

BMJ Open Primary care physicians' views on the factors for enhancing patients' trust in rural areas of Zhejiang province, China: a cross-sectional study

Jingjing Cai,¹ Dan Wu ,² Kai Sing Sun ,^{3,4} Shengzhi Yang,¹ Kwok Fai Lam,⁵ Lu Li,¹ Tai Pong Lam,³ Xudong Zhou ¹

To cite: Cai J, Wu D, Sun KS, *et al.* Primary care physicians' views on the factors for enhancing patients' trust in rural areas of Zhejiang province, China: a cross-sectional study. *BMJ Open* 2021;**11**:e049114. doi:10.1136/bmjopen-2021-049114

► Prepublication history and supplemental material for this paper is available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2021-049114>).

Received 17 January 2021
Accepted 13 July 2021



© Author(s) (or their employer(s)) 2021. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

For numbered affiliations see end of article.

Correspondence to

Professor Xudong Zhou;
zhouxudong@zju.edu.cn and
Professor Tai Pong Lam;
tplam@hku.hk

ABSTRACT

Objectives To examine primary care physicians' (PCPs) perception of patients' trust and associated factors for enhancing perceived trust in rural China.

Design A cross-sectional questionnaire study.

Setting All township health centres (primary care facilities in rural areas of China) in both developed and less developed counties of Zhejiang province, China, were chosen as the study sites.

Participants A total of 849 questionnaires were distributed from December 2019 to January 2020, and 673 PCPs working in township health centres completed the questionnaires. The response rate was 79.3%.

Outcome measures PCPs' perceived patients' trust in them, PCPs' practices to meet patients' expectations and PCPs' perceived conflicting patient and employer interests were measured by a self-designed and verified questionnaire. Confirmatory factor analysis was applied to verify the measurement model of PCPs' practices. Multivariable logistic regression analyses were performed to explore the association between clinical practice characteristics, discordant patient and employer interests and perceived patient trust after controlling for social-demographic characteristics.

Results Among all participants, 572 (85.0%) PCPs often/always perceived patients' trust in their clinical competence, and over two-thirds of PCPs reported ever perceived patient worries about overprescriptions. After adjustment for social-demographic characteristics, regression model results indicated that, among PCPs' clinical practices characteristics, emotional support (OR=1.23, 95% CI=1.06 to 1.42) and accurate diagnosis and treatment (OR=1.35, 95% CI=1.17 to 1.55) were positively associated with PCPs' perceived patients' trust in their clinical competence. A strong association was found between accurate diagnosis and treatment (OR=1.20, 95% CI=1.08 to 1.34, $p<0.001$; OR=1.22, 95% CI=1.10 to 1.35, $p<0.001$), conflicting patient and employer interests (OR=1.35, 95% CI=1.12 to 1.63, $p<0.01$; OR=1.29, 95% CI=1.07 to 1.54, $p<0.01$) and PCPs' perceived patient worries about unnecessary medicine or tests, respectively.

Conclusions PCPs' emotional support to patients as well as their abilities to make accurate diagnosis and provide appropriate treatment is positively associated with PCPs' self-reported patients' trust. It is recommended that reforms to realign patient and employer's interests be investigated.

Strengths and limitations of this study

- The measurement of perceived patients' trust was composed of patients' trust in PCPs' clinical competence and patients' worries about overprescriptions, which may supplement health service evaluation.
- Guided by the definition of trust and empathy role in clinical practices, emotional support was adopted to measure clinical practice characteristics, which may provide reference for future health service surveys.
- The rural setting of the study may compromise the representativeness of the sample.
- As the first study that shed lights on PCPs' perspective in patients' trust, patients were not included in this study, and further studies may need to look into trust from both PCPs' and patients' perspectives.

INTRODUCTION

A good patient–doctor relationship is key to providing quality primary care. To make it happen, patients' trust in primary care physicians (PCPs) is fundamental.¹ Patients' trust has been frequently examined,¹ and studies reported that it can be affected by individual, social and systematic factors.^{2–4} However, the reciprocal feature of this relationship is often neglected. PCPs' perceived patients' trust was a gratifying feature of general practice and is of high importance for enhancing physicians' morale.⁵ According to the Chinese National Health Service Survey, with the decline in medical personnel's self-perceived patients' trust and respect, from 2008 to 2013, their perception of patient satisfaction and professional sense of honour dropped by 5.8 percentage and 15.5 points, respectively.⁶ Recognition of patients' trust helps to build a rewarding doctor–patient relationship from physicians' perspective.⁵ Furthermore, how physicians evaluate patients' trust in themselves is recognised as imperative to build an efficient health system.⁷ PCPs' perception of



patients' trust is therefore important to establish a well-functioning primary care system.⁸ Despite the significance, PCPs' self-perceived patients' trust in themselves is underexplored, both internationally and in China.

