Communication skills of providers at primary healthcare facilities in rural China

Q Zhou, Q An, N Wang, Jason Li, Y Gao, J Yang *, J Nie, Q Gao, H Xue

A B S T R A C T

Introduction: Effective provider-patient communication has been confirmed to improve diagnosis, treatment planning, health outcomes, patient satisfaction, and treatment compliance. Few studies have measured the effectiveness of communication between patients and rural providers in China. To fill this gap in the literature, the present study describes the communication skills of providers at primary healthcare facilities in rural China and investigates the provider- and facility-level factors underlying these communication skills.

Methods: The standardised patients successfully completed 504 interactions across two tiers of China's rural health system and engaged with providers at village clinics and township health centres. We assessed providers' communication skills based on recorded interactions between the providers and the standardised patients using the SEGUE Framework, which contains the following five dimensions: 'Set the stage', 'Elicit information', 'Give information', 'Understand the patient's perspective', and 'End the encounter'.

Results: The providers' overall average score was 50.6% on the SEGUE communication tasks. They did well in 'Set the stage' (54.4%) and 'Elicit information' (56.2%) but performed poorly in 'End the encounter' (24.5%) and 'Understand the patient's perspective' (44.0%). Female and younger providers scored 0.75 (P<0.05) and 0.04 (P<0.01) points higher than their male and older counterparts on total SEGUE score, respectively.

Conclusion: Providers in rural China had relatively poor communication skills overall, especially in terms of their demonstration of care for patients and inviting them to participate in the interaction. Gender and age were significantly associated with providers' level of communication skills in rural China.

New knowledge added by this study

- Rural providers in China scored 50.6% on the SEGUE Framework, revealing relatively poor communication skills.
- No correlations were found between education level and communication skills in rural China.
- The ability of providers in townships to establish a relationship with patients was worse than that of providers in villages.

Implications for clinical practice or policy

- Policy officials and medical educators must focus on systemically reforming medical school curricula and integrating evidence-based communication skills training rather than simply encouraging further education using an outdated curriculum.
- Appropriate incentives should be provided to encourage rural providers and improve their job satisfaction.
- It is necessary to enhance the ability of providers in townships to communicate with strangers.

Introduction

A wealth of literature has demonstrated the importance of providers' communication skills to the delivery of high-quality healthcare.[1,2] Although definitions of effective provider-patient communication vary, some common attributes are as follows: establish a provider-patient relationship, elicit and understand patient perspectives, convey empathy and affirmation, and reach shared decisions regarding treatment and goals.[2,3] Effective provider-patient communication has been shown to improve diagnoses, treatment plans, health outcomes,

patient satisfaction, and treatment compliance[1,2,4]; in contrast, deficiencies in provider-patient communication are associated with patient anger, frustration,[5] and malpractice litigation.[6]

Measuring and improving providers' communication skills are especially critical in rural China's primary healthcare facilities. As rural residents' first points of contact, village clinics and township healthcare centres provide services for a large proportion of the population in those areas (40.42%)[7,8]; however, their quality of service remains low.[9,10] For example, Shi et al[9] found that rural clinicians were incorrect in 41% of their diagnoses and gave prescriptions that were unnecessary or harmful 64% of the time.

Existing research has reached the consensus that quality medical care is heavily dependent on providers' communication skills,[1,2,4] but some prominent limitations also exist. First, to our knowledge, no studies have measured provider-patient communication skills in rural primary healthcare facilities in China. Instead, existing research has focused on medical students and related education[11,12] or examined providers in upper-tier hospitals.[13-15] Second, studies have primarily relied on recall-based assessments, such as patient exit interviews or surveys, which may be biased or inaccurate.[12,14] Finally, students and clinicians in those studies are notified in advance that they are being evaluated, which may lead them to deviate from their actual clinical behaviours because they know they are being observed (also known as the 'Hawthorne Effect').[12-14]

Given the above, it is critically important to understand how rural providers communicate with their patients. The primary goal of this study was to systematically describe and analyse the communication skills of primary care providers in China's rural healthcare system and to identify the provider- and facility-level factors of providers' interactions with standardised patients (SPs).

