BMC Medical Education

RESEARCH

Open Access

Student perspectives on student-led family medicine clinics in Qatar: a descriptive qualitative study

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Abstract

Background Student-led clinic is an educational-professional training environment where students are leading the care of patients under the supervision of licensed health care professionals. This study aims to explore medical students' experiences in leading family medicine clinics in Qatar.

Methods The study used a qualitative descriptive method. To collect the data, the researchers have used semi-structured interviews. To recruit students, a convenience sampling strategy was used by sending a call to participate to all students who completed the rotation and met the inclusion criteria. An inductive thematic analysis was employed to data analysis.

Results Ten students participated in the study. Data analysis revealed six themes. These are: Student led clinic as transitional and transformative stage, Challenges faced by students, coping strategies, protective factors, implications of the experience and students' reflections for future rotations. The study revealed that students experienced a mixture of anxiety and excitement during the transition to leading clinics. Challenges included patient-related challenges such as language barriers, challenges related to personal skills such as time and knowledge, and institutional challenges that included limited supervisor availability and balancing academic responsibilities with clinic duties. Coping strategies included continuous knowledge revision, seeking advice from colleagues, and employing creative tools to overcome language barriers.

Conclusion Leading family medicine clinics has an impact on students such as enhancing their time management, diagnostic abilities, communication skills, and confidence. Support from supervisors, team members, patients, and colleagues play a crucial role in students' experiences. This transitional experience supports the shift from self-perception as students perceiving themselves as physicians.

Keywords Medical students, Family medicine, Student-led clinics, Medical education, Qatar

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Introduction

Student-led clinics (SLC) is an educational-professional training environment where students are leading the care of patients under the supervision of licensed health care professionals [1]. These clinics offer practical education across various health disciplines. Past studies report on these clinics as opportunities that offer health care students hands-on clinical experience while also delivering positive outcomes for the individuals receiving care [2, 3]. Drawing on students' experiences in eleven SLCs in occupational therapy, physiotherapy, and speech therapy Kavannagh et al. (2014) report that students have broadly positive experiences [2]. Moreover, an integrative review of medical students' experiences in SLCs reports positive results and suggests that SLCs deliver good outcomes across various health conditions [3].

To further illustrate the positive impact of SLCs in medical education, Smith et al. (2014) found that medical student involvement in an SLC program resulted in improved student knowledge, skills, attitudes and self-efficacy, and increased interest in primary care and in working with disadvantaged populations after graduation [4]. In the United States, 76% of the medical programs involve SLCs reflecting their role in promoting community health [5]. Supervised SLCs provide clinical services to underserved communities, while helping the students develop clinical, communication, leadership, and teamwork skills in multidisciplinary settings [6]. Research focusing on patient perspectives is also generally positive. A study by Burgess and Roberts in 2022 explored the experiences of patients participating in student led clinic indicated that patients found the interprofessional nature of the clinic beneficial to their health goals and helped build their healthcare knowledge and confidence [7]. However, several studies have revealed negative impacts on students, including stress and uncertainty [8, 9].

In the Arab region, a recent study in Jordan by Ismail et al. (2024) explored patient satisfaction to dental student led clinic, it was found that patients showed satisfaction with the quality of treatment [10]. However, there have been no studies or reports on SLC programs among medical students. According to a review by Wilson et al. (2023), there is a significant research gap in relation to student-led learning opportunities in the Middle East, and the majority of SLCs are based in the USA, Canada, and Europe [11]. This study is the first to evaluate medical students' SLC experiences in an Arab country in general and Qatar in particular.

Qatar's healthcare system is primarily funded and managed by the government. In recent years, the country has invested in new healthcare infrastructure and facilities, including several world-class hospitals and health centers [12]. The healthcare system in Qatar is mainly provided by the government through Primary Health Care Corporation (PHCC) and Hamad Medical Corporation (HMC). PHCC operates more than thirty health centers and urgent care centers across the country, providing a range of services including general medical consultations, vaccinations, and maternal and child health services. In addition to the PHCC and HMC, several private hospitals and clinics are providing specialized medical services and treatments.

Most medical students in Qatar study at one of two institutes: Weill-Cornell Medicine-Qatar (WCM-Q) and Qatar University College of Medicine (QU-CMED) rotating through various departments and services, including primary care clinics, emergency walk-in clinics, and specialty clinics to gain diverse medical experiences. This study focuses on medical students from QU-CMED.

The College of Medicine at QU offers a six-year program for students, divided into two phases: the preclerkship phase, which includes Problem-Based Learning (PBL) in the early years, and the clerkship phase, starting from year four. In year six, students participate in the Family Medicine Clerkship at PHCC, along with mandatory clerkships in Psychiatry and Emergency Medicine at HMC during the same year. The family Medicine clerkship program at QU-CMED is an eight-week program that aims to build a strong foundation in family medicine and prepare them to deliver comprehensive healthcare in diverse settings to patients of all ages. The program emphasises outcome-oriented, evidence-based care and exposes students to acute, chronic, and preventive care, health promotion, and disease prevention. Key areas of focus are common medical problems in primary care, as well as, dermatology, ENT and ophthalmology. The program includes supervised clinics, one-to-one teaching, small/large group educational sessions, and self-directed learning. To facilitate more independent consultation, SLCs were introduced in the family medicine clerkship program in 2020. The eight-week SLC placement is faculty-guided, and based within PHCC health centers across Qatar.

All students receive two days of full-time orientation through didactic lectures, small and large group discussions, and workshops before commencing the health center-based attachment.

From week two onwards, the program requires the students to be attached to one of the clinical supervisors who oversee the students practice=history taking, conducting clinical examinations, and formulating management plans independently. To ensure effective learning, but more importantly patient safety, students' discuss each case with their clinical supervisors and document details in the electronic medical records (EMR) system, which must be counter-signed by the supervisor. In addition, any investigations and prescriptions must also be agreed upon and initiated by the supervisor.

Students see seven to eight patients per day, spending thirty minutes with each patient and fifteen minutes discussing the case with the faculty. The implementation varies based on patient demand and time allocated in health centers. Throughout their placement working at the SLC, students demonstrate competency in advanced history taking, appropriate physical examination, effective communication skills, apply critical thinking, evidence-based health promotion and disease prevention management plans, and write accurate, relevant documentation. The program emphasizes professional duties in a respectful, reliable, and responsible manner, and adheres to the ethical principles of patient care. The Family Medicine Clerkship Program runs a SLC as a unique opportunity by providing work-integrated learning for medical students undertaking the clinic to enhance their competence and confidence in patient care.