Since the beginning of the market-oriented economic reforms in the late 1970s, the elimination of social and economic basis of primary care system in rural areas has threatened the stability of primary care workforce.⁹ China has launched an ambitious health system reform since 2009, and one of its long-term strategies is to build a strong primary care system.¹⁰ As health resources in rural areas are limited compared with urban areas,⁸ township health centres are the main accessible and affordable source of care for rural residents. Thus, PCPs working in township health centres have received unprecedented attention.¹¹ To enhance the primary care system by encouraging the gate-keeping role of PCPs, there is a need to improve PCPs' perception of patients' trust in rural China.

Patients' trust in PCPs in China has been frequently reported to have deteriorated in the past few decades,¹² which may in turn affect PCPs' self-perceived patients' trust. A systematic review on the present profile of Chinese primary health workforce revealed that few rural PCPs felt high patients' trust in them.¹³ Patients' trust is commonly believed to be closely related to China's profit-oriented primary care system.¹⁴ During the barefoot doctor era when essential medical care was free, township health centres and village clinics provided first-contact primary care for the majority of rural citizens, while county and higher-level hospitals were responsible for providing subspecialty care. However, this three-tiered system has been malfunctioning since the market-oriented economic reforms.¹⁵ The dismantle of collective resident fundraising mechanism and reduction of governmental financial subsidies undermined financial stability of rural primary care system. Township health centres shifted from providing public health services to profitable health services in order to survive.⁹ PCPs working in township health centres were encouraged to generate revenue from diagnostic tests and medications. This led to widespread prescriptions of unnecessary tests and medicines,^{15 16} leaving many patients feeling being exploited. Patient worries about PCPs' overprescribing behaviours and distrust in PCPs' professionalism are increasingly reported in the past decade.¹⁷ Furthermore, some PCPs felt pressured about making profit for the primary care facilities from unnecessary prescriptions and by compromising the benefits of patients, leading to a self-denial sentiment.¹⁴

Another key factor influencing PCPs' perceived patients' trust is their self-confidence in clinical competence. Earlier qualitative research indicated that Chinese PCPs seemed to have poor self-confidence in their clinical competence, and they also reported patient's distrust in their clinical capacity.¹⁸ Previous studies found that many Chinese residents preferred county or higher-level hospitals to primary care facilities even for minor health issues.^{10 11} Some PCPs commented that patients perceive

them as non-professional, which means that PCPs were only capable of providing a narrow range of low-quality healthcare services in patients' eyes.¹⁹ Such negative attitudes may discourage PCPs, harming their morale and enthusiasm to provide quality care.^{20 21}

Priorities have been given to primary care system throughout the world; especially in remote rural regions, PCPs received unprecedented attention. Although it is of great significance to have an insight of the patient-physician relationship from a mutual perspective, previous studies, in relation to patient-physician trust, focused on examining patients' attitudes. Earlier studies with Chinese PCPs examined job satisfaction and burnout, experience with patient violence and intention to quit.^{11 22} No published quantitative studies, however, are identified on Chinese PCPs' self-perceived patients' trust despite its importance. Only few qualitative studies found that there were five out of 12 rural physicians reporting patients' trust in them, suggesting the lack of large-scale empirical evidence in rural PCPs' perceived patients' trust.²³ Our study aims to (1) examine PCPs' self-perceived patients' trust in rural areas of China and (2) explore potential factors that were related to PCPs' perceived patients' trust. In this study, both PCPs' perception of trust in clinical competence and prescribing behaviours were adopted to measure PCPs' perception of patients' trust, corresponding to the definition of physician-patient trust.²⁴ Furthermore, previous studies claimed that trust was an anticipation of practices, so we hypothesised that there might be association between clinical practice characteristics, conflicting patient and employer interests and PCPs' perceived patients' trust.

METHODS

Sampling and data collection

We conducted a cross-sectional survey in rural areas of Zhejiang province, China, from December 2019 to January 2020. By the end of 2017, there were a total of 48009 primary healthcare workers, including 21 134 PCPs in community-based health facilities in Zhejiang, which ranked third across the whole country. We defined developed and less developed areas according to gross domestic product (GDP) per capita of all counties using the 2018 census data of Zhejiang province. Those whose GDP per capita ranked in the top half were defined as developed areas, while those in the bottom half were defined as less developed areas.

