

RESEARCH

Open Access



# Assessing clinical associate students' views on learning opportunities and involvement during primary health care placements: a mixed methods study in Tshwane

Sanele Ngcobo<sup>1\*</sup>, Murray Louw<sup>1</sup>, Luvuyo Bayeni<sup>1,2</sup> and Edith Madela-Mntla<sup>1</sup>

## Abstract

**Background** The training model for Clinical Associates (Clin-As), initially centered on district hospitals, has increasingly involved primary healthcare (PHC) facilities over the past few years. This study explore and compare the perceptions and experiences of Clin-A students regarding learning opportunities and involvement during hospital and clinic rotations.

**Methodology** This cross-sectional mixed-methods study involved two primary data collection techniques: the administration of the validated medical education instructional questionnaire (MedIQ) questionnaire and the facilitation of focus group discussions.

**Results** A total of 74 Clin-A students participated in the quantitative study, including 20 s-year students from 2022, 35 s-year students from 2023, and 19 third-year students from 2023. The only statistically significant difference was noted in follow-up care, where student involvement was significantly higher in clinics ( $M = 3.39$ ) compared to hospitals ( $M = 2.96$ ), with a  $t$ -value of 2.933 ( $p = 0.002$ ). For learning opportunities, the highest mean difference was observed in 'participation in patient education', where clinics ( $M = 4.38$ ) had a higher mean than hospitals ( $M = 3.96$ ), but without statistical significance ( $t = 1.715$ ,  $p = 0.089$ ). Students perceived better learning diversity and proficiency development in clinics ( $M: 3.91$ ,  $SD: 1.31$ ;  $M: 4.18$ ,  $SD: 1.203$ ) compared to hospitals ( $M: 4.00$ ,  $SD: 1.489$ ;  $M: 3.97$ ,  $SD: 1.385$ ). Clinics generally outscored hospitals, especially in involvement in patient education, chronic illness, and procedures. Ten students attended two focus group discussion: one with 2023 third-years ( $n = 5$ ) and one with 2023 s-years ( $n = 5$ ). Students valued clinics for skill development and patient journey exposure but faced challenges such as feeling like employees, disrupted learning from frequent rotations, patient overcrowding, and poor communication between the program and healthcare staff.

**Conclusion** This study underscores the importance of primary healthcare settings in Clin-A training, demonstrating that clinics provide learning opportunities and involvement in patient care comparable to hospitals. To address challenges such as high workload areas where students feel like employees, insufficient teaching, lack of staff

\*Correspondence:  
Sanele Ngcobo  
[Sanele.Ngcobo@up.ac.za](mailto:Sanele.Ngcobo@up.ac.za)

Full list of author information is available at the end of the article



© The Author(s) 2025. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

awareness, limited learning in low-volume clinics, and disrupted rotations requires, structured rotations, enhanced preceptor training, and improved communication between programs and clinical sites are essential.

**Keywords** Clinical associates, Students, South African healthcare system, Primary health care, Healthcare system strengthening

## Introduction

South Africa is currently embarking on a transformative journey towards establishing a national health insurance system (NHI) [1]. One of the pivotal facets of this transition is the strengthening of the healthcare system, particularly with a specific focus on the reengineering of primary healthcare (PHC) services [2]. PHC plays a pivotal role in improving competency-based education by offering a dynamic, patient-centered learning environment that mirrors the realities of community healthcare delivery. PHC settings expose students to diverse clinical scenarios, enabling them to apply theoretical knowledge in practical settings while fostering critical skills such as communication, teamwork, and decision-making. These environments emphasize continuity of care, cultural competence, and adaptability—essential attributes for healthcare professionals operating in resource-constrained settings. Moreover, PHC training aligns with global trends advocating for community-based education to better prepare students for addressing population health challenges.

As the process of healthcare system strengthening and reengineering unfolds, it is essential to consider the key players involved in this critical transformation. Clinical Associates (Clin-As) are among the health provider groups for the implementation of the NHI [3]. In 2008, a significant milestone was achieved with the introduction of three-year Clin-A training programs at three South African universities: The University of Witwatersrand, Walter Sisulu University, and the University of Pretoria (UP) [4]. Clin-As are essential members of the healthcare workforce, possessing the necessary skills and knowledge to operate effectively within PHC settings such as clinics, community health centers (CHCs), and district hospitals [4, 5]. Similar roles include Physician Assistants (PAs) in the U.S., Physician Associates (PAs) in the U.K., and Clinical Officers in countries like Kenya and India. They assist in diagnosing, treating, and managing patients, expanding healthcare access, especially in underserved areas.

