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Medical Staffs' Attitude Toward Patient-Centeredness in China's H City: A Cross-Sectional Study

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Abstract

Objectives: More patient-centred communication is associated with improved patient satisfaction and health status, fewer malpractice complaints, increased adherence and harmonious doctor-patient relationship. The study was based on doctor-patient relationships and the medical system in China, to measure preferences of physicians towards patient-centred communication of physicians in Northeast China, to explore background factors of patient-centred attitudes, and to provide references for medical reform and doctor-patient relationship.

Methods: A cross-sectional survey of medical staff conducted from January to February 2018 in H City of Heilongjiang Province, northeast China utilized the Chinese-revised Patient-Practitioner Orientation Scale (CR-PPOS), a validated instrument designed to measure individual preferences towards various aspects of the doctor-patient relationship and medical staff's attitudes. The medical staff demographic data were collected, including their gender, age, marital

status, service year, seniority, education level, pay satisfaction, and doctor-patient relationship cognition. A multiple logistic regression analysis was performed to identify factors associated with CR-PPOS.

Patient and Public Involvement: No patient involved

Results: A total of 618 valid questionnaires were obtained (representing 95.1% efficiency). The scale demonstrated sound reliability and validity. The Chinese medical staff scored considerably higher on the Caring subscale (20.42) (including patients' preferences into the decision-making process) than on the Sharing subscale (15.26) (sharing information/responsibility with patients), indicating that physicians showed a lower level of patient-centeredness in clinical communication. Medical staff's preference towards patient-centred communication was influenced by age, education level, average hours worked per day, and harmonious doctor-patient relationship cognition.

Conclusions: The present survey observed lower 'patient-centred' attitudes towards communication between doctors in Northeast China. Adapting physicians' communication strategies to patients' preferences based on their personal characteristics can be a viable approach towards improving doctor-patient relationship. The medical process should incorporate strong communication skills, and should provide required information on patients' health status. Society as a whole and the entire healthcare system also need to affirm the value.

Strengths and limitations of this study

- This was the first report to use the CR-PPOS to measure PCC in Northeast China;
- Promoted a more comprehensive understanding of Chinese northeast physicians' PCC;
- Most physicians placed more emphasis on caring than sharing in Northeast China;
- It has significant implication for medical practice based on Chinese special Context,Possible intervention approaches were found to enhance the value of PCC;
- The analysis only included general hospitals that focused on physicians in one city,which could lead to limited external validity.

Keywords: Patient‐Practitioner Orientation Scale (PPOS), Patient-Centered communication (PCC), China,Doctor-patient relationship

Introduction

Traditional biomedicine practices are based on Western science, focusing on the specific disease rather than the patient as a whole, and tending to grant doctors the decision-making power [1].Traditionally, the type of health care provided by medical practitioners in hospitals and general hospitals in particular has predominantly been doctor-centred. Patients in the process of diagnosis and treatment usually need to unconditionally obey the doctor's orders and accept the doctor's diagnosis, and if there are inappropriate, actions they will be reprimanded [2]. Because the suppressive relationship has ignored patients as unique human beings, transformation was imminent.

With the development of the Biopsychosocial paradigm, much attention has been directed to studying the varying orientations of physicians toward their patients, in particular the distinction between a patient-oriented style versus a doctor-oriented style of interaction[3-5]. The origin of patient-centred care can be traced to a period as far back as the time of Hippocrates within Western medical traditions.

Since then, each patient has been considered a relatively independent individual [6]. Patient-centeredness, however, has not been uniformly defined. It generally refers to establishment a partnership among physicians, patients and their families (when appropriate), in order to care for patients' needs, preferences and values,and to provide the necessary information and support, so that patients can actively participate in their own care and clinical decision-making [7, 8].

Patient-centred clinical practice is a holistic concept, in which components interact and unite in a unique way in each patient-doctor encounter [9]. Patient-centred communication (PCC), cultural sensitivity, and shared decision-making have become core values in medicine, and considerable research has been focused on improving communication between healthcare providers and their patients [10]. Communication has been considered crucial to high-quality health care. It is associated with higher patient and physician satisfaction, better biomedical outcomes related to patient adherence to treatment, decreased prescription-related adverse effects, improved self-management of chronic diseases, and improved health status [11]. Patient-centeredness has been regarded as one of the six core components of high-quality medical care[12].It contributes to building a partnership between physicians and patients, instead of promoting the traditional paternalism[13].

With increasing recognition of patient-centred care, it is becoming a core value of health services worldwide, and imparting patient-centred care has become an obligation for medical educators. However, it remains largely unexplored in practice, even as it is important for evaluating the tendencies of medical staff's clinical behaviour [14].

Harmonious doctor-patient relationship is the prerequisite for the progress of medical activities. At present, the doctor-patient relationship in China is complicated, medical disputes are frequent, and the crisis of mistrust between doctors and patients is deepening. The disharmony between doctors and patients has become a major obstacle to citizen's health rights and social harmony [15]. According to the 2017 'White Paper on the status of Medical Practitioners in China', 62% of doctors thought the working environment abominable, 50% thought that their work was not recognized by the society, and 66% have experienced some

degree of doctor-patient conflict[16]. This may be caused by the doctor's service orientation. Doctors, as the provider of medical services and the leader of medical behaviour, play a vital role in building a harmonious doctor-patient relationship [17]. Moreover, the subjective feelings of doctors on the doctor-patient relationship affect their medical behaviours and attitudes, as well as the overall state of doctor-patient relationships [18]. Therefore, it is necessary to explore the centeredness orientation from the perspective of doctors and dig deeply into factors associated with the lack of doctor-patient trust in order to rebuild doctor-patient trust and a positive medical environment.

Assessing such attitudes has become increasingly important in the context of health care and clinical treatment process. Much of the existing research related to patient-centred communication involves questionnaires designed to assess patient and physician preferences, and their correlations with patient outcomes. One widely used scale is the Patient–Practitioner Orientation Scale (PPOS). Originally developed by American scholar Krupat et al , PPOS is a previously validated 18-item instrument designed to access the attitudes of physicians, medical students, and patients toward their respective roles[19].The scale includes the ‘sharing’ and ‘caring’ dimensions[20]. The Caring subscale refers to the extent of the respondent’s belief about the importance of emotions, good interpersonal relationships during doctor patient encounters, and treating the patient as a whole person rather than as a medical condition. The Sharing subscale reflects the willingness to share information and power with patients, as well as the willingness to share control in decision-making [21]. Answers are based on a 6-point Likert scale (strongly agree-strongly disagree), with higher scores reflecting more patient-centred attitudes (score ranging from 1 to 6) in clinical communication. The PPOS has demonstrated strong psychometric properties and has been widely validated against a range of other attitudinal measures and relevant patient outcomes.

It has been extensively used in the US and has been translated into various languages, gaining worldwide popularity in measuring the preferences towards patient-centred communication .Shaw et al. conducted a secondary analysis to assess the validity of the PPOS from recorded visits for back pain[22]. Mudiyanse et al. translated and validated the PPOS in Sri Lanka[21] . Tsimtsiou et al. conducted a cross-sectional study of patients’ attitudes toward patient-centred care with the PPOS in Greece[23]. Moore carried out a cross-sectional survey, using an adapted version of the PPOS with a random sample of patients attending a general outpatient department in rural Nepal[24]. Kim used the PPOS to compare the attitudes of patients and doctors toward the roles that they should play in the health care process[25]. Lau et al. used the PPOS to investigate patients' preferences for patient-centred communication (PCC) in the encounter with healthcare professionals in an outpatient department in rural Sierra Leone [9].

In China, accounts of patient–physician communication have been prominent in the new healthcare era, as patient-centeredness is increasingly highlighted in clinical practice. Scholars have gradually begun studying patient-centred doctor–patient relationships from different perspectives. Ting et al. conducted a survey to identify patients’ preferences towards patient-centred communication in a hospital in the southwest part of China, the earliest known attempt to

apply PPOS in China[26].Later, Wang et al . conducted a cross-sectional study among physicians and patients in clinical settings in Shanghai, China to measure the preference towards patient-centred communication with the Chinese-revised Patient–Practitioner Orientation Scale (CR-PPOS)[27]. However, the economic development and the quantity of health resources in different regions of China vary greatly. It is thus unclear how well this instrument would work in other regions and surroundings.

China is a country with vast regional differences and uneven economic development, which have led to widening gaps between the rich and poor in terms of access to healthcare, quality of care, and health outcomes [28]. We conducted this research in H City, Heilongjiang, which is the northeast of China adjacent to the border, and China's old industrial base. The study measured preferences of physicians towards patient-centred communication on using the improved CR-PPOS, and further explored factors that might exert influence on physicians' preferences concerning patient-centred communication.

Materials & Methods

Study population and data collection: A cross-sectional survey of medical staff was conducted from January to February 2018 in H City of Heilongjiang Province, northeast China. A stratified sampling design was adopted to ensure that study data were representative of the area. Seven medical institutions were selected based on size and level of development. Considering the length of time allotted for this research and the limited time available to engage with medical staff, participants were intentionally selected for the study utilizing certain inclusion criteria. All staff had worked for at least one year in the clinical department, and had volunteered to participate; those who were absent were excluded. All respondents were also full-time employees of the hospital, thus ensuring the integrity and effectiveness of data collection; the average research time at each hospital was from one day to one and a half days. Self-reporting questionnaires were distributed in person by 14-trained investigators. The researchers obtained oral informed consent prior to beginning the study and a group-wide oral informed consent was read by the investigators to the participants., and the data were collected anonymously to ensure confidentiality. Respondents chose the best time to complete the questionnaire, and most completed questionnaires were collected on the same day by investigators. In cases where respondents wanted to participate but were unable to complete the questionnaire on the same day, it was collected on an agreed-upon date. Before distributing the questionnaire, the investigators informed all respondents of the purposes and methods of the study in a notification letter. The investigators stayed about half of the day in each hospital for data collection. They collected the questionnaires approximately 15 minutes after distribution, and they checked the completeness of each. If any key questions were not filled in, the investigator returned to the doctor for further answers.

Through this process, 650 questionnaires were distributed and 618 valid questionnaires were obtained (representing 95.1% efficiency). The sample represented 10.87% of all licensed physicians (nearly 5686 as of 2017) in the H City.

Patient and Public Involvement: No patient involved

Questionnaire design: The original PPOS is a self-administered instrument that contains 18 items regarding various aspects of doctor-patient relationship and communication. The responder expresses their level of agreement with each item on a six-point Likert scale from strongly agree to strongly disagree. Compared with the original PPOS, the 11-item Chinese-revised Patient–Practitioner Orientation Scale (CR-PPOS), revised by Chinese researcher Wang, et al. , obtained better psychometric indices, and displayed strong overall reliability and validity[27]. The CR-PPOS is a better instrument in a Chinese context than the original translated version. However, Jie Wang conducted this research in Shanghai, which is among the most developed cities in China and possesses abundant high-quality medical resources. Compared with Shanghai, China's Heilongjiang Province is an underdeveloped region, and medical resources are relatively scarce. Therefore, the differences in the investigation area and the limited educational level and cognitive ability of some medical staff needed to be taken into account. After obtaining the consent of the original author of PPOS and Professor Jie Wang, and combining suggestions and feedback from experts, scholars and respondents on the content and expression of the scale, we verbally revised the relevant items and formed the final scale consisting of two dimensions and 11 items.

Moreover, according to the report, the income of Chinese physicians was inconsistent with their social contribution, and income was an indispensable factor affecting doctor-patient relationship. Medical staffs were increasingly dissatisfied with the working environment and doctor-patient relationship. Therefore, we supplemented these two items in the basic information section to measure the pay satisfaction and the cognition of doctor-patient relationship of Chinese medical staffs, and whether it would affect their clinical behaviour and patient-centred care or not. In the survey respondents answered: overall satisfaction with pay, and do you think the current doctor-patient relationship is harmonious?

Additionally, taking into account Chinese cultural differences and filling habits, the 6-point Likert scale represented in the questionnaire was :1 = ‘strongly disagree’, 2 = ‘disagree’, 3 = ‘somewhat disagree‘, 4 = ‘somewhat agree’, 5=‘ agree’, 6= ‘strongly agree’; and in order to facilitate comparison with the results of broader research, we have reversed all items before the statistical analysis.

Statistical analysis: Descriptive statistics (mean scores and standard deviations for quantitative data, and frequencies and percentages for qualitative data) were computed to describe respondents’ demographic characteristics and their work status. Cronbach’s α coefficient was used to evaluate the reliability of the scale, and confirmatory factor analysis (CFA) was used to evaluate the validity. In addition, multiple logistic regression was performed to analyse the

factors (including gender, age, marital status, education level, seniority, average working time per day, pay satisfaction, harmonious doctor-patient relationship cognition) that were likely to influence patient-centred clinical practice. Consequently, in this study, an overall score of over the median indicated 'patient-centred', and a score below the median indicated 'clinician-centred'. Multivariate logistic regression analyses of models Sharing, Caring, and Total was performed to identify significant influencing factors of patient-centred clinical practice; The median of the Sharing, Caring and Total was 15, 21 and 37; In the models, '0' equalled 'clinician-centred' and '1' equalled 'patient-centred'. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated. SPSS V.19.0 (IBM Corporation, Armonk, NY, USA) and AMOS 21.0 were used to conduct the analysis.

Ethical considerations: Ethical approval to conduct this study was granted by the research ethics committee of Harbin Medical University and informed consent to participate was obtained from each hospital and healthcare worker involved in the investigation. All respondents who gave their informed consent completed the questionnaire.

Results

Socio-demographic characteristics: The demographic and professional characteristics of 618 study participants are shown in Table 1. Of the investigated medical staff members, 49.7% are females. The ages ranged from 20 to 70, with an average age of 36. Over three-quarter of the respondents were married (76.2%). The largest proportion of respondents held the 'intermediate' professional title (38.6%), and the majority of respondents held a master's degree (52.8%). Only a tenth of people were satisfied with their pay, while almost 90% medical staff felt that the current doctor-patient relationship is not harmonious (Table 1).

Table 1. Respondents' social demographic characteristics ($N = 618$).