Methods

Setting and study design

Stratified random sampling was employed as the sampling method. The study sample was drawn from rural areas in three provinces: Anhui, Eastern China; Sichuan, Central China; and Shaanxi, Western China. Specifically, 21 counties were randomly selected from a total of 24 counties in the sample provinces. Within the selected counties, 209 township health centres and 139 village clinics were randomly selected as the study sample (441 providers in total).

Two separate waves of data collection were conducted among the village- and township-level providers: an initial provider survey conducted in June 2015 and visits by SPs in August 2015. The provider

中國農村基層醫療機構醫生的醫患溝通技能

周倩、安琪、王楠、李嘉傑、高源、楊潔、聶景春、高秋風、薛浩

目標：有效的醫患溝通可以改善診斷、治療、健康結果、患者滿意度和治療依從性。很少有研究衡量中國農村醫生與患者的溝通現狀。為了彌補該方面文獻的不足，本研究描述中國農村基層醫療機構醫生的醫患溝通技能，並從醫生和機構層面分析影響其醫患溝通技能的因素。

方法：標準化病人完成與中國農村基層醫生的504次就診，包括村衛生室和鄉鎮衛生院兩個層級的醫生。本研究使用SEGUE醫患溝通技能量表，根據醫生接診情況測量其醫患溝通技能，具體包括以下五個維度：準備、資訊收集、資訊給予、理解患者和結束問診。

結果：中國農村基層醫生的醫患溝通技能平均得分率為50.6%。醫生在準備（54.4%）和資訊收集（56.2%）兩個維度表現良好，但在結束問診（24.5%）和理解患者（44.0%）兩個維度表現較差。女醫生和年輕醫生比男醫生和年紀較大醫生的醫患溝通技能總分分別高0.75分（P<0.05）和0.04分（P<0.01）。

結論：總的來說，中國農村基層醫生醫患溝通技能相對較差，尤其是在向患者表達關懷和邀請患者參與就診方面。醫生的性別和年齡與其醫患溝通技能顯著相關。

survey included items about basic demographic characteristics, educational attainment, medical experience, medical instruments, and the facility in which they worked. In August 2015, SPs visited all sampled township health centres and village clinics with concealed devices to record their encounters. The recordings were then transcribed with the consultation of the SPs.

Standardised patients

A total of 63 individuals (42 male and 21 female; mean age 36 years; range, 25-50 years) were hired and trained as SPs in three provinces (21 from each province). To be qualified as SPs, they had to be of average weight and height and in good overall health with no obvious signs of illness or other conditions that might influence the accuracy of diagnoses. The SPs were divided into 21 groups of three. In each group, each SP was taught to report a case of either pulmonary tuberculosis, childhood viral gastroenteritis, or unstable angina. In each location, the group of three SPs visited the township health centre in a randomly arranged order. Only one SP was sent to village clinics to minimise the risk that SPs were identified as fake patients. The case reported by SPs visiting a village clinic was randomly determined beforehand. Upon presenting to the provider, the SPs made an opening statement describing the primary symptom(s) of their disease case (fever and cough for pulmonary tuberculosis, diarrhoea for viral gastroenteritis, or chest pain for angina). For the

viral gastroenteritis cases, the SPs presented the case of a child who was not present. The SPs responded to all questions asked by the providers following a predetermined script, purchased all medications prescribed (which are sold by providers in China), and paid the providers their fees. After each visit, the SPs were debriefed using a structured questionnaire, and the SPs' responses were confirmed against a recording of the interaction taken using a concealed recording device.

Measuring communication skills

Over the past 10 years, China has used various methods and tools to measure the communication level of Chinese providers; although progress has been made, rigorously validated and widely accepted measurement tools are still lacking. Meanwhile, studies in other countries have used a variety of verified scales owing to their large amount of research on this topic over the last 30 years. The SEGUE Framework is one of the most common tools used to assess providers' communication skills. In previous studies, the scale has demonstrated acceptable psychometric characteristics (inter-rater reliability, validity, and sensitivity to differences in performance) in varied contexts.[11,14-16]

