BMJ Open

GP residents' experiences and perceptions of outpatient training in primary care settings in China: a qualitative study

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2023-076821
Article Type:	Original research
Date Submitted by the Author:	17-Jun-2023
Complete List of Authors:	Wu, Lingyan; The Second Affiliated Hospital, Zhejiang University School of Medicine, Department of General Practice Tong, Yuling; The Second Affiliated Hospital, Zhejiang University School of Medicine, Department of General Practice Yu, Yingying; The Second Affiliated Hospital, Zhejiang University School of Medicine, Department of General Practice Yu, Xinyan; The Second Affiliated Hospital, Zhejiang University School of Medicine, Department of General Practice Zhou, Yening; Xiaoying District Community Healthcare Center Xu, Meiqun; Nanxing District Community Healthcare Center Guo, Yi; The Second Affiliated Hospital, Zhejiang University School of Medicine, Department of General Practice Song, Zhenya; The Second Affiliated Hospital, Zhejiang University School of Medicine, Department of General Practice Xu, Zhijie; The Second Affiliated Hospital, Zhejiang University School of Medicine, Department of General Practice
Keywords:	Primary Care < Primary Health Care, QUALITATIVE RESEARCH, MEDICAL EDUCATION & TRAINING

I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our licence.

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which Creative Commons licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

GP residents' experiences and perceptions of outpatient training in primary care settings in China: a qualitative study

Lingyan Wu, M.D.[1], Yuling Tong, M.D.[1], Yingying Yu, M.D.[1], Xinyan Yu, M.D.[1], Yening Zhou, M.B.B.S.[2], Meiqun Xu, M.B.B.S.[3], Yi Guo, M.D.[1], Zhenya Song, M.D.[1], Zhijie Xu. M.D.[1],

1. Department of General Practice, The Second Affiliated Hospital, Zhejiang University School of Medicine, Hangzhou, China;

2. Xiaoying District Community Healthcare Center, Hangzhou, China;

3. Nanxing District Community Healthcare Center, Hangzhou, China

Corresponding author: Zhijie Xu, M.D.

Email: zhijiexu@zju.edu.cn

Address: NO.88, Jiefang Rd, Shangcheng District, Hangzhou, Zhejiang, P.R. China, 310009.

Tel: 0571-87767089

Number of references: 38

Number of table: 1

Number of figure: 0

Word counts for the main text: 5873

Word counts for the abstract: 300

GP residents' experiences and perceptions of outpatient training in primary care settings in China: a qualitative study

ABSTRACT

Objectives: The implementation of outpatient training in primary care settings is the essential part of residency training for general practitioner (GP) residents in China, yet how they view it has not been well studied. This study aimed to explore the experiences and perceptions of GP residents regarding outpatient training in primary care settings in China and offer insights into the training process and recommendations for enhancing training quality.

Design: A qualitative descriptive study employing in-depth interviews.

Setting: Two community healthcare centers (CHCs) that implement outpatient training program for GP residents in Zhejiang Province, China.

Participants: Twenty GP residents affiliated with 14 community healthcare centers and two hospitals across Zhejiang Province and Guizhou Province who had completed outpatient training in either CHC for over one month.

Results: Of the 20 participants in this study, 11 (55%) were women, and the mean age of was 28 years. GP residents completed the process of consultation, physical examination, and therapy independently; subsequently, the community preceptors provided feedback based on

their clinical performance and modeled their clinical skills. The benefits perceived by GP residents included improved clinical skills and confidence in practice, and they learned approaches to maintaining good relationships with patients. They preferred dealing with complex cases, discussions with peers, and the indirect supervision of community preceptors in the training session. Residents recommended that measures be taken to improve the training quality regarding patient selection and recruitment, clinical skills in the training session, and assessment of clinical performance.

Conclusions: The outpatient training in primary care settings provides opportunities for GP residents to constructively and encouragingly improve their professional competencies. Although the current training sessions and the abilities of community preceptors largely satisfy the needs of GP residents, future research is needed to evaluate the effectiveness of training and explore approaches to improve its quality.

KEYWORDS: Outpatient training; General practitioner resident; Primary care; Qualitative research

Abbreviations

GP: General practitioner;

SAHZU: The Second Affiliated Hospital of Zhejiang University School of Medicine;

COREQ: Consolidated Criteria for Reporting Qualitative Research

CHC: Community Healthcare Center

Strength and limitations of this study

- ⇨ This is the first qualitative study exploring GP residents' experiences and perceptions of outpatient training in primary care settings in China.
- ⇨ The researchers conducted semi-structured in-depth interviews with participants who were selected in conjunction with the process of data analysis.
- ⇨ The study recruited GP residents from a single teaching hospital and the results may not reflect the wider population.
- ⇨ One of the interviewers had prior experience as a trainer in the teaching hospital and worked with a few participants, which may have influenced the results.

INTRODUCTION

Outpatient training in primary care settings is a critical component of general practitioner (GP) residency training globally. It equips GP residents with essential clinical skills in real-world patient care, communication, and inter-professional collaboration. Despite the growing importance of outpatient care, GP residency training focuses primarily on inpatient settings, leaving many graduates unprepared for careers in outpatient care [1]. Current training models limit GP residents' exposure to outpatient settings, which can negatively affect their confidence, stress levels, and personal fulfillment in providing high-quality care [2]. For example, GP residents in the United States spent approximately one-third of their training time in ambulatory settings, and there is a need to address this gap in order to align training with future practice [3].

The challenges faced by China in regard to GP resident training are broadly similar to those

faced by other countries, but with a few complexities. Since 2009, China has implemented various GP training programs utilizing different approaches; however, uniform educational blueprints and core competencies are lacking in these programs, leading to inconsistent GP competencies and decreased public trust [4, 5]. In China, GP residency rotations span three years, during which residents spend only two periods of one month and one period of five months in outpatient primary care settings [6]. Further, the proportion of community GPs who have been officially certified as qualified preceptors is relatively low because national or provincial training and certification have only been introduced in recent decades [7]. The short and fragmented nature of residency rotations in primary care settings and the shortage of qualified community GP preceptors further contribute to the challenge of effectively training GPs for primary care settings.

Exploring GP residents' experiences is important in order to better understand the current situation and has the potential to inform improvements in outpatient training, gathering GP residents' perceptions allows programs to be tailored to meet their needs, ensuring comprehensive learning and better patient care. Insights from GP residents can help identify best practices and support ongoing evaluation, leading to improved supervision, mentoring, and training outcomes and ultimately preparing them to provide high-quality primary care [8-10]. Previous research has demonstrated results regarding the implementation of outpatient training in primary care settings in China. For example, it was found that community preceptors often lack proper teaching skills and resources, and overcrowded training environments further limit the effectiveness of standardized outpatient training [11, 12]. However, how Chinese GP residents perceive these problems during outpatient training has not been well studied.

Although a few studies have noted the beneficial impact of outpatient training in primary care settings in China, with GP residents expressing high satisfaction with community preceptors and recognizing that the training considerably improved their clinical expertise and communication abilities [13, 14], there is a paucity of data on the overall impact of outpatient training on GP residents' experiences and perceptions. Utilizing a qualitative approach enables researchers to capture the intricate nuances of training experiences and offers a comprehensive understanding of the process, resulting in an enhanced training system and strategies for GP residents and community preceptors [15].

This study used a qualitative method to explore GP residents' experiences and perceptions of outpatient training in primary care settings in China. We aimed to gain a contextualized understanding of the GP resident outpatient training process, as well as the factors that may influence the effectiveness of such training, ultimately informing new strategies for developing high-quality training programs.

METHODS

We employed qualitative interpretive description as the principal methodological approach because of its capacity for flexibility in addressing intricate experiential inquiries while simultaneously considering pragmatic outcomes [16]. This approach aligns with our objective of examining GP residents' experiences and perceptions of outpatient training in primary care settings. Our primary focus was not on theory construction, but rather on providing a comprehensive understanding of the training GP residents underwent in addition to their perceptions of the training, in order to provide recommendations for enhancing training quality.

This study adhered to the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines in order to maintain rigorous reporting standards for qualitative research [17]. Ethical approval for this study was obtained from the Institutional Review Board of the Second Affiliated Hospital of Zhejiang University School of Medicine (SAHZU), and the research was conducted in accordance with the principles outlined in the Declaration of Helsinki [18].

Setting and study population

A purposive sampling strategy was used, with invitations extended personally or through a mobile application (DingTalk). GP residents undergoing training at SAHZU were chosen from 14 community healthcare centers and two hospitals across Zhejiang and Guizhou Provinces to ensure maximum variation in age, educational background, practice duration, and institutional affiliation. The eligibility criteria included a minimum of two years of training experience at SAHZU and at least one month of outpatient training in either the Xiaoying or Nanxing District Community Healthcare Center (CHC). The recruitment process was conducted iteratively in conjunction with the data analysis, and the sample size was established based on data saturation. Interview scheduling was terminated when the accumulation of additional interview data had minimal impact on the established codebook and did not reveal any more novel patterns or themes. Three residents declined to participate due to scheduling conflicts. Participants were familiar with their interviewers, with approximately one-third having worked with one of the interviewers (LW) in the past. Participation in the study was voluntary, and no compensation was offered to the residents. Repeat interviews were not conducted.

Interview guide

The interview guide was developed through a comprehensive review of the relevant literature, followed by pilot interviews with two GP residents and extensive discussions among all authors. To further enhance the rigor of the interview guide, experts in the fields of primary care and medical education were consulted, and their feedback and suggestions were incorporated into the final version of the guide. The probing questions were iteratively refined to align with the data analysis process. The interview questions broadly addressed the nature of the outpatient training received by GP residents in primary care settings, focusing on three key domains: (1) participants' experiences during the training process, (2) participants' perceptions of the training, and (3) recommendations for improving the quality of the training (see online supplemental file 1). Beyond the prepared questions, participants were encouraged to share any additional comments they deemed relevant to their interviews.

Data collection

From August 5 to October 30, 2022, two interviewers, one female (LW) and one male (ZX), both of whom were GPs themselves and with expertise in qualitative research methods, independently conducted semi-structured in-depth interviews. The interviewers first contacted the participants via telephone to coordinate a mutually agreeable interview time. Two days before the scheduled interview, the participants received an interview outline, allowing them to familiarize themselves with the topics to be discussed. At the appointed time, the interviewers and participants engaged in an in-depth interview in a quiet and private setting, ensuring optimal conditions for open and candid dialogue.

Before conducting the interviews, a comprehensive explanation of the study's objectives, methodology, and potential implications was provided to all participants. Subsequently, they were given the opportunity to address any concerns or inquiries. Once their understanding was confirmed, the participants voluntarily provided written informed consent, confirming their agreement to participate in the study and acknowledging the potential use of their anonymized data for academic purposes. Personal data was collected from each participant to establish a comprehensive understanding of their background and context; however, measures were taken to minimize the risk of accidental information disclosure.

Throughout the face-to-face interview process, the interviewers inquired about the participants' experiences and perceptions regarding outpatient training received in primary care settings. Interviewers adopted a flexible approach, adjusting the sequence and manner of questioning according to the individual circumstances of each participant. To elicit more comprehensive and nuanced information, probing questions such as "Why do you hold this opinion?" and "Can you provide an example?" were used. The interviewers maintained a respectful stance, refraining from judgment and avoiding any encouragement or intervention to ensure an unbiased and open exchange of perspectives.

During the interviews, a recording device (IFlytek SR501) was employed to capture the entire interview, with the duration of each interview kept within a 30- to 50-minute timeframe. The interviewers made field notes on key information whenever necessary. These field notes served as an additional source of data to complement the audio recordings and transcripts of the interviews by capturing non-verbal cues, contextual factors, and other pertinent observations [19]. Participants were assigned numerical codes, and all personal identifiers were

removed from the transcripts and other study documents to ensure anonymity while maintaining the integrity of the data collection process.

Data processing and analysis

The interview data were transcribed verbatim within 24 hours of each interview, and the transcripts were meticulously checked for accuracy against the corresponding audio recordings. Two researchers (LW and YT), both with extensive training in qualitative data analysis, adopted a line-by-line approach to code the transcripts separately. During this process the two researchers generated initial open codes, which were then discussed and refined, ultimately leading to the development of a preliminary codebook. Subsequently, the two researchers analyzed the coded data across transcripts to identify themes and subthemes regarding GP residents' experiences and perceptions of outpatient training in primary care settings. The constant comparative method was utilized to compare and expand existing categories while identifying novel categories until no further subcategories emerged [20]. The data analysis was conducted between August 2022 and January 2023 using the MAXQDA 2020 (VERBI Software, Berlin) software. Frequent team meetings were held to review and discuss the coding and analysis processes and to enhance the rigor and reliability of the study.