Characteristic	n	%
Gender		
Male	311	50.3
Female	307	49.7
Age		

≤25	30	4.9
25–30	136	22.0
30–40	323	52.3
＞40	129	20.9
Marital status		
Unmarried	134	21.7
Married	471	76.2
Divorced and others	13	2.1
Service year		
≤5	243	39.5
5–10	165	26.8
＞10	207	33.7
Seniority		
Senior	66	10.7
Sub-senior	104	16.9
Intermediate	237	38.6
Primary	168	27.4
No title	39	6.4
Education level		
Junior college and below	4	0.6
Bachelor’s degree	171	27.7

Master's degree and above	443	71.7
Pay satisfaction		
No	533	89.0
Yes	66	11.0
Harmonious doctor-patient relationship cognition		
No	553	89.6
Yes	64	10.4

Reliability and validity of the scale: Cronbach's alpha was calculated as a measure of internal consistency. The following Cronbach's alpha coefficients for total score was 0.720, for Caring subscale was 0.739 and Sharing subscale was 0.705. In the exploratory factor analysis, the Bartlett's sphericity test yielded a value of 1457.716 (df = 55, $p < 0.001$) and the Kaiser-Meyer-Olkin (KMO) index was 0.780 (Table 2).

Table2. The internal consistency of the scale

	Cronbach's α
Sharing subscale	0.705
Caring subscale	0.739
Total score	0.720

Item to total and component to total correlations were performed using Pearson correlation coefficient to substantiate these observations. For Sharing, item-to-total correlation varied from 0.573 to 0.705 ($P < 0.05$) and for total PPOS from 0.372 to 0.613 ($P < 0.05$). For Caring, item-to-total correlation varied from 0.613 to 0.775 ($P < 0.05$) and for total PPOS from 0.495 to 0.617 ($P < 0.05$). The correlation coefficient for the association between Sharing and Caring scores was 0.2 ($P < 0.001$). Both Sharing and Caring components had very high correlations to the total PPOS ($P < 0.001$) (Table 3).

Table 3. Item-to-component and item-to-total CR-PPOS correlations

Items	Item-to-sharing	Item-to-caring	Item-to-total CR-PPOS
1s	0.641**		0.395**
2s	0.662**		0.372**
5s	0.631**		0.438**
7s	0.573**		0.613**
9s	0.705**		0.603**
11s	0.628**		0.423**
3c		0.613**	0.533**
4c		0.775**	0.560**
6c		0.676**	0.617**
8c		0.697**	0.495**
10c		0.748**	0.541**

Spearman correlation coefficients: **, P<0.001; s indicates sharing items and c indicates caring items. CR-PPOS =Chinese-revised Patient-Practitioner Orientation Scale

Confirmatory factor analysis was verified by maximum likelihood analysis and the adjustment indices of the model: the RMSEA was 0.100, the CFI was 0.880 and IFI was 0.882 .

CR-PPOS scale scores: The scores were calculated using the standard scoring methods proposed by the author of the original PPOS. Descriptive statistics were calculated for the total score of CR-

PPOS and the Sharing and Caring components of the CR-PPOS for the participant. The Sharing subscale score was 15.26±4.205; the Caring subscale score was 20.42±4.415; the Total score was 35.62±6.642. For the all items, the highest score was Item 4: 'If doctors are truly good at diagnosis and treatment, the way they relate to patients is not that important', with 4.68±1.234. The lowest score was Item 2 'Patients should rely on their doctors' knowledge and not try to find out their conditions on their own', with 2.08±0.941 (Table 4).

Table 4. Distribution of scores (Mean ± SD) of sharing, caring and total of CR-PPOS

Subscale	Items	Mean±SD	
S	1.The doctor is the one who should decide what gets talked about during a visit	2.39±1.060	15.26±4.205 Total score：36 Standard score：42.39
	2.Patients should rely on their doctors' knowledge and not try to find out their conditions on their own.	*2.08±0.941*	
	5.Many patients continue asking questions even though they are not learning anything.	2.37±1.063	
	7.When patients disagree with their doctor, this is a sign that the doctor does not have the patient's respect and trust.	**3.27±1.260**	
	9.The patient must always be aware that the doctor is in charge.	**2.81±1.174**	
	11.When patients find out medical information on their own, this usually confuses more than it helps.	2.43±1.162	
C	3.When doctors ask a lot of questions about a patient's background, they are prying too much into personal matters.	3.65±1.346	20.42±4.415 Total score：30 Standard score：68.06
	4.If doctors are truly good at diagnosis and treatment, the way they relate to patients is not that important.	**4.68±1.234**	
	6.If a doctor mainly relies on being open and warm, the doctor will not have a lot of success.	*3.58±1.311*	
	8.Most patients want to get in and out of the doctor's office as quickly as possible.	4.31±1,195	
	10.It is not that important to know a patient's culture and background to treat the person' s illness.	4.19±1.236	
Total			35.62±6.642 Total score：66

		Standard score： 53.96

Notes: Score of 1 (strongly agree)=most clinician-centred; Score of 6 (strongly disagree)=most patient-centred.

Analysis of factors influencing patient-centred clinical practice: Multivariable logistic regression analysis was used to analyse the factors that influenced the respondents' patient-centred clinical practice. This study found several factors associated with medical staffs' clinical practice. The respondents' general characteristics and their work status were used in the multiple logistic regression analysis to examine the factors influencing their choices of the most useful strategies to improve clinical practice; an adjusted OR and a 95% CI are shown. In the Sharing Model, when compared with bachelor's degree and below, master's degree and above were more likely to share with patients (OR = 1.779, 95%CI:1.180~2.681); health-care workers who averaged less than an 8 hours work day were more likely to share with patients than those who did not (OR = 0.589, 95%CI:0.403~0.860); moreover, as far as the current cognition of the doctor-patient relationship was concerned, the medical staff who thought that the doctor-patient relationship was harmonious at present were more likely to share with the patients (OR = 1.918, 95%CI:1.345~2.736). In the Caring Model, medical staff aged 30-40 provided less care to patients than other age groups (OR = 0.587, 95%CI:0.345~1.000); however, it was of marginal significance. In the Total Model, medical staff aged over 40 were less patient-centred in clinical practice than those who were not (OR = 0.502, 95%CI:0.256~0.987); similarly to the Sharing Model, medical staff who thought that the doctor-patient relationship was harmonious were more likely to patient-centred in clinical practice (OR = 1.712, 95%CI:1.205~2.433) (Table 5).

Table 5. Multiple logistic regression analysis of factors associated with patient-centered clinical practice.

Category	Sharing		Caring		Total	
	p	**OR (95CI%)**	***p***	**OR (95CI%)**	***p***	**OR (95CI%)**
Gender						
Male	–	–	–	–	–	–
Female	0.523	1.120 (0.791~1.584)	0.559	1.105 (0.790~1.547)	0.102	1.332 (0.944~1.879)
Age						
≤30	0.457	–	0.144	–	0.708	–
30–40	0.225	0.717	**0.050***	**0.587**	0.480	0.826

		(0.418~1.228)		**(0.345~1.000)**		(0.485~1.404)
＞40	0.502	0.794 (0.404~1.558)	0.188	0.642 (0.332~1.241)	**0.046***	**0.502 (0.256~0.987)**
Marital status						
Unmarried	–	–	–	–	–	–
Married	0.311	0.766 (0.458~1.283)	0.815	1.062 (0.640~1.763)	0.967	0.989 (0.595~1.644)
Education level						
Bachelor's degree and below	–	–	–	–	–	–
Master's degree and above	**0.006***	**1.779 (1.180~2.681)**	0.412	1.178 (0.797~1.741)	0.223	1.284 (0.859~1.918)
Seniority						
Primary and below	–	–	–	–	–	–
Intermediate and above	0.211	0.729 (0.445~1.196)	0.304	1.292 (0.792~2.108)	0.622	1.131 (0.693~1.846)
Average working time per day						
≤8h	–	–	–	–	–	–
＞8h	**0.006***	**0.589 (0.403~0.860)**	0.410	1.167 (0.808~1.685)	0.653	0.918 (0.631~1.334)
Pay satisfaction						
No	–	–	–	–	–	–
Yes	0.382	1.172 (0.821~1.674)	0.408	0.864 (0.611~1.222)	0.402	1.164 (0.816~1.660)

Harmonious doctor-patient relationship cognition						
No	_	_	_	_	_	_
Yes	**0.000***	**1.918 (1.345~2.736)**	0.977	0.995 (0.704~1.405)	**0.003***	**1.712 (1.205~2.433)**

Discussion

Although the PPOS has been widely used in various languages and areas, only a few studies have been reported in China, with no results related to China northeast physicians to date. Beginning with this premise, we adopted the verbally revised CR-PPOS to analyse China northeast physicians' perception. The revised CR-PPOS was demonstrated to be reliable and demonstrated good internal consistency, with moderate Cronbach's alphas for Caring and Sharing and Total scores. The survey scale is also suitable for further statistical analysis and comparison.

Standardized scores indicated similar trends in both the Sharing dimension and the Caring dimension. In the overall scale, the participants obtained medium scores (around the median value of 3.5), and both had relatively high scores on the Caring scale (over 3.0) and low scores on the Sharing scale (around 2.5 or below) respectively. Comparing the data of this study with that from at home and abroad, the majority showed a similar pattern that physicians were more patient-centred in Caring than in Sharing. There were still two exceptions; Surveys conducted in Portugal and in Australia indicated Sharing score was higher than Caring score [29, 30],which may be due to the difference in physicians cognitive level and overall local medical systems. Thus, further research is needed to determine the reasons for such a distinction. According to previous studies, higher scores indicated patient-centred and lower scores indicated clinician-centred. Mean scores were ranked and divided into three groups for comparison: high scores (patient-centred, with a mean score of 5.00 or greater), medium scores (greater than 4.57 but less than 5.00), and low scores (doctor-centred, mean of 4.57 or less)[20]. The results indicated that although physicians showed a lower level of patient-centeredness in clinical communication, they still expressed higher preferences towards Caring from a biopsychosocial perspective than sharing information and involvement in decision- making.

The mean scores (3.24±0.604) in this study were comparable to Shanghai, China, scores reported in Jie Wang, et al.[27],which were 3.66±0.59; In Edward Krupat, et al. the survey was performed among physicians at Harvard Pilgrim Health Care (HPHC), the largest health maintenance organization in New England, which were 4.26±0.75[19]; Ariane Laplante-Lévesque, et al. conducted the audiologist survey in Australia (4.46). [31]. Overall, a low preference to patient-centeredness is indicated. It noted that the scores were not only lower than other countries, but also lower than Shanghai, the developed region of China, showing a lower

level of patient-centeredness in clinical communication. These results might be explained by differences in socio-economic conditions or by religious and cultural differences across countries. In addition to the differences of the participants, in this study medical staffs were from public hospitals, while Jie Wang's research included medical personnel from public hospitals and community hospitals. Lower scores indicated that doctors' cognitive level was more likely to be associated with economic and health development levels in different regions [32]. At present, there are differences in the overall medical system and medical environment in different regions. The economic and health development level of Shanghai is close to that of the developed countries, while China's H City is at a relatively less developed level, and the patient-centred concept is still in the process of formation.

Of the scores that contributed most to the overall Caring subscale score, item four (i.e. if doctors are truly good at diagnosis and treatment, the way they relate to patients is not that important.) received the highest preference for patient-centeredness. The mean score of 4.68 indicated a strong preference to strengthen the relationship with patients, and medical staffs prefer a relationship between clinician and patient that includes shared perception, agreement on goals, and emotional context [33]. Additionally, of the scores that contributed most to the overall Sharing dimension score, item 7 (i.e. When patients disagree with their doctor, this is a sign that the doctor does not have the patient^{s}' respect and trust.) indicated the physicians' preference for trust and respect from the patient when there is disagreement. It also indicated a strong preference for sharing decision - making with the patient.

On the other hand, medical staff generally had relatively lower preference for item 2 and item 6. The mean scores of 2.08 on item 2 (i.e. Patients should rely on their doctors' knowledge and not try to find out their conditions on their own.) and 3.58 on item 6 (i.e. If a doctor mainly relies on being open and warm, the doctor will not have a lot of success.) suggest that while physicians value their knowledge and skills, improving the quality of medical services and technology to better meet the needs of their patients' health care may be deemed of greater importance. The results were generally consistent with other research [30, 33].

Preference towards patient-centred communication, as measured by the CR-PPOS, may be influenced by both personal characteristics and social environmental factors. This study represents the attempt to detect the potential influential factors of patient-centred communication among Chinese northeast physicians. Overall, the current study results indicate incongruence among Sharing, Caring, and Total scores for patient-centeredness. This difference may be attributed to a number of factors, including gender, age, marital status, education level, seniority; average hours worked per day, pay satisfaction, and harmonious doctor-patient relationship cognition.

Notably, we found that physicians who work longer days on average were generally less likely to prefer patient-centeredness in clinical communication. This may have the potential link to another factor that was frequently mentioned in the existing research -doctors' burnout. Dana Loet al. found that burnout was higher among doctors who worked over 40 h/week in China[34]. The average working time could indicate the burnout level of the medical staff, meaning the

longer working time, the higher burnout level. These results were consistent with several prior studies in other countries[32, 35] .The high burnout level showed a negative correlation with job satisfaction and higher incidence of medical mistakes,may lead physicians make negative evaluation of their work or even avoid contact with patients[36].This indicates that burnout level might exert impact on physicians' sharing with patients. Sharing implies equal autonomy of the patient in making decisions. This requires time and effort on part of the physician to address patients' concerns and their choices. Physicians experiencing burnout from long hours worked and a heavy workload could display lack of sharing [32].

Meanwhile, an interesting finding was the cognition of doctor-patient relationship may influence patient-centred clinical, especially for Sharing and Total orientation. A plausible explanation is that those who hold that the current doctor-patient relationship is harmonious may pay more attention to the communication and decision-making with the patients. In light of the reported growth in disputes between patients and healthcare providers in China, most doctors expected to emphasize power sharing with the patients in decision-making and responsibilities[26].The physicians indicated a desire for interactive process-communication built on mutual-understanding. In particular they focused on being treated in a friendly manner and being cared for in a manner that was considerate of patients' psychosocial context.

Educational levels of physicians is also a factor. Physicians with higher degrees were more likely to share with patients, and were more likely to value information and desire active involvement with patients in the treatment process. This may be due to the difference in physician training modes and the cognitive level of different groups [37].Also, there was lack of educational interventions like communication skills training aimed at improving doctor-patient relationship in lower grade curricula, which may be the reason for difference of the attitude. This result support the positive effects of education on health literacy and of health literacy on empowerment, self-efficacy and increased engagement in decision-making processes [28].