First developed by Makoul,[17] the SEGUE Framework employs a nominal (Yes/No) scale to allow coders to assess medical communication skills using a task-based checklist. The SEGUE checklist contains 25 items, which are classified into the five aforementioned dimensions as follows: (1) 'Set the stage' [5 items]; (2) 'Elicit information' [10 items]; (3) 'Give information' [4 items]; (4) 'Understand the patient's perspective' [4 items]; and (5) 'End the encounter' [2 items]. Each of the 25 items comprising the SEGUE Framework can also be coded into one of two categories: communication content (17 items) or communication process (8 items). Communication content tasks include topics raised or behaviours enacted at least once during the encounter (eg, Discuss antecedent treatments). Conversely, communication process items focus on the manner in which providers communicate, assessing aspects such as behaviours that should be maintained throughout the encounter (eg, Maintain a respectful tone).[17] We used a Chinese version of the SEGUE, which was translated to test the communication skills of Chinese medical students.[11]

Eight research assistants were recruited from the local community and trained to code the providers' communication skills. Following a highly structured protocol, we conducted a series of training sessions to ensure that the coders could understand and accurately use the SEGUE Framework to score various possible behaviours and interactions. The coders then followed the transcripts while listening to the recordings and identified the targeted behaviours contained in the SEGUE Framework whenever they occurred. Coders were blinded to the provider-, facility-, and regional-level characteristics of each encounter. The overall score for all of the different communication dimensions was computed by adding the total scores for each dimension per encounter. The Cronbach's α internal consistency reliability estimate of SEGUE Framework is 0.63. This moderate reliability result suggests that the SEGUE Framework is an acceptable measurement tool.

Statistical analysis

We calculated the mean, standard deviation, and scoring rate (the rate at which providers achieved the SEGUE checklist items) across all SP interactions for each of our primary outcomes: the five dimensions, Communication content, Communication process, and the total score across all five SEGUE dimensions. Ordinary least squares regressions were conducted to assess the correlates of the different dimensions of communication skills. For each of the primary outcomes mentioned above, we assessed the correlations with a fixed set of provider-level and facility-level characteristics. These included the provider's gender, age, education, certification, number of patients in catchment area, number of full-time physicians employed at the facility, distance between the county hospital and the facility, and the monetary value of the facility's medical instruments. All regressions controlled for the fixed effects of the disease cases, the SPs, and the coders. Analyses were conducted using Stata 14.2 (Stata Corporation; College Station, [TX], United States).

Results

Provider and facility characteristics

A total of 413 providers and 504 SP encounters were included in our analysis (Table 1). The providers' mean age was 45.40 years, and 87.4% of them were male. A total of 47.9% of the providers had achieved a minimum education level of college diploma, and 43.6% had a practising physician certificate, which is the highest level of medical certification that can be obtained by physicians in rural China. Township health centres had a more developed and extensive medical infrastructure than village clinics had (P<0.01): the average value of the medical equipment in township health centres was much higher than that in village clinics (RMB 711 000 vs RMB 9000; Table 1).

Communication skills scores

Table 2 shows the descriptive statistics for the total SEGUE score and each of the five SEGUE dimensions. On average, providers scored 50.6% (12.15 of 24) on all SEGUE communication tasks (range, 16.7%-

TABLE 1. Characteristics of providers and facilities*

	All (n=413)	Township (n=288)	Village (n=125)	P value†
Provider characteristics				
Female	12.59%	11.46%	15.20%	0.29
Age (years)	45.40 ± 10.46	43.49 ± 10.01	49.79 ± 10.19	<0.01
Education, college or higher	47.94%	62.85%	13.60%	<0.01
Certificate, practising physician certificate or higher‡	43.58%	61.11%	3.20%	<0.01
Facility characteristics				
No. of patients in catchment area (10 000 patients)	2.01 ± 2.17	2.79 ± 2.17	0.20 ± 0.13	<0.01
No. of physicians working full time at the facility	6.35 ± 7.19	8.38 ± 7.75	1.67 ± 1.08	<0.01
Distance from the county hospital (100 km)	0.38 ± 0.24	0.37 ± 0.23	0.40 ± 0.2	0.34
Value of medical instruments (RMB100 000)	4.99 ± 6.56	7.11 ± 6.84	0.09 ± 0.09	<0.01

* Data are shown as mean ± standard deviation or %, unless otherwise specified
† Observations at provider level
‡ There are three levels of medical certifications for physicians in rural China, and the practising physician certificate is the highest level