Data saturation was attained after the completion of 17 interviews, after which three additional residents were interviewed to ensure comprehensive data coverage. In instances in which discrepancies emerged in the data analysis, a third investigator (ZX) was consulted to facilitate a resolution. The transcripts were not returned to the participants; however, five interviewees were provided with the results of the data analysis (i.e., the main findings of the

preliminary manuscript, a table comprised of themes, subthemes, interpretations, and representative quotes) to review and offer feedback upon, thereby indicating their consent and collaboration.

RESULTS

Twenty GP residents (consisting of five second-year residents and 15 third-year residents) were interviewed, which lasted a mean of 42.7 minutes (range: 35-49 minutes). Of the participants, nine were male and 11 were female, with a median age of 28 years (age range: 25–35 years). The distribution of residents who received outpatient training at Xiaoying and Nanxing CHCs was similar. Most participants (85%) were affiliated with community health centers (Table 1).

Experiences

Patient characteristics

The patients in this outpatient training program were purposefully recruited by community preceptor. A significant proportion of patients seen by the GP residents had multiple stable chronic conditions, with diabetes and hypertension being the most prevalent. Conversely, a minority of their patients exhibited symptoms but had not been diagnosed with any specific disease. Participants acknowledged that both types of patients provided unique opportunities to enhance their clinical skills in distinct ways.

"So, the patients we worked with had a range of chronic conditions like peptic ulcers, hypertension, diabetes, and coronary heart disease. These are pretty common conditions,

so it was a great learning opportunity for me to develop my skills in managing chronic diseases...I get a kick out of working with new patients who have unusual symptoms that haven't been diagnosed yet. It was kind of like being a detective, trying to figure out what was going on and how we could help them." [Participant 9, male, PGY-3, 27 years old]

Many patients attending clinics were well prepared, providing detailed medical histories during consultations, and frequently brought their previous clinical reports with them. Some participants stated that patients displayed a high degree of patience throughout the training process, which facilitated effective face-to-face communication, promoted a supportive learning environment, and fostered greater empathy among GP residents.

"When I first started out, I was a bit worried about how patients might perceive us as young doctors. But as it turned out, I found the patients to be incredibly friendly and cooperative. Even when I asked a lot of questions or repeated myself, they were always patient and willing to help me learn." [Participant 6, male, PGY-3, 27 years old]

Training process

During the course of outpatient training, GP residents were required to obtain detailed information regarding patient complaints and other health-related issues. In addition, they were expected to inquire about the patients' emotional well-being, economic status, and family support. Targeted physical examinations were also performed based on patients' specific needs. The collected information was then integrated and analyzed by residents to formulate diagnoses

and treatment plans. The residents were also expected to document the patients' medical records in the SOAP format (i.e., subjective, objective, assessment and plan) using a standardized manual.

> *"The preceptors required us to write medical records immediately after each patient consultation in the clinic. It was a challenging task, as we had to document the patient's complaints, clinical examinations, diagnosis, and treatment plan in just fifteen minutes. This kind of record contains a lot of information, and it took a lot of practice to complete it within the given time limit." [Participant 19, male, PGY-3, 27 years old]*

The GP residents were instructed on how to make appropriate referrals when necessary. However, a minority of the participants admitted that they might have overlooked the need for referrals unless prompted by community preceptors. Some participants expressed uncertainty regarding the indications for referral because of their limited experience in determining whether a patient should visit the emergency room or seek specialist care.

> *"I found it challenging to decide when to refer a patient to a specialist or the emergency room. It's particularly difficult when dealing with patients with multiple conditions, such as those with diabetes who experience persistent chest tightness or those taking statins who complain of unexplained muscle soreness. It's a tricky balancing act. I want to make sure that I am making the right decisions for my patients." [Participant 12, female, PGY-3, 30 years old]*

Most GP residents underscored the significance of effective communication regarding health education, with particular emphasis on lifestyle modifications. Several participants revealed that they often advise patients with metabolic disorders to lose weight and engage in regular exercise. In addition, some have employed visual aids such as diagrams and models of food and vessels to better convey their recommendations. Nevertheless, the participants acknowledged the difficulties encountered when offering advice on medication use, with many admitting that resolving medication-related issues was particularly challenging.

> *"I am good at taking medical history and performing physical examinations, and I feel confident to help patients make positive lifestyle changes. But when it comes to medication therapy, I find it difficult to create a detailed management plan...I often only provided rough plans and general advice...I need more training and guidance to create more professional plans." [Participant 13, female, PGY-2, 26 years old]*

Community preceptor guidance

According to study participants, community preceptors carefully observed GP residents' performances during the patient consultation process, including their non-verbal communication, verbal communication, and clinical decision-making abilities. They noted the residents' interactions with patients and provide constructive feedback for improvement. In general, preceptors refrained from interrupting unless the residents requested assistance or made significant errors that could potentially harm the patient.

Following a consultation, preceptors typically pointed out any missing details in the medical history or physical examination, explained the treatment plan to the patient, and provided additional instructions. Many participants mentioned that they appreciated the preceptors for escorting patients out of the clinic and expressed gratitude for their participation. Moreover, several residents reported having received instructions from preceptors to pay close attention to the family support of patients, particularly older adults.

"When I was seeing the patient, the preceptor came over and pointed out some details that I missed. He focused on the treatment plan and highlighted what the patient should remember in their lifestyle. Then, he explained everything to the patient in a way that they could understand. It was really helpful. HE even reminded the patient to call back if she forgot any of the advice." [Participant 17, male, PGY-2, 26 years old]

At the conclusion of each training session, community preceptors provide regular feedback to GP residents on their clinical performance. Typically, the feedback began with positive remarks highlighting the areas where residents excelled, before addressing any areas of weakness that required improvement. The preceptors then offered suggestions for practices aimed at enhancing residents' clinical skills. Additionally, community preceptors provided feedback on residents' written case files, including corrections and commentaries. However, a few participants noted that feedback from preceptors was occasionally too general and failed to provide adequate guidance for improvement.

"When the preceptors checked our medical records, they used a red pen to correct any mistakes or missing information. They would then give some brief comments on the records and suggested ways to improve them. For example, they pointed out the importance of identifying modifiable and non-modifiable risk factors for certain diseases." [Participant 3, female, PGY-3, 28 years old]

"I felt like the preceptor didn't give me enough practical advice. Sometimes, they would just go through the process and give general feedback that wasn't really useful for me to improve." [Participant 20, male, PGY-3, 27 years old]

Perceptions

Perceived benefits

The participants unanimously agreed that the outpatient training created a good environment for them to apply what they had learned in practice. The GP residents saw real patients, dealt with their medical problems mainly by themselves, and were thus able to use the knowledge and skills they had learned to solve the patients' health problems. They believed that this training gave them the opportunity to constantly practice and accumulate clinical experience.

"The opportunity to see a patient by ourselves was relatively lacking when we were trained in the hospitals, but here, we have the opportunity to experience how to deal with patients in the primary care clinics. The training is always resident-centered. You are expected to have your own ideas, make decisions and communicate with patients." [Participant 20, male,

PGY-3, 27 years old]

The participants also agreed that the outpatient training helped them discover and overcome shortcomings in their performance. The differences observed between the preceptors' modeling and their own performance, or the shortcomings pointed out by the preceptors during feedback, made it clear to residents what they needed to improve the next time. This aroused their enthusiasm for participating in training as well as for finding ways to improve themselves. Some participants expressed full confidence in their ability to deal with patients after the training, whereas others said that they had learned how to help patients, which increased their sense of responsibility.

"At the beginning I was a little nervous, but later on, I felt like I could handle it, like I had some experience and confidence. After several times of training, I know how to answer their questions, which examinations need to be done, and what is urgent to be done. I have a plan for the patient, and I can solve some of their problems." [Participant 12, female, PGY-3, 30 years old]

A few participants mentioned that they learned from community preceptors to maintain good relationships with patients. One participant said she learned how to show empathy for patients through the words and actions of the community preceptors (e.g., listening to patient complains quietly, acknowledging and praising patient progress, and giving patients their personal recommendations if they faced challenges). The participants were surprised that the patients in

the community had such high trust in the community preceptors and were willing to share their private information with them.

"They know a lot about their patients, even their family members and family relationships. They understand whether the patient would follow their advice...The performance of the preceptors, like ways of speaking and eye contact, is easier for patients to accept. That's what we're eager to learn." [Participant 20, male, PGY-3, 27 years old]

Training preferences

Some participants reported a preference for encountering patients with common chronic diseases who had developed new or atypical disorders. They believed that these cases would provide greater opportunities to improve their clinical skills and knowledge, thereby enhancing their overall competency at clinicians. This preference for complex cases may also be attributed to the residents' desire to learn and apply novel diagnostic and treatment strategies. However, the participants acknowledged that managing complex cases could pose greater challenges in terms of decision-making, communication, and collaboration with other healthcare providers.

"If we encountered diabetic patients with complaints of dizziness or abdominal pain, these types of cases are excellent to improve our clinical abilities. These types of cases can challenge our diagnostic skills and allow us to practice effective communication and physical examination techniques with patients...We can learn how to provide comprehensive care and manage a variety of health concerns that we may encounter in our future practice."

[Participant 10, male, PGY-3, 27 years old]

Most participants recommended that having two to three residents in each half-day outpatient training session was appropriate. They perceived this as beneficial because it allowed them to observe and learn from their peers' performances. The participants also noted that having multiple residents facilitated discussions during the feedback sessions, allowing for a broader range of perspectives and insights that were considered conducive to creating a supportive learning atmosphere.

"While one resident is seeing the patient, the others can observe and take notes. After the consultation, we can sit together and discuss our experiences and learning points. This not only provides an opportunity for us to compare our performances, but also allows us to learn from each other's strengths and weaknesses." [Participant 8, female, PGY-3, 27 years old]

Several participants expressed a preference for indirect supervision, whereby community preceptors observed the interactions between residents and patients from another room through videos. While some participants felt a sense of security with preceptors in the clinic, others believed that indirect supervision could foster greater independence and promote greater autonomy in decision-making. They believed that this mode of supervision was more effective for developing clinical competencies.

"I do prefer that preceptors are not physically present in the room but instead monitor our performance through video. This approach helps me feel more independent in my decision-making process, but at the same time, it provides a sense of security knowing that the preceptors are still observing and providing feedback." [Participant 4, female, PGY-3, 27 years old]

Recommendations for training improvement

GP residents commonly regard patient selection as an important issue requiring greater attention. While some participants voiced concerns that patients with complex illnesses may be better served by specialists as well as be relatively rare in primary care settings, others argued that patients with relatively simple conditions may not present sufficient opportunities for residents to acquire new knowledge and skills.

"I personally think that diabetes and hypertension are common...While they are important and relevant, there may not be much room for further exploration or discussion, as patients with these conditions are usually diagnosed and treated with established plans. I think it would be more beneficial to encounter cases that are challenging and have the potential to expand my knowledge and skills." [Participant 2, male, PGY-3, 31 years old]

Many participants indicated the importance of expanding patient recruitment methods to increase the diversity of patients during outpatient training sessions. Suggestions for achieving this goal include establishing a shared patient database accessible to all community preceptors

and organizing public awareness campaigns to promote training programs. Additionally, a few participants recommended ensuring patient satisfaction as they may act as positive promoters and attract more patients to participate.

"It's crucial to provide high-quality patient care in our training sessions...The community healthcare centers could organize some publicity activities highlighting the advantages of our program. And of course, it's important to ensure that the patients are satisfied with the service provided. If they have a good experience and feel like their problems were addressed, they are likely to spread the words to their friends and family." [Participant 18, male, PGY-3, 29 years old]

Several participants raised concerns about the practicality of the skills they had learned during the outpatient training. They noted that GP residents typically spend over 20 minutes with each patient, whereas in primary care settings in China, GPs usually spend only approximately 5 minutes per patient. They suggested that learning how to improve the efficiency of patient consultations should be prioritized. Although some preceptors suggested that residents should focus on key points and control the pace of the process, many participants felt that specific guidance on how to achieve this was lacking.

"Well, I understand the importance of taking time with patients, but in reality, community healthcare centers are often crowded, and it may not be feasible to spend half an hour on each patient. I suppose that we need to be trained in how to see and communicate with

patients quickly and efficiently." [Participant 3, female, PGY-3, 28 years old]

Several participants proposed video-recording their training sessions to assess and improve their performance. They believed that such recordings would provide an overview of their interactions with patients, highlight their strengths and weaknesses, and facilitate a better understanding of the feedback provided by community preceptors. One participant suggested that these recordings could serve as valuable resources for studying the outpatient training programs.

"There were times when I felt a little lost when the preceptor gave me feedback. I was so anxious that I couldn't recall what I did during the patient consultation. That's why I think it would be great to collect data, like audio and video recordings. By analyzing these materials later, we could identify areas that need improvement." [Participant 13, female, PGY-2, 26 years old]

DISCUSSION

To our knowledge, this is the first qualitative study exploring GP residents' experiences and perceptions of outpatient training in primary care settings in China. Through in-depth interviews with 20 GP residents, our study focused on the training process, the perceived benefits and challenges of the training, and recommendations for improvements.