In this study, younger physicians expressed a higher preference for patient-centred communication in both Caring and Total orientation. This may be related to the increased access of younger medical staffs to modern medical education model [37]. Therefore, strengthening the transformation of the medical model would be a good starting point to increase patient-centred communication in China.

Strengths of this study: This is the first study to report on Chinese northeast physicians' attitudes toward patient-centred care. Comparing the Chinese northeast physicians' scores with other research scores (measured with the same tool) promotes a more comprehensive understanding of Chinese northeast physicians' patient-centred attitudes.

Because it is a systematic study to access the Patient-centred orientation in China's northeast area, and considering the deteriorating physician–patient relationships in current Chinese society, this study has significant implications for medical practice.

The association between broader factors and participants' preference towards patient-centred communication was explored. Thus, possible intervention approaches were found to be needed to improve the patient-centred communication.

Limitations and suggestions for future research: When interpreting our findings, we should bear in mind the limitations of our research. Through further research in the future, we will more comprehensively explore the patient-centred attitude of medical staff in different regions.

The participants in this study were sampled only from seven clinical units in the northeast of China, which could lead to limited external validity. Future related research could include large sample sizes to increase our understanding of this topic.

The analysis only included general hospitals that focused on physicians in one city. It would be helpful if future research incorporated longitudinal analyses or follow-up studies on other types of hospitals (e.g. primary hospital and specialized hospital).

Conclusions

In general, the present survey observed lower 'patient-centred' attitudes towards communication between doctors in northeast China, and findings indicated that higher Caring subscale scores but less patient-centred as measured by the Sharing subscale scores. Age, education level, average working time per day, and harmonious doctor-patient relationship cognition had significant impact on medical staffs' patient-centred attitudes, Therefore, possible intervention approaches would be needed to improve the patient-centred communication in China's H City.

Our research indicates that relieving burnout, and improving the cognition of doctor - patient relationship and medical education could help physicians to be more patient-centred in communication. Meanwhile, developing required medical educational interventions related to patient-centred care, establishing communication skills workshops, displaying the positive effects of a patient-centred relationship, increasing patients' awareness and abilities, and broadcasting activities about communication improvement methods on mass media are some approaches to address the low level of patient-centred care [35]. It is expected that these improvements would change the current status to a desired one in which physicians take their patients' needs into account, try to provide required information on their health status in an understandable way, and involve them more in the decision making process.

Improving medical physicians' patient-centred skills can result in establishing higher-quality medical services in China. However, education reform alone cannot fully achieve patient-centred care; instead, society as a whole and the entire healthcare system also need to affirm the value and significance of patient-centred care before it can be fully realized.

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Competing Interests

The authors declare there are no competing interests.

Authors' Contributors

Weijian Song contributed as the first author to this article for the drafting of the manuscript. Libo Liang and Qunhong Wu designed the study and collected the data. Yanhua Hao and Xiaowen Zhao provided statistical expertise. Wei Liu and Siyi Tao analyzed the data. Yuxin Xue and Juan Zhao provided questionnaire translation and literature review. Qiao Zhang and Mingli Jiao provided administrative support. Yu Cui , Weilan Xu, Hong Sun, Ye Li and Linghan Shan made critical revisions to the paper for important scientific content and reviewed various drafts as well as the final manuscript. All authors read and approved the final manuscript.

References:

[1] Engel G L. The clinical application of the biopsychosocial model[J]. J Med Philos, 1981,6(2):101-123.

[2] Rees C E, Knight L V, Wilkinson C E. Doctors being up there and we being down here: a metaphorical analysis of talk about student/doctor-patient relationships[J]. Soc Sci Med, 2007,65(4):725-737.

[3] Manchaiah V, Gomersall P A, Tome D, et al. Audiologists' preferences for patient-centredness: a cross-sectional questionnaire study of cross-cultural differences and similarities among professionals in Portugal, India and Iran[J]. BMJ Open, 2014,4(10):e5915.

[4] Chan C M, Wan A W, Yusof M M, et al. Patient-Centredness, Job Satisfaction and Psychological Distress: a Brief Survey Comparing Oncology Nurses and Doctors[J]. Asian Pac J Cancer Prev, 2015,16(16):6895-6898.

[5] Ting X, Yong B, Yin L, et al. Patient perception and the barriers to practicing patient-centered communication: A survey and in-depth interview of Chinese patients and physicians[J]. Patient Educ Couns, 2016,99(3):364-369.

[6] Ribeiro M M, Krupat E, Amaral C F. Brazilian medical students' attitudes towards patient-centered care[J]. Med Teach, 2007,29(6):e204-e208.

[7] Castro E M, Van Regenmortel T, Vanhaecht K, et al. Patient empowerment, patient participation and patient-centeredness in hospital care: A concept analysis based on a literature review[J]. Patient Educ Couns, 2016,99(12):1923-1939.

[8] Health I O M U, Delivery C. Envisioning the National Health Care Quality Report[M]. Washington (DC): National Academies Press (US), 2001.

[9] Lau S R, Christensen S T, Andreasen J T. Patients' preferences for patient-centered communication: a survey from an outpatient department in rural Sierra Leone[J]. Patient Educ Couns, 2013,93(2):312-318.

[10] Cegala D J. Patient communication skills training: a review with implications for cancer patients[J]. Patient Educ Couns, 2003,50(1):91-94.

[11] Charlton C R, Dearing K S, Berry J A, et al. Nurse practitioners' communication styles and their impact on patient outcomes: an integrated literature review[J]. J Am Acad Nurse Pract, 2008,20(7):382-388.

[12] America I O M U. Crossing the Quality Chasm: A New Health System for the 21st Century[M]. Washington (DC): National Academies Press (US), 2001.

[13] Taylor K. Paternalism, participation and partnership - the evolution of patient centeredness in the consultation[J]. Patient Educ Couns, 2009,74(2):150-155.

[14] Haidet P. Patient-centredness and its challenge of prevailing professional norms[J]. Med Educ, 2010,44(7):643-644.

[15] Yi Y, Yanhua H, Libo L, et al. Analysis of medical staff perspective factors influencing a harmonious doctor-patient relationship: Based on 27 public hospitals of Heilongjiang province[J]. Chinese Journal of Health Policy, 2016,9(6):15-19.

[16] http://www.199it.com/archives/673838.html.

[17] Jianhua Z, Wenjie T, Min T, et al. Influencial Factors Analysis and Policy Selection of Physician-Patient Relationship in View of Hospital and Medical Staff[J]. Chinese Medical Ethics, 2011,24(1):123-125.

[18] Roter D. The enduring and evolving nature of the patient-physician relationship[J]. Patient Educ Couns, 2000,39(1):5-15.

[19] Krupat E, Rosenkranz S L, Yeager C M, et al. The practice orientations of physicians and patients: the effect of doctor-patient congruence on satisfaction[J]. Patient Educ Couns, 2000,39(1):49-59.

[20] Krupat E, Hiam C M, Fleming M Z, et al. Patient-Centeredness and its Correlates among First Year Medical Students[J]. The International Journal of Psychiatry in Medicine, 1999,29(3):347-356.

[21] Mudiyanse R M, Pallegama R W, Jayalath T, et al. Translation and validation of patient-practitioner orientation scale in Sri Lanka[J]. Educ Health (Abingdon), 2015,28(1):35-40.

[22] Shaw W S, Woiszwillo M J, Krupat E. Further validation of the Patient-Practitioner Orientation Scale (PPOS) from recorded visits for back pain[J]. Patient Educ Couns, 2012,89(2):288-291.

[23] Tsimtsiou Z, Kirana P, Hatzichristou D. Determinants of patients' attitudes toward patient-centered care：A cross-sectional study in Greece[J]. Patient Education and Counseling, 2014,97:391-395.

[24] Moore M. What does patient-centred communication mean in Nepal?[J]. Med Educ, 2008,42(1):18-26.

[25] Kim M J. [Differences in attitude toward patient-centeredness in patients and physicians][J]. Korean J Med Educ, 2013,25(2):149-156.

[26] Ting X, Yong B, Yin L, et al. Patient perception and the barriers to practicing patient-centered communication: A survey and in-depth interview of Chinese patients and physicians[J]. Patient Educ Couns, 2016,99(3):364-369.

[27] Wang J, Zou R, Fu H, et al. Measuring the preference towards patient-centred communication with the Chinese-revised Patient-Practitioner Orientation Scale: a cross-sectional study among physicians and patients in clinical settings in Shanghai, China[J]. BMJ Open, 2017,7(9):e16902.

[28] Hung L M, Rane S, Tsai J, et al. Advancing primary care to promote equitable health: implications for China[J]. Int J Equity Health, 2012,11:2.

[29] Laplante-Levesque A, Hickson L, Grenness C. An Australian survey of audiologists' preferences for patient-centredness[J]. Int J Audiol, 2014,53 Suppl 1:S76-S82.

[30] Manchaiah V, Gomersall P A, Tome D, et al. Audiologists' preferences for patient-centredness: a cross-sectional questionnaire study of cross-cultural differences and similarities among professionals in Portugal, India and Iran[J]. BMJ Open, 2014,4(10):e5915.

[31] Laplante-Levesque A, Hickson L, Grenness C. An Australian survey of audiologists' preferences for patient-centredness[J]. Int J Audiol, 2014,53 Suppl 1:S76-S82.

[32] Ahmad W, Ashraf H, Talat A, et al. Association of burnout with doctor-patient relationship and common stressors among postgraduate trainees and house officers in Lahore-a cross-sectional study[J]. PeerJ, 2018,6:e5519.
[33] Manchaiah V, Dockens A L, Bellon-Harn M, et al. Noncongruence between Audiologist and Patient Preferences for Patient-Centeredness[J]. J Am Acad Audiol, 2017,28(7):636-643.
[34] Lo D, Wu F, Chan M, et al. A systematic review of burnout among doctors in China: a cultural perspective[J]. Asia Pac Fam Med, 2018,17:3.
[35] Akkafi M, Sajadi H S, Sajadi Z S, et al. Attitudes Toward Patient-Centered Care in the Mental Care Services in Isfahan, Iran[J]. Community Ment Health J, 2018.
[36] Wen J, Cheng Y, Hu X, et al. Workload, burnout, and medical mistakes among physicians in China: A cross-sectional study[J]. Biosci Trends, 2016,10(1):27-33.
[37] Hurley E A, Doumbia S, Kennedy C E, et al. Patient-centred attitudes among medical students in Mali, West Africa: a cross-sectional study[J]. BMJ Open, 2018,8(1):e19224.

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		Reporting Item	Page Number
Title			
	#1	Indicate that the manuscript concerns an initiative to improve healthcare (broadly defined to include the quality, safety, effectiveness, patientcenteredness, timeliness, cost, efficiency, and equity of healthcare)	1
Abstract			
	#02a	Provide adequate information to aid in searching and indexing	1
	#02b	Summarize all key information from various sections of the text using the abstract format of the intended publication or a structured summary such as: background, local problem, methods, interventions, results, conclusions	1-2
Introduction			
Problem description	#3	Nature and significance of the local problem	2-4

Available knowledge	#4	Summary of what is currently known about the problem, including relevant previous studies	2-4
Rationale	#5	Informal or formal frameworks, models, concepts, and / or theories used to explain the problem, any reasons or assumptions that were used to develop the intervention(s), and reasons why the intervention(s) was expected to work	2-4
Specific aims	#6	Purpose of the project and of this report	3-5
Methods			
Context	#7	Contextual elements considered important at the outset of introducing the intervention(s)	6
Intervention(s)	#08a	Description of the intervention(s) in sufficient detail that others could reproduce it	6
Intervention(s)	#08b	Specifics of the team involved in the work	6
Study of the Intervention(s)	#09a	Approach chosen for assessing the impact of the intervention(s)	6
Study of the Intervention(s)	#09b	Approach used to establish whether the observed outcomes were due to the intervention(s)	6
Measures	#10a	Measures chosen for studying processes and outcomes of the intervention(s), including rationale for choosing them, their operational definitions, and their validity and reliability	6
Measures	#10b	Description of the approach to the ongoing assessment of contextual elements that contributed to the success, failure, efficiency, and cost	6-7
Measures	#10c	Methods employed for assessing completeness and accuracy of data	6-7
Analysis	#11a	Qualitative and quantitative methods used to draw inferences from the data	6-7
Analysis	#11b	Methods for understanding variation within the data, including the effects of time as a variable	6-7
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Results			

	#13a	Initial steps of the intervention(s) and their evolution over time (e.g., time-line diagram, flow chart, or table), including modifications made to the intervention during the project	6
	#13b	Details of the process measures and outcome	6-7
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Medical professionals' Attitude Toward Patient-Centeredness in China's H City: A Cross-Sectional Study

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Abstract

Objectives: More patient-centred communication is associated with improved patient satisfaction and health status, fewer malpractice complaints, increased adherence and harmonious doctor-patient relationship. The study was based on doctor-patient relationships and the medical system in China, to measure preferences of medical professionals towards patient-centred communication of medical professionals in Northeast China, to explore background factors of patient-centred attitudes, and to provide references for medical reform and doctor-patient relationship.

Methods: A cross-sectional survey of medical professionals conducted from January to February 2018 in H City of Heilongjiang Province, northeast China utilized the Chinese-revised Patient-Practitioner Orientation Scale (CR-PPOS), a validated instrument designed to measure individual preferences towards various aspects of the doctor-patient relationship and medical professionals' attitudes. The medical professionals demographic data were collected, including their gender, age, marital status, service year, seniority, education level, pay satisfaction, and doctor-patient relationship cognition. A multiple logistic regression analysis was performed to identify factors associated with CR-PPOS.

Patient and Public Involvement: No patient involved

Results: A total of 618 valid questionnaires were obtained (representing 95.1% efficiency). The scale demonstrated sound reliability and validity. The Chinese medical professionals scored considerably higher on the Caring subscale (20.42) (including patients' preferences into the

decision-making process) than on the Sharing subscale (15.26) (sharing information/responsibility with patients), indicating that medical professionals showed a lower level of patient-centeredness in clinical communication. Medical professionals' preference towards patient-centred communication was influenced by age, education level, average hours worked per day, and harmonious doctor-patient relationship cognition.