This study aims to explore medical students' experiences in leading family medicine clinics in Qatar. To our knowledge, there are no studies in the Arab region that examined undergraduate medical students' experiences in leading clinics. We believe that our study is the first study on medical SLCs in the Arab region and Qatar, hence, it's an explorative study that examines experiences, meanings, processes, and implications. Therefore, qualitative descriptive research methods were applied using semi-structured interviews with students.

Methods

Study design

This study is a qualitative descriptive study that aims to explore students' experiences in leading clinics. A qualitative descriptive design was used because this method seeks to discover and understand a phenomenon, a process, and the perspectives of the people involved, rather than focusing on culture as does ethnography, the lived experience as in phenomenology or the building of theory as with grounded theory [13].

Participants and recruitment

A convenience sampling strategy was used to recruit students, through which a call to participate with the consent form was sent to 36 students who had completed their SLC. Convenience sampling was used as participants were those who met the inclusion criteria and expressed interest, willingness and availability to participate. Students were informed that if they were interested in taking part in the study, they should contact the leading principal investigator (LPI-SDN) via email and express their interest. Initially, seven students agreed to participate, but since data-saturation was not reached, a call to participate continued to be sent to students. Data collection stopes when data-saturation was reached. I.e., when no additional data offered, and no new themes evolved throug the analysis. The main inclusion criteria were being a medical student who had experienced and completed a full SLC rotation in the PHCC, expressed interest to participate in the study, can speak in English or in Arabic, and able to use an online platform for the interview. Students who did not experience SLC at all or did not complete a full rotation were excluded from the study. This exclusion is due to the aim of the study to examine the entire experience of students. Moreover, the exclusion criteria were inability to communicate in English or in Arabic.

Ethical assurances

The study was approved by Qatar University IRB under the number QU-IRB- 1598-EA/21 (September 2021). Informed consent was obtained via email prior to the interview after student sent and expression of interest to participate to the LPI (SDN). Moreover, to ensure the absence of any pressure on students, or any hierarchal impact on their decision to participate, SDN was the one to conduct the interviews as she was not involved in any direct or indirect activity with the students. The consent form included information about the research, the objectives, involved institutions, principal researcher's contact details, participants' rights, ethical approval, and confidentiality assurances. All participants were informed about their right to withdraw at any stage of the study, and their right to decline recording and use manual documentation of the interview. To ensure confidentiality, the study uses numbers instead of names. Interviews were transcribed verbatim.

Data collection

To collect the data, semi-structured interviews were used (See Appendix: Interview Protocol). The interview guide was developed by the research team based on past studies on the same topic in other contexts, and on their experience in Qatar's context. Additional questions were developed during each interview based on the participant's answers.

All interviews were conducted in English by the lead PI (SDN) because English is the language of instruction in CMED and is used among healthcare providers in the PHCC. SDN is a medical anthropologist with long and rich experience in qualitative research in health care, and in medical education. All interviews were conducted online via Webex due to COVID-19 restrictions being at the time of collecting the data. Interviews lasted for 45–60 min on average. Despite restricted and hybrid modality in higher education, students practiced onsite clinical training in the PHCC following the restrictions that are expected from other healthcare workers at the place. All students accepted the recording of their interviews, and no one withdrew from the study at any point.

Data analysis

To analyze the data, an inductive thematic analysis was used following Braun and Clarke's 6 steps of thematic analysis [14]. This enabled us to identify patterns (themes) within the data and report them descriptively. The analysis began after the completion of interview number four. Two team members (SDN & RS), began with the first step, which is familiarization with the data by reading thoroughly the four interviews and creating memos. This was followed by the second step, which is generating of initial codes of these four interviews by applying open coding, followed by the third step which identification of the main themes by both members separately. After that both members met, compared, resolved discrepancies and agreed on the main emerging themes (the fourth step). In the fifth step, they both defined and named these themes. SDN continued to analyze the remaining 3 interviews in parallel to conducting them. However, data saturation was not reached, and therefore additional call was sent, additional students were recruited and interviewed. Analysis was simultaneously conducted until saturation was reached at interview number 10. The last stage was to draft the results report and presenting the main findings to the whole team. Data reliability was ensured by cross-checking the results with the original transcripts. The results were presented, discussed, amended, and approved by the whole research team. The authors followed qualitative research methods approaches to maintain rigor and trustworthiness. These were established through the different stages of collecting, analyzing and writing the data. For example, throughout the data collection the interviewer (SDN) continuously referred to the research questions and objectives. Moreover, the analysis of the first four interviews by two team members, and the discussion surrounding the content-thematic analysis enables reflexivity of the interviewer and invited her to reflect on her biases and rationale for her propping questions and labels of codes and themes. This helped her in decision making as the interviews progressed. Additionally, two members analyzed the first four interviews, ensured consistency and minimum bias or subjectivity. Lastly presenting the initial results to the team and opening a discussion that validated the analysis and interpretation, was additional approach for maintaining rigor and accuracy.

Results

Ten students participated in the study. All were at the end of their last year of studies (year 6) and were 22–24 years of age. Seven were women and three were men; nine were Arabs and one was non-Arab. In general, the SLC experience as described by the students involves shadowing a supervisor for one week, and then having their own room, attached to the supervisor's room. The students are assigned by the admission team to several patients, who approach the students directly. The students introduce themselves, and if the patient agrees to be examined by the student, they take history and build a management plan. Before communicating this plan to the patient, they ask for the patient permission to leave the room and confirm their examination and plan with their supervisor. Then they return to the patient to communicate the plan, and officially discharge the patient. The thematic analysis revealed six themes as presented in Table 1 (See also Fig. 1.).