Our study highlights the effectiveness of outpatient training in primary care settings for

enhancing the clinical competencies of GP residents. The findings suggest that the opportunity to apply learned knowledge and skills to real patients in a supportive and constructive environment increases residents' confidence. The findings are consistent with previous studies that have shown the benefits of practical training in primary care settings [14, 21]. Although previous studies have used standardized patients (SPs) to simulate specific diseases and enhance residents' clinical skills [22-24], our study suggests that real patients can provide unique training opportunities to improve patient-centered care in real-world healthcare environments. Future studies should explore the long-term impact of outpatient training using SPs versus real patients on GP residents' professional competencies and patient satisfaction outcomes in order to determine the most effective training methods for GP residents.

Our findings suggest that encounters with patients with atypical or new disorders were preferred by GP residents, as these cases facilitated the application of novel diagnostic and treatment strategies. However, the challenges posed by complex cases and medication use should not be underestimated. Residents need to develop decision-making, communication, and collaborative skills to effectively handle such cases. In addition, the preference for having multiple residents in each patient session suggests the benefits of peer learning, which allows residents to observe and learn from each other's performance. Learning from peers has been shown to be an effective way to acquire new knowledge and skills, promote self-reflection and critical thinking, and foster a supportive learning environment, and peer observation and feedback in clinical settings have been shown to be effective in improving clinical skills and performance [25, 26].

Our findings suggest that community preceptors play a significant role in observing residents'

performance and providing constructive and encouraging feedback. Feedback provided by community preceptors following patient consultations is important for improving residents' clinical knowledge, skills, and their ability to provide patient-centered care. This aligns with previous research emphasizing the positive impact of feedback on medical education and training [27]. However, feedback from preceptors must be specific, focused, and individualized to be effective. Training sessions should focus on improving the feedback process to make it more specific and personalized for each resident. Moreover, we found that community preceptors emphasize family support and emotional status in patients, which highlights the need for GP residents to consider social determinants of health in their practice. This practice is in line with a review by Rosland et al. that suggested the importance of family support in promoting successful outcomes in patients with chronic conditions [28]. Overall, community preceptors are key stakeholders in the success of outpatient training in primary care settings, and it is necessary to explore best practices for preceptor training and feedback to optimize the training process.

In our study, the use of indirect supervision through video observation was preferred by several participants as it fostered greater independence and autonomy in decision-making. Indirect supervision through video observation has been recognized as a viable method in healthcare education because it facilitates self-reflection, self-directed learning, and increased independence and autonomy in decision-making [29]. Studies have shown that video observation can be used to assess and enhance clinical competencies in healthcare professionals, including medical residents [30, 31]. Our study contributes to the literature by highlighting the preference for indirect supervision through video observations of GP residents. The effect of

this method on the development of clinical competencies among GP residents also needs to be examined in future studies. Such research could establish best practices for using video observations to improve the effectiveness of outpatient training in primary care settings.

The concerns raised by GP residents regarding the practicality of the skills they learned during the outpatient training reflect the challenges that GPs face in primary care settings. Several studies have highlighted the time constraints of GPs in many countries, including China, which affect the quality of primary care [32-34]. One possible approach to address this issue is to use technology, such as electronic health records and telemedicine, to streamline the consultation process. This has been shown to improve patient outcomes and increase efficiency [35, 36]. Further, barriers to patient recruitment were concerned by participants in this study. Research has shown that a patient-centered approach can improve patient satisfaction and lead to better health outcomes [37, 38]. Therefore, efforts should be made to ensure patient satisfaction with training programs to promote positive outcomes and attract more patients to participate.

This study has several important implications for research and practice. First, GP residents perceived the distinct benefits and challenges of outpatient training in primary care settings; therefore, in the future, quantitative methodologies (e.g., clinical skill examinations or scales) should be used to measure the effectiveness of training sessions across various dimensions of clinical performance and to identify areas that need improvement. Second, the teaching abilities of community preceptors are essential in outpatient training because their feedback constitutes the principal source of knowledge acquisition for GP residents. However, the number of qualified community preceptors remains small, and many are less professional and have

inadequate training in guiding GP residents. Therefore, it is vital for teaching hospitals in China to explore approaches to improve the competencies of community preceptors, as well as increase the total number of qualified community preceptors. Finally, the recommendations proposed by the participants indicate that there is room for improvement in the outpatient training process. Future research is needed to explore the implementation of novel training practices, such as indirect supervision through video observation, as this could help improve the effectiveness of outpatient training in primary care settings.

Limitations

Our study has several limitations that should be considered when interpreting the findings. First, the study participants were recruited from a single teaching hospital in China, and the results may not reflect the wider population. However, to increase the sample diversity, we used maximum variation sampling to recruit participants from 16 medical institutions across the two provinces, giving some diversity to the data. Second, participants' recall bias may have affected their responses if they had different experiences with outpatient training at various time points. To mitigate this bias, we included participants who had attended outpatient training sessions multiple times and excluded those who had not attended them for more than six months. Third, one of the interviewers had prior experience as a trainer in the teaching hospital and worked with a few participants, which may have influenced the results. However, we took measures to minimize potential bias by ensuring that the study was conducted in a transparent and rigorous

manner, and data analysis was performed independently using established qualitative research methods.

CONCLUSION

The outpatient training in primary care settings is essential for GP residents in China to improve their professional competencies as it provides opportunities for residents to use their learned knowledge and clinical skills to deal with real patients in a constructive environment. Although the current training as well as the abilities of community preceptors largely satisfy the needs of GP residents, residents face several challenges during the outpatient training in primary care settings. Future research should focus on evaluating the effectiveness of such training programs and explore approaches to improve the quality of training sessions.

Acknowledgments

The authors would like to thank Editage (www.editage.cn) for English language editing.

Author contributions

All authors were involved in the study concept and design. LW and ZX conducted the interviews, and LW and YT transcribed the interview recordings. LW and YT initially analyzed the data and discussed the results with ZX, YY, and XY. The first draft was written by LW. All authors commented on previous versions of the manuscript. All authors read and approved the final version of the manuscript.

Funding

This work was supported by the Medical Science and Technology Project of Zhejiang Province (grant no. 2023KY762, 2022KY815, 2021KY707, 2021KY711) and Scientific Research Fund of Zhejiang Provincial Education Department (grant no. Y202148336).

Competing interests

None declared.

Patient and public involvement

Not applicable.

Patient consent for publication

Not applicable.

Ethics approval

The study was approved by the Second Affiliated Hospital of Zhejiang University School of Medicine Ethics Committee [ID: (2023)伦理研第(0294)号].

Data availability statement

The transcripts used during the current study are available from the corresponding author upon reasonable request (zhijiexu@zju.edu.cn).

References

1. DeGette RL, Knox M, Bodenheimer T. The Outpatient Training Gap: A Pilot Study. Fam Med. 2020;52(2):131-4. DOI: 10.22454/FamMed.2020.369455.

2. Barnes K, Morris CG. Clinic First: Prioritizing Primary Care Outpatient Training for Family Medicine Residents at Group Health Cooperative. J Gen Intern Med. 2015;30(10):1557-60. DOI: 10.1007/s11606-015-3272-z.
3. Wynn BO, Smalley R, Cordasco KM. Does It Cost More to Train Residents or to Replace Them? A Look at the Costs and Benefits of Operating Graduate Medical Education Programs. Santa Monica, CA: RAND Corporation; 2013.
4. Zou C, Liao XY, Spicer J, et al. Ten years' GP training in China: progress and challenges. Br J Gen Pract. 2020;70(699):511-2. DOI: 10.3399/bjgp20X712961.
5. Xu Z. GP trainers should learn how to provide primary care in community settings. Br J Gen Pract. 2020;70(701):583. DOI: 10.3399/bjgp20X713669.
6. China Medical Doctor Association. Contents and Standards of Standardized Training for Residents (2022 Edition). Available at: https://wsjkw.qinghai.gov.cn/ywgl/kewc/tzgg/2022/09/26/1664164328688.html. Accessed 8 April 2023.
7. Ministry of Health of the People's Republic of China. Opinions on the Implementation of General Practice Teacher Training (Trial). Available at: http://www.law-lib.com/law/law_view.asp?id=408358. Accessed 10 April 2023.
8. Derksen FAWM, Olde Hartman TC, Lagro-Janssen ALM, et al. Clinical empathy in GP-training: Experiences and needs among Dutch GP-trainees. "Empathy as an element of personal growth". Patient Educ Couns. 2021;104(12):3016-22. DOI: 10.1016/j.pec.2021.03.030.
9. Tang L, Yang H, Mao Z, et al. The negative factors influencing the career intention of general practice trainees in eastern China: a qualitative study. BMC Med Educ. 2022;22(1):393. DOI: 10.1186/s12909-022-03456-x.
10. Pan GC, Zheng W, Liao SC. Qualitative study of the learning and studying process of resident physicians in China. BMC Med Educ. 2022;22(1):460. DOI: 10.1186/s12909-022-03537-x.
11. Shi R, Guo A, Yan C, et al. Problems and countermeasures in teaching evaluation on general practice standardized training community bases in 2017. Chin J Gen Pract. 2018;17(4):255-9. DOI:10.3760/cma.j.issn.1671-7368.2018.04.003.

12. Yuan M, Zhu S, Gu J, et al. Establishment and practice of the model of general practice teaching out-patient clinic in rural areas. Shanghai Medical & Pharmaceutical Journal. 2016;37(12):28-30,51.
13. Chen L, Zhou J, Wang T, et al. Practice and discussion of the community general teaching clinic. Chin Gen Pract. 2019;22(s2):263-5.
14. Wang Y, Zou W, Wang Z, et al. Application Effect of "Driving School VIP Training Model" and "Five,Three,One-step Transition Method" in Standardized Training of General Practitioners in Community Clinics. Chin Gen Pract. 2021,24(4):480-3,495. DOI:10.12114/j.issn.1007-9572.2020.00.291.
15. Sawatsky AP, Ratelle JT, Beckman TJ. Qualitative Research Methods in Medical Education. Anesthesiology. 2019;131(1):14-22. DOI: 10.1097/ALN.0000000000002728.
16. Thompson Burdine J, Thorne S, Sandhu G. Interpretive description: A flexible qualitative methodology for medical education research. Med Educ. 2021;55(3):336-343. DOI: 10.1111/medu.14380.
17. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care. 2007;19(6):349-57. DOI: 10.1093/intqhc/mzm042.
18. World Medical Association. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. JAMA. 2013;310(20):2191-4. DOI: 10.1001/jama.2013.281053.
19. Montgomery P, Bailey PH. Field notes and theoretical memos in grounded theory. West J Nurs Res. 2007;29(1):65-79. DOI: 10.1177/0193945906292557.
20. Hewitt-Taylor J. Use of constant comparative analysis in qualitative research. Nurs Stand. 2001;15(42):39-42. DOI: 10.7748/ns2001.07.15.42.39.c3052.
21. Chen L, Zhou J, Wang T, et al. Application of START method in general practice teaching clinic of Shanghai Huangdu Community Health Service Center. Chin J Gen Pract. 2020;19(2):154-7. DOI: 10.3760/cma.j.issn.1671-7368.2020.02.016.
22. Ge Y, Takeda Y, Liang P, et al. Improving the communication skills of medical students --A survey of simulated patient-based learning in Chinese medical universities. BMC Med Educ. 2022;22(1):539. DOI: 10.1186/s12909-022-03596-0.

23. Dietrich E, Le Corre Y, Dupin N, et al. Benefits of simulation using standardized patients for training dermatology residents in breaking bad news. Ann Dermatol Venereol. 2021;148(3):156-60. DOI: 10.1016/j.annder.2020.11.003.

24. Zeng J, Liang S, Zhang X, et al. Assessment of clinical competency among TCM medical students using standardized patients of traditional Chinese medicine: A 5-year prospective randomized study. Integr Med Res. 2022;11(2):100804. DOI: 10.1016/j.imr.2021.100804.

25. Mariano MT, Mathew N, Del Regno P, et al. Improving residents' performance on the PRITE: is there a role for peer-assisted learning? Acad Psychiatry. 2013;37(5):342-4. DOI: 10.1176/appi.ap.12100176.

26. Ohta R, Sano C. Bedside Teaching in Rural Family Medicine Education in Japan. Int J Environ Res Public Health. 2022;19(11):6807. DOI: 10.3390/ijerph19116807.

27. Weallans J, Roberts C, Hamilton S, et al. Guidance for providing effective feedback in clinical supervision in postgraduate medical education: a systematic review. Postgrad Med J. 2022;98(1156):138-49. DOI: 10.1136/postgradmedj-2020-139566.

28. Rosland AM, Heisler M, Piette JD. The impact of family behaviors and communication patterns on chronic illness outcomes: a systematic review. J Behav Med. 2012;35(2):221-339. DOI: 10.1007/s10865-011-9354-4.