In this study, the sample size required was calculated according to the sample size calculation formula of observational research. With limited evidence in PCPs' perceived patients' trust, we took the medical personnel's perception of patients' trust as an alternative. According to the 2013 Chinese National Health Service Survey, the proportion of medical personnel that perceived patients' trust in them was 53.5%⁶; with a margin of error of 0.0535 at the 95% confidence level, a sample of size 348 is required. Considering a rejection and invalidity

rate of 20%, a minimum sample of size 435 is required. PCPs were recruited using a stratified cluster sampling method. We randomly selected two counties (Ning Hai and Wu Yi) in the developed areas and two counties (Pan An and Jiang Shan) in the less developed areas. All township health centres and affiliated units located within the four selected counties were included in this study. PCPs who were working in a township-based health centre or unit and holding a Chinese qualification for clinical practices certified by health authorities (referred as certified general practitioner) were invited to participate in this study. Those who were working in a secondary or tertiary hospital setting or temporarily working in a township health facility but holding a position in a higher-level care facility or serving as public health practitioners, nurses and technicians were excluded.

We collaborated with local health bureaus and a list of local township health facility directors, and contact details were provided by them. Our research staff reached out to facility directors and fully explained the research purpose and activities via telephone calls. We emphasised voluntary participation to directors, and refusal to participate would not affect interests of their facilities in any way. After obtaining approval from facility directors, we then invited eligible PCPs working on survey days. We provided informed consent form for PCPs, explained the research purpose and survey content and ensured potential participants' anonymity for the study. When informed consent was obtained, we invited PCPs to answer the questionnaire using an online questionnaire tool 'Sojump'.

Questionnaire

We developed our survey instrument based on our literature review and formative qualitative findings, and the questionnaire had been pretested in Zhejiang province. We measured PCPs' self-perceived patients' trust from two main aspects—clinical competence and worries about overprescriptions including medications and tests. Despite limited evidence from PCPs' perceived patients' trust in them, some studies have shown the mutual feature of physician–patient trust relationship that it refers to expectations of anticipated practices,²⁵ which indicated the possible relationship between PCPs' practices to meet patients' expectations and PCPs' perceived patients' trust. A qualitative research conducted in rural China found that clinical treatment, clinical attitude and medical morality were recognised as three main factors, which may influence the establishment of physician–patient trust from physicians' perspective.²³ Consistent with empathy, theoretically and conceptually studied in the context of medical practice, emotional support, other than clinical treatment, provided by physicians with empathy is important to establish satisfied physician–patient relationship.²⁶ Therefore, in our study, we adopted clinical practice characteristics, which could meet patients' expectations to see if there was association with PCPs' perceived trust. Regarding clinical practice

characteristics, we evaluated from three dimensions—diagnosis and treatment, explanation and elaboration and emotional support.

PCPs' perceived patient trust

According to the definition of physician–patient trust,²⁵ the history of health reform in China and our previous studies, we measured PCPs' perceived patient trust from both perception of trust in medical services and PCPs' perception of patients' trust in their clinical competence (one item) and perception of trust in the maintenance of patients' interest and PCPs' perceived patient worries about overprescribing behaviours (two items). Questions were asked using a four-point Likert Scale. PCPs were invited to comment how often (1=seldom, 2=occasionally, 3=often and 4=always) they perceived patient trust in their clinical competence and how often they felt patient worries about unnecessary medicine or tests.

Clinical practice characteristics

A 10-item scale was used to assess PCPs' practices. With reference to our formative qualitative findings and Expectation Met Questionnaire (EMQ),²⁷ a scale composed of three subscales, emotional support (four items), diagnosis and treatment (four items) and explanation and elaboration (two items), was constructed. Items were rated on a four-point Likert Scale from 1 'seldom' to 4 'always' to generate the total scores of three subscales. A higher score represents better quality of a certain domain of clinical practice and overall quality of clinical practices assessed in the study. Cronbach's α of the scale in this study was 0.887. The result of confirmatory factor analysis (CFA) demonstrated a good construct validity of this scale (shown in online supplemental table 1 in appendix; $p < 0.001$; Normed fit index (NFI)=0.936; comparative fit index (CFI)=0.943; parsimony comparative fit index (PCFI)=0.670).

