

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

Themes	Sub-themes	Interpretation	Represented Quotations
Experiences	Patient characteristics	<ul style="list-style-type: none"> ● Patients' condition: types of illnesses and severity of conditions that GP residents deal with in outpatient training session ● Patient involvement: patients' attitudes towards and behavior of participating in outpatient training in primary care settings 	<p><i>"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]</i></p> <p><i>"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]</i></p> <p><i>"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]</i></p>
	Training process	<ul style="list-style-type: none"> ● Patient consultations: GP residents communicate and interact with patients for medical assessment and treatment ● Medical record writing: GP residents' practice of documenting and managing a patient's medical information 	<p><i>"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]</i></p> <p><i>"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></p> <p><i>"I found it challenging to decide when to</i></p>

		<ul style="list-style-type: none"> ● Patient Referral: GPs recommend the patients to consult a specialist or other health professionals for further evaluation and treatment when necessary ● Medical decision-making: assessing patient information to determine appropriate strategies of diagnosis and treatment 	<p><i>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]</i></p> <p><i>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></p> <p><i>"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]</i></p>
	Community preceptor guidance	<ul style="list-style-type: none"> ● Supervision during patient consultations: the process of preceptors supervising GP residents during patient consultations ● Community preceptor's demonstration: preceptors provide examples of seeing a patient and recommendations on the clinical skills ● Evaluation of medical record: preceptors assess medical records written by GP residents based on the standardized criteria 	<p><i>"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]</i></p> <p><i>"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]</i></p> <p><i>"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</i></p>

		<ul style="list-style-type: none"> ● Preceptor's feedback: preceptors provide feedback on GP residents' performance 	<p><i>importance of identifying modifiable and non-modifiable risk factors for certain diseases." [Participant 3, female, PGY-3]</i></p> <p><i>"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></p> <p><i>"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]</i></p>
Perceptions	Perceived benefits	<ul style="list-style-type: none"> ● Independent practice: the outpatient training increases GP residents' independence of clinical practice ● Interactive ability: the outpatient training improves GP residents' ability of communication and interaction with patients ● Confidence: the outpatient training building up GP residents' confidence in consulting and managing patients 	<p><i>"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]</i></p> <p><i>"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]</i></p> <p><i>"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]</i></p> <p><i>"The training has highlighted areas where I can improve, and I believe that's actually a</i></p>

		<ul style="list-style-type: none"> ● 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 	<p><i>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]</i></p> <p><i>"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]</i></p>
	Training preferences	<ul style="list-style-type: none"> ● 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 	<p><i>"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]</i></p> <p><i>"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]</i></p> <p><i>"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]</i></p> <p><i>"Personally, I actually prefer having the</i></p>

		<ul style="list-style-type: none"> Approaches of preceptor's guidance: GP residents prefer different approaches of preceptors observing and providing guidance (e.g., sitting aside, video observation) 	<p><i>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."</i> [Participant 15, female, PGY-2]</p> <p><i>"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."</i> [Participant 4, female, PGY-3]</p>
Recommendations for training improvement	Patient selection	<ul style="list-style-type: none"> GP residents' recommendations on selecting patients for outpatient training 	<p><i>"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."</i> [Participant 2, male, PGY-3]</p>
	Patient Recruitment	<ul style="list-style-type: none"> GP residents' recommendations on the approach to recruiting enough patients for outpatient training 	<p><i>"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."</i> [Participant 18, male, PGY-3,]</p> <p><i>"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."</i> [Participant 19, male, PGY-3]</p>

	Efficiency Enhancement	<ul style="list-style-type: none"> ● GP residents' recommendations on training of dealing with patients efficiently 	<p><i>"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]</i></p> <p><i>"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]</i></p>
	Video-based Performance Enhancement	<ul style="list-style-type: none"> ● GP residents' recommendations on being observed through video recordings 	<p><i>"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]</i></p>