29. Hassanpour N, Chen R, Baikpour M, et al. Video observation of procedural skills for assessment of trabeculectomy performed by residents. J Curr Ophthalmol. 2016;28(2):61-4. DOI: 10.1016/j.joco.2016.03.003.

30. Rea J, Stephenson C, Leasure E, et al. Perceptions of scheduled vs. unscheduled directly observed visits in an internal medicine residency outpatient clinic. BMC Med Educ. 2020;20(1):64. DOI: 10.1186/s12909-020-1968-1.

31. Jain NS, Schwarzkopf R, Scolaro JA. Video Review as a Tool to Improve Orthopedic Residents′ Performance of Closed Manipulative Reductions. J Surg Educ. 2017;74(4):663-7. DOI: 10.1016/j.jsurg.2017.01.003.

32. Østbye T, Yarnall KS, Krause KM, et al. Is there time for management of patients with chronic diseases in primary care? Ann Fam Med. 2005;3(3):209-14. DOI: 10.1370/afm.310.

33. von dem Knesebeck O, Koens S, Marx G, et al. Perceptions of time constraints among

primary care physicians in Germany. BMC Fam Pract. 2019;20(1):142. DOI: 10.1186/s12875-019-1033-5.

34. Xu Z, Lu Y, Liang X, et al. Primary care physician responses to requests by older adults for unnecessary drugs: a qualitative study. BMC Prim Care. 2022;23(1):247. DOI: 10.1186/s12875-022-01857-x.
35. Fleming DA, Riley SL, Boren S, et al. Incorporating telehealth into primary care resident outpatient training. Telemed J E Health. 2009;15(3):277-82. DOI: 10.1089/tmj.2008.0113.
36. Bhatia R, Gilliam E, Aliberti G, et al. Older adults' perspectives on primary care telemedicine during the COVID-19 pandemic. J Am Geriatr Soc. 2022;70(12):3480-92. DOI: 10.1111/jgs.18035.
37. Kuipers SJ, Cramm JM, Nieboer AP. The importance of patient-centered care and co-creation of care for satisfaction with care and physical and social well-being of patients with multi-morbidity in the primary care setting. BMC Health Serv Res. 2019;19(1):13. DOI: 10.1186/s12913-018-3818-y.
38. Epstein RM, Street RL Jr. The values and value of patient-centered care. Ann Fam Med. 2011;9(2):100-3. DOI: 10.1370/afm.1239.

Supplement file 1. Interview guide

Key Areas	Semi-structured interview guide
Introduction	• We are particularly interested in your experiences and perceptions of outpatient training in the community. Could you please walk me through a typical outpatient training you have experienced? What does your outpatient training look like? How do you like your outpatient training in community?
Experiences	• How did you prepare for your outpatient training in primary care settings? • How many times have you had outpatient training sessions? • Could you remember the conditions of the patients who participated in the session? Can you tell me some details of the patients? • What kind of problems did the patients have? How did you deal with those problems? • Could you describe the whole process of seeing a patient in an outpatient training session? • Did you complete the whole procedure all by yourself? (If not) Which part was the most difficult? Did the patients cooperate to complete the procedure? • How did the community preceptors demonstrate to see the patients? Was there any difference between you and community preceptor when seeing patients? If so, what were the differences? • What impressed you that the community preceptors had demonstrated in outpatient training session? • Did community preceptors provide feedback on treatment, prevention, management, and rehabilitation of diseases? Which part was the most/least helpful? • Do you think the community preceptors gave you feedback that was helpful to your clinical performance? How did they give the feedback?
Perceptions	• How do you feel about the organization and arrangement of outpatient training in primary care settings? • How many residents do you think would be appropriate for an outpatient training session? What are your reasons? • How long did one outpatient training session last? Was the duration appropriate for you? • How frequently did you attend outpatient training? Was it appropriate for you? • When you saw a patient, would you rather have had the community preceptors stay with you in the room or stay in an observation room? What are your reasons? • Would you rather your preceptors teach you while you see the patient, or after you complete the whole procedure? What are your reasons? • Do you think outpatient training in primary care settings improves your clinical performance? (If yes) can you share some details? • Are there any other benefits you have gained from the outpatient training? (If yes) What are those? • Were there any weakness in the training session? In your opinion, how did these problems affect the training outcomes?
Ending words	• I have finished all my questions. Do you have any other comments on this interview? • Thank you for your participation! After all the interviews and data analysis are completed, I may invite you to review and discuss the results of our results. I hope we can keep in touch.

COREQ Checklist

Topic	Item No.	Reported information	Reported on page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	LW & ZX	8
Credentials	2	M.D. (LW), M.D. (ZX)	1
Occupation	3	Both are GPs	8
Gender	4	Male (ZX); Female (LW)	8
Experience and training	5	Both have expertise in qualitative research methods	8
Relationship with participants			
Relationship established	6	About one-third participants had worked with one of the interviewers (LW) in the past	8
Participant knowledge of the interviewer	7	Participants were familiar with their interviewers.	8
Interviewer characteristics	8	Both served as GPs with expertise in the qualitative study	8
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	Interpretive description	6
Participant selection			
Sampling	10	Purposive sample in 14 community healthcare centers and two hospitals across Zhejiang and Guizhou Provinces	7
Method of approach	11	Face to face	9
Sample size	12	20	11
Non-participation	13	Three residents declined to participate due to scheduling conflicts.	7 & 8
Setting			
Setting of data collection	14	In quiet and private settings	9
Presence of non-participants	15	No	N/A
Description of sample	16	Twenty GP residents (consisting of five second-year residents and 15 third-year residents) were interviewed. Of the participants, nine were male and 11 were female, with a median age of 28 years (age range: 25–35 years).	11

Data collection			
Interview guide	17	The interview guide was developed through a comprehensive review of the relevant literature, followed by pilot interviews with two GP residents and extensive discussions among all authors.	8
Repeat interviews	18	No	8
Audio/visual recording	19	Audio recording	10
Field notes	20	The interviewers made field notes on key information whenever necessary.	10
Duration	21	A mean of 42.7 minutes (range: 35-49 minutes)	11
Data saturation	22	Data saturation was attained after the completion of 17 interviews	11
Transcripts returned	23	No	11
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	Two researchers (LW. and YT), both with extensive training in qualitative data analysis, adopted a line-by-line approach to code the transcripts separately.	10
Description of the coding tree	25	No	N/A
Derivation of themes	26	Themes were derived from data collected and the constant comparative method was utilized	10
Software	27	MAXQDA 2020	10
Participant checking	28	Five interviewees were provided with the results of the data analysis to review and offer feedback upon, thereby indicating their consent and collaboration.	11
Reporting			
Quotations presented	29	Yes	Results
Data and findings consistent	30	Yes	Results
Clarity of major themes	31	Major themes resulting from the interviews were outlined in Results.	Results
Clarity of minor themes	32	Manor themes resulting from the interviews were outlined in Results.	Results

BMJ Open

General practitioner residents' experiences and perceptions of outpatient training in primary care settings in China: a qualitative study

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2023-076821.R1
Article Type:	Original research
Date Submitted by the Author:	16-Aug-2023
Complete List of Authors:	Wu, Lingyan; The Second Affiliated Hospital of Zhejiang University School of Medicine, Department of General Practice Tong, Yuling; The Second Affiliated Hospital of Zhejiang University School of Medicine, Department of General Practice Yu, Yingying; The Second Affiliated Hospital of Zhejiang University School of Medicine, Department of General Practice Yu, Xinyan; The Second Affiliated Hospital of Zhejiang University School of Medicine, Department of General Practice Zhou, Yening; Xiaoying District Community Healthcare Center Xu, Meiqun; Nanxing District Community Healthcare Center Guo, Yi; The Second Affiliated Hospital of Zhejiang University School of Medicine, Department of General Practice Song, Zhenya; The Second Affiliated Hospital of Zhejiang University School of Medicine, Department of General Practice Xu, Zhijie; The Second Affiliated Hospital of Zhejiang University School of Medicine, Department of General Practice
Primary Subject Heading:	Medical education and training
Secondary Subject Heading:	Qualitative research, Medical education and training
Keywords:	Primary Care < Primary Health Care, QUALITATIVE RESEARCH, MEDICAL EDUCATION & TRAINING

I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our licence.

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which Creative Commons licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

General practitioner residents' experiences and perceptions of outpatient training in primary care settings in China: a qualitative study

Lingyan Wu, M.D.[1], Yuling Tong, M.D.[1], Yingying Yu, M.D.[1], Xinyan Yu, M.D.[1], Yening Zhou, M.B.B.S.[2], Meiqun Xu, M.B.B.S.[3], Yi Guo, M.D.[1], Zhenya Song, M.D.[1], Zhijie Xu. M.D.[1]

1. Department of General Practice, The Second Affiliated Hospital, Zhejiang University School of Medicine, Hangzhou, China;

2. Xiaoying District Community Healthcare Center, Hangzhou, China;

3. Nanxing District Community Healthcare Center, Hangzhou, China

Corresponding author: Zhijie Xu, M.D.

Email: zhijiexu@zju.edu.cn

Address: No.88, Jiefang Rd, Shangcheng District, Hangzhou, Zhejiang, P.R. China, 310009.

Tel: 0571-87767089

Number of references: 40

Number of tables: 0

Number of figures: 0

Word count for the main text: 5770

Word count for the abstract: 295

General practitioner residents' experiences and perceptions of outpatient training in primary care settings in China: a qualitative study

ABSTRACT

Objectives: The implementation of outpatient training in primary care settings is an essential part of residency training for general practitioner (GP) residents. However, limited research exists on their experiences and perceptions of this training. This study aimed to explore the experiences and perceptions of GP residents regarding outpatient training in primary care settings in China and provide insights and recommendations to enhance training quality.

Design: A qualitative descriptive study employing in-depth interviews.

Setting: Two community healthcare centers (CHCs) that implement outpatient training programs for GP residents in Zhejiang Province, China.

Participants: In total, 20 GP residents affiliated with 14 community healthcare centers and two hospitals across Zhejiang Province and Guizhou Province who had completed outpatient training in either CHC for over one month.

Results: Of the 20 participants in this study, 11 (55%) were women, and the mean age was 28 years. GP residents completed the process of consultation, physical examination, and therapy independently; subsequently, the community preceptors provided feedback based on their

clinical performance and modeled their clinical skills. The benefits perceived by GP residents included improved clinical skills and confidence in practice, and they learned approaches to maintaining good relationships with patients. They preferred dealing with complex cases, discussions with peers, and the indirect supervision of community preceptors in the training session. Residents recommended that measures be taken to improve the training quality regarding patient selection and recruitment, clinical skills in the training session, and assessment of clinical performance.

Conclusions: The outpatient training in primary care settings provides constructive opportunities for GP residents to improve their professional competencies. Although the current training sessions and the abilities of community preceptors largely satisfy the needs of GP residents, further research is needed to evaluate the effectiveness of training and explore approaches to improve its quality.

KEYWORDS: Outpatient training; General practitioner resident; Primary care; Qualitative research

Abbreviations

GP: General practitioner

SAHZU: The Second Affiliated Hospital of Zhejiang University School of Medicine

COREQ: Consolidated Criteria for Reporting Qualitative Research

CHC: Community Healthcare Center

Strength and limitations of this study

- ⇨ This is the first qualitative study exploring GP residents' experiences and perceptions of outpatient training in primary care settings in China.
- ⇨ The researchers conducted semi-structured in-depth interviews with participants who were selected in conjunction with the process of data analysis.
- ⇨ The study recruited GP residents from a single teaching hospital and the results may not reflect the wider population.
- ⇨ One of the interviewers had prior experience as a trainer in the teaching hospital and worked with a few participants, which might have influenced the results.

INTRODUCTION

Outpatient training in primary care settings is a critical component of general practitioner (GP) residency training globally. It equips GP residents with essential clinical skills in real-world patient care, communication, and inter-professional collaboration. Despite the growing importance of outpatient care, GP residency training focuses primarily on in-patient settings, leaving many graduates unprepared for careers in outpatient care [1]. Current training models limit GP residents' exposure to outpatient settings, which can negatively affect their confidence, stress levels, and personal fulfillment in providing high-quality care [2]. For example, GP residents in the United States spent approximately one-third of their training time in ambulatory settings, and measures to close this gap are needed to align training with future practice [3].

The challenges of GP resident training in China are broadly similar to those in other

countries, but with a few complexities. Since 2009, China has implemented multiple GP training programs taking a variety of different approaches; however, these programs lack uniform educational blueprints and core competencies, leading to inconsistent GP competencies and decreased public trust [4,5]. The medical education system for GPs in China comprises five different training programs, each with its own duration and objectives. The most highly regarded program is the "5 + 3" model, which involves five years of medical school followed by a three-year GP residency. Upon completion of the five-year undergraduate education, doctors have the option to independently apply for a GP residency at standardized training bases or to enter into labor contracts with employing institutions such as hospitals or community healthcare centers (CHCs), which may then send GPs to standardized GP training bases for further training [6]. The certification of a standardized GP training base, which is endorsed by the Chinese Medical Association, is inclusive of both hospitals and CHCs [7]. During the three-year GP training, residents engage in a combination of in-hospital and staged community training. This comprehensive framework allows for the development of diverse pathways to produce highly skilled GPs.

