely due to limited equipment and lower diagnostic capacity in primary care institutions. Economically, after drug markups were eliminated in public institution reforms, "drug-dependent revenue" decreased while "equipment-dependent revenue" became a major factor driving up medical costs. Our safety results support this: unnecessary medication and examination proportions were 55.9% and 60.2% respectively—relatively high rates that increase total costs and patient burden.

3.3 Patient-Centered Communication Improves Service Quality
3.3.1 Improvements in Adherence, Effectiveness, and Safety: Regression results demonstrate that patient-centered communication improves adherence to recommended consultation items, diagnostic accuracy, treatment accuracy, and reduces unnecessary medication. Through communication, physicians collect information, understand conditions, build good relationships, and facilitate patient expression, enabling richer clinical judgment and treatment plans. As socioeconomic development increases patients' health service demands and expectations for care experience and convenience, particularly in the new era, physicians' inability to recognize emotions, perceive needs, and demonstrate empathy can lead to tense doctor-patient relationships. Therefore, deepening patient-centered communication in primary public institution

reforms is necessary to improve service quality.

3.3.2 Increased Medical Costs: Our regression analysis also shows that patient-centered communication increased total and drug costs, consistent with previous research documenting inappropriate medical behaviors like excessive examinations and prescriptions in primary care—supplier-induced demand. Physicians in public primary institutions also have profit motives; researchers have noted that public hospitals' public welfare orientation has deviated, requiring balance between public welfare and self-interest goals to promote quality services.

This study has several limitations. First, the small sample size may have resulted in insufficient statistical power for some indicators. Second, the standardized patient method is limited to cases without obvious physical symptoms, invasive examinations, or complex presentations, so results may not represent broader disease treatment capacity. Third, this study focuses on correlational rather than causal analysis.

Overall, primary public institution service quality has room for improvement, requiring continued public institution reforms and strengthened patient-centered communication. Based on the health systems macro-model, we propose recommendations across four domains: resource endowment, salary incentives, doctor-patient relationships, and collaborative services. First, institutions should implement regular systematic training reforms to strengthen standardized, high-quality workforce development and leverage technological, equipment, and funding resources. Second, salary incentives can balance institutional and physician self-interest with public welfare attributes, controlling unreasonable growth in drug and examination fees. Third, public institutions must establish patient-centered care philosophies, emphasizing public welfare and improving doctor-patient relationships through communication, particularly by better understanding patients and reaching consensus. Finally, medical consortiums should support primary public institutions to create collaborative service delivery patterns.

Author Contributions: LI Dongxu conceived and designed the study, collected data, performed analysis, and wrote the manuscript. SU Min conceived and designed the study, revised the manuscript, and provided quality control. LIU Bin, ZHANG Tianjiao, and ZHANG Weile collected and organized data and revised the manuscript. All authors approved the final version.

Conflict of Interest Statement: The authors declare no conflicts of interest.

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