Conflicting patient and employer interests

Conflicting patient and employer interests was measured by patient interest representation (one item) and perceived need for profit-making for their employer facility (one item). PCPs were asked to comment how often they put patients' interest first (reversely coded as 4=seldom, 3=occasionally, 2=often and 1=always) and how often they need to make revenue for medical institutions (1=seldom, 2=occasionally, 3=often and 4=always). A total score is generated by summing up both items. A higher score indicates more perception profit-making need.

Social-demographic characteristics

The social–demographic characteristics included gender, general practitioner qualification, practice year, education, annual income and geographical locations. On account of restrictive requirements for academic qualifications for the profession of physicians, educational attainment was dichotomised into 'postsecondary or less' and 'university or higher'. According to the average annual income in Chinese medical industry, PCPs were

asked to comment whether their annual income was over 11 814 (US\$) or not.

Data analysis

Descriptive analysis was conducted to observe social-demographical characteristics of rural PCPs, perceived patient trust in rural PCPs and PCPs' practices to meet patients' expectations. CFA was applied to examine whether the relationship between a factor and the corresponding measurement item conforms to the theoretical relationship—EMQ. Multivariable logistic regression analyses with the forced entry method were performed to explore the association between clinical practice characteristics to meet patient expectations, discordant patient and employer interests and perceived patient trust by adjusting for the effects of the social-demographic characteristics. All analyses were performed using SPSS V.20.0 and AMOS V.25.0.

Patient and public involvement

No patients were involved in the design, recruitment and conduct of the study. The study participants and their faculties were offered feedback of the study results.

RESULTS

Among 849 invited, a total of 697 PCPs agreed to participate in this study, resulting in a response rate of 82.1%. Duplicate participants were counted at the first time; then, the valid response rate was 79.3% (n=673). **Table 1** presents social-demographic characteristics of our sample of rural PCPs. Overall, there were slightly more PCPs working in developed rural areas (57.9%). And slightly more female physicians responded (54.8%). Nearly two-fifths of the respondents reported less than 10 years of experience. The majority of PCPs had obtained formal general practitioner qualification (70.6%) and university level of education or above (71.2%).

Table 2 summarises participants' responses to individual items related to PCPs' perceived patients' trust and clinical practice characteristics. Most PCPs (85%) often/always perceived patients' trust in their clinical competence. In the meantime, over two-thirds of PCPs reported perceived patient worries (including sometimes, often and always) about unnecessary medicine and test (67.3% and 67.6%, respectively). As to clinical practice characteristics, the mean score of the three subscales are 13.6, 8.3 and 6.3, respectively, in emotional support, diagnosis and treatment and explanation and elaboration. With regard to conflicting patient and employer interests, the mean score is 4.2.

Table 3 shows the results of the multivariable logistic regression analyses. After adjustments of social-demographic factors, increase in emotional support scores (OR=1.23, 95% CI=1.06 to 1.42, p<0.01) and diagnosis and treatment scores (OR=1.35, 95% CI=1.17 to 1.55, p<0.001) were associated with higher perceived patients' trust in PCPs' clinical competence. After adjusting for

Table 1 Social-demographic factors of the sampled rural PCPs in Zhejiang province, China

	N (%)
Gender	
Man	304 (45.2)
Woman	369 (54.8)
Certified general practitioner	
Yes	475 (70.6)
No	198 (29.4)
Practice year	
0–10	262 (38.9)
11–20	192 (28.5)
>20	219 (32.5)
Educational attainment	
Postsecondary or less	194 (28.8)
University or higher	479 (71.2)
Annual income (US\$)	
≤11 814 (80 026 RMB)	340 (50.5)
>11 814 (80 026 RMB)	333 (49.5)
Geographical locations	
Developed areas	
Ning Hai	225 (33.4)
Wu Yi	165 (24.5)
Less developed areas	
Jiang Shan	201 (29.9)
Pan An	82 (12.2)

PCPs, primary care physicians; RMB, renminbi.

all social-demographic variables, respondents who scored higher in diagnosis and treatment (OR=1.20, 95% CI=1.08 to 1.34, p<0.001) reported more perceived patient worries about unnecessary medicine. In addition, those who reported higher level of conflicting patient and employer interests (OR=1.35, 95% CI=1.12 to 1.63, p<0.01) represented stronger need of profit-making and seldom put patients' interest first, also with more perception of patient worries about unnecessary medicine. The same association was shown between clinical practicing characteristics (OR=1.22, 95% CI=1.10 to 1.35, p<0.001), conflicting patient and employer interests (OR=1.29, 95% CI=1.07 to 1.54, p<0.01) and perceived patient worries about unnecessary test.