TABLE 2. Communication skills scores at each assessment point (n=504)*

	No. of items	Mean ± standard deviation	Scoring rate (%)
Total score	24	12.15 ± 2.76	50.6%
Content vs process			
Communication content	16	5.77 ± 2.16	36.1%
Communication process	8	6.39 ± 1.21	79.9%
Five dimensions			
Set the stage	5	2.72 ± 0.69	54.4%
Elicit information	10	5.62 ± 1.47	56.2%
Give information	4	2.02 ± 0.91	50.5%
Understand the patient's perspective†	3	1.32 ± 0.67	44.0%
End the encounter	2	0.49 ± 0.51	24.5%

* Observations are at the standardised patient–provider interaction level
† Item 20 (the provider should acknowledge the patient's accomplishments, progress, and challenges) was excluded from our analysis. It was deemed inapplicable because the standardised patients were not specifically instructed to mention their struggles or progress with the disease case presented

79.2%; 4-19 of 24), indicating that providers in rural China had relatively poor communication skills. Moreover, the providers scored means of 36.1% (5.77 of 16) and 79.9% (6.39 of 8) on Communication content and Communication process, respectively. Among the five SEGUE dimensions, the providers had difficulty with 'End the encounter' and 'Understand the patient's perspective', scoring means of 24.5% (0.49 of 2) and 44.0% (1.32 of 3), but attained relatively high mean scores of 54.4% (2.72 of 5) and 56.2% (5.62 of 10) in 'Set the stage' and 'Elicit information', respectively.

Further summary statistics of provider communication skills are presented by gender, age, education, and facility type in Table 3. The total score achieved by female providers was slightly but significantly higher than that of male providers (12.98 vs 12.03, P<0.05), which was also the case for Communication content (6.52 vs 5.66, P<0.01), 'Elicit information' (5.94 vs 5.57, P<0.1), 'Understand the patient's perspective' (1.47 vs 1.30, P<0.1), and 'End the encounter' (0.64 vs 0.47, P<0.05). We found statistically significant differences when the individual SEGUE dimensions were examined among subgroups. For instance, providers aged <45 years, who had a college education, and who were based in township health centres performed better in 'Give information' and 'End the encounter'. However, their counterparts scored higher in 'Set the stage'.

Predictors of providers' communication skills

Table 4 shows the results of multiple linear regressions between the different dimensions of communication

TABLE 3. Communication skills scores by gender, age, education, and facility level*

	Gender		P value	Age (years)		P value	Education: college or higher?†		P value	Facility type		P value
	Female (n=64)	Male (n=440)		<45 (n=264)	≥45 (n=240)		Yes (n=255)	No (n=249)		Township (n=379)	Village (n=125)	
Total score	12.98 ± 2.86	12.03 ± 2.73	<0.05	12.27 ± 2.71	12.03 ± 2.81	0.32	12.26 ± 2.73	12.05 ± 2.79	0.39	12.20 ± 2.64	12.03 ± 3.09	0.57
Content vs process												
Communication content	6.52 ± 2.25	5.66 ± 2.13	<0.01	5.85 ± 2.12	5.68 ± 2.21	0.38	5.88 ± 2.11	5.65 ± 2.22	0.23	5.83 ± 2.05	5.57 ± 2.46	0.23
Communication process	6.47 ± 1.18	6.38 ± 1.21	0.56	6.42 ± 1.24	6.35 ± 1.18	0.47	6.38 ± 1.29	6.40 ± 1.13	0.85	6.36 ± 1.26	6.46 ± 1.05	0.41
Five dimensions												
Set the stage	2.77 ± 0.71	2.71 ± 0.69	0.54	2.66 ± 0.70	2.78 ± 0.68	<0.1	2.69 ± 0.71	2.74 ± 0.67	0.39	2.68 ± 0.70	2.82 ± 0.67	<0.1
Elicit information	5.94 ± 1.62	5.57 ± 1.44	<0.1	5.66 ± 1.44	5.57 ± 1.50	0.48	5.61 ± 1.48	5.62 ± 1.45	0.91	5.66 ± 1.42	5.49 ± 1.59	0.26
Give information	2.17 ± 0.92	2.00 ± 0.90	0.14	2.08 ± 0.89	1.95 ± 0.92	0.12	2.11 ± 0.88	1.92 ± 0.92	<0.05	2.06 ± 0.87	1.87 ± 0.98	<0.05
Understand the patient's perspective	1.47 ± 0.69	1.30 ± 0.66	<0.1	1.34 ± 0.66	1.30 ± 0.68	0.49	1.33 ± 0.69	1.31 ± 0.65	0.79	1.30 ± 0.67	1.38 ± 0.67	0.20
End the encounter	0.64 ± 0.48	0.47 ± 0.51	<0.05	0.54 ± 0.51	0.43 ± 0.51	<0.05	0.53 ± 0.51	0.45 ± 0.51	<0.1	0.50 ± 0.51	0.47 ± 0.52	0.65