Conclusions: The present survey observed lower 'patient-centred' attitudes towards communication between medical professionals in Northeast China. Adapting medical professionals' communication strategies to patients' preferences based on their personal characteristics can be a viable approach towards improving doctor-patient relationship. The medical process should incorporate strong communication skills, and should provide required information on patients' health status. Society as a whole and the entire healthcare system also need to affirm the value.

Strengths and limitations of this study

- This was the first report to use the CR-PPOS to measure PCC in Northeast China;
- It has significant implication for medical practice based on Chinese special Context.
- Promoted a more comprehensive understanding of Chinese northeast medical professionals' PCC;
- Possible intervention approaches were found to enhance the value of PCC;
- Future related research might also include large medical sample sizes and patient opinions to increase our understanding of this topic.

Keywords: Patient‐Practitioner Orientation Scale (PPOS), Patient-Centered communication (PCC), China,Doctor-patient relationship

Introduction

With the development of the Biopsychosocial paradigm, much attention has been directed to studying the varying orientations of medical professionals toward their patients, in particular the distinction between a patient-oriented style versus a doctor-oriented style of interaction[1-3]. The origin of patient-centred care can be traced to a period as far back as the time of Hippocrates within Western medical traditions.Since then, each patient has been considered a relatively independent individual [4]. Patient-centeredness, however, has not been uniformly defined. It generally refers to establishment a partnership among physicians, patients and their families (when appropriate), in order to care for patients' needs, preferences and values,and to provide the necessary information and support, so that patients can actively participate in their own care and clinical decision-making [5, 6].

Patient-centred clinical practice is a holistic concept, in which components interact and unite in a unique way in each patient-doctor encounter [7]. Patient-centred communication (PCC), cultural sensitivity, and shared decision-making have become core values in medicine, and

considerable research has been focused on improving communication between healthcare providers and their patients [8]. Communication also has been considered crucial to high-quality health care, it is associated with higher doctor-patient satisfaction, better biomedical outcomes [9]. Patient-centeredness has been regarded as one of the six core components of high-quality medical care[10].It contributes to building a partnership between medical professionals and patients, instead of promoting the traditional paternalism[11].With increasing recognition of patient-centred care, it is becoming a core value of health services worldwide, and imparting patient-centred care has become an obligation for medical educators. However, it remains largely unexplored in practice, even as it is important for evaluating the tendencies of medical professionals' clinical behaviour [12].

Harmonious doctor-patient relationship is the prerequisite for the progress of medical activities. At present, the doctor-patient relationship in China is complicated, medical disputes are frequent, and the crisis of mistrust between doctors and patients is deepening. The current situation of doctor-patient affected by various factors, including mechanism, legal system, society and public, as well as hospital management, medical concept and public cognition. The disharmony between doctors and patients has become a major obstacle to citizen's health rights and social harmony [13]. According to the 2017 'White Paper on the status of Medical Professionals in China', 62% of clinicians thought the working environment abominable, 50% thought that their work was not recognized by the society, and 66% have experienced some degree of doctor-patient conflict[14]. This may be caused by the professionals' service orientation. Medical professionals, as the provider of medical services and the leader of medical behaviour, play a vital role in building a harmonious doctor-patient relationship [15]. Moreover, the subjective feelings of medical professionals on the doctor-patient relationship affect their medical behaviours and attitudes, as well as the overall state of doctor-patient relationships [16]. Therefore, it is necessary to explore the centeredness orientation from the perspective of medical professionals and dig deeply into factors associated with the lack of doctor-patient trust in order to rebuild doctor-patient trust and a positive medical environment.

Assessing such attitudes has become increasingly important in the context of health care and clinical treatment process. Much of the existing research related to patient-centred communication involves questionnaires designed to assess patient and medical professionals' preferences, and their correlations with patient outcomes. One widely used scale is the Patient–Practitioner Orientation Scale (PPOS). Originally developed by American scholar Krupat et al , PPOS is a previously validated 18-item instrument designed to access the attitudes of medical professionals, medical students, and patients toward their respective roles[17].The scale includes the 'sharing' and 'caring' dimensions[18]. The Caring subscale refers to the extent of the respondent's belief about the importance of emotions, good interpersonal relationships during doctor patient encounters, and treating the patient as a whole person rather than as a medical condition. The Sharing subscale reflects the willingness to share information and power with patients, as well as the willingness to share control in decision-making [19]. Answers are based on a 6-point Likert scale (strongly agree-strongly disagree), with higher scores reflecting more

patient-centred attitudes (score ranging from 1 to 6) in clinical communication. The PPOS has demonstrated strong psychometric properties and has been widely validated against a range of other attitudinal measures and relevant patient outcomes. Shaw et al. (2012)[20],Mudiyanse et al. (2015)[19] ,Tsimtsiou et al.(2014) [21],Moore(2008) [22],Kim (2013)[23],Lau et al.(2013) [7] used the PPOS in the northeastern USA,Sri Lanka, Greece,rural Nepal,South Korea,rural Sierra Leone , respectively.

In China, accounts of patient–physician communication have been prominent in the new healthcare era, as patient-centeredness is increasingly highlighted in clinical practice. Scholars have gradually begun studying patient-centred doctor–patient relationships from different perspectives. Ting et al. (2016)conducted a survey to identify patients' preferences towards patient-centred communication in a hospital in the southwest part of China, the earliest known attempt to apply PPOS in China[24].Later, Wang et al . (2017)conducted a cross-sectional study among medical professionals and patients in clinical settings in Shanghai, China to measure the preference towards patient-centred communication with the Chinese-revised Patient–Practitioner Orientation Scale (CR-PPOS)[25]. However, the economic development and the quantity of health resources in different regions of China vary greatly. It is thus unclear how well this instrument would work in other regions and surroundings.

China is a country with vast regional differences and uneven economic development, which have led to widening gaps between the rich and poor in terms of access to healthcare, quality of care, and health outcomes [26]. We conducted this research in H City, Heilongjiang, which is the northeast of China adjacent to the border, and China's old industrial base. The study measured preferences of medical professionals towards patient-centred communication on using the improved CR-PPOS, and further explored factors that might exert influence on medical professionals' preferences concerning patient-centred communication.

Materials & Methods

Study population and data collection: A cross-sectional survey of medical professionals was conducted from January to February 2018 in H City of Heilongjiang Province, northeast China. A stratified sampling design was adopted to ensure that study data were representative of the area. Seven medical institutions were selected based on size and level of development. Considering the length of time allotted for this research and the limited time available to engage with medical professionals, medical professionals were intentionally selected for the study utilizing certain inclusion criteria. Firstly,all medical professionals had worked for at least one year in the clinical department, and had volunteered to participate; those who were absent were excluded . Secondly,all respondents were also full-time employees of the hospital, including doctors,medical technical professionals (e.g.,anesthesiologists),nurse were excluded,thus ensuring the integrity and effectiveness of data collection; Furthermore, to ensure a reliable results,the participants are conscious and have strong willingness to participate in research, can comprehend the questionnaire independently and have written ability.The average research time at each hospital was from one day to one and a half days. Self-reporting questionnaires were distributed in person by 14-trained investigators.Participants in the survey was voluntary ,also,

the investigators informed the participants of how to fill in the questionnaire. The researchers obtained verbal consent prior to beginning the study and a group-wide verbal consent was read by the investigators to the participants, and the data were collected anonymously to ensure confidentiality and quality. Respondents chose the best time to complete the questionnaire, and most completed questionnaires were collected on the same day by investigators. In cases where respondents wanted to participate but were unable to complete the questionnaire on the same day, it was collected on an agreed-upon date. Before distributing the questionnaire, the investigators informed all respondents of the purposes and methods of the study in a notification letter. The investigators stayed about half of the day in each hospital for data collection. They collected the questionnaires approximately 15 minutes after distribution, and they checked the completeness of each. If any key questions were not filled in, the investigator returned to the doctor for further answers.

Through this process, 650 questionnaires were distributed and 618 valid questionnaires were obtained (representing 95.1% efficiency). The sample represented 10.87% of all licensed medical professionals (nearly 5686 as of 2017) in the H City.

Patient and Public Involvement: No patient involved

Questionnaire design: The original PPOS is a self-administered instrument that contains 18 items regarding various aspects of doctor-patient relationship and communication. The responder expresses their level of agreement with each item on a six-point Likert scale from strongly agree to strongly disagree.Based on the original PPOS, the 11-item Chinese-revised Patient–Practitioner Orientation Scale (CR-PPOS), revised by Chinese researcher Wang, et al. , obtained better psychometric indices, and displayed strong overall reliability and validity[25]. The CR-PPOS is a better instrument in a Chinese context than the original translated version.In our research, we combined the original PPOS with the CR-PPOS and the unique medical background in China, this process involved three main stages:

1.Forward translation: A pair of bilingual translators, competent in both English and Chinese, independently translated the original questionnaire from English to Chinese.Then compared with CR-PPOS,considered Professor Jie Wang conducted this research in Shanghai, which is among the most developed cities in China and possesses abundant high-quality medical resources. However,, China's Heilongjiang Province is an underdeveloped region, and medical resources are relatively scarce. Therefore, the differences in the investigation area and cognitive ability of some medical professionals needed to be taken into account,several items were modified accordingly(e.g.,Item 8 supplementary specification: to reduce communication time with doctors).

2. Expert back translation:After obtaining the consent of the original author of PPOS and Professor Jie Wang, and combining suggestions and feedback from experts, scholars and respondents on the content and expression of the scale, the translators synthesized the translation after reaching a consensus on the translation of words, phrases and items.Additionally, taking into account Chinese cultural differences and filling habits, the 6-point Likert scale represented

in the questionnaire was :1 = ‘strongly disagree’, 2 = ‘disagree’, 3 = ‘somewhat disagree‘, 4 = ‘somewhat agree’, 5=‘ agree’, 6= ‘strongly agree’; and in order to facilitate comparison with the results of broader research, we have reversed all items before the statistical analysis.

3.Pretesting:Several medical professionals independently tested the cultural appropriateness, representativeness and content validity of the instrument, rating the degree that each item reflected the concept that it was intended to measure. The same professionals also rated the understandability of the translated instrument and the semantic and content equivalence of the Chinese version with the English original.Followed process of perfected,formed the final scale consisting of two dimensions and 11 items.

Moreover, according to the 2017 ‘White Paper on the status of Medical Professionals in China’, the income of Chinese medical professionals was inconsistent with their social contribution, which means they generally deem that their income is far below their work intensity and stress,also medical professionals' income was an indispensable factor affecting doctor-patient relationship[14]. Medical professionals were increasingly dissatisfied with the working environment and doctor-patient relationship. Therefore, we supplemented these two items in the basic information section to measure the pay satisfaction and the cognition of doctor-patient relationship of Chinese medical professionals, and whether it would affect their clinical behaviour and patient-centred care or not. In the survey respondents answered: overall satisfaction with pay, and do you think the current doctor-patient relationship is harmonious?

Statistical analysis: Descriptive statistics (mean scores and standard deviations for quantitative data, and frequencies and percentages for qualitative data) were computed to describe respondents’ demographic characteristics and their work status. The demographic information collected in the survey included gender (male/female),age(≤25/25－30/30－40/＞40),marital status(unmarried/married/divorced and others),service year(≤5/5-10/＞10),seniority(senior/sub-senior/intermediate/primary/no title),education level(junior college and below/bachelor's degree/Master's degree and above),pay satisfaction(no/yes),harmonious doctor-patient relationship cognition(no/yes).

Cronbach’s α coefficient was used to evaluate the reliability of the scale, normally, a Cronbach’s α of no less than 0.6 is deemed acceptable for an instrument ,and confirmatory factor analysis (CFA) was used to evaluate the validity,including root mean square error of approximation (RMSEA), incremental fit index (IFI) and comparative fit index (CFI). RMSEA value <0.08 and IFI and CFI>0.9 suggest ideal model fit. In order to compare with previous research results horizontally and vertically,considered the data itself and distribution,the CR-PPOS descriptive statistics for the items ,subscale and total scores were analyzed by means and standard deviations. In addition, multiple logistic regression was performed to analyse the factors (including gender, age, marital status, education level, seniority, average working time per day, pay satisfaction, harmonious doctor-patient relationship cognition) that were likely to influence patient-centred clinical attitude. Consequently, in this study, an overall score of over the median indicated ‘patient-centred’, and a score below the median indicated ‘clinician-centred’. Multivariate

logistic regression analyses of models Sharing, Caring, and Total was performed to identify significant influencing factors of patient-centred clinical attitude; The median of the Sharing, Caring and Total was 15, 21 and 37; In the models, '0' equalled 'clinician-centred' and '1' equalled 'patient-centred'. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated. SPSS V.19.0 (IBM Corporation, Armonk, NY, USA) and AMOS 21.0 were used to conduct the analysis.

Ethical considerations: Ethical approval to conduct this study was granted by the research ethics committee of Harbin Medical University and informed consent to participate was obtained from each hospital and healthcare worker involved in the investigation. All respondents who gave their informed consent completed the questionnaire.

Results

Socio-demographic characteristics: The demographic and professional characteristics of 618 study participants are shown in Table 1. Of the investigated medical professional members, 49.7% are females. The ages ranged from 20 to 70, with an average age of 36. Over three-quarter of the respondents were married (76.2%). The largest proportion of respondents held the 'intermediate' professional title (38.6%), and the majority of respondents held a master's degree (52.8%). Only a tenth of people were satisfied with their pay, while almost 90% medical professionals felt that the current doctor-patient relationship is not harmonious (Table 1).

Table 1. Respondents' social demographic characteristics ($N = 618$).

Characteristic	n	%
Gender		
Male	311	50.3
Female	307	49.7
Age		
≤25	30	4.9
25–30	136	22.0
30–40	323	52.3
＞40	129	20.9

Marital status		
Unmarried	134	21.7
Married	471	76.2
Divorced and others	13	2.1
Service year		
≤5	243	39.5
5–10	165	26.8
＞10	207	33.7
Seniority		
Senior	66	10.7
Sub-senior	104	16.9
Intermediate	237	38.6
Primary	168	27.4
No title	39	6.4
Education level		
Junior college and below	4	0.6
Bachelor's degree	171	27.7
Master's degree and above	443	71.7
Pay satisfaction		
No	533	89.0

Yes	66	11.0
Harmonious doctor-patient relationship cognition		
No	553	89.6
Yes	64	10.4

Reliability and validity of the scale: Cronbach's alpha was calculated as a measure of internal consistency and reliability. In the exploratory factor analysis, the Bartlett's sphericity test yielded a value of 1457.716 (df = 55, $p < 0.001$) and the Kaiser-Meyer-Olkin (KMO) index was 0.780 (Table 2).