SLC as a transitional stage

Participants in the study described the beginning of the SLC as a crucial period that prepared them to manage their new experience. All the students highlighted that they were shocked when they had heard about the idea of the project from the clinical training director. They mainly could not imagine themselves "managing patients from A to Z" (Participant 10). They all mentioned the anxiety they felt during the few days prior to their first day in the clinic. This anxiety and fear stemmed mainly from the thought that they might make mistakes that may cause harm to patients, but also from being embarrassed and/or disappointing the patients and the supervisor. They mentioned that the main sources of these feelings were the fact that this was their first time being alone in a room with patient, along with their lack of knowledge, experience, and confidence. Participant 2 for example, said:

> *At first I was very confused, it was first time I heard about the student-led clinic and never done it before and I was worried that's going to be difficult and I was unable to do it [...] I was worried of having my own clinic and see the patient on my own from A to Z, I felt that it going to be little difficult what if something go wrong or I said a wrong thing, if I miss something in the history it would be mess completely.*

This fear was mixed with tense and excitement, as participant 7 explained:

> *I was excited to have my own clinic but still tensed and worried, so once we started actually doing it in the PHCC it became much easier, it was actually fun, I found it better than shadowing a doctor [...].*

Most of the students mentioned that they managed these feelings by familiarizing themselves with the details of the clinic. Participant 1 for example, noted "I had to familiarize myself with the instruments that were there, that a family physician would use." Other students mentioned rehearsing basic skills such as history taking and

Table 1 Thematic analysis: themes, subthemes, and number of responses

Higher order themes	Lower order themes and number of responses
SLC as a transitional stage	Feelings - Anxiety = 10 - Excitement = 7 - Tense = 5 Reasons - Fear of making mistakes = 10 - Lack of knowledge = 5 - Being alone with patient = 4 - Lack of confidence = 3 Management - Familiarization with the place = 4 - Revisions = 4 - Shadowing = 10 - Consulting seniors = 5
Challenges faced by the students	Patient related challenges - Rejection = 2 - Lack of patience and empathy = 3 - Testing students' knowledge = 2 - Obscuring the real health condition = 2 - Gender issues = 2. Personal skills related challenges: - Managing patients' emotional reactions = 3 - Language barrier = 6 - Performing medical procedures = 8 - Time management = 9 Institution related challenges: - Several students for one mentor = 4 - Additional academic requirements = 9
Coping with challenges	- Revising knowledge from previous rotations and preclinical stage = 8 - Talking to and sharing with other colleagues = 6 - Language barriers: Use of body language, drawing and using smart devices for illustration = 10 - Empathizing patients and avoiding taking rejection personally = 6
Protective factors	Personal backgrounds - Clinical skills training in the preclinical stage: Communication skills, history taking and physical examination = 10 - Time and management skills from previous rotations: Psychiatry = 5; emergency medicine = 5; internal medicine = 4 - Sociodemographic: age = 4, gender = 5, language (Speaking Arabic) = 6 Academic structure of the SLC: - Being in a room attached to the supervisor = 6 - Shadowing for two weeks = 5 - Orientation period prior to the SLC = 5 Systems of support: - Supervisor's support = 10 - Other team members = 6 - Patients = 5 - Their colleagues = 5
Implications of the experience	Impact on professional skills: - Time management = 10 - Teamwork = 8 - Communication skills = 10 - Asking the right questions = 4 - Making diagnosis = 3 - Independent build of management plan = 4 - Managing relationship with patients and families = 5 - Using telemedicine = 4 - Social and cultural competence = 5 Impact on personality traits: - Increased confidence = 5 - Impact on life perceptions = 6 - Feelings of real doctor = 6

Table 1 (continued)

Higher order themes	Lower order themes and number of responses
Reflections for future SLCs	Reflections to directors - Alternative assessment methods that are skilled focus and tailored to SLC = 8 - Less reflective practices as these are time consuming = 7 - Less bureaucratic requirements and paperwork = 7 - Continue with the daily feedback and continuous evaluation of their supervisors = 8 Reflections to students - Talk about your weaknesses with supervisors = 5 - Show interest and engagement = 4

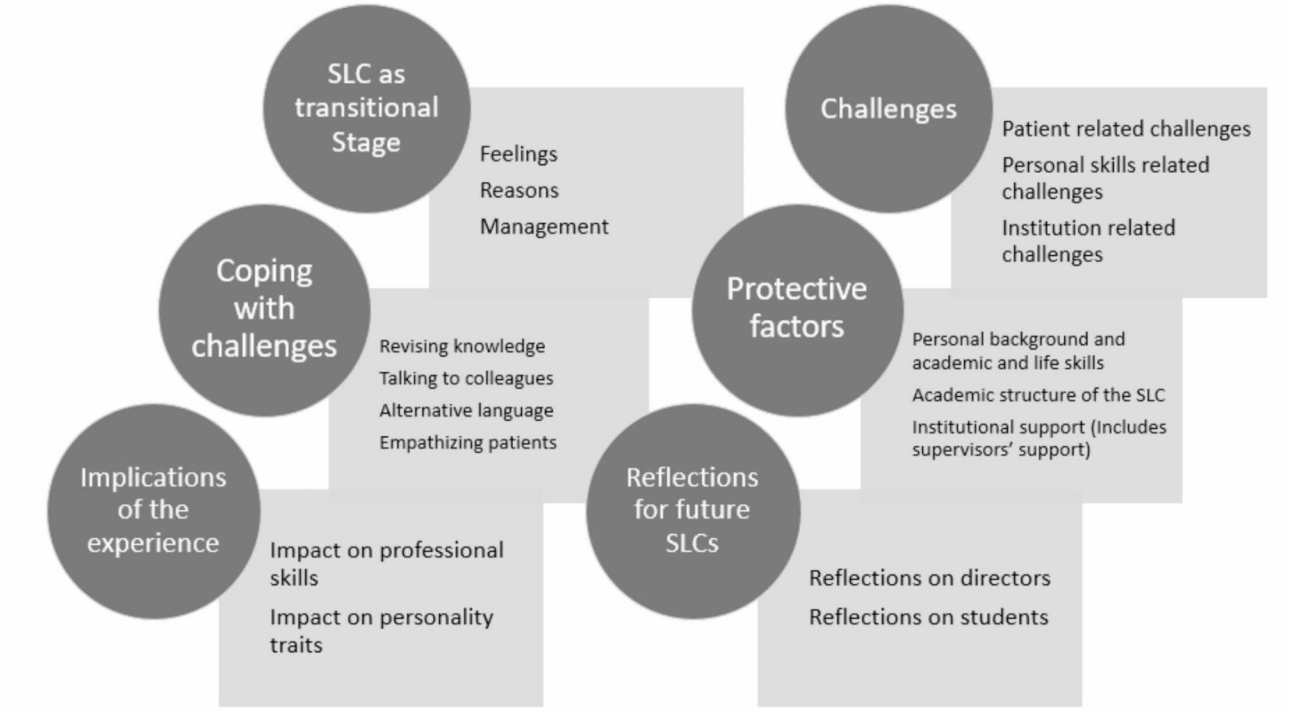

Fig. 1 Summary of the emerged themes

communication skills and reading about the most common cases and symptoms presented in family medicine, their presentations, and the appropriate management plans.