The Clin-A training combines early patient contact, self-directed learning, and workplace-based training. Since its inception, 1,581 graduates had completed the program country-wide from the three participating institutions, by the end of 2022, with 600 students enrolled in 2023 [6]. Initially, most graduates were deployed in the public healthcare sector (81% in 2016), but this declined to 32% in 2023 due to limited government posts, while current employment records in private healthcare (28%),

NGOs (12%), and academia (7%) demonstrate an increase over the same period [6].

Upon completing the Bachelor of Clinical Medical Practice (BCMP) degree, Clin-As are immediately eligible for registration with the Health Professions Council of South Africa (HPCSA), enabling them to practice as licensed medical professionals. Their broad scope of practice encompasses conducting consultations, ordering and interpreting medical investigations, diagnosing and treating common conditions, performing medical procedures, assisting in surgeries, providing patient education and counselling, making clinical decisions regarding admissions, discharges, and referrals, prescribing medications, as well as issuing sick certificates. Initially, this training primarily took place within district hospitals and higher-level healthcare facilities affiliated with universities, a trend that has been slowly changing to incorporate lower-level facilities, including clinics and CHCs [7].

By 2013 the UP Clin-A training program trained students across 20 urban and rural districts and secondary hospitals in KwaZulu-Natal, Mpumalanga, Limpopo, and Gauteng [8]. However, due to various challenges, including issues related to accommodation, inadequate support, limited access to the internet, financial constraints, and the failure of some facilities to meet acceptable training standards for students, the number of participating hospitals has been substantially reduced to just eight hospitals in 2023. Of these, five are situated in Gauteng, while the remaining three, which are located in Mpumalanga, are solely utilized by third-year students. As of 2023, in response to spatial constraints and the need to expand the Clin-A training program at UP beyond hospital settings, students are now involved in rotations between hospitals and primary healthcare facilities. This evolution signifies a dynamic approach to healthcare training, aligning with the changing landscape of South Africa's healthcare system, which uses the district health system. The inclusion of clinic rotations reflects an effort to expose students to the realities of primary healthcare delivery, fostering skills essential for addressing healthcare challenges in underserved areas. However, there has not been a study in South Africa comparing the learning opportunities and involvement of Clin-A students in PHC settings and hospitals. This manuscript seeks to explore and compare the perceptions and experiences of Clin-A students regarding learning opportunities and involvement during hospital and clinic rotations,

providing insights into how these settings shape their training and competencies.

## Methods

### Overview

This cross-sectional mixed-methods study involved two primary data collection techniques: the administration of the medical education instructional questionnaire (MedIQ) and the facilitation of focus group discussions. The MedIQ was utilized to obtain quantitative data which provided insights into students' perceptions and experiences. This was complemented by focus group discussions, enabling an in-depth exploration of their viewpoints and fostering a comprehensive understanding of the study's research objectives. The study was conducted with students from the UP, based in Gauteng Province, South Africa. In 2022, students were placed in health-care facilities across several provinces, including Gauteng (Kalafong, Tshwane District, Mamelodi, Pretoria West, and Tembisa), Mpumalanga (Ermelo, Tonga and Mmametlake), Limpopo (Seshego), and KwaZulu-Natal (GJ Crooks). In 2023, placements were limited to facilities within Gauteng. The study cohort comprised students enrolled in both the second and third years of the Clin-A programme at UP at the time of the study (2022 and 2023), representing diverse stages of their training journey.

### Inclusion and exclusion criteria

The inclusion criteria for this study encompassed second-year Clin-A students of 2022 and 2023 and third-year Clin-A students of 2023, as these cohorts had substantial exposure to hospital and clinic rotations. Exclusion criteria are those placed outside Gauteng in 2023. The rationale behind excluding students placed outside Gauteng was that in 2023 they primarily engaged in hospital rotations and had limited or no clinic exposure. Additionally, first-year Clin-A students were excluded as they had not yet gained sufficient experience and developed perspectives in hospital settings and had not participated in clinic rotations.