Table2. The internal consistency of the scale

	Cronbach's α
Sharing subscale	0.705
Caring subscale	0.739
Total score	0.720

Confirmatory factor analysis was verified by maximum likelihood analysis and the adjustment indices of the model: the RMSEA(root mean square error of approximation) was 0.100, the CFI(comparative fit index) was 0.880 and IFI(incremental fit index) was 0.882 .The CFA of the scale indicated moderate model fit , which called for further revision.

Item-to-component and item-to-total CR-PPOS correlations: Item to total and component to total correlations were performed using Pearson correlation coefficient to substantiate these observations. For Sharing, item-to-total correlation varied from 0.573 to 0.705 ($P < 0.05$) and for total PPOS from 0.372 to 0.613 ($P < 0.05$). For Caring, item-to-total correlation varied from 0.613 to 0.775 ($P < 0.05$) and for total PPOS from 0.495 to 0.617 ($P < 0.05$). The correlation coefficient for the association between Sharing and Caring scores was 0.2 ($P < 0.001$). Both Sharing and Caring components had very high correlations to the total PPOS ($P < 0.001$) (Table 3).

CR-PPOS scale scores: Descriptive statistics were calculated for the total score of CR-PPOS and the Sharing and Caring components of the CR-PPOS for the participants. The Sharing subscale score was 15.26±4.205; the Caring subscale score was 20.42±4.415; the Total score was 35.62±6.642. For the all items, the highest score was Item 4: 'If doctors are truly good at diagnosis and treatment, the way they relate to patients is not that important', with 4.68±1.234. The lowest score was Item 2 'Patients should rely on their doctors' knowledge and not try to find out their conditions on their own', with 2.08±0.941 (Table 3).

Table 3. Correlations and distribution of scores (Mean ± SD) of sharing, caring and total of

CR-PPOS

Subscale	Items	Item-to-subscale	Item-to-total	Mean±SD	
S	1.The doctor is the one who should decide what gets talked about during a visit	0.641**	0.395**	2.39±1.060	**15.26±4.205 Total score：36 Standard score：42.39**
	2.Patients should rely on their doctors' knowledge and not try to find out their conditions on their own.	0.662**	0.372**	*2.08±0.941*	
	5.Many patients continue asking questions even though they are not learning anything.	0.631**	0.438**	2.37±1.063	
	7.When patients disagree with their doctor, this is a sign that the doctor does not have the patient's respect and trust.	0.573**	0.613**	**3.27±1.260**	
	9.The patient must always be aware that the doctor is in charge.	0.705**	0.603**	**2.81±1.174**	
	11.When patients find out medical information on their own, this usually confuses more than it helps.	0.628**	0.423**	2.43±1.162	
C	3.When doctors ask a lot of questions about a patient's background, they are prying too much into personal matters.	0.613**	0.533**	3.65±1.346	**20.42±4.415 Total score：30 Standard score：68.06**
	4.If doctors are truly good at diagnosis and treatment, the way they relate to patients is not that important.	0.775**	0.560**	**4.68±1.234**	
	6.If a doctor mainly relies on being open and warm, the doctor will not have a lot of success.	0.676**	0.617**	*3.58±1.311*	
	8.Most patients want to get in and out of the doctor's office as quickly as possible.	0.697**	0.495**	4.31±1,195	
	10.It is not that important to know a patient's culture and background to treat the person' s illness.	0.748**	0.541**	4.19±1.236	
Total	**35.62±6.642 Total score：66 Standard score：53.96**				

Notes: Spearman correlation coefficients: **, P<0.001; s indicates sharing items and c indicates caring items.

CR-PPOS =Chinese-revised Patient-Practitioner Orientation Scale

Score of 1 (strongly agree)=most clinician-centred; Score of 6 (strongly disagree)=most patient-centred.

Analysis of factors influencing patient-centred clinical practice: Multivariable logistic regression analysis was used to analyse the factors that influenced the respondents' patient-

centred clinical practice. This study found several factors associated with medical professionals' potential clinical practice. The respondents' general characteristics and their work status were used in the multiple logistic regression analysis to examine the factors influencing their choices of the most useful strategies to improve clinical practice; an adjusted OR and a 95% CI are shown. In the Sharing Model, when compared with bachelor's degree and below, master's degree and above were had higher patient-centred attitude(OR = 1.779, 95%CI:1.180~2.681); medical professionals who averaged less than an 8 hours work day had higher patient-centred attitude than those who did not (OR = 0.589, 95%CI:0.403~0.860); moreover, as far as the current cognition of the doctor-patient relationship was concerned, the medical professionals who thought that the doctor-patient relationship was harmonious at present had higher patient-centred attitude (OR = 1.918, 95%CI:1.345~2.736). In the Caring Model, medical professionals aged 30-40 had lower patient-centred attitude than other age groups (OR = 0.587, 95%CI:0.345~1.000); however, it was of marginal significance. In the Total Model, medical professionals aged over 40 had lower patient-centred attitude than those who were not (OR = 0.502, 95%CI:0.256~0.987); similarly to the Sharing Model, medical professionals who thought that the doctor-patient relationship was harmonious had higher patient-centred attitude (OR = 1.712, 95%CI:1.205~2.433) (Table 4).

Table 4. Multiple logistic regression analysis of factors associated with patient-centered clinical practice.

Category	Sharing		Caring		Total	
	p	OR (95CI%)	*p*	OR (95CI%)	*p*	OR (95CI%)
Gender						
Male	–	–	–	–	–	–
Female	0.523	1.120 (0.791~1.584)	0.559	1.105 (0.790~1.547)	0.102	1.332 (0.944~1.879)
Age						
≤30	0.457	–	0.144	–	0.708	–
30–40	0.225	0.717 (0.418~1.228)	**0.050***	**0.587 (0.345~1.000)**	0.480	0.826 (0.485~1.404)
＞40	0.502	0.794 (0.404~1.558)	0.188	0.642 (0.332~1.241)	**0.046***	**0.502 (0.256~0.987)**
Marital status						

Unmarried	–	–	–	–	–	–
Married	0.311	0.766 (0.458~1.283)	0.815	1.062 (0.640~1.763)	0.967	0.989 (0.595~1.644)
Education level						
Bachelor's degree and below	–	–	–	–	–	–
Master's degree and above	**0.006***	**1.779 (1.180~2.681)**	0.412	1.178 (0.797~1.741)	0.223	1.284 (0.859~1.918)
Seniority						
Primary and below	–	–	–	–	–	–
Intermediate and above	0.211	0.729 (0.445~1.196)	0.304	1.292 (0.792~2.108)	0.622	1.131 (0.693~1.846)
Average working time per day						
≤8h	–	–	–	–	–	–
＞8h	**0.006***	**0.589 (0.403~0.860)**	0.410	1.167 (0.808~1.685)	0.653	0.918 (0.631~1.334)
Pay satisfaction						
No	–	–	–	–	–	–
Yes	0.382	1.172 (0.821~1.674)	0.408	0.864 (0.611~1.222)	0.402	1.164 (0.816~1.660)
Harmonious doctor-patient relationship cognition						
No	–	–	–	–	–	–
Yes	**0.000***	**1.918 (1.345~2.736**	0.977	0.995 (0.704~1.405)	**0.003***	**1.712 (1.205~2.433)**

		)				

Discussion

Although the PPOS has been widely used in various languages and areas, only a few studies have been reported in China, with no results related to China northeast physicians to date. Beginning with this premise, we adopted the verbally revised CR-PPOS to analyse China northeast medical professionals' perception. The revised CR-PPOS was demonstrated to be reliable and demonstrated good internal consistency, with moderate Cronbach's alphas for Caring and Sharing and Total scores. The survey scale is also suitable for further statistical analysis and comparison.

Standardized scores indicated similar trends in both the Sharing dimension and the Caring dimension. In the overall scale, the participants obtained moderate scores (around the moderate value of 3.5), and both had relatively high scores on the Caring scale (over 3.0) and low scores on the Sharing scale (around 2.5 or below) respectively. Comparing the data of this study with that from at home and abroad, the majority showed a similar pattern that medical professionals were more patient-centred in Caring than in Sharing. There were still two exceptions; Surveys conducted in Portugal and in Australia indicated Sharing score was higher than Caring score [27, 28],which may be due to the difference in medical professionals cognitive level and overall local medical systems. Thus, further research is needed to determine the reasons for such a distinction. According to previous studies, higher scores indicated patient-centred and lower scores indicated clinician-centred[17, 18, 25]. Mean scores were ranked and divided into three groups for comparison: high scores (patient-centred, with a mean score of 5.00 or greater), medium scores (greater than 4.57 but less than 5.00), and low scores (doctor-centred, mean of 4.57 or less)[18]. The results indicated that although medical professionals showed a lower level of patient-centeredness in clinical communication, they still expressed higher preferences towards Caring from a biopsychosocial perspective than sharing information and involvement in decision- making.

The mean scores (3.24±0.604) in this study were lower than Shanghai,China (3.66±0.59)[25],Harvard Pilgrim Health Care (HPHC)(4.26±0.75) [17],Australia (4.46) [29]. Overall, a low preference to patient-centeredness was found in this study, compared to others. It noted that the scores were not only lower than other countries, but also lower than Shanghai, the developed region of China, showing a lower level of patient-centeredness in clinical communication. These results might be explained by differences in socio-economic conditions or by religious and cultural differences across countries. Lower scores indicated that medical professionals' cognitive level was more likely to be associated with economic and health development levels in different regions [30]. At present, there are differences in the overall medical system and medical environment in different regions. The economic and health development level of Shanghai is close to that of the developed countries, while China's H City is at a relatively less developed level, and the patient-centred concept is still in the process of formation.

Regarding the scores obtained,strengthen the relationship with patients and mutual respect also beneficial for patient-centeredness.Of the scores that contributed most to the overall Caring

subscale score, item four (i.e. if doctors are truly good at diagnosis and treatment, the way they relate to patients is not that important.) received the highest preference for patient-centeredness. The mean score of 4.68 indicated a strong preference to strengthen the relationship with patients, and medical professionals prefer a relationship between them and patient that includes shared perception, agreement on goals, and emotional context [31]. Additionally, of the scores that contributed most to the overall Sharing dimension score, item 7 (i.e. When patients disagree with their doctor, this is a sign that the doctor does not have the patient's' respect and trust.) indicated the medical professionals' preference for trust and respect from the patient when there is disagreement. It also indicated a strong preference for sharing decision - making with the patient.On the other hand, medical professionals generally had relatively lower preference for item 2 and item 6. The mean scores of 2.08 on item 2 (i.e. Patients should rely on their doctors' knowledge and not try to find out their conditions on their own.) and 3.58 on item 6 (i.e. If a doctor mainly relies on being open and warm, the doctor will not have a lot of success.) suggest that while medical professionals value their knowledge and skills, improving the quality of medical services and technology to better meet the needs of their patients' health care may be deemed of greater importance. The results were generally consistent with other research [28, 31].

Preference towards patient-centred communication, as measured by the CR-PPOS, may be influenced by both personal characteristics and social environmental factors. This study represents the attempt to detect the potential influential factors of patient-centred communication among Chinese northeast medical professionals. Overall, the current study results indicate incongruence among Sharing, Caring, and Total scores for patient-centeredness. This difference may be attributed to a number of factors, including gender, age, marital status, education level, seniority; average hours worked per day, pay satisfaction, and harmonious doctor-patient relationship cognition.

Notably, we found that medical professionals who work longer days on average were generally less likely to prefer patient-centeredness in clinical communication. This may have the potential link to another factor that was frequently mentioned in the existing research -doctors' burnout. Dana Loet al. found that burnout was higher among doctors who worked over 40 h/week in China[32]. The average working time could indicate the burnout level of the medical professionals, meaning the longer working time, the higher burnout level. These results were consistent with several prior studies in other countries[30, 33] .The high burnout level showed a negative correlation with job satisfaction and higher incidence of medical mistakes,may lead medical professionals make negative evaluation of their work or even avoid contact with patients[34].This indicates that burnout level might exert impact on medical professionals' sharing with patients. Sharing implies equal autonomy of the patient in making decisions. This requires time and effort on part of the medical professionals to address patients' concerns and their choices. Medical professionals experiencing burnout from long hours worked and a heavy workload could display lack of sharing [30].

Meanwhile, an interesting finding was the cognition of doctor-patient relationship may influence patient-centred clinical, especially for Sharing and Total orientation. A plausible

explanation is that those who hold that the current doctor-patient relationship is harmonious may pay more attention to the communication and decision-making with the patients. In light of the reported growth in disputes between patients and medical professionals in China, most medical professionals expected to emphasize power sharing with the patients in decision-making and responsibilities[24].The medical professionals indicated a desire for interactive process-communication built on mutual-understanding. In particular they focused on being treated in a friendly manner and being cared for in a manner that was considerate of patients' psychosocial context.

Educational levels of medical professionals is also a factor. Medical professionals with higher degrees were more likely to share with patients, and were more likely to value information and desire active involvement with patients in the treatment process. This may be due to the difference in physician training modes and the cognitive level of different groups [35].Also, there was lack of educational interventions like communication skills training aimed at improving doctor-patient relationship in lower grade curricula, which may be the reason for difference of the attitude. This result support the positive effects of education on health literacy and of health literacy on empowerment, self-efficacy and increased engagement in decision-making processes [26].

In this study, younger medical professionals expressed a higher preference for patient-centred communication in both Caring and Total orientation. This may be related to the increased access of younger medical professionals to modern medical education model [35]. Therefore, strengthening the transformation of the medical model would be a good starting point to increase patient-centred communication in China.

Strengths of this study: This is the first study to report on Chinese northeast medical professionals' attitudes toward patient-centred care. Comparing the Chinese northeast medical professionals' scores with other research scores (measured with the same tool) promotes a more comprehensive understanding of Chinese northeast medical professionals' patient-centred attitudes.

Because it is a systematic study to access the Patient-centred orientation in China's northeast area, and considering the deteriorating physician–patient relationships in current Chinese society, this study has significant implications for medical practice.

The association between broader factors and participants' preference towards patient-centred communication was explored. Thus, possible intervention approaches were found to be needed to improve the patient-centred communication.

