

hospital than at the tertiary hospital. The main method of doctor–patient communication in China is face-to-face communication, but the previous study reported similar for between screen-to-screen and face-to-face doctor–patient communication⁶⁰; additionally, researchers have documented that a "Photo Stories" presentation contributes to doctor–patient communication⁶¹, which all provide evidence of future communication methods in China. Importantly, Chinese medical staff must develop their communication skills, such as listening to patients, engaging them in shared decision making about health, and increasing awareness of performance–related feedback in medical practice^{62–64}. Certainly, patients should also seriously (2020) 10:21956 | <https://doi.org/10.1038/s41598-020-78921-y> 7 Vol.:(0123456789) www.nature.com/scientificreports/ Scientific Reports | Vol.:(1234567890) adhere to individual literacy in health training, and with the participation of their families, they should alleviate their discomfort and vulnerability and feel open to express themselves^{65,66}. Moreover, the service quality, which is the foundation of the medical industry, should be improved in reality, which is not only reflected in the professional skills of medical staff but also reflected in their attitudes and basic behaviours in medical service delivery. Hospitals should establish a systematic medical training and learning system to ensure that medical personnel are able to constantly improve their professional talents and cultivate a sense of responsibility, which may decrease the occurrence of lower service quality, adverse events, and medical errors^{52,67}. Additionally, the medical staff should be required to establish the "patient-centred" service concept, which embodies the respect and humanistic healthcare in the whole medical service process⁶⁷. Patients with preferential treatment from the doctor may be more likely to provide positive feedback, which may account for reporting bias. Additionally, the factor analysis showed that the measurements of the constructs displayed good reliability and validity, which provided a possible solution for the measurement of service quality and service satisfaction in future studies. Future studies could combine participants' self-reported measures and content analyses by interviewing them to obtain their opinions and feedback from others. Moreover, consistent with the previous study, patient-perceived service satisfaction was another factor that predicted doctor–patient trust, but some studies have implied that patients were not very satisfied with the medical services in China^{19,54,55}. After careful consideration, this finding is logical, because effective doctor–patient communication enables medical staff to better understand the patient's health service needs, to provide better services, and thus in turn to improve patient satisfaction with medical services, which is conducive to the establishment of doctor–patient trust^{4,58}. Therefore, service satisfaction should be viewed as a feedback index of the quality of medical service in future practice; on the other hand, service satisfaction should also be continuously measured and improved, which may contribute to the establishment of doctor–patient trust. Hence, the TB dispensaries should strengthen the improvement of medical technology, and the tertiary hospital should consider lower prices for medical services to improve doctor–patient trust. Additionally, effective doctor–patient communication helps to eliminate the psychological barriers and differences between doctors and patients, which all are beneficial to encouraging doctor–patient trust^{50,51}. Furthermore, this study clarified the mediating relationship between doctor–patient communication, medical service quality, service satisfaction, and the dependent variable doctor–patient trust. Additionally, the medical service quality and service satisfaction are considered sequential

mediators from doctor–patient communication to doctor–patient trust, a relationship that has not been confirmed in previous studies. First, sufficient doctor–patient communication positively influenced doctor–patient trust mediated by medical service quality or service satisfaction