* Data are shown as mean ± standard deviation, unless otherwise specified. Observations are at the standardised patient–provider interaction level
† Including adult education

TABLE 4. Facility and provider characteristics and associations with communication skills scores (n=504)*

	Total SEGUE score	Content vs process		Five dimensions				
		Communication content	Communication process	Set the stage	Elicit information	Give information	Understand the patient's perspective	End the encounter
Female provider	0.75 (0.35)	0.71 (0.28)	0.04 (0.16)	0.03 (0.09)	0.42 (0.19)	0.05 (0.12)	0.12 (0.09)	0.13 (0.07)
Provider age (years)	-0.04 (0.01)	-0.03 (0.01)	-0.01 (0.01)	0.00 (0.00)	-0.02 (0.01)	-0.01 (0.00)	-0.00 (0.00)	-0.01 (0.00)
Provider education, college or higher	-0.00 (0.28)	-0.07 (0.22)	0.07 (0.13)	0.07 (0.07)	-0.18 (0.15)	0.06 (0.09)	0.06 (0.07)	-0.01 (0.06)
Practising physician certificate or higher	-0.17 (0.26)	-0.07 (0.21)	-0.10 (0.12)	-0.04 (0.07)	-0.08 (0.14)	0.01 (0.09)	-0.06 (0.06)	-0.00 (0.05)
No. of patients in catchment area (10 000 patients)	0.05 (0.08)	0.08 (0.06)	-0.03 (0.03)	-0.02 (0.02)	0.05 (0.04)	0.03 (0.03)	-0.02 (0.02)	0.01 (0.02)
No. of physicians working full time at the facility	-0.01 (0.02)	-0.01 (0.02)	0.00 (0.01)	-0.00 (0.01)	-0.01 (0.01)	-0.00 (0.01)	0.01 (0.01)	-0.00 (0.00)
Distance from the county hospital (100 km)	0.01 (0.50)	0.07 (0.40)	-0.06 (0.22)	-0.22 (0.13)	0.26 (0.27)	0.05 (0.17)	-0.03 (0.12)	-0.04 (0.10)
Value of medical instruments (100 000 yuan)	-0.02 (0.02)	-0.00 (0.02)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.00 (0.01)	-0.00 (0.01)	0.00 (0.00)
R squared	0.32	0.28	0.27	0.21	0.26	0.29	0.27	0.16

* Standard errors are shown in parentheses. Observations are at the standardised patient–provider interaction level. All regressions control for fixed effects resulting from disease cases, coders, and standardised patients

skills and provider and facility characteristics. The provider's gender was the factor that had the strongest correlation with communication skills. Female providers scored 0.75 points higher in their total communication score (P<0.05) and 0.71 points higher in the aspect of Communication content (P<0.05) than their male counterparts. Among the five different dimensions of interaction that were examined, female providers mainly excelled in their ability to 'Elicit information', scoring about 0.42 points higher than male providers did (P<0.05). In addition to provider gender, provider age was also significantly correlated with communication skills. Younger providers scored 0.04 points higher than

their older counterparts on total SEGUE score (P<0.01). Younger providers were more likely to score higher in three of the five SEGUE dimensions: 'Elicit information', 'Give information', and 'End the encounter'. The results of the regressions without correction for fixed effects are shown in the online supplementary Appendix.

Discussion

The results revealed that rural providers in China had relatively poor communication skills overall, especially in terms of understanding patients, caring for them, and inviting patients to participate in the interaction. Female and younger providers had significantly higher overall communication scores, even after controlling for fixed effects of SPs, disease cases, and coders.