Limitations and suggestions for future research: When interpreting our findings, we should bear in mind the limitations of our research.Firstly,the duration of the cross-sectional survey may have an impact on the patient-centred attitudes of medical professionals.

Also,the participants in this study were sampled only from seven clinical units in the northeast of China, which could lead to limited external validity and the generalizability of our findings. Overall, the current study results indicate incongruence among Sharing, Caring, and

Total scores for patient-centeredness.Future related research could include large medical sample sizes and patient opinions to increase our understanding of this topic.

The analysis only included general hospitals that focused on medical professionals in one city. It would be helpful if future research incorporated longitudinal analyses or follow-up studies on other types of hospitals (e.g. primary hospital and specialized hospital).

Conclusions

In general, the present survey observed lower 'patient-centred' attitudes towards communication between medical professionals in northeast China, and findings indicated that higher Caring subscale scores but less patient-centred as measured by the Sharing subscale scores. Age, education level, average working time per day, and harmonious doctor-patient relationship cognition had significant impact on medical professionals' patient-centred attitudes, Therefore, possible intervention approaches would be needed to improve the patient-centred communication in China's H City.

Our research indicates that relieving burnout, and improving the cognition of doctor - patient relationship and medical education could help medical professionals to be more patient-centred in communication. Meanwhile, developing required medical educational interventions related to patient-centred care, establishing communication skills workshops, displaying the positive effects of a patient-centred relationship, increasing patients' awareness and abilities, and broadcasting activities about communication improvement methods on mass media are some approaches to address the low level of patient-centred care [33]. It is expected that these improvements would change the current status to a desired one in which medical professionals take their patients' needs into account, try to provide required information on their health status in an understandable way, and involve them more in the decision making process.

Improving medical professionals' patient-centred skills can result in establishing higher-quality medical services in China. However, education reform alone cannot fully achieve patient-centred care; instead, society as a whole and the entire healthcare system also need to affirm the value and significance of patient-centred care before it can be fully realized.

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Competing Interests

The authors declare there are no competing interests.

Authors' Contributors

Weijian Song contributed as the first author to this article for the drafting of the manuscript. Libo Liang and Qunhong Wu designed the study and collected the data. Yanhua Hao and Xiaowen Zhao provided statistical expertise. Wei Liu and Siyi Tao analyzed the data. Yuxin Xue and Juan Zhao provided questionnaire translation and literature review. Qiao Zhang and Mingli Jiao provided administrative support. Yu Cui , Weilan Xu, Hong Sun, Ye Li and Linghan Shan made critical revisions to the paper for important scientific content and reviewed various drafts as well as the final manuscript. All authors read and approved the final manuscript.

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References

[1] Manchaiah V, Gomersall P A, Tome D, et al. Audiologists' preferences for patient-centredness: a cross-sectional questionnaire study of cross-cultural differences and similarities among professionals in Portugal, India and Iran[J]. BMJ Open, 2014,4(10):e5915.

[2] Chan C M, Wan A W, Yusof M M, et al. Patient-Centredness, Job Satisfaction and Psychological Distress: a Brief Survey Comparing Oncology Nurses and Doctors[J]. Asian Pac J Cancer Prev, 2015,16(16):6895-6898.

[3] Ting X, Yong B, Yin L, et al. Patient perception and the barriers to practicing patient-centered communication: A survey and in-depth interview of Chinese patients and physicians[J]. Patient Educ Couns, 2016,99(3):364-369.

[4] Ribeiro M M, Krupat E, Amaral C F. Brazilian medical students' attitudes towards patient-centered care[J]. Med Teach, 2007,29(6):e204-e208.

[5] Castro E M, Van Regenmortel T, Vanhaecht K, et al. Patient empowerment, patient participation and patient-centeredness in hospital care: A concept analysis based on a literature review[J]. Patient Educ Couns, 2016,99(12):1923-1939.

[6] Health I O M U, Delivery C. Envisioning the National Health Care Quality Report[M]. Washington (DC): National Academies Press (US), 2001.

[7] Lau S R, Christensen S T, Andreasen J T. Patients' preferences for patient-centered communication: a survey from an outpatient department in rural Sierra Leone[J]. Patient Educ Couns, 2013,93(2):312-318.

[8] Cegala D J. Patient communication skills training: a review with implications for cancer patients[J]. Patient Educ Couns, 2003,50(1):91-94.

[9] Charlton C R, Dearing K S, Berry J A, et al. Nurse practitioners' communication styles and their impact on patient outcomes: an integrated literature review[J]. J Am Acad Nurse Pract, 2008,20(7):382-388.

[10] America I O M U. Crossing the Quality Chasm: A New Health System for the 21st Century[M]. Washington (DC): National Academies Press (US), 2001.

[11] Taylor K. Paternalism, participation and partnership - the evolution of patient centeredness in the consultation[J]. Patient Educ Couns, 2009,74(2):150-155.

[12] Haidet P. Patient-centredness and its challenge of prevailing professional norms[J]. Med Educ, 2010,44(7):643-644.

[13] Yi Y, Yanhua H, Libo L, et al. Analysis of medical staff perspective factors influencing a harmonious doctor-patient relationship: Based on 27 public hospitals of Heilongjiang province[J]. Chinese Journal of Health Policy, 2016,9(6):15-19.

[14] http://www.199it.com/archives/673838.html.

[15] Jianhua Z, Wenjie T, Min T, et al. Influencial Factors Analysis and Policy Selection of Physician-Patient Relationship in View of Hospital and Medical Staff[J]. Chinese Medical Ethics, 2011,24(1):123-125.

[16] Roter D. The enduring and evolving nature of the patient-physician relationship[J]. Patient Educ Couns, 2000,39(1):5-15.

[17] Krupat E, Rosenkranz S L, Yeager C M, et al. The practice orientations of physicians and patients: the effect of doctor-patient congruence on satisfaction[J]. Patient Educ Couns, 2000,39(1):49-59.

[18] Krupat E, Hiam C M, Fleming M Z, et al. Patient-Centeredness and its Correlates among First Year Medical Students[J]. The International Journal of Psychiatry in Medicine, 1999,29(3):347-356.

[19] Mudiyanse R M, Pallegama R W, Jayalath T, et al. Translation and validation of patient-practitioner orientation scale in Sri Lanka[J]. Educ Health (Abingdon), 2015,28(1):35-40.

[20] Shaw W S, Woiszwillo M J, Krupat E. Further validation of the Patient-Practitioner Orientation Scale (PPOS) from recorded visits for back pain[J]. Patient Educ Couns, 2012,89(2):288-291.

[21] Tsimtsiou Z, Kirana P, Hatzichristou D. Determinants of patients' attitudes toward patient-centered care：A cross-sectional study in Greece[J]. Patient Education and Counseling, 2014,97:391-395.

[22] Moore M. What does patient-centred communication mean in Nepal?[J]. Med Educ, 2008,42(1):18-26.

[23] Kim M J. [Differences in attitude toward patient-centeredness in patients and physicians][J]. Korean J Med Educ, 2013,25(2):149-156.

[24] Ting X, Yong B, Yin L, et al. Patient perception and the barriers to practicing patient-centered communication: A survey and in-depth interview of Chinese patients and physicians[J]. Patient Educ Couns, 2016,99(3):364-369.

[25] Wang J, Zou R, Fu H, et al. Measuring the preference towards patient-centred communication with the Chinese-revised Patient-Practitioner Orientation Scale: a cross-sectional study among physicians and patients in clinical settings in Shanghai, China[J]. BMJ Open, 2017,7(9):e16902.

[26] Hung L M, Rane S, Tsai J, et al. Advancing primary care to promote equitable health: implications for China[J]. Int J Equity Health, 2012,11:2.

[27] Laplante-Levesque A, Hickson L, Grenness C. An Australian survey of audiologists' preferences for patient-centredness[J]. Int J Audiol, 2014,53 Suppl 1:S76-S82.

[28] Manchaiah V, Gomersall P A, Tome D, et al. Audiologists' preferences for patient-centredness: a cross-sectional questionnaire study of cross-cultural differences and similarities among professionals in Portugal, India and Iran[J]. BMJ Open, 2014,4(10):e5915.

[29] Laplante-Levesque A, Hickson L, Grenness C. An Australian survey of audiologists' preferences for patient-centredness[J]. Int J Audiol, 2014,53 Suppl 1:S76-S82.

[30] Ahmad W, Ashraf H, Talat A, et al. Association of burnout with doctor-patient relationship and common stressors among postgraduate trainees and house officers in Lahore-a cross-sectional study[J]. PeerJ, 2018,6:e5519.

[31] Manchaiah V, Dockens A L, Bellon-Harn M, et al. Noncongruence between Audiologist and Patient Preferences for Patient-Centeredness[J]. J Am Acad Audiol, 2017,28(7):636-643.

[32] Lo D, Wu F, Chan M, et al. A systematic review of burnout among doctors in China: a cultural perspective[J]. Asia Pac Fam Med, 2018,17:3.
[33] Akkafi M, Sajadi H S, Sajadi Z S, et al. Attitudes Toward Patient-Centered Care in the Mental Care Services in Isfahan, Iran[J]. Community Ment Health J, 2018.
[34] Wen J, Cheng Y, Hu X, et al. Workload, burnout, and medical mistakes among physicians in China: A cross-sectional study[J]. Biosci Trends, 2016,10(1):27-33.
[35] Hurley E A, Doumbia S, Kennedy C E, et al. Patient-centred attitudes among medical students in Mali, West Africa: a cross-sectional study[J]. BMJ Open, 2018,8(1):e19224.

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1-2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1-2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2-4
Objectives	3	State specific objectives, including any prespecified hypotheses	2-4
Methods			
Study design	4	Present key elements of study design early in the paper	4-6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4-5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	4-5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5-6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-7
Bias	9	Describe any efforts to address potential sources of bias	5-6
Study size	10	Explain how the study size was arrived at	4-5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	4-5
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	6-7
		(*b*) Describe any methods used to examine subgroups and interactions	6-7
		(*c*) Explain how missing data were addressed	6-7
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	6-7
		(*e*) Describe any sensitivity analyses	6-7
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7-9
		(b) Give reasons for non-participation at each stage	4-5
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	7-9
		(b) Indicate number of participants with missing data for each variable of interest	
Outcome data	15*	Report numbers of outcome events or summary measures	
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	9-12

		(*b*) Report category boundaries when continuous variables were categorized	9-12
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	9-12
Discussion			
Key results	18	Summarise key results with reference to study objectives	13-15
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	15-46
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	16
Generalisability	21	Discuss the generalisability (external validity) of the study results	15-16
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	16-17

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Attitudes of Medical Professionals Toward Patient-Centeredness: a Cross-Sectional Study in H City, China

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Attitudes of Medical Professionals Toward Patient-Centeredness: a Cross-Sectional Study in H City, China

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Abstract

Objectives: Patient-centred communication improves patient experiences and patient care outcomes. This study aimed to assess the preference of medical professionals in China towards patient-centred communication under the context of the deteriorating doctor-patient relationship.

Methods: A cross-sectional survey of medical professionals was conducted in January and February 2018 in H city of Heilongjiang province, the northeast of China. The Chinese-Revised Patient-Practitioner Orientation Scale (CR-PPOS) was adopted to measure the individual

preference of respondents towards patient-centredness in clinical communication. Multivariate logistic regression models were established to identify the sociodemographic (gender, age, marital status, educational attainment) and work experience (years of working, seniority, satisfaction with income, daily workload, perceived doctor-patient relationship) predictors of the preference towards patient-centredness.

Patient and Public Involvement: Not applicable.

Results: A total of 618 valid questionnaires were returned. The CR-PPOS demonstrated acceptable reliability and validity. Overall, a low level of preference towards patient-centeredness in clinical communication was found. Relatively higher scores on "caring for patients" (20.42±4.42) was found compared with those on "information/responsibility sharing" (15.26±4.21). Younger age, higher educational attainment, lower daily workload, and a perception of harmonious doctor-patient relationship were associated with a higher preference towards patient-centredness in clinical communication.

Conclusions: A low level of preference towards patient-centredness in clinical communication was found in medical professionals in the northeast of China, which may further jeopardise the efforts to improve doctor-patient relationship.

Strengths and limitations of this study

- This study is the first of its kind in the northeast of China using the CR-PPOS;
- The study adopted a cross-sectional design with a large sample size, which can help improve our understanding on the attitudes of medical professionals toward patient-centredness in clinical communication;
- The findings have significant implications on the management of medical practice under the specific context of China;
- The study identified sociodemographic and work experience predictors of the preference of medical professionals towards patient-centredness in clinical communications, but no causal relationships can be assumed due to the cross-sectional design.

Keywords: Patient–Practitioner Orientation Scale (PPOS), Patient-Centered Communication (PCC), China, Doctor-Patient Relationship

Introduction

With the shift to the biopsychosocial paradigm, people have become increasingly concerned about the orientation of medical professionals towards clinical communication with their patients. Studies have distinguished between the patient-oriented style versus a doctor-oriented style of interaction [1-3]. The origin of the concept of patient-centred care can be traced back to the ancient time of Hippocrates when each patient was considered as a relatively independent individual [4]. The fundamental principles of patient-centeredness, however, have not been consistently defined until recently. It generally refers to the establishment of a partnership between providers and patients for the purpose of care tailored to the individual needs of patients in line with their preferences and values. Patients are empowered to actively participate in their own care and clinical decision-making [5, 6].

Patient-centred care has to be holistic, with multiple components being integrated in each patient-doctor encounter [7]. At the core of patient centred care is patient-centred communication (PCC). It needs to be cultural sensitive, but meanwhile encourages shared decision-making. Extensive studies have been conducted with a focus on improving communication between healthcare providers and their patients [8]. Empirical evidence shows that effective communication is crucial to high quality care as measured by patient experience and patient care outcomes [9]. Indeed, patient-centeredness itself has become one of the indicators of quality care in the 21st century [10]. It represents a serious challenge to the traditional medical approach of paternalism [11]. However, our understanding on the tendency of medical professionals towards patient-centredness is very limited [12].