Students also indicated that the first 1–2 weeks of the clinic placement, which they spent shadowing their supervisors (some called them senior doctors) before handling cases alone, was of significant help in overcoming these feelings. As participant 10 explained:

> *The fact that I was with the doctor for two weeks, was most helpful to overcome my anxiety. She was very kind, supportive, and gave me the opportunity to manage cases while she's in the room […] Despite that, being alone in the room with the patient was a little bit stressful in the first week, but later that's it, you get used to it, especially that you know a senior doctor is in the nearby room and you can always ask for help.*

Some students sought feedback from the previous year's students, who encouraged them and gave them tips on managing the experience.

Challenges faced by the students

Despite the support they received from their supervisors and the various strategies they had used to cope with the beginning of the experience, the interviews revealed that students faced several challenges on three levels: patient-related challenges, personal skills related challenges, and institution related challenges.

Patient-related challenges

Students mentioned several ways in which patients challenged them. One of these was when patients rejected being examined by a student due to a lack of trust in their skills. This was not a common experience, but it did leave an impact on the students and sometimes shaped their

feelings towards the next patient. For instance, participant 3 said:

It did not happen regularly, but I remember three of them rejecting me because they knew I'm a student. One of them politely said he prefers to discuss the issue with an experienced specialist. I responded by saying yes of course. The second said that he's already following up with the doctor and prefers to go and talk to him because he knows. The third case, he was very rude, and I will never forget him. He treated me in an insulting way as if I'm working for him.

Another challenge was that they sometimes lacked patience and empathy for students and the SLC process. For example, participant 5 said:

Sometimes I have met patients who are in a hurry, and they do not accept the fact of waiting for you to go and have the supervisor's opinion. Once a patient came in and the doctor asked me to examine her. She got upset saying she waited so long and now this young non-experienced will examine her and asked to see the doctor. When he came, she told him different things. It was embarrassing.

Sometimes the lack of patience came from a family member, as stated in participant 8 story:

I remember, there was a case, when the doctor asked the patient who came with her husband if she can go to the next-door room and another doctor will assist you. The husband was angry, because he waited for, like, maybe 5 min more […] He [the husband] didn't agree.

Few students mentioned that patients sometimes tried to test their knowledge by asking the same questions they had asked the senior doctor before or by asking the same questions in different ways. Furthermore, some patients obscured the real health issues they were facing, like in the following example of participant 2:

> *There was this patient who came in with amenorrhea for long time and she has not tried to check it out for a long time before she came […] It was strange that she has had amenorrhea and she's saying it was primary, and that she did not have period before, although she gave birth. So she's saying she's never had a amenorrhea. She's never had her period before and have kids. This was strange to me. At the end I asked for the help of the consultant….*

Another challenge from patients was related to the students' genders. Some patients refused to be seen by a student of a different gender, while others refused to be seen by a student of the same gender. There was no consistent preference, and it was not a common issue.

Personal skills related challenges

Students described four areas of weaknesses they perceived in their professional skills which caused challenges during their SLC experiences. The first was their inability to handle extreme emotional reactions from patients, especially when they broke bad news to them. Participant 4, for example, told us about his experience with a man who was diagnosed with epigastric cancer:

A man presented with epigastric pain, and he is a smoker with sedentary lifestyle for more than 10 years. One of his relatives, had also epigastric pain and was diagnosed with stomach cancer. He was afraid he would have the same, so we started him 6 weeks on PPI. But after 6 weeks still the pain persists, so he came back, and we stopped the PPI and we referred him to do an endoscopy and unfortunately revealed that he has gastric cancer. And this was very hard for us and the patient. I was there but the consultant told him. He couldn't believe what we were saying. He was shouting and screaming. We tried to calm him down. It was very hard for me to manage even with the doctor.

Another challenge is the language barriers between the students and patients. Most of the students knew Arabic and English, but some patients were expats and did not speak either and could only use their native languages, such as Tiglao, Urdu, or Hindi. Participant 3 said:

> *Speaking Arabic was helpful because many patients are Arabic speaking. The problem was when the patient do not speak either Arabic or English. Then you have to be creative.*

An additional challenge mentioned by the students was their lack of knowledge about performing some procedures such as changing or deciding upon the dose and frequency of medication, or when to refer for tests such as MRI or CT scans, especially when the case did not exactly fit with guidelines they had studied as part of their clinical skills in the preclinical stage. Participant 10 for example, said:

> *Procedural skills are big weakness, uh, for me personally, and I would say also for other members of my batch […] We don't get enough exposure even in the rotation in the clinical phase as well. Another example, pap smear for females or other procedural skills.*

Another professional skill gap mentioned by many, which was among the skills the respondents mentioned they had developed as a result of the SLC, was the efficient use of the short time and focused history taking. Participant 1 for example said:

> *I would say, one weakness was being very thorough. As a student, you tend to ask everything to the patient and many times the things you ask are point-*

less. This takes time and makes the patient sometimes annoyed and worried […] I improved a little bit. The doctors are supposed to finish everything in 15 min. But I would need 20 min minimum even for a simple case, because I also need to document everything on the computer and placing orders. So time management was a weakness that I explored, and I did improve it.

Institutional challenges

The study participants mentioned several institutional challenges they experienced throughout the SLC. Among others, they mentioned that supervisors were assigned to more than one student (most often to two) in addition to needing to treat their own patients; thus, when the student wanted to seek their opinion and confirmation of the diagnosis and treatment plan, they had to wait until the supervisor was finished with their own patient and they could enter the room. Meanwhile, the student's patient was waiting in the room, which sometimes caused frustration and anger among patients. Furthermore, assigning many patients to students by the admission team was another issue, as stated by participant 7:

The admission team is very supportive but sometimes they are not aware to our skills and limitations, so they assign to us many patients and I begin to feel overwhelmed because it take me time to manage each case, more than the regular doctor.