We found that rural providers in China had relatively poor communication skills overall. They performed poorly at most tasks involving patient engagement during the encounter, such as inviting them to discuss their questions and concerns. In these cases, patients generally adopt a more passive role, which could lead to inaccuracies and inefficiencies when providers do not elicit all information necessary to develop an effective diagnosis and treatment plan.[18] Moreover, while rural providers generally maintained a respectful tone throughout their patient encounters, they seldom actively expressed understanding, care, or concern.

Two possible explanations may account for the rural providers' poor communication skills. First, in the past, medical students (ranging from those in-service to those engaged in continuing education) rarely received instruction in provider-patient communication.[19-21] According to a 2015 survey of 81 independent medical colleges, the proportion of medical students who took provider-patient communication courses was 61%, and the percentage required to take compulsory communication courses was only 27%.[20] Thus, most currently practising occupational health technicians have not received systematic education in provider-patient communication at an academic level.[22] Training for rural providers is more concerned with clinical skills and medication knowledge and does not generally involve provider-patient communication.[23] This gap has caused rural clinicians to have an insufficient understanding of the importance of communication, and their interpersonal abilities tend to be relatively weak. Indeed, our data revealed no correlation between education level and communication skills, suggesting that further education does not improve the providers' methods of interacting with their patients (Tables 3 and 4). Second, rural providers have heavy workloads but low incomes compared

with urban providers.[24,25] Thus, they sometimes lack enthusiasm for their work, are unwilling to give patients humane care, and lack the motivation to improve their communication skills.[26,27] According to survey data from providers in Chinese township hospitals, income and provider-patient relationship quality have positive impacts on rural providers' job satisfaction, and the provider-patient relationship has strong endogeneity.[28]

Compared with the providers in townships, the providers at village clinics were more likely to make personal connections with their patients and established a warmer and more accessible clinic environment during the encounters. This result is unsurprising, as township health centres serve a patient population that is 13 times that of village clinics (Table 1). Consequently, providers in villages are more likely to develop longitudinal relationships with their local patients and communities, enabling greater knowledge of villagers' socioeconomic backgrounds and more personable communication.[24,29]

Our study also found that the providers' gender was associated with their level of communication skills, especially in gathering information and reviewing the next steps with patients. These results are in line with a large body of literature that links female gender with greater provider engagement in patient concerns and asking more psychosocial questions.[30,31] These behaviours may stimulate greater patient disclosure of aspects that are both psychosocial and biomedical in nature. Thus, although male and female providers did not differ in the amount of information they provided to their patients, the patients of female physicians collected more biomedical information than those of male providers.

Moreover, we found that younger providers performed well in the two dimensions that are directly related to diseases: eliciting or sharing information, and reviewing the next steps with patients. We conclude that greater experience may not necessarily help providers to develop better communication skills. One possible explanation is that low income, heavy workload, lack of appreciation, and restrictions on providers' autonomy imposed by hospital guidelines may contribute to fading enthusiasm and burnout.[32,33] Burnout may influence the quality of care, resulting in more suboptimal and less compassionate care.[34] Older providers who have been in their roles for longer periods are more likely to experience emotional exhaustion.[35] Therefore, although older providers have more experience communicating with patients, they do not necessarily communicate better. This is consistent with previous findings indicating that communication skill does not automatically develop over time or with experience.[36,37]

Our study has three main limitations. First, we evaluated providers' communication skills using audio recordings from concealed devices rather than videos, which may have resulted in an underestimation of providers' communication skills due to our sole reliance on verbal communication. Second, although unannounced SPs may capture actual provider behaviour more accurately, the SPs themselves may not have accurately mimicked actual patients, as they did not initially offer disease-related information unless the providers asked for it. However, any effects caused by the simulated environment did not impact the comparisons between different types of providers. We also increased the accuracy of our observation of the providers' communication behaviour by excluding any influence of the patient's communication ability on the provider. Finally, the physician-patient relationship in the Asian context has historically been described as more paternalistic than that in Western countries.[38] Thus, the SEGUE scale, which was based on a Western model, may not be completely suitable for measuring Chinese providers' communication skills. However, as increasing numbers of patients and providers are recognising the importance of 'patient-centred' communication,[21,39] the SEGUE Framework is an effective tool for understanding the characteristics of rural providers' communication skills in most regards.