Arguably, PCC requires a harmonious doctor-patient relationship. Unfortunately, China is currently experiencing serious challenges in relation to the doctor-patient relationship. Medical disputes are frequently reported. There exists a crisis of distrust and mistrust between medical professionals and patients due to a wide range of reasons within and outside of the health sector. The disharmony between medical professionals and patients has been deemed a major obstacle of the health system reform [13]. According to the 2017 'White Paper on Medical Workforce in China', only half of medical workers believed that their contributions were appreciated by the society. More than 65% experienced disputes with their patients and 62% were dissatisfied with

their working environment [14]. A lack of patient-centredness can fuel distrust and mistrust from the patients. Therefore, medical professionals can and should play a vital role in building a harmonious doctor-patient relationship through patient-centred care [15]. However, a perception of poor doctor-patient relationship may deter medical professionals from adopting a PCC approach in clinical practices [16].

This study aimed to advance our understanding on the preference of medical professionals in China towards patient-centredness in clinical communication. The study adopted the Patient–Practitioner Orientation Scale (PPOS) to measure PCC. The PPOS was developed by Krupat et al [17], containing 18 items measuring two dimensions 'sharing' and 'caring' [18]. The caring dimension assesses the tendency of treating patients as a whole person, concerning not only their medical conditions but also their emotional and social needs. The sharing subscale assesses willingness of medical professionals to share information and decision making power with their patients [19]. It has been validated in a variety of study settings, including in the USA, Sri Lanka, Greece, Nepal, South Korea, Sierra Leone [7][19][20][21][22][23].

Although PCC has started to gain momentum in China, there are only a few studies documenting the attitudes of medical professionals in China toward patient-centredness in clinical communication. Ting et al. (2016) made the earliest known attempt to apply the PPOS to assess patient preference towards PCC in a hospital in the southwest of China [24]. Since then, the Chinese-Revised Patient–Practitioner Orientation Scale (CR-PPOS) has been validated in the medical professionals and the patients in Shanghai [25]. However, there is paucity in the literature documenting the preference of medical professionals in other regions in China toward patient-centredness. Significant regional disparities in economic development exist in China, which has a profound impact on health resources and health services [26].

This study addressed the gap in the literature by conducting a cross-sectional study of the medical professionals in China's oldest industrial base - H city in Heilongjiang province using the CR-PPOS.

Materials & Methods

Study population and data collection: A cross-sectional questionnaire survey of medical professionals was conducted in January and February 2018. Study participants were recruited through a stratified sampling strategy to ensure representativeness. Seven medical institutions in H City were selected first considering a balance of size and economic zones. Eligible medical professionals from the participating institutions were invited to participate in the survey. The eligibility criteria included: (1) full-time employees of registered medical doctors in various disciplines including anesthetists; (2) working in clinical practice for at least one year. Those who were not registered medical doctors (such as nurses) and were absent on the day of data collection were excluded. The survey was voluntary and the respondents had to be able to complete the questionnaire independently without assistance. The survey was open to each hospital for one day or one and a half days.

The questionnaire was distributed in person to the study participants by 14 trained investigators. They explained the purpose and the study protocol in line with the informed consent letter to the participants in groups before distributing the questionnaire. They also provided instructions about how to fill in the questionnaire. Verbal informed consent was obtained from the participants prior to the commencement of the survey. Completion and return of the completed questionnaire was voluntary and anonymous. The respondents did not have to complete the questionnaire on the same day although most did so. In cases where the respondents wanted to participate but were unable to complete the questionnaire on the same day, another date was set up in negotiation with the respondents. Collection of the returned questionnaires started approximately 15 minutes after the questionnaire distribution. The investigators checked completeness of each returned questionnaire. Missing data, if found, were filled through a request with the original respondents.

In total, 650 questionnaires were distributed and 618 (95.1%) valid questionnaires were obtained. The sample represented 10.9% of all registered medical professionals (nearly 5686 as of 2017) in H City.

Patient and Public Involvement: There was no patient and public involvement.

Questionnaire design: The original PPOS contains 18 items. The CR-PPOS reduced the number of items to 11, which demonstrated better psychometric properties and high overall reliability and validity [25]. In this study, we adopted the CR-PPOS with the consent from the authors of both PPOS and CR-PPOS. Each item was rated on a six-point Likert scale: 1 = 'strongly disagree', 2 = 'disagree', 3 = 'somewhat disagree', 4 = 'somewhat agree', 5=' agree', 6= 'strongly agree'.

The questionnaire also collected the sociodemographic characteristics (gender, age, marital status, educational attainment) and work experience (years of working, seniority, daily workload) of the respondents. In addition, we assessed the degree of satisfaction of the respondents with their income and their perceived relationship with patients. It is not uncommon in China for medical professionals to complain about their income, which can adversely affect their relationship with patients [14]. Such a problem is particularly profound in the less developed regions of China.

Statistical analysis: Frequency distributions of respondents across different groups were described, which included gender (male, female), age (≤25, 26～30, 31～40, >40 years), marital status (unmarried, married, divorced, others), educational attainment (<bachelor, bachelor degree, postgraduate degree), years of working (≤5, 6～10, >10), professional title (senior, sub-senior, intermediate, primary, no title), satisfaction with income (no, yes), and perceived harmonious doctor-patient relationship (no, yes).

The scores of the CR-PPOS items were aligned to the same direction before a summed score was calculated for the "caring" and "sharing" dimensions and the entire scale. They were described using mean values and standard deviations. A higher score indicates a higher preference toward patient-centredness. The reliability of the CR-PPOS scale was assessed using Cronbach's α coefficient. A Cronbach's α of above 0.6 was deemed acceptable. Confirmatory factor analysis (CFA) was performed to assess the construct validity of the CR-PPOS scale. Root

mean square error of approximation (RMSEA<0.08), incremental fit index (IFI>0.90) and comparative fit index (CFI>0.90) were examined to assess fitness of the data into the model.

The "sharing", "caring" and total scores of the CR-PPOS were dichotomised using the median value (15, 21 and 37, respectively) as a cut-off point. A more patient-centred approach was assigned with a value of 1, otherwise 0. Multivariate logistic regression models were established to identify the sociodemographic (gender, age, marital status, educational attainment) and work experience (years of working, seniority, satisfaction with income, daily workload, perceived doctor-patient relationship) predictors of the preference towards patient-centredness. Adjusted odds ratio (OR) and its 95% confidence interval (95% CI) for each tested predictor was presented.

The statistical analyses were performed using SPSS V.19.0 (IBM Corporation, Armonk, NY, USA) and AMOS 21.0.

Ethical considerations: Ethics approval was granted by the research ethics committee of Harbin Medical University. Informed consent was obtained from each participating hospital and each study participant. The survey was anonymous and voluntary.

Results

Socio-demographic characteristics of respondents: About half respondents were female and in the age between 31 and 40 years. Over 76% of respondents were married at the time of the survey. Intermediate professional title was the most common title (38.6%), followed by primary title (27.4%). The majority of respondents (71.7%) had a postgraduate degree. Only a tenth of respondents were satisfied with their income and perceived a harmonious relationship with patients (Table 1).

Table 1. Characteristics of respondents (n=618)

Characteristic	n	%

Gender		
Male	311	50.3
Female	307	49.7
Age		
≤25	30	4.9
26～30	136	22.0
31～40	323	52.3
>40	129	20.9
Marital status		
Unmarried	134	21.7
Married	471	76.2
Divorced and others	13	2.1
Years of working		
≤5	243	39.5
6～10	165	26.8
>10	207	33.7
Professional title		
Senior	66	10.7
Sub-senior	104	16.9
Intermediate	237	38.6
Primary	168	27.4
No title	39	6.4
Educational attainment		
< Bachelor	4	0.6
Bachelor degree	171	27.7
Postgraduate degree	443	71.7
Satisfaction with income		
No	533	89.0
Yes	66	11.0
Harmonious doctor-patient relationship		
No	553	89.6
Yes	64	10.4

Reliability and validity of the CR-PPOS scale: The Cronbach's alpha coefficients of the CR-PPOS scale exceeded 0.7, indicating good internal consistency (Table 2).

Table 2. The internal consistency of the CR-PPOS scale

	Cronbach's α
Sharing subscale	0.705
Caring subscale	0.739

Total score	0.720

The Bartlett's sphericity test yielded a value of 1457.716 (df = 55, p<0.001) and the Kaiser-Meyer-Olkin (KMO) index was 0.780, indicating appropriateness for factor analyses. The confirmatory factor analysis showed a weak model fit: RMSEA=0.100; CFI=0.880; IFI=0.882. The results indicate a need for further revisions.

Item-to-component and item-to-total correlations: The Pearson correlation coefficients showed strong item-to-component correlations: 0.573-0.705 for sharing (P<0.05) and 0.613-0.775 for caring (P<0.05); and moderate item-to-total correlations: 0.372-0.613 for sharing (P<0.05) and 0.495-0.617 for caring (P<0.05). Both sharing and caring were highly correlated with the total CR-PPOS scores (P<0.001) despite a weak correlation between the sharing and caring scores (0.2, P<0.001) (Table 3).

CR-PPOS scale scores: The respondents had a mean sharing score of 15.26 (SD=4.21), compared with a mean caring score of 20.42 (SD=4.42). The total CR-PPOS score reached 35.62±6.64. The highest item score was found in the question 'If doctors are truly good at diagnosis and treatment, the way they relate to patients is not that important' (4.68±1.23). Whereas, the lowest score was found in the question 'Patients should rely on their doctors' knowledge and not try to find out their conditions on their own' (2.08±0.94) (Table 3).

Table 3. CR-PPOS item and scale scores and their correlations

Subscale	Items	Item-to-subscale correlation	Item-to-total correlation	Mean±SD	Standardised score ranging from 0 to 100
Sharing				**15.26±4.21**	**30.86**
	1. The doctor is the one who should decide what gets talked about during a visit	0.641**	0.395**	2.39±1.06	
	2. Patients should rely on their doctors' knowledge and not try to find	0.662**	0.372**	*2.08±0.94*	

	out their conditions on their own.				
	5. Many patients continue asking questions even though they are not learning anything.	0.631**	0.438**	2.37±1.06	
	7. When patients disagree with their doctor, this is a sign that the doctor does not have the patient's respect and trust.	0.573**	0.613**	**3.27±1.26**	
	9. The patient must always be aware that the doctor is in charge.	0.705**	0.603**	**2.81±1.17**	
	11. When patients find out medical information on their own, this usually confuses more than it helps.	0.628**	0.423**	2.43±1.16	
Caring				**20.42±4.42**	**61.68**
	3. When doctors ask a lot of questions about a patient's background, they are prying too much into personal matters.	0.613**	0.533**	3.65±1.35	
	4. If doctors are truly good at diagnosis and treatment, the way they relate to patients is not that important.	0.775**	0.560**	**4.68±1.23**	
	6. If a doctor mainly relies on being open and warm, the doctor will not have a lot of success.	0.676**	0.617**	*3.58±1.31*	
	8. Most patients want to get in and out of the doctor's office as quickly as possible.	0.697**	0.495**	4.31±1.20	
	10. It is not that important to know a patient's culture and background to treat the person' s illness.	0.748**	0.541**	4.19±1.24	
Total				**35.62±6.64**	**44.76**

Notes: **Spearman correlation coefficients, P<0.001; CR-PPOS =Chinese-revised Patient-Practitioner Orientation Scale; Score of 1 (strongly agree)=most clinician-centred; Score of 6 (strongly disagree)=most patient-centred.

Predictors of patient-centredness in clinical communications: The multivariate logistic regression models showed that the respondents who had a postgraduate degree (AOR=1.779, 95% CI: 1.180~2.681), worked less than 8 hours per day (AOR=0.589, 95% CI: 0.403~0.860), and perceived a harmonious doctor-patient relationship (AOR=1.918, 95% CI: 1.345~2.736) were more likely than others to agree with sharing information and decision power. The respondents aged between 31 and 40 years were marginally less likely to agree with caring centred around patients than their younger counterparts (AOR = 0.587, 95% CI: 0.345~1.000). In terms of the total scores, the respondents aged over 40 years were less likely to endorse patient-centredness

(AOR = 0.502, 95% CI: 0.256~0.987) than their younger counterparts; but those who perceived a harmonious doctor-patient relationship were more likely to endorse patient-centredness (AOR=1.712, 95% CI: 1.205~2.433) (Table 4).

Table 4. Logistic regression analyses on factors associated with patient-centeredness in clinical communications

Category	Sharing		Caring		Total	
	p	AOR (95% CI)	*p*	AOR (95% CI)	*p*	OR (95% CI)
Gender						
Male	_	_	_	_	_	_
Female	0.523	1.120 (0.791~1.584)	0.559	1.105 (0.790~1.547)	0.102	1.332 (0.944~1.879)
Age						
≤30	0.457	_	0.144	_	0.708	_
31～40	0.225	0.717 (0.418~1.228)	**0.050***	**0.587 (0.345~1.000)**	0.480	0.826 (0.485~1.404)
>40	0.502	0.794 (0.404~1.558)	0.188	0.642 (0.332~1.241)	**0.046***	**0.502 (0.256~0.987)**
Marital status						
Unmarried	_	_	_	_	_	_
Married	0.311	0.766 (0.458~1.283)	0.815	1.062 (0.640~1.763)	0.967	0.989 (0.595~1.644)
Educational attainment						
≤ Bachelor	_	_	_	_	_	_
Postgraduate degree	**0.006***	**1.779 (1.180~2.681)**	0.412	1.178 (0.797~1.741)	0.223	1.284 (0.859~1.918)
Professional title						
Primary and below	_	_	_	_	_	_
Intermediate and above	0.211	0.729 (0.445~1.196)	0.304	1.292 (0.792~2.108)	0.622	1.131 (0.693~1.846)
Average working hours per day						
≤8h	_	_	_	_	_	_
>8h	**0.006***	**0.589 (0.403~0.860)**	0.410	1.167 (0.808~1.685)	0.653	0.918 (0.631~1.334)
Satisfaction with income						
No	_	_	_	_	_	_
Yes	0.382	1.172 (0.821~1.674)	0.408	0.864 (0.611~1.222)	0.402	1.164 (0.816~1.660)

Harmonious doctor-patient relationship						
No	_	_	_	_	_	_
Yes	**0.000***	**1.918 (1.345~2.736)**	0.977	0.995 (0.704~1.405)	**0.003***	**1.712 (1.205~2.433)**

Discussion

Although the PPOS has been widely used in the international community and its Chinese version (CR-PPOS) has also been made available[7] [19] [20][21][22][23], only a few studies reported the results in China using the CR-PPOS[25]. This study represents the first attempt of using the CR-PPOS to measure the attitudes of medical professionals toward patient-centredness in the northeast region of China. The CR-PPOS demonstrated good internal consistency.