The majority of students mentioned their struggle to manage the additional academic requirements, such as research and reflections, that they have to complete parallel to the SLC. They considered these time-consuming and stressful and stated that they negatively impacted their passion for performing well in the clinic.

Coping with challenges

Students reported several strategies they used to cope with the challenges they experienced. These included continuous revision of previous knowledge they needed to ensure good performance, especially basic science, and clinical skills. They also talked to their colleagues who had done SLCs the year before them and discussed with them what to expect and how to manage things. In addition, they tried to use creative ways to overcome language barriers. Participant 5 for example said:

I felt I have problem with the basic sciences, but I have a good base in clinical skills such history taking and physical examination. I used to go back to materials from the university [the preclinical phase] and revise them and watch really good videos they made for us. This was very helpful for me.

When discussing their approaches to coping with language barriers, the students mentioned their use of body language, drawing, and using devices for illustration and translation. Participant 4 for example explained:

Sometimes I could not understand the language of some nationalities. For example I don't know how to speak Hindi or Urdu. So first I ask the consultant if he knows the patient from before, if he does not I ask for the help of a nurse or if there's translator because nurses sometimes speak languages other than English and Arabic. If we don't have translator, I try to draw for them or use my hands or something from a website on my mobile.

To help themselves cope with being rejected by patients, students tried to empathize with patients and understand their rejection without taking it personally. For instance, participant 8 told us "I accept that because it's not like against me as a person, or they do not like or trust me. Maybe there is another issue that they go through." Participant 9 framed rejection in a similar way, adding that he performed a kind of neutralization of his feelings. He said,

There are two types of rejection. Sometimes it happens that they don't want my presence at all. Sometimes they want me to take history, but they don't want to do the physical examination. So sometimes it's full rejection and sometimes it's partial. I used to understand and find reasons why they don't want me to be there or partially and neutralize my feelings because I am used to it.

Protective factors

The students mentioned several protective factors that helped ensure a positive experience in leading clinics. These factors can be divided into three types: personal background, the academic structure of SLC, and support from different bodies.

Personal background

These features included the knowledge students had gained in their clinical skills training in the preclinical phase (phase II of the program at the College of Medicine at Qatar University). The most frequently mentioned areas of knowledge were communication skills, history taking, and physical examination. Participant 8 mentioned:

The communication skills I gained in the college were very helpful […] In the clinical phase we deal with patients, we take history we conduct physical examination and I feel we have a strong basis. When I went to the SLC I felt that our communication skills are strong which helped us in building good doctor-patient relationships.

Another feature was the knowledge and skills students had gained in their previous rotations. Different students mentioned different clerkships as being the most helpful for them. Some mentioned psychiatry because it helped them deal with different personalities and taught them resilience; others mentioned emergency medicine because it taught them to work quickly under pressure; and some mentioned internal medicine and family medicine. The feature shared by all these clerkships is that they helped students develop comprehensive skills in communication, physical examination, and dealing with different types of patients. Participant 10 for example said:

> *Every rotation taught me something new. I feel like I gained many skills from them all and the question how I should use them when I'm alone with the patient. At the beginning I knew I have many skills, but the question how to apply. When I began the clinic alone, I also began to know my weaknesses in these skills and my strengths and towards what I should aim.*

The third personal feature is the students' sociodemographic backgrounds, including age, gender, and language. Being young and studying medicine created a kind of empathy among many patients. This sometimes led them to pray for the students at the end of the session and wish them good luck. Female students, who were the majority in this study, mentioned how their gender facilitated their work. Participant 9 for example said:

Being female was helpful because the majority of those attend the PHCC are females, either for themselves or for their kids. It is helpful with kids as well. I remember once when the doctor wanted to examine a 5-year-old boy, he was crying. I came close to him and hugged him then he felt more relieved. Most of the kids, if I was not there they cried.

Students mentioned that speaking Arabic was a facilitator because most patients were Arabic speakers; hence, patients felt comfortable when somebody in the room spoke their language, understood their needs, and could explain their health conditions to them.

Academic structure of the SLC

Students mentioned three features of the SLC structure that were very helpful for them. In addition to the supervisor's presence in the room next door, they found shadowing the supervisor for two weeks at the beginning of the placement very helpful. As mentioned by Participant 6:

> *When we began the rotation, the first two weeks I was in the same room with the consultant. I was observing and performing. I observed how she did things, asked questions, communicated with patients and many other things. When I performed, she could give me comments that were very helpful when I got my own room next to her.*

The third feature was the orientation period before the beginning of the SLC, which helped the students to understand what an SLC is and what to expect. Participant 3 explained this and said:

> *Yes, it [the idea] was truly explained by the director. That was I still remember in the orientation, Dr XX presented to us what will be expected in the clinic, and it was detailed on everything in the clinic. He also explained that we will see around 7 to 8 patients in a day and we will go present it to supervisors. It was very clearly explained and helped to understand what we are going for.*

Systems of support

All participants mentioned the support they received from a wide range of other people, including the supervisor/consultant, the other team members in the clinic, the patients, and their colleagues and friends. In addition to teaching and supervision, the support students received from supervisors encompassed continuous evaluation and feedback, which helped students to identify their strengths and weaknesses and to work on the latter. Empowerment was another meaningful kind of support students mentioned receiving from their supervisors. Participant 6 said:

> *From the moment I joined the clinic she [the supervisor] began to prepare me. She gave me many advises. Sometimes I felt her a friend more than supervisor. She was very supportive on all levels and all means.*

In addition to the supervisor's support, students mentioned the support from other clinic team members, especially nurses. For example, participant 1 told us:

> *The nurses were excellent. Especially for me [as a male] any female patient, I would need to have a nurse female has to come and chaperone. If I needed anything, any help […] whatever it was, they would be there and support me.*

The students mentioned that the residents were very busy and not always available or able to help them professionally when needed. Nonetheless, they were reported as being very nice and supportive of the students.

The students also mentioned receiving support and encouragement from patients. Sometimes patients said a dua [prayer] for them, and sometimes they lifted the students' moods with a kind word. Participant 3, for example, told us about a very 'rude' patient who insulted him, but who was followed by an older adult woman who changed his mood entirely by saying good words and Duaa for him.