In China, GP residency rotations span three years, during which residents spend only two periods of one month and one period of five months in community healthcare training bases (i.e., CHCs) , with a primary focus on outpatient training [7]. GP residents receive training in primary care settings led by experienced GPs in the community healthcare training bases, known as community preceptors. Preceptor's teaching is supervised by both the community healthcare training base and the standardized GP training base (i.e., the teaching hospital) [8]. Given their relatively low educational background and inadequate training in teaching skills,

community preceptors exhibit limited teaching proficiency. Further, the proportion of community GPs who have been officially certified as qualified preceptors is relatively low because national or provincial training and certification have only been introduced in recent decades [9]. The short and fragmented nature of residency rotations in primary care settings and the shortage of qualified community GP preceptors further contribute to the challenge of effectively training GPs for primary care settings.

Investigating the experiences of GP residents is crucial to gain a comprehensive understanding of the current situation and to facilitate potential improvements in outpatient training. By collecting GP residents' perceptions, tailored programs can be devised to address their specific requirements, thus ensuring comprehensive learning and enhancing patient care outcomes. Insights from GP residents can help identify best practices and support ongoing evaluation, leading to improved supervision, mentoring, and training outcomes and ultimately preparing them to provide high-quality primary care [10-12]. Previous research on the implementation of outpatient training in primary care settings in China has reported, for example, that community preceptors often lack proper teaching skills and resources, and that overcrowded training environments further limit the effectiveness of standardized outpatient training [13, 14]. However, Chinese GP residents' perceptions of these problems during outpatient training have not been well studied.

Although a few studies have noted the beneficial impact of outpatient training in primary care settings in China, with GP residents expressing high satisfaction with their community preceptors and recognizing that the training considerably improved their clinical expertise and communication abilities [15, 16], there is a paucity of data on the overall impact of outpatient

training on GP residents' experiences and perceptions. A qualitative approach enables researchers to capture the intricate nuances of training experiences and offers a comprehensive understanding of the process, resulting in an enhanced training system and strategies for GP residents and community preceptors [17].

This study explored GP residents' experiences and perceptions of outpatient training in primary care settings in China qualitatively. We aimed to gain a contextualized understanding of the GP resident outpatient training process, as well as the factors that may influence the effectiveness of such training, ultimately informing new strategies for developing high-quality training programs.

METHODS

We employed qualitative interpretive description as the principal methodological approach because of its flexibility in addressing intricate experiential inquiries while considering pragmatic outcomes [18]. This approach aligns with our objective of examining GP residents' experiences and perceptions of outpatient training in primary care settings. Our primary focus was not on theory construction, but rather on providing a comprehensive understanding of the training GP residents underwent in addition to their perceptions of the training, in order to provide recommendations for enhancing training quality.

This study adhered to the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines in order to maintain rigorous reporting standards for qualitative research [19]. Ethical approval for this study was obtained from the Institutional Review Board of the

Second Affiliated Hospital of Zhejiang University School of Medicine (SAHZU) [ID: (2022) 伦理研第(0294) 号], and the research was conducted in accordance with the principles outlined in the Declaration of Helsinki [20].

Setting and study population

A purposive sampling strategy was used, with invitations extended personally or through a mobile application (DingTalk). GP residents undergoing training at SAHZU were chosen from 14 CHCs and two hospitals across Zhejiang and Guizhou Provinces to ensure maximum variation in age, educational background, practice duration, and institutional affiliation. The eligibility criteria included a minimum of two years of training experience at SAHZU and at least one month of outpatient training in either the Xiaoying District Community Healthcare Center or Nanxing District Community Healthcare Center. The recruitment process was conducted iteratively in conjunction with the data analysis, and the sample size was established based on data saturation. Interview scheduling was terminated when the accumulation of additional interview data had minimal impact on the established codebook and did not reveal any more novel patterns or themes. Three residents declined to participate due to scheduling conflicts. Participants were familiar with their interviewers, with approximately one-third having worked with one of them (LW) in the past. Participation in the study was voluntary, and no compensation was offered to the residents. Repeat interviews were not conducted.

Interview guide

The interview guide was developed through a comprehensive review of the relevant literature, followed by pilot interviews with two GP residents and extensive discussions among all authors. To further enhance the rigor of the interview guide, experts in the fields of primary care and medical education were consulted, and their feedback and suggestions were incorporated into the final version of the guide. The probing questions were iteratively refined to align with the data analysis process. The interview questions broadly addressed the nature of the outpatient training received by GP residents in primary care settings, focusing on three key domains: (1) participants' experiences during the training process, (2) participants' perceptions of the training, and (3) recommendations for improving the quality of the training (see online supplemental file 1). Beyond the prepared questions, participants were encouraged to share any additional comments they deemed relevant to their interviews.

Data collection

From August 5 to October 30, 2022, two interviewers, one female (LW) and one male (ZX), both of whom were GPs with expertise in qualitative research methods, independently conducted semi-structured in-depth interviews. The interviewers first contacted the participants via telephone to coordinate a mutually agreeable interview time. Two days before the scheduled interview, the participants received an interview outline, allowing them to familiarize themselves with the topics to be discussed. At the appointed time, the interviewers and participants engaged in an in-depth interview in a quiet and private setting, ensuring optimal conditions for open and candid dialogue.

Before conducting the interviews, a comprehensive explanation of the study's objectives,

methodology, and potential implications was provided to all participants. Subsequently, they were given the opportunity to address any concerns or inquiries. Once their understanding was confirmed, the participants voluntarily provided written informed consent, confirming their agreement to participate in the study and acknowledging the potential use of their anonymized data for academic purposes. Personal data were collected from each participant to establish a comprehensive understanding of their background and context; however, measures were taken to minimize the risk of accidental information disclosure.

Throughout the face-to-face interview process, the interviewers inquired about the participants' experiences and perceptions regarding outpatient training received in primary care settings. Interviewers adopted a flexible approach, adjusting the sequence and manner of questioning according to the individual circumstances of each participant. To elicit more comprehensive and nuanced information, probing questions such as "Why do you hold this opinion?" and "Can you provide an example?" were used. The interviewers maintained a respectful stance, refraining from judgment and avoiding any encouragement or intervention to ensure an unbiased and open exchange of perspectives.

During the interviews, a recording device (IFlytek SR501) was employed to capture the entire interview, with the duration of each interview kept within a 30–50-minute timeframe. The interviewers made field notes on key information whenever necessary that served as an additional source of data to complement the audio recordings and transcripts of the interviews by capturing non-verbal cues, contextual factors, and other pertinent observations [21]. Participants were assigned numerical codes, and all personal identifiers were removed from the transcripts and other study documents to ensure anonymity while maintaining the integrity

of the data collection process.

Data processing and analysis

The interview data were transcribed verbatim within 24 hours of each interview, and the transcripts were meticulously checked for accuracy against the corresponding audio recordings. Two researchers (LW and YT), both with extensive training in qualitative data analysis, adopted a line-by-line approach to code the transcripts separately. During this process, the two researchers generated initial open codes, which were then discussed and refined, ultimately leading to the development of a preliminary codebook. Subsequently, the two researchers analyzed the coded data across transcripts to identify themes and subthemes regarding GP residents' experiences and perceptions of outpatient training in primary care settings. The constant comparative method was utilized to compare and expand existing categories while identifying novel categories until no further subcategories emerged [22]. The data analysis was conducted between August 2022 and January 2023 using the MAXQDA 2020 (VERBI Software, Berlin) software. Frequent team meetings were held to review and discuss the coding and analysis process and to enhance the rigor and reliability of the study.

Data saturation was attained after the completion of 17 interviews, after which three additional residents were interviewed to ensure comprehensive data coverage. In instances in which discrepancies emerged in the data analysis, a third investigator (ZX) was consulted to facilitate a resolution. The transcripts were not returned to the participants; however, five interviewees were provided with the results of the data analysis (i.e., the main findings of the preliminary manuscript, a table comprised of themes, subthemes, interpretations, and

representative quotes) to review and offer feedback upon, thereby indicating their consent and collaboration (see online supplemental file 2).

Patient and public involvement

In this qualitative study on the experiences and perceptions of GP residents in outpatient training, all authors and participants, including the primary researcher who conducted the interviews, are practicing GPs. Our research questions centered around GP residents' outpatient training, requiring direct engagement with the GP residents themselves. We aimed to capture their experiences to inform improvements in training programs in primary care settings. Therefore, patient and public involvement was not included in this study.

RESULTS

In total, 20 GP residents (consisting of five second-year residents and 15 third-year residents) were interviewed for a mean of 42.7 minutes (range: 35–49 minutes). Of the participants, nine were male and 11 were female, with a median age of 28 years (age range: 25–35 years). The distribution of residents who received outpatient training at Xiaoying and Nanxing CHCs was similar. Most participants (85%) were affiliated with CHCs before they received GP residency training, and the remaining were affiliated with comprehensive hospitals.

Experiences

Patient characteristics

The community preceptors purposefully recruited patients for this outpatient training

program. They had prior familiarity with the patients' medical conditions before their encounters in the outpatient setting. A significant proportion of patients seen by the GP residents had multiple stable chronic conditions, with diabetes and hypertension being the most prevalent. Conversely, a minority of their patients exhibited symptoms but had not been diagnosed with any specific disease. Participants acknowledged that both types of patients provided unique opportunities to enhance their clinical skills in distinct ways.

> *So, the patients we worked with had a range of chronic conditions like peptic ulcers, hypertension, diabetes, and coronary heart disease. These are pretty common conditions, so it was a great learning opportunity for me to develop my skills in managing chronic diseases...I get a kick out of working with new patients who have unusual symptoms that haven't been diagnosed yet. It was kind of like being a detective, trying to figure out what was going on and how we could help them. [Participant 9, male, PGY-3]*

Many patients attending clinics were well prepared, providing detailed medical histories during consultations, and frequently brought their previous clinical reports with them. Some participants stated that patients displayed a high degree of patience throughout the training process, which facilitated effective face-to-face communication, promoted a supportive learning environment, and fostered greater empathy among GP residents.

> *When I first started out, I was a bit worried about how patients might perceive us as young doctors. But as it turned out, I found the patients to be incredibly friendly and*

cooperative. Even when I asked a lot of questions or repeated myself, they were always patient and willing to help me learn. [Participant 6, male, PGY-3]

Training process

During the course of outpatient training, GP residents were required to obtain detailed information regarding patient complaints and other health-related issues. In addition, they were expected to inquire about the patients' emotional well-being, economic status, and family support. Targeted physical examinations were also performed based on patients' specific needs. The collected information was then integrated and analyzed by residents to formulate diagnoses and treatment plans. The residents were also expected to document the patients' medical records in the SOAP format (i.e., subjective, objective, assessment and plan) using a standardized manual.

The preceptors required us to write medical records immediately after each patient consultation in the clinic. It was a challenging task, as we had to document the patient's complaints, clinical examinations, diagnosis, and treatment plan in just 15 minutes. This kind of record contains a lot of information, and it took a lot of practice to complete it within the given time limit. [Participant 19, male, PGY-3]

The GP residents were instructed on how to make appropriate referrals when necessary. However, a minority of the participants admitted that they might have overlooked the need for referrals unless prompted by community preceptors. Some participants expressed uncertainty

regarding the indications for referral because of their limited experience in determining whether a patient should visit the emergency room or seek specialist care.

I found it challenging to decide when to refer a patient to a specialist or the emergency room. It's particularly difficult when dealing with patients with multiple conditions, such as those with diabetes who experience persistent chest tightness or those taking statins who complain of unexplained muscle soreness. It's a tricky balancing act. I want to make sure that I am making the right decisions for my patients. [Participant 12, female, PGY-3]

Most GP residents underscored the significance of effective communication regarding health education, with particular emphasis on lifestyle modifications. Several participants revealed that they often advise patients with metabolic disorders to lose weight and engage in regular exercise. In addition, some have employed visual aids such as diagrams and models of food and vessels to better convey their recommendations. Nevertheless, the participants acknowledged the difficulties encountered when offering advice on medication use, with many admitting that resolving medication-related issues was particularly challenging.

I am good at taking medical history and performing physical examinations, and I feel confident in helping patients make positive lifestyle changes. But when it comes to medication therapy, I find it difficult to create a detailed management plan...I often only provided rough plans and general advice...I need more training and guidance to create more professional plans. [Participant 13, female, PGY-2]

Community preceptor guidance

During GP residents' consultation process, community preceptors typically sit alongside GP residents, closely observing their performance. This comprehensive observation encompasses the evaluation of multiple aspects, such as non-verbal and verbal communication skills, as well as their ability to make clinical decisions effectively. They noted the residents' interactions with patients and provide constructive feedback for improvement. In general, preceptors refrained from interrupting unless the residents requested assistance or made significant errors that could potentially harm the patient.