DISCUSSION

China has given top priority to the transition from hospital-based to primary-care-centred health delivery system, especially in rural areas.¹¹ In this context, the stability of primary care workforce assumes great significance. In order to improve PCPs' work morale, it is important to understand how PCPs perceive patients' trust

Table 2 Perceived patients' trust, clinical practicing characteristics and conflicting patient and employer interests

	N (%)
Perceived trust in clinical competence	
Seldom	12 (1.8)
Sometimes	89 (13.2)
Often	418 (62.1)
Always	154 (22.9)
Worries about unnecessary medicine	
Seldom	220 (32.7)
Sometimes	285 (42.3)
Often	129 (19.2)
Always	39 (5.8)
Worries about unnecessary test	
Seldom	218 (32.4)
Sometimes	274 (40.7)
Often	137 (20.4)
Always	44 (6.5)
Emotional support (total), mean (SD)	
	13.6 (2.3)
I care about the psychological state of the patient (such as their worries and mood)	
Seldom	7 (1.0)
Sometimes	64 (9.5)
Often	377 (56.0)
Always	225 (33.4)
I am polite to patients	
Seldom	5 (0.7)
Sometimes	24 (3.6)
Often	282 (41.9)
Always	362 (53.8)
I have empathy for the patient (put myself in the patients' situation)	
Seldom	6 (0.9)
Sometimes	29 (4.3)
Often	306 (45.5)
Always	332 (49.3)
I take care of the whole conditions of patients during consultation	
Seldom	7 (1.0)
Sometimes	31 (4.6)
Often	312 (46.4)
Always	323 (48.0)
Diagnosis and treatment (total), mean (SD)	
	8.3 (2.0)
I believe my diagnosis and management plans are up to date	
Seldom	58 (8.6)
Sometimes	225 (33.4)

Continued

Table 2 Continued

	N (%)
Often	289 (42.9)
Always	101 (15.0)
I can differentiate most early-stage and undiagnosed illnesses	
Seldom	48 (7.1)
Sometimes	206 (30.6)
Often	332 (49.3)
Always	87 (12.9)
I can correctly refer my patients when they need referral care professionally	
Seldom	11 (1.6)
Sometimes	130 (19.3)
Often	398 (59.1)
Always	134 (19.9)
Explanation and elaboration (total), mean (SD)	
	6.3 (1.3)
I will give patients plenty of time to explain their condition	
Seldom	10 (1.5)
Sometimes	70 (10.4)
Often	363 (53.9)
Always	230 (34.2)
I have time to fully explain to the patient	
Seldom	11 (1.6)
Sometimes	101 (15.0)
Often	350 (52.0)
Always	211 (31.4)
Conflicting patient and employer interests (total), mean (SD)	
	4.2 (1.1)
I put the interests of patients first at work*	
Seldom	8 (1.2)
Sometimes	51 (7.6)
Often	331 (49.2)
Always	283 (42.1)
I need to consider how to make revenue for medical institutions	
Seldom	112 (16.6)
Sometimes	218 (32.4)
Often	242 (36.0)
Always	101 (15.0)

seldom=1, sometimes=2, often=3 and always=4.

*This item was reversely coded.

in them and what factors may enhance PCPs' perception of patients' trust.⁵ This is the first study that looked into PCPs' perceived patient trust and its associated factors in rural China. We found that both accurate diagnosis and appropriate treatment and emotional support were

**Table 3** The association between PCPs' perceived patients' trust, clinical practicing characteristics and conflicting patient and employer interests