Another form of support that the students mentioned was the support they received from their colleagues, including both those who were in the same clinic and those who had attended an SLC the year before. The latter gave them advice on many aspects of the program based on their experiences, and they were there for them each time they needed help. It seems that students create their own supportive community, and medical education should look at these communities as an asset for junior students.

Implications of the experience

The participants mentioned several impacts the SLC had on them on both the professional and personal levels. All students repeatedly mentioned how this experience had taught them to manage time efficiently, including asking the right questions without spending time on unnecessary questions, speed-reading the file prior to welcoming the patient, etc. An example can be found in Participant 6 statement:

I learned that in family medicine there's no need to take full history. Only the main issues related to their complaints. At the beginning it took me so long to take history but later with practice and supervision I learned that it's not the case here. I learned how to manage the time by tuning my watch to light 5 min before the end of the session. Slowly it became automatic.

In addition, students learned how to make a diagnosis and develop a management plan independently. Previously, they had shadowed doctors while the latter diagnosed and formulated the plans. In the SLC, the students must make clinical decisions and develop the plan, and then seek the supervisor's approval. As stated by Participant 8:

We were involved as I mentioned in the clinical reasoning and being able to put the threshold diagnosis, according to my assessment, and then provide the management plan first to my supervisor and then to the patient.

Over time, students could also identify the role that doctors play in multidisciplinary teams, as well as their role in diagnosis and treatment. Participant 5 described this and said:

> *At the beginning I was very nervous and studied all the examinations we learned in the past, and I shared my tense with the consultant and asked what if a patient comes in and I don't know how to diagnose. He answered me that we don't make full examination, sometimes we check things on some systems, we rule out red flags which is the most important.*

Students also described how they developed and enhanced their communication skills with patients, learning how to show empathy and build good professional relationships. Participant 4 for example explained:

What we learn in the college is not the same as in reality. Communication skills are basic for connecting with people, this helped me in building a good relationship with patients, in a way that I make him asking to see me when comes next time by building trust. I also learned that for that I must have good knowledge in order to gain their trust.

The skills they gained strengthened the students' confidence. The vast majority of the participants mentioned confidence as the main impact the SLC experience had on them. An example is in Participant 9statement:

> *I feel much more confident and even with a higher sense of responsibility. I feel I'll be able to carry a lot more responsibility than I did before. This will be very helpful for me in the residency. I feel students who made the SLC will be more confident and stronger than those who did not.*

Furthermore, the students mentioned that they had learned skills in managing relationships with different patients. For example, participant 2 said:

> *I saw how the doctor would treat very, very nicely everyone, but I learned that with some patients you'd be a little sterner. I found that strange at the beginning, like, how, and why, why he would treat different patients differently. but when I started paying more attention, I noticed the difference when he sees that the patient in front of him is genuinely concerned, or generally has a problem then he would treat them very nicely, very compassionate and it's great but when he realizes the patient in front of him came only for sick leave. He would do the job properly. No problem. But he would clarify to the patient that he should not just come for sick leave because that's not allowed.*

Other students learned how to manage interactions with patients' family members. This is clear in the following story told by participant 6:

A woman arrived to the clinic with her husband, I was trying to take history and every other minute her husband interrupts, in an aggressive way towards her and telling her what she has and what she does not have, to point I asked him to not interrupting me because I want to hear from the patient. I told him, let her speak. And he has two options either he stays with no interruption, or he leaves the room until I finish. Then he agreed to stay with no interruption.

Different students mentioned different additional skills they developed through their SLC experiences, such as how to ask the right questions, how to adjust their tone according to the patient's status, how to be a good listener, how to effectively use telemedicine, how to make eye contact and how to successfully utilize non-verbal communication.

Several students declared how SLC had helped them to learn things about themselves and think about their future careers. Participant 9 for example said:

I always wanted to specialize in pediatrics, but after this experience and the experience in the ICU prior to that, I decided that it is not the specialty I want. Sometimes you are in hard situations with them, like when parents wanted to sign a DNR. I felt I cannot, it's too much for me.

The students also described various ways in which they learned more about people, especially about their social and cultural lives. Participant 4 learned that many people do not have the money to buy their medications when they asked her for cheaper ones. Participant 6 learned how not to be judgmental because they cannot know what is going on in patients' lives. Participant 9 learned how even a diagnosis such as diabetes, which to her did not sound like a deadly disease, can be very bad news for patients and can produce an extreme emotional reaction. The major impacts on students in all aspects reveal that SLCs shape not only better doctors, but also more human and culturally competent doctors.

Reflections for future SLCs

At the end of each interview, the students were asked to give recommendations for future SLC projects. Their recommendations generally fell into two categories: some were directed at directors and addressed academic issues, while others were directed at students and addressed performance aspects.

Academically, students agreed on the need to build an alternative way to assess their performance. They believed that the E-Value used is too general and is not tailored to the SLC content. For them, the continuous reflections they were required to write were time-consuming and overwhelming, sometimes distracting from the SLC itself. They believed that they should be able to give the SLC their full attention, with no additional requirements such as research and reflections, because treating patients is a full-time job with long shifts that they need to prepare for. Participant 9 said that she "asked to change the E-Value because it's not fair and time-consuming for us and for doctors." The students also mentioned that they were overwhelmed by the Excel sheets that they had to complete on the patients they saw. This was seen as time-consuming and confusing because students sometimes could not remember all the patients, they had seen that week. They did not even have enough time between patient consultations to both write notes about the patient they had just seen and review the next patient's records before they came in. Therefore, there is a need for tailored assessment methods, and streamlined administrative processes, that takes into consideration effectiveness, time and impact on students' performance.

Students mentioned the added value of the daily and continuous evaluations and feedback done by their supervisors, and thought it should continue in future SLCs.

Participants also recommended several steps students can take to build good communication and relationships with their supervisors. This included openly discussing their weaknesses and needs, because they saw this as a way to build tailored expectations. Participant 5 for example said:

I recommend them to be honest with their consultant, to ask what he expect from them and being honest about their level. For example, if there's anything that causes them tense, or if there's something they don't feel confident to do it, so it's important that he knows about it and gives them space to improve it. My supervisor never used my weaknesses against me because I was honest. If I said I know but my performance is bad my evaluation will be bad because I made him have expectations from me.