Overall, the study participants reported an attitude not in favour of patient-centredness in clinical communication, with the standardised score below 50. The participants gave a relatively higher rating on caring (standardised score of 62) than on sharing (standardises score of 31). This pattern is consistent with the findings of most existing studies. However, there are two exceptions. The studies in Portugal and Australia revealed relatively higher scores in sharing compared with caring [27, 28]. The underlying reasons are unknown. But it is likely to be associated with the professional culture and local medical system environments. Further comparative studies are warranted.

In some studies, the PPOS scores were ranked and categorised into three groups using an average item score of 5 indicating a high preference, 4.57-4.59 indicating a medium preference, and less than 4.57 indicating a low preference towards patient centredness [18]. Our study participants would be deemed to have extremely low preference towards patient-centredness using these criteria despite a slightly higher tendency towards caring for the needs of the whole person. Indeed, the mean item scores (3.24±0.604) revealed in this study are lower than those found in the studies in Shanghai (3.66±0.59)[25], the US Pilgrim Health Care (HPHC) (4.26±0.75) [17], and Australia (4.46) [29]. The differences in the results may be partly explained by the differences in socio-economic conditions and religious beliefs and cultural values. The

attitudes of medical professionals may also change with the economic and health system development [30]. The level of economic and health development in Shanghai has matched that of the developed countries. There exist great disparities between Shanghai and our study setting H city. The concept of patient-centred care in H city is still in its infant stage of development.

It is worth noting that the caring item "If doctors are truly good at diagnosis and treatment, the way they relate to patients is not that important" attracted the highest score (4.68), indicating a relatively strong awareness of the study participants in regard to the need of skills beyond technical skills in caring for patients. There is consensus in medical professionals that patient care outcomes depend on shared goals and actions between patients and their care providers [31]. This sentiment is support by the highest scored item in sharing "When patients disagree with their doctor, this is a sign that the doctor does not have the patients' respect and trust". It indicates that the study participants understood that patients might want to engage in clinical decision making in a respectful way. It is concerning, however, that the study participants showed low confidence in the ability of patients to meaningfully engage in clinical decision making. The sharing question "Patients should rely on their doctors' knowledge and not try to find out their conditions on their own" (2.08) and the caring question "If a doctor mainly relies on being open and warm, the doctor will not have a lot of success" (3.58) attracted the lowest scores, respectively, suggesting that the study participants put very high values on their technical inputs in clinical communication. These results are generally consistent with the findings of other studies [28, 31].

Both sociodemographic characteristics and working environmental factors are associated with the attitudes of medical professionals toward patient-centredness in clinical communication. We found in this study that higher workloads are associated with a lower preference towards patient-centeredness. Previous studies revealed that high workloads of health workers have become a serious concern in China, which can lead to burnout [32]. Burnout in turn can result in low job satisfaction, high incidence of medical errors, worsened relationship with patients [30, 33], and even avoidance of direct contacts with patients [34]. It is hard to imagine how a medical

doctor experiencing burnout can dedicate time and efforts to share information and power and address the concerns and choices of their patients [30].

An interesting finding of this study is that a perceived harmonious relationship with patients is positively associated with the preference towards patient-centredness in clinical communication, especially in regard to sharing information and decision making power. A plausible explanation is that those who perceive a harmonious doctor-patient relationship may place high trust in their patients and are less likely to be hesitated to share information and power with their patients. The growing medical disputes reported in China may become a serious barrier for promoting patient-centredness in clinical communication [24]. Medical professionals desire a process of communication built on mutual-respect and mutual-understanding.

Education can also play a role in promoting patient centredness. Our study found that the study participants with a postgraduate qualification were more likely to prefer sharing information and power with patients. The medical educational curricula may have contributed to the results [35]. There has been a lack of emphasis on the communication components in vocational training curricula for medical practitioners. Researchers have called for strengthening the educational role of medical practitioners for their patients [26]. It appeared that the medical training curricula in China may have started to adapt to the changing trend [35]. The younger medical professionals in this study were found to have a relatively higher preference towards patient-centredness in clinical communication.

Strengths of this study: This is the first study of its kind to report the attitudes of medical professionals in the northeast of China toward patient-centred care. Low levels of preference towards patient-centredness in clinical communication were found. Findings of this study have significant implications on the management of medical practice under the specific context of China. The sample size of this study was large, which enabled us to identify the sociodemographic and work experience predictors of the attitudes toward patient-centredness.

Limitations and suggestions for future research: The study adopted a cross-sectional design. No causal relationships can be assumed. It is also important to note the short survey

period. The attitudes of medical professionals may change over time. In addition, the participants in this study were sampled from seven medical institutions in H city, which limits the external validity of the study and generalisability of the findings. Further studies are needed in a more representative large sample, which can include a comparative study across different regions and settings. It is also important to understand the view of patients on this matter. A longitudinal study is also desired to determine changes in the attitudes of medical professionals over time.

Conclusions

Overall, the survey revealed a low preference of medical professionals in the northeast of China towards patient-centredness in clinical communication. A relatively higher preference towards caring was found in comparison with sharing. Younger age, higher education, lower working loads, and a perception of harmonious doctor-patient relationship are significant predictors of more favourable attitudes toward patient-centredness in clinical communication.

Improving medical education and working environments may be plausible strategies for promoting patient-centredness. However, the intense patient-provider relationship in China presents a serious challenge. It is equally important to empower patients and enhance their endorsement of partnership building with medical professionals. This should include the use of mass media [33].

Training is important for improving the communication skills of medical professionals. However, training alone is not enough. The society as a whole and the entire healthcare system need to embrace the value and significance of patient-centred care.

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Competing Interests

The authors declare there are no competing interests.

Authors' Contributors

Weijian Song and Mingli Jiao contributed equally as the first author to this article. Libo Liang and Qunhong Wu designed the study and collected the data. Yu Cui, Yanhua Hao and Xiaowen Zhao provided statistical expertise. Chaojie Liu critically revised the manuscript. Wei Liu and Siyi Tao analyzed the data. Yuxin Xue and Juan Zhao performed questionnaire translation and literature review. Qiao Zhang provided administrative support. Weilan Xu, Hong Sun, Ye Li and Linghan Shan made critical revisions to the paper for important scientific content and reviewed various drafts as well as the final manuscript. All authors read and approved the final manuscript.

Data sharing statement Data are available upon reasonable request, additional data from this study could be accessed by contacting the corresponding author Libo Liang via llbhit@163.com.

References

[1] Manchaiah V, Gomersall P A, Tome D, et al. Audiologists' preferences for patient-centredness: a cross-sectional questionnaire study of cross-cultural differences and similarities among professionals in Portugal, India and Iran[J]. BMJ Open, 2014,4(10):e5915.

[2] Chan C M, Wan A W, Yusof M M, et al. Patient-Centredness, Job Satisfaction and Psychological Distress: a Brief Survey Comparing Oncology Nurses and Doctors[J]. Asian Pac J Cancer Prev, 2015,16(16):6895-6898.

[3] Ting X, Yong B, Yin L, et al. Patient perception and the barriers to practicing patient-centered communication: A survey and in-depth interview of Chinese patients and physicians[J]. Patient Educ Couns, 2016,99(3):364-369.

[4] Ribeiro M M, Krupat E, Amaral C F. Brazilian medical students' attitudes towards patient-centered care[J]. Med Teach, 2007,29(6):e204-e208.

[5] Castro E M, Van Regenmortel T, Vanhaecht K, et al. Patient empowerment, patient participation and patient-centeredness in hospital care: A concept analysis based on a literature review[J]. Patient Educ Couns, 2016,99(12):1923-1939.

[6] Health I O M U, Delivery C. Envisioning the National Health Care Quality Report[M]. Washington (DC): National Academies Press (US), 2001.

[7] Lau S R, Christensen S T, Andreasen J T. Patients' preferences for patient-centered communication: a survey from an outpatient department in rural Sierra Leone[J]. Patient Educ Couns, 2013,93(2):312-318.

[8] Cegala D J. Patient communication skills training: a review with implications for cancer patients[J]. Patient Educ Couns, 2003,50(1):91-94.

[9] Charlton C R, Dearing K S, Berry J A, et al. Nurse practitioners' communication styles and their impact on patient outcomes: an integrated literature review[J]. J Am Acad Nurse Pract, 2008,20(7):382-388.

[10] America I O M U. Crossing the Quality Chasm: A New Health System for the 21st Century[M]. Washington (DC): National Academies Press (US), 2001.

[11] Taylor K. Paternalism, participation and partnership - the evolution of patient centeredness in the consultation[J]. Patient Educ Couns, 2009,74(2):150-155.

[12] Haidet P. Patient-centredness and its challenge of prevailing professional norms[J]. Med Educ, 2010,44(7):643-644.

[13] Yi Y, Yanhua H, Libo L, et al. Analysis of medical staff perspective factors influencing a harmonious doctor-patient relationship: Based on 27 public hospitals of Heilongjiang province[J]. Chinese Journal of Health Policy, 2016,9(6):15-19.

[14] http://www.199it.com/archives/673838.html.

[15] Jianhua Z, Wenjie T, Min T, et al. Influencial Factors Analysis and Policy Selection of Physician-Patient Relationship in View of Hospital and Medical Staff[J]. Chinese Medical Ethics, 2011,24(1):123-125.

[16] Roter D. The enduring and evolving nature of the patient-physician relationship[J]. Patient Educ Couns, 2000,39(1):5-15.

[17] Krupat E, Rosenkranz S L, Yeager C M, et al. The practice orientations of physicians and patients: the effect of doctor-patient congruence on satisfaction[J]. Patient Educ Couns, 2000,39(1):49-59.

[18] Krupat E, Hiam C M, Fleming M Z, et al. Patient-Centeredness and its Correlates among First Year Medical Students[J]. The International Journal of Psychiatry in Medicine, 1999,29(3):347-356.

[19] Mudiyanse R M, Pallegama R W, Jayalath T, et al. Translation and validation of patient-practitioner orientation scale in Sri Lanka[J]. Educ Health (Abingdon), 2015,28(1):35-40.

[20] Shaw W S, Woiszwillo M J, Krupat E. Further validation of the Patient-Practitioner Orientation Scale (PPOS) from recorded visits for back pain[J]. Patient Educ Couns, 2012,89(2):288-291.

[21] Tsimtsiou Z, Kirana P, Hatzichristou D. Determinants of patients' attitudes toward patient-centered care : A cross-sectional study in Greece[J]. Patient Education and Counseling, 2014,97:391-395.

[22] Moore M. What does patient-centred communication mean in Nepal?[J]. Med Educ, 2008,42(1):18-26.

[23] Kim M J. [Differences in attitude toward patient-centeredness in patients and physicians][J]. Korean J Med Educ, 2013,25(2):149-156.

[24] Ting X, Yong B, Yin L, et al. Patient perception and the barriers to practicing patient-centered communication: A survey and in-depth interview of Chinese patients and physicians[J]. Patient Educ Couns, 2016,99(3):364-369.

[25] Wang J, Zou R, Fu H, et al. Measuring the preference towards patient-centred communication with the Chinese-revised Patient-Practitioner Orientation Scale: a cross-sectional study among physicians and patients in clinical settings in Shanghai, China[J]. BMJ Open, 2017,7(9):e16902.

[26] Hung L M, Rane S, Tsai J, et al. Advancing primary care to promote equitable health: implications for China[J]. Int J Equity Health, 2012,11:2.

[27] Laplante-Levesque A, Hickson L, Grenness C. An Australian survey of audiologists' preferences for patient-centredness[J]. Int J Audiol, 2014,53 Suppl 1:S76-S82.

[28] Manchaiah V, Gomersall P A, Tome D, et al. Audiologists' preferences for patient-centredness: a cross-sectional questionnaire study of cross-cultural differences and similarities among professionals in Portugal, India and Iran[J]. BMJ Open, 2014,4(10):e5915.

[29] Laplante-Levesque A, Hickson L, Grenness C. An Australian survey of audiologists' preferences for patient-centredness[J]. Int J Audiol, 2014,53 Suppl 1:S76-S82.

[30] Ahmad W, Ashraf H, Talat A, et al. Association of burnout with doctor-patient relationship and common stressors among postgraduate trainees and house officers in Lahore-a cross-sectional study[J]. PeerJ, 2018,6:e5519.

[31] Manchaiah V, Dockens A L, Bellon-Harn M, et al. Noncongruence between Audiologist and Patient Preferences for Patient-Centeredness[J]. J Am Acad Audiol, 2017,28(7):636-643.

[32] Lo D, Wu F, Chan M, et al. A systematic review of burnout among doctors in China: a cultural perspective[J]. Asia Pac Fam Med, 2018,17:3.

[33] Akkafi M, Sajadi H S, Sajadi Z S, et al. Attitudes Toward Patient-Centered Care in the Mental Care Services in Isfahan, Iran[J]. Community Ment Health J, 2018.

[34] Wen J, Cheng Y, Hu X, et al. Workload, burnout, and medical mistakes among physicians in China: A cross-sectional study[J]. Biosci Trends, 2016,10(1):27-33.

[35] Hurley E A, Doumbia S, Kennedy C E, et al. Patient-centred attitudes among medical students in Mali, West Africa: a cross-sectional study[J]. BMJ Open, 2018,8(1):e19224.

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1-2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1-2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2-3
Objectives	3	State specific objectives, including any prespecified hypotheses	2-3
Methods			
Study design	4	Present key elements of study design early in the paper	4-5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4-5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	4-5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	4-5
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	4-5
Bias	9	Describe any efforts to address potential sources of bias	4-5
Study size	10	Explain how the study size was arrived at	4-5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	4-5
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	5
		(*b*) Describe any methods used to examine subgroups and interactions	5
		(*c*) Explain how missing data were addressed	5
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	5
		(*e*) Describe any sensitivity analyses	5
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	5-6
		(b) Give reasons for non-participation at each stage	5-6
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	5-6
		(b) Indicate number of participants with missing data for each variable of interest	
Outcome data	15*	Report numbers of outcome events or summary measures	
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	5-9

		(*b*) Report category boundaries when continuous variables were categorized	5-9
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	9-11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	11
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11
Generalisability	21	Discuss the generalisability (external validity) of the study results	11-12
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	12

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.