Following a consultation, community preceptors typically pointed out any missing details in the medical history or physical examination, explained the treatment plan to the patient, and provided additional instructions. Many participants mentioned that they appreciated the preceptors for escorting patients out of the clinic and expressed gratitude for their participation. Moreover, several residents reported having received instructions from preceptors to pay close attention to the family support of patients, particularly older adults.

When I was seeing the patient, the preceptor came over and pointed out some details that I missed. He focused on the treatment plan and highlighted what the patient should remember in their lifestyle. Then, he explained everything to the patient in a way that they could understand. It was really helpful. He even reminded the patient to call back if she forgot any of the advice. [Participant 17, male, PGY-2]

At the conclusion of each training session, community preceptors provide regular feedback to GP residents on their clinical performance. Typically, the feedback began with positive remarks highlighting the areas where residents excelled, before addressing any weakness that required improvement. The preceptors then offered suggestions for practices aimed at enhancing residents' clinical skills. Additionally, the preceptors provided feedback on residents' written case files, including corrections and commentaries. However, a few participants noted that feedback from preceptors was occasionally too general and failed to provide adequate guidance for improvement.

> *When the preceptors checked our medical records, they used a red pen to correct any mistakes or missing information. They would then give some brief comments on the records and suggested ways to improve them. For example, they pointed out the importance of identifying modifiable and non-modifiable risk factors for certain diseases. [Participant 3, female, PGY-3]*

> *I felt like the preceptor didn't give me enough practical advice. Sometimes, they would just go through the process and give general feedback that wasn't really useful for me to improve. [Participant 20, male, PGY-3]*

Perceptions

Perceived benefits

The participants unanimously agreed that the outpatient training created a good environment

for them to apply what they had learned in practice. The GP residents saw real patients, dealt with their medical problems mainly by themselves, and were thus able to use the knowledge and skills they had learned to solve the patients' health problems. They believed that this training gave them the opportunity to constantly practice and accumulate clinical experience.

The opportunity to see a patient by ourselves was relatively lacking when we were trained in the hospitals, but here we have the opportunity to experience how to deal with patients in the primary care clinics. The training is always resident-centered. You are expected to have your own ideas, make decisions, and communicate with patients. [Participant 20, male, PGY-3]

The participants also agreed that the outpatient training helped them discover and overcome shortcomings in their performance. The differences observed between the preceptors' modeling and their own performance, and the shortcomings pointed out by the preceptors during feedback, made it clear to residents what they needed to improve. This aroused their enthusiasm for participating in training as well as for finding ways to improve themselves. Some participants expressed full confidence in their ability to deal with patients after the training, whereas others said that they had learned how to help patients, which increased their sense of responsibility.

At the beginning I was a little nervous, but later on, I felt like I could handle it, like I had some experience and confidence. After several times of training, I know how to answer

their questions, which examinations need to be done, and what urgently needs to be done. I have a plan for the patient, and I can solve some of their problems. [Participant 12, female, PGY-3]

A few participants mentioned that they learned from community preceptors how to maintain good relationships with patients. One participant said she learned how to show empathy for patients through the words and actions of the community preceptors (e.g., listening to patient complains quietly, acknowledging and praising patient progress, and giving patients their personal recommendations if they faced challenges). The participants were surprised that the patients in the community had such high trust in the community preceptors and were willing to share their private information with them.

They know a lot about their patients, even their family members and family relationships. They understand whether the patient would follow their advice...The performance of the preceptors, like ways of speaking and eye contact, is easier for patients to accept. That's what we're eager to learn. [Participant 20, male, PGY-3]

Training preferences

Some participants reported a preference for encountering patients with common chronic diseases who had developed new or atypical disorders. They believed that these cases would provide greater opportunities to improve their clinical skills and knowledge, thereby enhancing their overall competency at clinicians. This preference for complex cases may also

be attributed to the residents' desire to learn and apply novel diagnostic and treatment strategies. However, the participants acknowledged that managing complex cases could pose greater challenges in terms of decision-making, communication, and collaboration with other healthcare providers.

> *If we encountered diabetic patients with complaints of dizziness or abdominal pain, these types of cases are excellent for improving our clinical abilities. These types of cases can challenge our diagnostic skills and allow us to practice effective communication and physical examination techniques with patients...We can learn how to provide comprehensive care and manage a variety of health concerns that we may encounter in our future practice. [Participant 10, male, PGY-3]*

Most participants recommended that having two to three residents in each half-day outpatient training session was appropriate. They perceived this as beneficial because it allowed them to observe and learn from their peers' performances. The participants also noted that having multiple residents facilitated discussions during the feedback sessions, allowing for a broader range of perspectives and insights that were considered conducive to creating a supportive learning atmosphere.

> *While one resident is seeing the patient, the others can observe and take notes. After the consultation, we can sit together and discuss our experiences and learning points. This not only provides an opportunity for us to compare our performances, but also allows us to*

learn from each other's strengths and weaknesses. [Participant 8, female, PGY-3]

Several participants expressed a preference for indirect supervision, whereby community preceptors observed the interactions between residents and patients from another room through video. While some participants felt a sense of security with preceptors in the clinic, others believed that indirect supervision could foster greater independence and promote greater autonomy in decision-making. They believed that this mode of supervision was more effective for developing clinical competencies.

I do prefer that preceptors not be physically present in the room but instead monitor our performance through video. This approach helps me feel more independent in my decision-making process, but at the same time, it provides a sense of security knowing that the preceptors are still observing and providing feedback. [Participant 4, female, PGY-3]

Recommendations for training improvement

GP residents commonly regard patient selection as an important issue requiring greater attention. While some participants voiced concerns that patients with complex illnesses may be better served by specialists as well as be relatively rare in primary care settings, others argued that patients with relatively simple conditions may not present sufficient opportunities for residents to acquire new knowledge and skills.

I personally think that diabetes and hypertension are common...While they are important

and relevant, there may not be much room for further exploration or discussion, as patients with these conditions are usually diagnosed and treated with established plans. I think it would be more beneficial to encounter cases that are challenging and have the potential to expand my knowledge and skills. [Participant 2, male, PGY-3]

Many participants indicated the importance of expanding patient recruitment methods to increase the diversity of patients during outpatient training sessions. Suggestions for achieving this goal include establishing a shared patient database accessible to all community preceptors and organizing public awareness campaigns to promote training programs. Additionally, a few participants recommended ensuring patient satisfaction, as they may act as positive promoters and attract more patients to participate.

It's crucial to provide high-quality patient care in our training sessions...The community healthcare centers could organize some publicity activities highlighting the advantages of our program. And of course, it's important to ensure that the patients are satisfied with the service provided. If they have a good experience and feel like their problems were addressed, they are likely to spread the words to their friends and family. [Participant 18, male, PGY-3]

Several participants raised concerns about the practicality of the skills they had learned during the outpatient training. They noted that GP residents typically spend over 20 minutes with each patient, whereas in primary care settings in China, GPs usually spend only

approximately 5 minutes per patient. They suggested that learning how to improve the efficiency of patient consultations should be prioritized. Although some preceptors suggested that residents should focus on key points and control the pace of the process, many participants felt that specific guidance on how to achieve this was lacking.

Well, I understand the importance of taking time with patients, but in reality, community healthcare centers are often crowded, and it may not be feasible to spend half an hour on each patient. I suppose that we need to be trained in how to see and communicate with patients quickly and efficiently. [Participant 3, female, PGY-3]

Several participants proposed video-recording their training sessions to assess and improve their performance. They believed that such recordings would provide an overview of their interactions with patients, highlight their strengths and weaknesses, and facilitate a better understanding of the feedback provided by community preceptors. One participant suggested that these recordings could serve as valuable resources for studying the outpatient training programs.

There were times when I felt a little lost when the preceptor gave me feedback. I was so anxious that I couldn't recall what I did during the patient consultation. That's why I think it would be great to collect data, like audio and video recordings. By analyzing these materials later, we could identify areas that need improvement. [Participant 13, female, PGY-2]

DISCUSSION

To our knowledge, this is the first qualitative study exploring GP residents' experiences and perceptions of outpatient training in primary care settings in China. Through in-depth interviews with 20 GP residents, our study focused on the training process, the perceived benefits and challenges of the training, and recommendations for improvements.

Our study highlights the effectiveness of outpatient training in primary care settings in enhancing the clinical competencies of GP residents. The findings suggest that the opportunity to apply learned knowledge and skills to real patients in a supportive and constructive environment increases residents' confidence. The findings are consistent with previous studies that have shown the benefits of practical training in primary care settings [16, 23]. Although previous studies have used standardized patients (SPs) to simulate specific diseases and enhance residents' clinical skills [24-26], our study suggests that real patients can provide unique training opportunities to improve patient-centered care in real-world healthcare environments. Future studies should explore the long-term impact of outpatient training using SPs versus real patients on GP residents' professional competencies and patient satisfaction outcomes in order to determine the most effective training methods for GP residents.

Our findings suggest that encounters with patients with atypical or new disorders were preferred by GP residents, as these cases facilitated the application of novel diagnostic and treatment strategies. However, the challenges posed by complex cases and medication use

should not be underestimated. Residents need to develop decision-making, communication, and collaborative skills to effectively handle such cases. In addition, the preference for having multiple residents in each patient session suggests the benefits of peer learning, which allows residents to observe and learn from each other's performance. Learning from peers has been shown to be an effective way to acquire new knowledge and skills, promote critical thinking, and foster a supportive learning environment. Peer observation and feedback in clinical settings have also been shown to be effective in improving clinical skills and performance [27, 28].

Our findings suggest that community preceptors play a significant role in observing residents' performance and providing constructive and encouraging feedback. Feedback provided by the preceptors following patient consultations is important for improving residents' clinical knowledge, skills, and ability to provide patient-centered care. This aligns with previous research emphasizing the positive impact of feedback on medical education and training [29]. However, feedback from the preceptors must be specific, focused, and individualized to be effective. Training sessions should focus on improving the feedback process to make it more specific and personalized for each resident. Moreover, we found that community preceptors emphasize family support and emotional status in patients, which highlights the need for GP residents to consider social determinants of health in their practice. This practice is in line with a review by Rosland et al. that suggested the importance of family support in promoting successful outcomes in patients with chronic conditions [30]. Overall, community preceptors are key stakeholders in the success of outpatient training in primary care settings, and it is necessary to explore best practices for preceptor training and feedback

to optimize the training process.

In our study, the use of indirect supervision through video observation was preferred by several participants as it fostered greater independence and autonomy in decision-making. Indirect supervision through video observation has been recognized as a viable method of healthcare education because it facilitates self-reflection, self-directed learning, and increased independence and autonomy in decision-making [31]. Studies have shown that video observation can be used to assess and enhance clinical competencies in healthcare professionals, including medical residents [32, 33]. Our study contributes to the literature by highlighting GP residents' preference for indirect supervision through video observation. The effect of this method on the development of clinical competencies among GP residents also needs to be examined in future studies. Such research could establish best practices for using video observations to improve the effectiveness of outpatient training in primary care settings.

The concerns raised by GP residents regarding the practicality of the skills they learned during the outpatient training reflect the challenges that GPs face in primary care settings. Several studies have highlighted the time constraints of GPs in many countries, including China, which affect the quality of primary care [34-36]. One possible approach to address this issue is to use technology, such as electronic health records and telemedicine, to streamline the consultation process. This has been shown to improve patient outcomes and increase efficiency [37, 38]. Moreover, participants in this study expressed concerns about barriers to patient recruitment. Research has reported that a patient-centered approach can improve patient satisfaction and lead to better health outcomes [39, 40]. Therefore, efforts should be made to ensure patient satisfaction by instituting training programs to promote positive

outcomes and attract more patients.

This study has several important implications for research and practice. First, GP residents perceived the distinct benefits and challenges of outpatient training in primary care settings; therefore, in the future, quantitative methodologies (e.g., clinical skill examinations or scales) should be used to measure the effectiveness of training sessions across various dimensions of clinical performance and to identify areas that need improvement. Second, the teaching abilities of community preceptors are essential in outpatient training because their feedback constitutes the principal source of knowledge acquisition for GP residents. However, the number of qualified community preceptors remains small, and many are less professional and have inadequate training in guiding GP residents. Therefore, it is vital for the community healthcare training base and the standardized GP training base in China to explore approaches to improve the competencies of community preceptors, as well as increase the total number of qualified community preceptors. Finally, the recommendations proposed by the participants indicate that there is room for improvement in the outpatient training process. Future research is needed to explore the implementation of novel training practices, such as indirect supervision through video observation, as this could help improve the effectiveness of outpatient training in primary care settings.