	Perceived trust in clinical competence (0=seldom and sometimes; 1=often and always) OR (95% CI)	Worries about unnecessary medicine (0=seldom and sometimes; 1=often and always) OR (95% CI)	Worries about unnecessary test (0=seldom and sometimes; 1=often and always) OR (95% CI)
Clinical practicing characteristics			
Emotional support (continuous)	1.23 (1.06 to 1.42)**	0.94 (0.83 to 1.06)	0.97 (0.86 to 1.09)
Diagnosis and treatment (continuous)	1.35 (1.17 to 1.55)***	1.20 (1.08 to 1.34)***	1.22 (1.10 to 1.35)***
Explanation and elaboration (continuous)	1.17 (0.90 to 1.53)	1.00 (0.81 to 1.23)	0.90 (0.74 to 1.10)
Conflicting patient and employer interests (continuous)	0.83 (0.64 to 1.07)	1.35 (1.12 to 1.63)**	1.29 (1.07 to 1.54)**
Certified general practitioner status			
No	1	1	1
Yes	2.01 (1.14 to 3.55)*	0.96 (0.61 to 1.51)	0.94 (0.60 to 1.45)
Practice year			
0–10	1	1	1
11–20	1.30 (0.69 to 2.42)	0.69 (0.43 to 1.12)	0.69 (0.43 to 1.10)
≥21	1.38 (0.71 to 2.71)	0.54 (0.32 to 0.90)*	0.56 (0.34 to 0.93)*
Gender			
Man	1	1	1
Woman	0.86 (0.51 to 1.42)	0.75 (0.51 to 1.11)	0.84 (0.58 to 1.22)
Economic status of location			
Less developed	1	1	1
Developed	0.89 (0.54 to 1.45)	1.32 (0.89 to 1.94)	1.13 (0.78 to 1.64)
Education			
Postsecondary or less	1	1	1
University or higher	0.92 (0.54 to 1.56)	0.77 (0.51 to 1.16)	0.94 (0.62 to 1.42)
Income level (US\$)			
≤11814	1	1	1
>11814	1.29 (0.78 to 2.13)	0.68 (0.46 to 1.01)	0.82 (0.56 to 1.20)

*P<0.05; **p<0.01; ***p<0.001.

PCPs, primary care physicians.

positively associated with PCPs' perceived patients' trust in their clinical competence. Moreover, we found a high level of perceived patients' worries about overprescriptions, and diagnosis and treatment, conflicting patient and employer interests, were associated factors.

First, provision of emotional support to patients was found to be positively associated with PCPs' perception of patients' trust in their clinical competence. This is consistent with previous research findings that emotional support was positively associated with patients' trust.²⁸ This finding echoes the biopsychosocial model that highlights psychological support while managing patients in clinical care.⁵ Physicians' emotional support can benefit patients in several ways, which may lead to better patients' trust.²⁰ Patients with better emotional support from their physicians had better adherence to medications and

treatment effects. Patients were more likely to build partnership with physicians when they felt being cared.²⁹ These can consequently make PCPs feel more respected, trusted and appreciated.^{29,30} Our findings highlighted the need for mental health training in PCPs. Experiences in Hong Kong showed that mental health training module tailored for PCPs can improve their capacity to provide psychological care to patients.³¹ It may be worth considering to develop such training programmes as a strategy to improve rural PCPs' competence and self-value.

Despite high perceived patients' trust in clinical competence, over two-thirds of PCPs still reported sometimes/often/always perceived patient worries about unnecessary medications or tests. These were much higher proportions compared with those of urban PCPs at 38.5% and 40.7%, respectively.¹⁴ These are believed to be related

to the widespread profit orientation of health facilities due to the reduction of public fiscal support, permission of 15% profit margins and fee-for-service payment system since the economic reforms.^{14–16} Our findings also revealed that PCPs who felt the need of profit-making and conflicting patient–employer interests were more likely to perceive patient worries about overprescriptions. It is highly recommended that government should invest more in government-owned township health centres, so that PCPs could focus on providing quality care other than making revenue for employer facilities.

Surprisingly, PCPs who reported more frequent accurate diagnosis and appropriate treatment were more likely to perceive patient worries about unnecessary medicine or test. We speculate that this might be because physicians with better performance may generally have a higher patient volume due to patient preference.¹¹ This may consequently lead to two possibilities. First, such physicians may also be more likely to encounter patients with diverse economic backgrounds and those who have concerns about overprescriptions.^{32–33} Second, in line with previous study, time pressure was closely related to prescriptions.³⁴ With a larger average patient volume, the mean consultation time for each patient is likely shortened, causing more time pressure and insufficient communication about prescriptions.³⁴ It may suggest that the process from appointment to consultation be optimised.