Students recommended that their colleagues, or future SLC students, show interest, and ask for and do homework to study and revise. Participant 7 for example recommended:

I would recommend reviewing the handbook, that might include the common conditions that they might run into. And any preparation before starting the clinics would help. There is a list of common conditions that they would see and should revise. Then they should revise their physical exam skills, the history-taking skills trying to practice it before going to the clinic. Also if their clinic starts at 8 or 7, they can

come beforehand to set up their system and prevent delays for the patients.

Discussion

The present study has shed light on the experiences of ten medical students who participated in a student-led clinic (SLC) program in Qatar, at the end of their final year of studies. The study found that at the very beginning of their experience, students experience a mixture of feelings including excitement, anxiety, tense, and fear, mainly from making mistakes and causing harm to patients. These findings align with studies on medical students' transition to clinical setting and studies on student run clinics in other contexts. For instance, the scoping review of Toufan et al. (2023), reports that in general, the transition from classroom to clinical practice and working within medical setting is often accompanied by these feelings [15]. I.e., fear, anxiety, and excitement.

Furthermore, similar to our findings, studies on SLCs report that being with patients alone challenges the students and lead to developing learning strategies and problem-solving skills. Huang et al. (2021) found that despite the challenges, real-time participation in a patient encounter has forced students at the University of British Columbia to recognize and acknowledge the importance of the patient's perspectives, values, and goals [16]. Furthermore, they report that students cope through searching for resources, consulted health care experts available on-site, and developed tangible solutions for the patient (Ibid. P.1023). These coping mechanisms were also identified in our study, where students referred to the consultant, revised resources, and talked to their colleagues and seniors. The continuous revision of basic scientific knowledge and clinical skills, as well as the availability of resources and tools for translation and illustration, also acted as protective factors. This aligns with findings from prior literature showing that working with clinical supervisors is very helpful and important experience for students [3]. Even though the supervisors were busy with their own tasks, they were still approachable and enthusiastic. They were ready to answer questions and provide guidance to ensure the safety of the patients.

Globally, SLC is known also as student run clinic (SRC), that mainly aims to provide service and healthcare services for disadvantaged communities [9, 16]. In this case, students in general are not attached to supervisors like in Qatar's case. Our study presents results on SLC that aims to train students as professionals or doctors to be, rather than providing service for disadvantaged communities. Therefore, the long-term impact of this experience on our students' perceptions of inequalities and disparities in healthcare needs further investigation. A systematic review evaluated the effectiveness of student-led health interventions on clinical outcomes for patients with cardiovascular disease (CVD) or its risk factors. Predominantly implemented in free clinics for disadvantaged communities in the USA, these interventions enhance students' skills and knowledge. Results show positive health outcomes, particularly for patients with diabetes or those who are 'overweight' or with obesity, through individualized or group-based interventions [17].

Since Qatar is a small country, and the healthcare services are available for all in governmental clinics that can be easily accessed by local population, it is hard to create opportunities such as the ones in countries where medicine is privatized and access to health is challenged by availability, costs and more. However, future attempts to create these opportunities especially among the low income groups in Qatar such as domestic workers, could inspire students on social determinants of health, on upper midstream and macrolevel factors that affect health outcomes.

Among the challenges faced by students were gender related issues, that have emerged with some patients refusing treatment and consultations based on the student's gender. This finding is supported by other literature highlighting gender issues in healthcare, including findings that patients sometimes refuse consultations based on the gender of the healthcare provider [18]. Moreover, our study found that patient's attitudes towards students, resulted from the fact that they are students and still not licensed or postgraduates. Attitudes were mostly positive, while sometimes patients refused to be cared for by the students. A study from Sweden reported on high student and patient satisfaction from five disciplines indicate that a SRC in PHC can be adapted for different student groups [19]. Isaacson et al. (2014) examined patient perceptions of medical students involved in their care within an ambulatory setting. The study surveyed 314 patients from two primary care clinics, assessing visit satisfaction, perceived visit quality, adequacy of visit time, benefits of student involvement, and willingness to see a student again. Comparisons were made between patients who saw both a student and a preceptor and those who saw only the preceptor. The findings revealed high satisfaction rates in both groups, with 83% of patients who saw students being very satisfied. Additionally, 85% were open to seeing a student again, and 43% felt that students added value to their visit [20].

Despite the different challenges mentioned by the participants in our study, the SLC experience had impacted students' academic, professional, and personal aspects, and created opportunities for improving clinical skills such as taking history, communication skills such as managing language barriers, and developing efficient time management techniques, which could have positive implications for students' professional development.

Many past studies on SLCs and SRCs report on the positive impact on health professions students in general and on medical students in particular. A systematic review by Schutte et al. (2015) found that students reported improved skills and indicated that they had acquired knowledge they were unlikely to have gained elsewhere in the curriculum [21]. A study from United Kingdom have reported on how medical students experience and learn from real patient interactions. Conducted in a problem-based, community-oriented undergraduate program enhancing their learning through visual recognition, dialogue, and physical examination. They reported increased confidence, motivation, satisfaction, and professional identity, along with better cognitive understanding of context and complexity. Despite some negative responses about the difficulty of gaining experience, students showed high metacognitive awareness, emphasizing the importance of sensitive clinical mentorship [22].

Moreover, drawing on data from interviews with students, coordinators, and faculty, Sheu et al. (2013) has reported on six major domains related to learning opportunities in SRCs: interprofessional roles and collaboration; clinic organization; patient factors affecting access to care; awareness of the larger health care system and continuity of care; resource acquisition and allocation; and systems improvement [23]. Similarly, in their very recent study Huang et al. (2021) found two main themes in this regard. The first is that students gained insights into the complexities of incorporating the patient's perspective into their health management plans for patients [16]. The second is working as a team and understanding of the roles of other health professionals.