Conclusion

The study revealed that providers in rural China have poor communication skills overall. These deficits in communication skills were especially pronounced when providers were required to 'Understand the patient's perspective' and 'End the encounter.' They asked about basic symptoms but rarely took the initiative to invite patients to participate in the encounter or discuss their questions and concerns, and they also rarely showed care for the patients themselves. Moreover, we found that the providers from village clinics were more likely to make personal connections with their patients. Female and younger providers exhibited better communication skills, asked more follow-up questions, and explained future plans and steps more frequently than their male and older counterparts.

Author contributions

Concept or design: Q Zhou, J Yang, J Nie, H Xue.
Acquisition of data: Q Zhou, Q An, N Wang, J Li, Q Gao, H Xue.
Analysis or interpretation of data: Q Zhou, J Li, Y Gao, J Yang, J Nie, H Xue.
Drafting of the manuscript: Q Zhou, J Yang.
Critical revision of the manuscript for important intellectual content: All authors.

References

1. Orth JE, Stiles WB, Scherwitz L, Hennrikus D, Vallbona C. Patient exposition and provider explanation in routine interviews and hypertensive patients' blood pressure control. Health Psychol 1987;6:29-42.
2. Ward MM, Sundaramurthy S, Lotstein D, Bush TM, Neuwelt CM, Street RL Jr. Participatory patient-physician communication and morbidity in patients with systemic lupus erythematosus. Arthritis Rheum 2003;49:810-8.
3. Mafinejad MK, Rastegarpanah M, Moosavi F, Shirazi M. Training and validation of standardized patients for assessing communication and counseling skills of pharmacy students: a pilot study. J Res Pharm Pract 2017;6:83-8.
4. Henman MJ, Butow PN, Brown RF, Boyle F, Tattersall MH. Lay constructions of decision-making in cancer. Psychooncology 2002;11:295-306.
5. van Osch M, van Dulmen S, van Vliet L, Bensing J. Specifying the effects of physician's communication on patients' outcomes: a randomised controlled trial. Patient Educ Couns 2017;100:1482-9.
6. Levinson W, Roter DL, Mullooly JP, Dull VT, Frankel RM. Physician-patient communication. The relationship with malpractice claims among primary care physicians and surgeons. JAMA 1997;277:553-9.
7. Babiarz KS, Miller G, Yi H, Zhang L, Rozelle S. China's new cooperative medical scheme improved finances of township health centers but not the number of patients served. Health Aff (Millwood) 2012;31:1065-74.
8. National Bureau of Statistics, PRC Government. National Bureau of Statistics. 2018. Available from: http://www.stats.gov.cn/. Accessed 7 Jun 2019.
9. Shi Y, Xue H, Wang H, Sylvia S, Medina A, Rozelle S. Measuring the quality of doctors' health care in rural China: an empirical research using standardized patients [in Chinese]. Studies in Labor Econ 2016;4:48-71.
10. Xue H, Shi Y, Huang L, et al. Diagnostic ability and inappropriate antibiotic prescriptions: a quasi-experimental study of primary care providers in rural

China. J Antimicrob Chemother 2019;74:256-63.

11. Li J. Using the SEGUE Framework to assess Chinese medical students' communication skills in history-taking [in Chinese]. Dissertation. China Medical University. 2008. Available from: https://kns.cnki.net/KCMS/detail/detail.aspx?dbcode=CMFD&dbname=CMFD2008&filename=2008082494.nh. Accessed 7 Jun 2019.

12. Li H, Li D, Wang J, et al. Assessment on doctor-patient communication skills of medical students with SEGUE framework scale [in Chinese]. Hospital Manage Forum 2016;33:29-30.

13. Xu T, Dong E, Liu W, Liang Y, Bao Y. Reliability and validity of the Chinese version of the Liverpool Communication Skills Assessment Scale [in Chinese]. Chin Mental Health J 2013;27:829-33.

14. Shen L, Sun G. Assessment pf physician-patient communication skills in practicing physicians by SEGUE framework [in Chinese]. Chin Gen Pract 2017;20:1998-2002.

15. Zhao T, Zou X, Zhou H, Ma H. General practitioner-patient communications in outpatient clinic settings in Beijing [in Chinese]. Chin Gen Pract 2019;22:413-6.