Trusted primary care workforce and primary care services are crucial to a well-functioning rural three-tiered healthcare system. This current study identified several ways for rural PCPs to take the initiative to improve primary care practices and gain patients' trust. In addition to improved professionalism, having empathy for patients and taking care of patients' emotions may contribute to high-level PCPs' perceived patients' trust and improve PCPs' morale.²¹

This study expands our knowledge of PCPs' perceived patients' trust and its associated factors in rural China. This research will serve as a foundation for future targeted interventions to improve PCPs' perceived trust, specifically in remote rural regions. However, several limitations to this study need to be acknowledged. First, the cross-sectional design limits our understanding of causal inference between PCPs' perceived patients' trust, their clinical practice characteristics and conflicting patient and employer interest. As the first study to explore associated factors with PCPs' perceived trust, our study findings shed lights on PCPs' perspective in the patient–doctor relationship. More work is however needed to better understand the mechanisms. Second, only rural PCPs in an economically better off eastern province were included in this study. It should be very cautious to extrapolate these results to other geographical areas, including both Chinese and international settings. Third, patients were not included in this study for evaluating their opinions towards PCPs' practices. Future studies may include patients as another angle to examine patients' trust

and concerns in PCPs' professionalism and practices in rural China. Lastly, we adopted self-report measures in this study, and when it comes to clinical practice characteristics, PCPs may prefer to report positive feedback, which would lead to report bias. Although the interaction between physicians and patients was largely subjective and hard to quantify, future studies could consider surveying both physicians and patients to triangulate study findings.

CONCLUSION

This study highlighted the importance of patients' trust perceived by PCPs who should leverage the community-based primary care setting to build a good doctor–patient relationship through, for example, taking care of patients' emotional well-being. Health authorities are encouraged to offer mental health training modules tailored for PCPs working in township health centres. The findings also suggest that more public funding should be invested in township health centres, so that PCPs could focus on providing quality care rather than making revenue.

Author affiliations

¹The Institute of Social and Family Medicine, School of Medicine, Zhejiang University, Hangzhou, People's Republic of China

²International Diagnostic Centre, Clinical Research Department, London School of Hygiene & Tropical Medicine, London, UK

³Department of Family Medicine and Primary Care, The University of Hong Kong, Hong Kong, People's Republic of China

⁴School of Public Health and Primary Care, The Chinese University of Hong Kong, Hong Kong, People's Republic of China

⁵Department of Statistics and Actuarial Science, The University of Hong Kong, Hong Kong, People's Republic of China

Acknowledgements The authors thank all participants in this study, as well as all the interviewers for data collection.

Contributors JC, DW, KSS, SY, TPL, LL and XZ conceived and designed the study. JC and SY collected the data. JC did the statistical analysis. KFL helped interpret the results and proposed precious advice. JC, DW and KSS drafted the manuscript. All authors have approved the final version of the manuscript for publication.

Funding This work was supported by the Academy of Medical Sciences and the Newton Fund (grant number NIFR1\181020) and the Seed Fund for Basic Research, University Research Committee, the University of Hong Kong.

Competing interests None declared.

Patient consent for publication Not required.

Ethics approval Ethical approvals were obtained from the Institutional Review Board of the University of Hong Kong/Hospital Authority Hong Kong West Cluster (UW19-346) and Zhejiang University (ZGL201904-2).

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement No additional data are available.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially,