Furthermore, past reports highlight the impact on patients, and not only on students. Simpson and Long (2007) argue that SRCs can offer myriad services to disadvantaged patients [24]. Similarly, Lee et al. (2017) found that SRCs resulted in improved efficiency for clinic operations and reduced patient wait times, the number of specialty providers, patient visits for specialty care, lifestyle education visits for disease prevention and treatment [25]. Although our study could not capture the impact of the SLC on patients, especially from patients' perspectives, most students reported positive interaction with patients who found it helpful to have some speaks their languages in the room. It's important to mention that many of the healthcare providers in Qatar's healthcare system are not Arabic native speakers, which has been found as barrier in efficient healthcare delivery in many studies [26]. Moreover, students reported on empathy and encouragement from patients, which reflects their satisfaction from the experience. Most studies on patients in SRCs report on positive attitudes from patients, especially when they are based in disadvantageous contexts, and the SRCs provide them with the care that cannot be afform in formal pathways. Studies from different contexts report on high satisfaction among patients during receiving healthcare in SRC [19, 27].

In our study students reflected on the evaluation process as barrier for better performance, and as demanding. Studies in different context mentioned that the relaxing nature of SRCs because these are often a safe space for students to strengthen their clinical skills and achieve competency for residency with supervision but without the stress of formal evaluation [28], indicate the need to re-think the assessment methods used in QU's SLC. Moreover, in our study, students highlighted the importance of the supervisor and other colleagues support in better learning experience and better performance. Similarly, a study from Amsterdam reported that collaborative work between students in the SRC, the supervisor and other colleagues was motivating for the students, enhanced patient-centred teaching opportunity for students, and made students seeing the value of sharing knowledge [29]. By conducting this study and based on students' voices researchers could identify facilitators and barriers to positive and successful experience among the students. This will help to improve future SLCs programmes, especially if limitations of the current studies are considered and modified.

Limitations of the study

This study has several limitations, which should be considered in future studies. The first concerns the number of participants. Although data saturation was reached, including more voices would present richer and wider experiences from students. Furthermore, observing students was not applied in this study, hence the researchers could not use triangulation for results validation. The study also presents only the student perspective, and patient perspectives should be taken into consideration for better future application. Similarly, the study involved only a single institutional setting (PHCC), which may limit the relevance of the results in other institutional contexts. Future studies should include SLCs in other specialties and institutions to better understand the institutional and bureaucratic determinants of the students' experiences. Lastly, since this study did not include those who have not completed the full rotation, it is assumed that the findings might miss some challenges experienced by them, but not by those who completed the rotation. Therefore, future research should include those who completed and those who did not complete to compare and capture most challenges and facilitators as experienced by them all.

A further limitation is the lack of long-term follow-up to assess the enduring impact of the SLC experience on students' professional development and perceptions of healthcare disparities. Longitudinal studies tracking

students beyond their immediate clinical experiences would provide deeper insights into the lasting effects of SLC participation.

Despite these limitations, this study provides valuable insights into the experiences of medical students participating in an SLC program. Recognizing these limitations and addressing them in future research and program development will help advance the understanding and implementation of effective SLC experiences.

Conclusions

The findings of this study shed light on the experiences of medical students participating in an SLC program and have several implications for practice. First, inviting students who have previously completed an SLC placement to share their experiences can alleviate initial fears and uncertainties and promote a sense of community and mentorship among new enrolled students. In addition, hearing from former participants can offer a realistic and relatable perspective on the program, ultimately motivating more students to get involved.

Second, the importance of support from supervisors cannot be overstated. The study highlighted that supervisors' availability and approachability significantly contributed to the students' learning and overall experience. Therefore, it is essential for institutions to ensure that supervisors are adequately trained and supported to fulfil their roles effectively. Providing ongoing mentorship and resources for supervisors can further enhance the student-supervisor relationship, resulting in improved outcomes for both students and patients. Moreover, future SLC initiatives should emphasize the planned and proactive communication channels between students and supervisors.

Third, extending the SLC program to contexts beyond family medicine practices, particularly contexts in which students would have the experience of working with vulnerable groups, could be highly beneficial. The study did not investigate experiences in these contexts, but the potential benefits are evident.

Lastly, future research, should examine longitudinal outcomes and the sustained impact of SLC participation on students' professional development and patient care outcomes. This should be supported by including larger sample size that allows to generalize some of findings on other SLCs in the similar contexts.

Appendix: semi-structured interview protocol

Interview protocol

Thank you very much for accepting the invitation to participate in the study. As mentioned in the consent, I will begin the recording after documenting your personal demographics.

[Documenting demographics].....

Do you have any questions, comments, or requirements before I begin the recording?

.....

Recording begins:

- As a beginning, can you please tell me about the beginning of your experience in the student led clinic? (If not mentioned by the interviewee: how did they hear about it? Why did they decided to join? How did they feel? How did they cope with these feelings?)
- Can you please describe the process of managing the clinic/patients?
- Which skills you have learned in the preclinical and clinical phases that helped you in this experience?
- Which skills have you enhanced in leading/running the clinic? How?
- Which new skills did you develop by leading/running the clinic? How?
- What were the main challenges you faced while leading the clinic? (Give examples) (If the student does not talk about patients' reaction we ask: How did you introduce yourself to patients at first? How did they react? How did you deal with their reaction? how did you manage cultural differences?)
- What was the most difficult challenge to manage? Why?
- What did you do to cope with these challenges? (Examples)
- Which factors helped you to cope with these challenges? (Examples)
- How did this experience impact you on a personal level? (Give examples)
- Can you tell me about your experience with the supervisor?
- What do you recommend for future student-led clinic programs in Qatar?
- Would you like to add anything?

Thank you very much again.

Acknowledgements

The authors thank all students who had participated in the study and helped in improving the programme for new enrolled cohorts. The authors also thank the reviewers for their valuable comments and recommended revisions.

Author contributions

SDN, NAM, KB; Conducting the interviews: SDN; Data analysis: SDN, RS; Writing the introduction: NAM, MK; Writing the discussion: RS, KB; writing the abstract and conclusion: KB; All authors read, revised and approved the final manuscript.

Funding

N/A.

Data availability
Due to confidentiality assurances, data and materials of this study are available from the senior author (SDN: s.d.daher-nashif@keele.ac.uk) on a reasonable request.

Declarations

Consent for publication
Written informed consent was obtained from all of participants. Participants were informed about the outcomes of the study including publishing the results in a peer-reviewed academic journal.

Competing interests
The authors declare no competing interests.

Ethical approval
Research ethics approval was obtained by the Institutional Review Board of Qatar University under the number QU-IRB- 1598-EA/21 (September 2021).

Received: 31 January 2024 / Accepted: 4 October 2024
Published online: 18 October 2024

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