16. Makoul G. The SEGUE Framework for teaching and assessing communication skills. Patient Educ Couns 2001;45:23-34.

17. Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. Acad Med 2001;76:390-3.

18. Beckman HB, Frankel RM. The effect of physician behavior on the collection of data. Ann Intern Med 1984;101:692-6.

19. Li S, Liu Y. The achievements, problems and experiences of the health services development in China's 30-year reform and opening-up [in Chinese]. Chin J Health Policy 2008;1:3-8.

20. Liu H, Shen C. Investigation report on educational organization status of humanistic medicine in independent medical universities [in Chinese]. Med Philos (A) 2015;36:13-8, 50.

21. Liu X, Rohrer W, Luo A, Fang Z, He T, Xie W. Doctor-patient communication skills training in mainland China: a systematic review of the literature. Patient Educ Couns 2015;98:3-14.

22. Guo L, Wang H, Zeng Q, et al. Exploration and practice of the ways of cultivating communication and communication ability of rural doctors [in Chinese]. Chin Rural Health Serv Adm 2011;31:1017-8.

23. Song J, Yin W, Feng Z, et al. A study on-job-training status and demand of rural doctors in Shandong Province [in Chinese]. Chin Health Serv Manage 2017;34:378-80.

24. Hung LM, Shi L, Wang H, Nie X, Meng Q. Chinese primary care providers and motivating factors on performance. Fam Pract 2013;30:576-86.

25. Xue H, Shi Y, Medina A. Who are rural China's village clinicians? Chin Agric Econ Rev 2016;8:662-76.

26. Campbell N, McAllister L, Eley D. The influence of motivation in recruitment and retention of rural and remote allied health professionals: a literature review. Rural Remote Health 2012;12:1900.

27. Sun K, Yin W, Huang D, Yu Q, Zhao Y, Li Y. The effect of income on occupation mentality of rural doctors under the situation of new medical reform. Chin Health Serv Manage 2016;33:371-3.

28. Dong X, Ariana P. Why are rural doctors not satisfied with their work? An empirical study on job income, doctor-patient relationship and job satisfaction. Manage World 2012;(11):77-88.

29. Haddad S, Fournier P, Machouf N, Yatara F. What does quality mean to lay people? Community perceptions of primary health care services in Guinea. Soc Sci Med 1998;47:381-94.

30. Roter DL, Hall JA. Physician gender and patient-centered communication: a critical review of empirical research. Annu Rev Public Health 2004;25:497-519.

31. Swygert KA, Cuddy MM, van Zanten M, Haist SA, Jobe AC. Gender differences in examinee performance on the Step 2 Clinical Skills data gathering (DG) and patient note (PN) components. Adv Health Sci Educ Theory Pract 2012;17:557-71.

32. Hojat M, Vergare MJ, Maxwell K, et al. The devil is in the third year: a longitudinal study of erosion of empathy in medical school. Acad Med 2009;84:1182-91.

33. Shanafelt TD, Gradishar WJ, Kosty M, et al. Burnout and career satisfaction among US oncologists. J Clin Oncol 2014;32:678-86.

34. Dyrbye LN, Massie FS Jr, Eacker A, et al. Relationship between burnout and professional conduct and attitudes among US medical students. JAMA 2010;304:1173-80.

35. Yin S, Zhao J, Chen R. Empathy fatigue of clinical doctors and its influencing factors. Chin Gen Pract 2016;19:206-9.

36. Kosunen E. Teaching a patient-centred approach and communication skills needs to be extended to clinical and postgraduate training: a challenge to general practice. Scandi J Prim Health Care 2008;26:1-2.

37. Skoglund K, Holmström IK, Sundler AJ, Hammar LM. Previous work experience and age do not affect final semester nursing student self-efficacy in communication skills. Nurse Educ Today 2018;68:182-7.

38. Ishikawa H, Takayama T, Yamazaki Y, Seki Y, Katsumata N, Aoki Y. The interaction between physician and patient communication behaviors in Japanese cancer consultations and the influence of personal and consultation characteristics. Patient Educ Couns 2002;46:277-85.

39. Ting X, Yong B, Yin L, Mi T. Patient perception and the barriers to practicing patient-centered communication: a survey and in-depth interview of Chinese patients and physicians. Patient Educ Couns 2016;99:364-9.