and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iDs

Dan Wu <http://orcid.org/0000-0003-0415-5467>

Kai Sing Sun <http://orcid.org/0000-0003-0631-9699>

Xudong Zhou <http://orcid.org/0000-0002-0784-5343>

REFERENCES

- Murray B, McCrone S. An integrative review of promoting trust in the patient-primary care provider relationship. *J Adv Nurs* 2015;71:3–23.
- Carolyn T, Tim S, Richard B. Factors associated with patients trust in their general practitioner: a cross-sectional survey. *Brit J Gen Pract* 2003;53:798–800.
- O'Malley AS, Sheppard VB, Schwartz M, et al. The role of trust in use of preventive services among low-income African-American women. *Prev Med* 2004;38:777–85.
- Horn IB, Mitchell SJ, Wang J, et al. African-American parents' trust in their child's primary care provider. *Acad Pediatr* 2012;12:399–404.
- Gronseth IM, Malterud K, Nilsen S. Why do doctors in Norway choose general practice and remain there? A qualitative study about motivational experiences. *Scand J Prim Health Care* 2020;38:184–91.
- Wang H, Zhang YG, Xu L. Result 3 of the fifth National health service survey-the present situation of medical personnel practicing environment in China. *Chinese J Health Inform Manag* 2014;11:321–5.
- Ozawa S, Stripad P. How do you measure trust in the health system? A systematic review of the literature. *Soc Sci Med* 2013;91:10–14.
- Tao W, Zeng Z, Dang H, et al. Towards universal health coverage: lessons from 10 years of healthcare reform in China. *BMJ Glob Health* 2020;5:e2086
- Wang H, Gusmano MK, Cao Q. An evaluation of the policy on community health organizations in China: will the priority of new healthcare reform in China be a success? *Health Policy* 2011;99:37–43.
- Ta Y, Zhu Y, Fu H. Trends in access to health services, financial protection and satisfaction between 2010 and 2016: has China achieved the goals of its health system reform? *Soc Sci Med* 2020;245:112715.
- WCM Y, Hsiao WC, Chen W. Early appraisal of China's huge and complex health-care reforms. *Lancet* 2012;379:833–42.
- Duckett J, Hunt K, Munro N, et al. Does distrust in providers affect health-care utilization in China? *Health Policy Plan* 2016;31:1001–9.
- Li H, Yuan B, Wang D, et al. Motivating factors on performance of primary care workers in China: a systematic review and meta-analysis. *BMJ Open* 2019;9:e28619.
- Wu D, Lam TP, Lam KF, et al. Challenges to healthcare reform in China: profit-oriented medical practices, patients' choice of care and guanxi culture in Zhejiang Province. *Health Policy Plan* 2017;32:1241–7.
- Blumenthal D, Hsiao W. Privatization and its discontents—the evolving Chinese health care system. *N Engl J Med* 2005;353:1165–70.
- Babiarz KS, Miller G, Yi H, et al. China's new cooperative medical scheme improved finances of township health centers but not the number of patients served. *Health Aff* 2012;31:1065–74.
- Lim M-K, Yang H, Zhang T, et al. Public perceptions of private health care in socialist China. *Health Aff* 2004;23:222–34.
- Wu D. How to promote primary care in Zhejiang, China: a combined qualitative and quantitative study. PhD thesis. The University of Hong Kong 2017.
- Feng D, Zhang D, Li B, et al. Does having a usual primary care provider reduce patient self-referrals in rural China's rural multi-tiered medical system? A retrospective study in Qianjiang district, China. *BMC Health Serv Res* 2017;17:778.
- He W, Yuan X, Chen X. The relationship between patients' trust, medical explicit attitude and implicit attitude. *Chinese J Clin Psychol* 2019;27:777–81.
- Zhang L, Qiu Y, Zhang N, et al. How difficult doctor-patient relationships impair physicians' work engagement: the roles of prosocial motivation and problem-solving pondering. *Psychol Rep* 2020;123:885–902.
- Li H, Yuan B, Meng Q, et al. Contextual factors associated with burnout among Chinese primary care providers: a multilevel analysis. *Int J Environ Res Public Health* 2019;16 doi:10.3390/ijerph16193555
- Wu Y, Wang XY, LM Y. Study of doctor-patient trust in township hospitals based on doctors' interview. *Chinese Gen Pract* 2014;17:4056–9.
- Newcomer LN. Perspective: measures of trust in health care. *Health Aff* 1997;16:50–1.
- Yang T, Wu Y. A study on the influence of patient participation on patient trust-based on sample survey in China. *Front Psychol* 2018;9:2189.
- Linn LS, DiMatteo MR, Cope DW, et al. Measuring physicians' humanistic attitudes, values, and behaviors. *Med Care* 1987;25:504–15.
- Williams S, Weinman J, Dale J, et al. Patient expectations: what do primary care patients want from the GP and how far does meeting expectations affect patient satisfaction? *Fam Pract* 1995;12:193–201.
- Arora NK, Gustafson DH. Perceived helpfulness of physicians' communication behavior and breast cancer patients' level of trust over time. *J Gen Intern Med* 2009;24:252–5.
- Dawson-Rose C, Cuca YP, Weibel AR, et al. Building trust and relationships between patients and providers: an essential complement to health literacy in HIV care. *J Assoc Nurses AIDS Care* 2016;27:574–84.
- Roter DL, Stewart M, Putnam SM, et al. Communication patterns of primary care physicians. *JAMA* 1997;277:350–6.
- Lam TP, Sun KS, Piterman L, et al. Impact of training for general practitioners on their mental health services: the Hong Kong experience. *Aust J Gen Pract* 2018;47:550–5.
- Yang J, Lv Z, Wang X. Comparative study on the doctor-patient trust level of urban and rural areas in Beijing (Chinese article). *Chinese Hospital Manage* 2015;35:44–7.
- Liu H. On the patient feelings (Chinese article). *Med Philosop* 2017;38:6–10.
- Liu C, Liu C, Wang D, et al. Intrinsic and external determinants of antibiotic prescribing: a multi-level path analysis of primary care prescriptions in Hubei, China. *Antimicrob Resist Infect Control* 2019;8:112–32.