Limitations

Our study has several limitations that should be considered when interpreting the findings. First, the study participants were recruited from a single teaching hospital in China, and the

results may not reflect the wider population. However, to increase the sample diversity, we used maximum variation sampling to recruit participants from 16 medical institutions across two provinces, ensuring some diversity in the data. Second, participants' recall bias might have affected their responses if they had different experiences with outpatient training at different times. To mitigate this bias, we included participants who had attended outpatient training sessions multiple times and excluded those who had not attended them for more than six months. Third, one of the interviewers had prior experience as a trainer in the teaching hospital and worked with a few participants, which might have influenced the results. However, the familiarity between the interviewer and participants allowed for a more open and candid communication, potentially enabling a deeper exploration of the participants' perspectives. Besides, we took measures to minimize potential bias by ensuring that the study was conducted in a transparent and rigorous manner, and data analysis was performed independently using established qualitative research methods.

CONCLUSION

The outpatient training in primary care settings is essential for GP residents in China to improve their professional competencies, as it provides opportunities for residents to use their learned knowledge and clinical skills to deal with real patients in a constructive environment. Although the GP residents reported that their current training and the abilities of community preceptors largely satisfy their needs, they face several challenges in outpatient training in primary care settings. Future research should focus on evaluating the effectiveness of such training programs and explore approaches to address the potential barriers.

Acknowledgments

The authors would like to thank Editage (www.editage.cn) for English language editing.

Author contributions

All authors were involved in the study concept and design. LW and ZX conducted the interviews, and LW and YT transcribed the interview recordings. LW and YT initially analyzed the data and discussed the results with ZX, YY, and XY. YZ and MX contributed to the conception and design of the study. The first draft was written by LW. YG, ZS, and ZX drafted the manuscript. All authors commented on previous versions of the manuscript. All authors read and approved the final version of the manuscript. ZX is the guarantor and accepts full responsibility for the work, had access to the data, and controlled the decision to publish.

Funding

This work was supported by the Medical Science and Technology Project of Zhejiang Province (grant no. 2023KY762, 2022KY815, 2021KY707, 2021KY711) and Scientific Research Fund of Zhejiang Provincial Education Department (grant no. Y202148336).

Competing interests

None declared.

Patient consent for publication

Not applicable.

Ethics approval

The study was approved by the Second Affiliated Hospital of Zhejiang University School of Medicine Ethics Committee [ID: (2022)伦理研第(0294)号].

Data availability statement

The transcripts used during the current study are available from the corresponding author upon reasonable request (zhijiexu@zju.edu.cn).

References

1. DeGette RL, Knox M, Bodenheimer T. The outpatient training gap: a pilot study. Fam Med. 2020;52(2):131-4. DOI: 10.22454/FamMed.2020.369455.
2. Barnes K, Morris CG. Clinic first: prioritizing primary care outpatient training for family medicine residents at group health cooperative. J Gen Intern Med. 2015;30(10):1557-60. DOI: 10.1007/s11606-015-3272-z.
3. Wynn BO, Smalley R, Cordasco KM. Does it cost more to train residents or to replace them? a look at the costs and benefits of operating graduate medical education programs. Santa Monica, CA: RAND Corporation; 2013.
4. Zou C, Liao XY, Spicer J, et al. Ten years' GP training in China: progress and challenges. Br J Gen Pract. 2020;70(699):511-2. DOI: 10.3399/bjgp20X712961.
5. Xu Z. GP trainers should learn how to provide primary care in community settings. Br J Gen Pract. 2020;70(701):583. DOI: 10.3399/bjgp20X713669.
6. Wang W. Medical education in China: progress in the past 70 years and a vision for the future. BMC Med Educ. 2021;21(1):453. DOI:10.1186/s12909-021-02875-6
7. China Medical Doctor Association. Contents and standards of standardized training for residents (2022 Edition). Available at: https://wsjkw.qinghai.gov.cn/ywgl/kewc/tzgg/2022/09/26/1664164328688.html. Accessed 8 April 2023.

8. xin R, Li L, Qiaoli S. et al. Perspectives of general practitioners towards their supervisors over the past ten years in China. BMC Med Educ. 2022;22(1):415. DOI:10.1186/s12909-022-03442-3

9. Ministry of health of the people's republic of China. Opinions on the implementation of general practice teacher training (Trial). Available at: http://www.law-lib.com/law/law_view.asp?id=408358. Accessed 10 April 2023.

10. Derksen FAWM, Olde Hartman TC, Lagro-Janssen ALM, et al. Clinical empathy in GP-training: Experiences and needs among Dutch GP-trainees: "empathy as an element of personal growth". Patient Educ Couns. 2021;104(12):3016-22. DOI: 10.1016/j.pec.2021.03.030.

11. Tang L, Yang H, Mao Z, et al. The negative factors influencing the career intention of general practice trainees in eastern China: a qualitative study. BMC Med Educ. 2022;22(1):393. DOI: 10.1186/s12909-022-03456-x.

12. Pan GC, Zheng W, Liao SC. Qualitative study of the learning and studying process of resident physicians in China. BMC Med Educ. 2022;22(1):460. DOI: 10.1186/s12909-022-03537-x.

13. Shi R, Guo A, Yan C, et al. Problems and countermeasures in teaching evaluation on general practice standardized training community bases in 2017. Chin J Gen Pract. 2018;17(4):255-9. DOI:10.3760/cma.j.issn.1671-7368.2018.04.003.

14. Yuan M, Zhu S, Gu J, et al. Establishment and practice of the model of general practice teaching out-patient clinic in rural areas. Shanghai Medical & Pharmaceutical Journal. 2016;37(12):28-30,51.

15. Chen L, Zhou J, Wang T, et al. Practice and discussion of the community general teaching clinic. Chin Gen Pract. 2019;22(s2):263-5.

16. Wang Y, Zou W, Wang Z, et al. Application Effect of "Driving School VIP Training Model" and "Five, Three, One-step Transition Method" in standardized training of general practitioners in community clinics. Chin Gen Pract. 2021,24(4):480-3,495. DOI:10.12114/j.issn.1007-9572.2020.00.291.

17. Sawatsky AP, Ratelle JT, Beckman TJ. Qualitative research methods in medical education. Anesthesiology. 2019;131(1):14-22. DOI: 10.1097/ALN.0000000000002728.

18. Thompson Burdine J, Thorne S, Sandhu G. Interpretive description: a flexible qualitative methodology for medical education research. Med Educ. 2021;55(3):336-343. DOI: 10.1111/medu.14380.
19. Tong A, Sainsbury P, Craig J. Consolidated Criteria for Reporting Qualitative Research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care. 2007;19(6):349-57. DOI: 10.1093/intqhc/mzm042.
20. World Medical Association. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. JAMA. 2013;310(20):2191-4. DOI: 10.1001/jama.2013.281053.
21. Montgomery P, Bailey PH. Field notes and theoretical memos in grounded theory. West J Nurs Res. 2007;29(1):65-79. DOI: 10.1177/0193945906292557.
22. Hewitt-Taylor J. Use of constant comparative analysis in qualitative research. Nurs Stand. 2001;15(42):39-42. DOI: 10.7748/ns2001.07.15.42.39.c3052.
23. Chen L, Zhou J, Wang T, et al. Application of START method in general practice teaching clinic of Shanghai Huangdu Community Health Service Center. Chin J Gen Pract. 2020;19(2):154-7. DOI: 10.3760/cma.j.issn.1671-7368.2020.02.016.
24. Ge Y, Takeda Y, Liang P, et al. Improving the communication skills of medical students —a survey of simulated patient-based learning in Chinese medical universities. BMC Med Educ. 2022;22(1):539. DOI: 10.1186/s12909-022-03596-0.
25. Dietrich E, Le Corre Y, Dupin N, et al. Benefits of simulation using standardized patients for training dermatology residents in breaking bad news. Ann Dermatol Venereol. 2021;148(3):156-60. DOI: 10.1016/j.annder.2020.11.003.
26. Zeng J, Liang S, Zhang X, et al. Assessment of clinical competency among TCM medical students using standardized patients of traditional Chinese medicine: a 5-year prospective randomized study. Integr Med Res. 2022;11(2):100804. DOI: 10.1016/j.imr.2021.100804.
27. Mariano MT, Mathew N, Del Regno P, et al. Improving residents' performance on the PRITE: is there a role for peer-assisted learning? Acad Psychiatry. 2013;37(5):342-4. DOI: 10.1176/appi.ap.12100176.
28. Ohta R, Sano C. Bedside teaching in rural family medicine education in Japan. Int J

Environ Res Public Health. 2022;19(11):6807. DOI: 10.3390/ijerph19116807.

29. Weallans J, Roberts C, Hamilton S, et al. Guidance for providing effective feedback in clinical supervision in postgraduate medical education: a systematic review. Postgrad Med J. 2022;98(1156):138-49. DOI: 10.1136/postgradmedj-2020-139566.
30. Rosland AM, Heisler M, Piette JD. The impact of family behaviors and communication patterns on chronic illness outcomes: a systematic review. J Behav Med. 2012;35(2):221-339. DOI: 10.1007/s10865-011-9354-4.
31. Hassanpour N, Chen R, Baikpour M, et al. Video observation of procedural skills for assessment of trabeculectomy performed by residents. J Curr Ophthalmol. 2016;28(2):61-4. DOI: 10.1016/j.joco.2016.03.003.
32. Rea J, Stephenson C, Leasure E, et al. Perceptions of scheduled vs. unscheduled directly observed visits in an internal medicine residency outpatient clinic. BMC Med Educ. 2020;20(1):64. DOI: 10.1186/s12909-020-1968-1.
33. Jain NS, Schwarzkopf R, Scolaro JA. Video review as a tool to improve orthopedic residents' performance of closed manipulative reductions. J Surg Educ. 2017;74(4):663-7. DOI: 10.1016/j.jsurg.2017.01.003.
34. Østbye T, Yarnall KS, Krause KM, et al. Is there time for management of patients with chronic diseases in primary care? Ann Fam Med. 2005;3(3):209-14. DOI: 10.1370/afm.310.
35. von dem Knesebeck O, Koens S, Marx G, et al. Perceptions of time constraints among primary care physicians in Germany. BMC Fam Pract. 2019;20(1):142. DOI: 10.1186/s12875-019-1033-5.
36. Xu Z, Lu Y, Liang X, et al. Primary care physician responses to requests by older adults for unnecessary drugs: a qualitative study. BMC Prim Care. 2022;23(1):247. DOI: 10.1186/s12875-022-01857-x.
37. Fleming DA, Riley SL, Boren S, et al. Incorporating telehealth into primary care resident outpatient training. Telemed J E Health. 2009;15(3):277-82. DOI: 10.1089/tmj.2008.0113.
38. Bhatia R, Gilliam E, Aliberti G, et al. Older adults' perspectives on primary care telemedicine during the COVID-19 pandemic. J Am Geriatr Soc. 2022;70(12):3480-92.

DOI: 10.1111/jgs.18035.

39. Kuipers SJ, Cramm JM, Nieboer AP. The importance of patient-centered care and co-creation of care for satisfaction with care and physical and social well-being of patients with multi-morbidity in the primary care setting. BMC Health Serv Res. 2019;19(1):13. DOI: 10.1186/s12913-018-3818-y.
40. Epstein RM, Street RL Jr. The values and value of patient-centered care. Ann Fam Med. 2011;9(2):100-3. DOI: 10.1370/afm.1239.

Supplement file 1. Interview guide

Key Areas	Semi-structured interview guide
Introduction	• We are particularly interested in your experiences and perceptions of outpatient training in the community. Could you please walk me through a typical outpatient training you have experienced? What does your outpatient training look like? How do you like your outpatient training in community?
Experiences	• How did you prepare for your outpatient training in primary care settings? • How many times have you had outpatient training sessions? • Could you remember the conditions of the patients who participated in the session? Can you tell me some details of the patients? • What kind of problems did the patients have? How did you deal with those problems? • Could you describe the whole process of seeing a patient in an outpatient training session? • Did you complete the whole procedure all by yourself? (If not) Which part was the most difficult? Did the patients cooperate to complete the procedure? • How did the community preceptors demonstrate to see the patients? Was there any difference between you and community preceptor when seeing patients? If so, what were the differences? • What impressed you that the community preceptors had demonstrated in outpatient training session? • Did community preceptors provide feedback on treatment, prevention, management, and rehabilitation of diseases? Which part was the most/least helpful? • Do you think the community preceptors gave you feedback that was helpful to your clinical performance? How did they give the feedback?
Perceptions	• How do you feel about the organization and arrangement of outpatient training in primary care settings? • How many residents do you think would be appropriate for an outpatient training session? What are your reasons? • How long did one outpatient training session last? Was the duration appropriate for you? • How frequently did you attend outpatient training? Was it appropriate for you? • When you saw a patient, would you rather have had the community preceptors stay with you in the room or stay in an observation room? What are your reasons? • Would you rather your preceptors teach you while you see the patient, or after you complete the whole procedure? What are your reasons? • Do you think outpatient training in primary care settings improves your clinical performance? (If yes) can you share some details? • Are there any other benefits you have gained from the outpatient training? (If yes) What are those? • Were there any weakness in the training session? In your opinion, how did these problems affect the training outcomes?
Ending words	• I have finished all my questions. Do you have any other comments on this interview? • Thank you for your participation! After all the interviews and data analysis are completed, I may invite you to review and discuss the results of our results. I hope we can keep in touch.

Supplement file 2 Themes, sub-themes, interpretation and quotations of interviews

Themes	Sub-themes	Interpretation	Represented Quotations
Experiences	Patient characteristics	• Patients' condition: types of illnesses and severity of conditions that GP residents deal with in outpatient training session	*"So, the patients we worked with had a range of chronic conditions like peptic ulcers, hypertension, diabetes, and coronary heart disease. These are pretty common conditions, so it was a great learning opportunity for me to develop my skills in managing chronic diseases...I get a kick out of working with new patients who have unusual symptoms that haven't been diagnosed yet. It was kind of like being a detective, trying to figure out what was going on and how we could help them." [Participant 9, male, PGY-3]*
		• Patient involvement: patients' attitudes towards and behavior of participating in outpatient training in primary care settings	*"The patient has a rather extensive medical history. However, he came prepared with his past test results, and the information he provided was clear and concise. So, I was able to swiftly compile his medical background. " [Participant 11, female, PGY-3]*
			"When I first started out, I was a bit worried about how patients might perceive us as young doctors. But as it turned out, I found the patients to be incredibly friendly and cooperative. Even when I asked a lot of questions or repeated myself, they were always patient and willing to help me learn." [Participant 6, male, PGY-3]
	Training process	• Patient consultations: GP residents communicate and interact with patients for medical assessment and treatment	*"I manage the entire patient encounter, including taking their medical history, conducting the physical examination, communication, and formulating initial treatment plans--all on my own. " [Participant 14, female, PGY-2]*
		• Medical record writing: GP residents' practice of documenting and managing a patient's medical information	*"The preceptors required us to write medical records immediately after each patient consultation in the clinic. It was a challenging task, as we had to document the patient's complaints, clinical examinations, diagnosis, and treatment plan in just fifteen minutes. This kind of record contains a lot of information, and it took a lot of practice to complete it within the given time limit." [Participant 19, male, PGY-3]*
			"I found it challenging to decide when to

		• Patient Referral: GPs recommend the patients to consult a specialist or other health professionals for further evaluation and treatment when necessary	*refer a patient to a specialist or the emergency room. It's particularly difficult when dealing with patients with multiple conditions, such as those with diabetes who experience persistent chest tightness or those taking statins who complain of unexplained muscle soreness. It's a tricky balancing act. I want to make sure that I am making the right decisions for my patients." [Participant 12, female, PGY-3]*
		• Medical decision-making: assessing patient information to determine appropriate strategies of diagnosis and treatment	*I'll give diabetic patients some tips on improving their lifestyle, and sometimes I might use things like nutrition guides, meal plans, or even apps to help them out. [Participant 3, female, PGY-3]* *"I am good at taking medical history and performing physical examinations, and I feel confident to help patients make positive lifestyle changes. But when it comes to medication therapy, I find it difficult to create a detailed management plan...I often only provided rough plans and general advice...I need more training and guidance to create more professional plans." [Participant 13, female, PGY-2]*
	Community preceptor guidance	• Supervision during patient consultations: the process of preceptors supervising GP residents during patient consultations	*"While I'm seeing patients, the preceptor is there watching, providing reminders only when I make mistakes; otherwise, they refrain from actively engaging in conversations with me or the patients unless it is necessary." [Participant 7, female, PGY-3]*
		• Community preceptor's demonstration: preceptors provide examples of seeing a patient and recommendations on the clinical skills	*"when I finished seeing the patient, the preceptor came over and pointed out some details that I missed. He focused on the treatment plan and highlighted what the patient should remember in their lifestyle. Then, he explained everything to the patient in a way that they could understand. It was really helpful. HE even reminded the patient to call back if she forgot any of the advice." [Participant 17, male, PGY-2]*
		• Evaluation of medical record: preceptors assess medical records written by GP residents based on the standardized criteria	*"When the preceptors checked our medical records, they used a red pen to correct any mistakes or missing information. They would then give some brief comments on the records and suggested ways to improve them. For example, they pointed out the*

			importance of identifying modifiable and non-modifiable risk factors for certain diseases." [Participant 3, female, PGY-3]
		• Preceptor's feedback: preceptors provide feedback on GP residents' performance	*"Usually, the feedback starts by pointing out what I did well, like saying I took a detailed medical history or did a good physical examination. Then they point out where I still need improvement, and this part is usually quite detailed. Finally, they talk about how I can make things better, and this part is relatively brief." [Participant 10, male, PGY-3]*
			"I felt like the preceptor didn't give me enough practical advice. Sometimes, they would just go through the process and give general feedback that wasn't really useful for me to improve." [Participant 20, male, PGY-3]
Perceptions	Perceived benefits	• Independent practice: the outpatient training increases GP residents' independence of clinical practice	*"The opportunity to see a patient by ourselves was relatively lacking when we were trained in the hospitals, but here, we have the opportunity to experience how to deal with patients in the primary care clinics. The training is always resident-centered. You are expected to have your own ideas, make decisions and communicate with patients." [Participant 20, male, PGY-3]*
		• Interactive ability: the outpatient training improves GP residents' ability of communication and interaction with patients	*"My outpatient training has been incredibly valuable, as it gave me insights into effectively interacting with patients during clinic visits...this hands-on experience has allowed me to develop and refine my skills in providing assistance and support to patients." [Participant 7, female, PGY-3]*
		• Confidence: the outpatient training building up GP residents' confidence in consulting and managing patients	*"At the beginning I was a little nervous, but later on, I felt like I could handle it, like I had some experience and confidence. After several times of training, I know how to answer their questions, which examinations need to be done, and what is urgent to be done. I have a plan for the patient, and I can solve some of their problems." [Participant 12, female, PGY-3]*
			"The training has highlighted areas where I can improve, and I believe that's actually a

		• Potential abilities to be improved: the outpatient training helps GP residents recognize their limitations in clinical abilities • Patient-centered approach: GP residents learn patient-centered care from experienced preceptors	*positive outcome. It's like a reality check that's helping me see where I need to step up. Now I have a clearer idea of how to fill in those gaps and improve myself." [Participant 9, male, PGY-3]* *"They know a lot about their patients, even their family members and family relationships. They understand whether the patient would follow their advice...The performance of the preceptors, like ways of speaking and eye contact, is easier for patients to accept. That's what we're eager to learn." [Participant 20, male, PGY-3]*
	Training preferences	• Challenging cases: complex cases that need enhanced clinical skills and comprehensive patient care. • Peer learning: GP residents consult patients in the clinic room and have mutual observation, and discussion after consultation	*"If we encountered diabetic patients with complaints of dizziness or abdominal pain, these types of cases are excellent to improve our clinical abilities. These types of cases can challenge our diagnostic skills and allow us to practice effective communication and physical examination techniques with patients...We can learn how to provide comprehensive care and manage a variety of health concerns that we may encounter in our future practice." [Participant 10, male]* *"For example, when other residents are seeing patients, I can watch and see what issues they might face during the consultation. Then, I can compare it with how I would handle the situation if I were in their shoes. We take turns observing, which helps us not only spot each other's challenges but also motivate each other to improve." [Participant 19, male]* *"While one resident is seeing the patient, the others can observe and take notes. After the consultation, we can sit together and discuss our experiences and learning points. This not only provides an opportunity for us to compare our performances, but also allows us to learn from each other's strengths and weaknesses." [Participant 8, female, PGY-3]* *"Personally, I actually prefer having the*

		• Approaches of preceptor's guidance: GP residents prefer different approaches of preceptors observing and providing guidance (e.g., sitting aside, video observation)	*preceptor right there next to me. It just makes me feel more secure, you know? Like, when I met difficulties, the preceptor can step in and give me a hand or give me a nudge in the right direction. It's like having that backup plan to help me do my best." [Participant 15, female, PGY-2]* *"I do prefer that preceptors are not physically present in the room but instead monitor our performance through video. This approach helps me feel more independent in my decision-making process, but at the same time, it provides a sense of security knowing that the preceptors are still observing and providing feedback." [Participant 4, female, PGY-3]*
Recommendations for training improvement	Patient selection	• GP residents' recommendations on selecting patients for outpatient training	*"I personally think that diabetes and hypertension are common...While they are important and relevant, there may not be much room for further exploration or discussion, as patients with these conditions are usually diagnosed and treated with established plans. I think it would be more beneficial to encounter cases that are challenging and have the potential to expand my knowledge and skills." [Participant 2, male, PGY-3]*
	Patient Recruitment	• GP residents' recommendations on the approach to recruiting enough patients for outpatient training	*"It's crucial to provide high-quality patient care in our training sessions...The community healthcare centers could organize some publicity activities highlighting the advantages of our program. And of course, it's important to ensure that the patients are satisfied with the service provided. If they have a good experience and feel like their problems were addressed, they are likely to spread the words to their friends and family." [Participant 18, male, PGY-3,]* *"I prefer new patients, you know, they come in with some complains, and I can try to help them solve those problems. These kinds of patients can be a bit challenging, which is actually a great learning experience for me." [Participant 19, male, PGY-3]*

	Efficiency Enhancement	• GP residents' recommendations on training of dealing with patients efficiently	*"Well, I understand the importance of taking time with patients, but in reality, community healthcare centers are often crowded, and it may not be feasible to spend half an hour on each patient. I suppose that we need to be rained in how to see and communicate with patients quickly and efficiently." [Participant 3, female, PGY-3]* *"You see, the thing is, GPs don't get much time with patients. So, it is crucial that we receive training on effectively managing patient consultations within those brief moments, prioritizing the delivery of quality care and efficiently addressing their needs. This skill becomes even more vital in the fast-paced nature of primary care settings, where time constraints are common." [Participant 8, female, PGY-3]*
	Video-based Performance Enhancement	• GP residents' recommendations on being observed through video recordings	*"There were times when I felt a little lost when the preceptor gave me feedback. I was so anxious that I couldn't recall what I did during the patient consultation. That's why I think it would be great to collect data, like audio and video recordings. By analyzing these materials later, we could identify areas that need improvement." [Participant 13, female, PGY-2]*

COREQ Checklist

Topic	Item No.	Reported information	Reported on page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	LW & ZX	9
Credentials	2	M.D. (LW), M.D. (ZX)	1
Occupation	3	Both are GPs	9
Gender	4	Male (ZX); Female (LW)	9
Experience and training	5	Both have expertise in qualitative research methods	9
Relationship with participants			
Relationship established	6	About one-third participants had worked with one of the interviewers (LW) in the past	8
Participant knowledge of the interviewer	7	Participants were familiar with their interviewers.	8
Interviewer characteristics	8	Both served as GPs with expertise in the qualitative study	9
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	Interpretive description	7
Participant selection			
Sampling	10	Purposive sample in 14 community healthcare centers and two hospitals across Zhejiang and Guizhou Provinces	8
Method of approach	11	Face to face	10
Sample size	12	20	12
Non-participation	13	Three residents declined to participate due to scheduling conflicts.	8
Setting			
Setting of data collection	14	In quiet and private settings	9
Presence of non-participants	15	No	N/A
Description of sample	16	Twenty GP residents (consisting of five second-year residents and 15 third-year residents) were interviewed. Of the participants, nine were male and 11 were female, with a median age of 28 years (age range: 25–35 years).	12

Data collection			
Interview guide	17	The interview guide was developed through a comprehensive review of the relevant literature, followed by pilot interviews with two GP residents and extensive discussions among all authors.	9
Repeat interviews	18	No	8
Audio/visual recording	19	Audio recording	10
Field notes	20	The interviewers made field notes on key information whenever necessary.	10
Duration	21	A mean of 42.7 minutes (range: 35-49 minutes)	12
Data saturation	22	Data saturation was attained after the completion of 17 interviews	11
Transcripts returned	23	No	11
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	Two researchers (LW. and YT), both with extensive training in qualitative data analysis, adopted a line-by-line approach to code the transcripts separately.	11
Description of the coding tree	25	No	N/A
Derivation of themes	26	Themes were derived from data collected and the constant comparative method was utilized	11
Software	27	MAXQDA 2020	11
Participant checking	28	Five interviewees were provided with the results of the data analysis to review and offer feedback upon, thereby indicating their consent and collaboration.	11 & 12
Reporting			
Quotations presented	29	Yes	Results
Data and findings consistent	30	Yes	Results
Clarity of major themes	31	Major themes resulting from the interviews were outlined in Results.	Results
Clarity of minor themes	32	Minor themes resulting from the interviews were outlined in Results.	Results