### Population and sample size

All students meeting the inclusion criteria were invited to participate in the study, with the MedIQ survey being sent to the entire eligible student population. An initial email containing the questionnaire was sent to these students, followed by two reminders to encourage their participation. For the focus group discussion, a list of eligible students who met the inclusion criteria was compiled, and random numbers were assigned to each individual. A random number generator was then used to select participants from this list. Students were randomly selected from BCMP II and BCMP III to ensure diverse

representation by academic level, while gender and academic performance were excluded to focus on general perceptions of clinical learning. Those selected were subsequently invited via email to participate in an in-person focus group discussion. A total of 20 Clin-A students were invited to participate in the focus group, with 10 students selected from the 2023 s year and 10 from the 2023 third year. To ensure their attendance, a reminder email was sent to the selected students on the day of the scheduled discussion agreed with them. This number was based on the assumption that 10–14 students would accept the invitation and attend the focus group discussions, aligning with the sample size recommendations for focus group discussions, which suggest smaller groups of 5–7 participants for in-depth exploration of complex topics [9]. Of those invited, 10 students participated, comprising five from each academic year.

## Data collection

### Qualitative

Focus group discussion was led by SN, with the assistance of an administrative intern. The discussion began with a warm welcome and an introduction to the study's objectives. Written informed consent was obtained from all study participants. The discussion was guided by open-ended questions, probing for deeper insights, and encouraging participant interaction. An interview guide (supplementary 1) was used to guide the flow of the interview, and the interview was audio recorded. This discussion took place in June 2023, with the first group being third-year students followed by second-year students on the same day. Data saturation was achieved, as no new themes or insights emerged by the end of the discussions.

### Quantitative

To measure the instructional quality in the Clinical Learning Centres (CLCs) at district hospitals, the MedIQ was first used for Clin-A students at UP in 2010 and 2011 [10]. This tool was utilized to evaluate the perceived instructional quality by second- and third-year Clin-A students, and to serve as a baseline for monitoring future developments and developing interventions to improve the Clin-A training programme. The study found a significant increase in instructional quality, particularly in learner involvement from the second to the third year [10]. This validated tool [11], consists of statements covering four subscales: preceptor activities, learning opportunities, learner involvement, and learning environment [12]. The MedIQ tool, designed for clinical settings without specifying a level of care, was suitable for evaluating both hospital and clinic environments. Students answered the same set of questions for both settings, enabling a consistent comparison of instructional quality and learning experiences.

The Qualtrics online survey platform at UP was utilized as the online platform for collecting student MediQ responses. Upon receiving this survey, students independently completed it on their devices, with the option to contact the principal investigator if they had any questions about the MediQ. The initial section of this platform included an informed consent that students were requested to sign before proceeding to answer questions about their experiences. In January 2023, third-year Clin-A students submitted their initial MediQ reports detailing their experiences from 2022, when, as second years, they were exclusively based in hospitals without clinic exposure. By the conclusion of the first semester in 2023, both second and third-year students completed the MediQ. At this point, they had encountered both clinic and hospital settings during their training. Third-year students had the opportunity to provide responses in both January and June 2023, whereas second-year students only completed it in June 2023.

## Data analysis

### Qualitative

Qualitative data analysis in this study followed a thematic analysis approach, as outlined by Castleberry, comprising five key steps: data compilation, code generation, theme development, theme interpretation, and drawing conclusions [13]. The principal author read the transcripts multiple times to gain familiarity with the data, detected emerging themes and codes, and discussed the evolving themes from the interviews with the transcriber. ATLAS.ti 8 Scientific Software Development GmbH, Berlin, Germany was used for the organization, arrangement, and management of qualitative data [14]. Themes were developed by SN using ATLAS.ti by grouping related codes. For example, *"I get there and I do the work, there's no teaching, there's nothing"* was coded as "lack of teaching" under the theme "Teaching and Learning," while *"For me, it has been the best experience because that's where I was more allowed to see how I can improve what I have in mind into actual work"* was coded as "skills improvement" under "Clinic Experience." This ensured the themes captured key student perceptions systematically. The thickness and thinness of these themes were analysed, and the diversity and coherence of the data were carefully assessed as part of the qualitative analysis process.

### Quantitative

The quantitative data analysis process commenced with the cleaning and extraction of data from the Qualtrics online survey platform at UP. Subsequently, the data were imported into SPSS version 26 (IBM Corp., 2019) for analysis. Learning opportunities, assessed on a scale from 1 (Strongly Disagree) to 6 (Strongly Agree), were

compared between clinics and hospitals across various dimensions. The assessment of student involvement in diverse aspects of patient care within the Clin-A program, was assessed using a 4-point scale where 4 signifies "Supervised participation with shared responsibility" and 1 indicates "no exposure." An independent samples t-test was conducted to analyze the mean scores for different aspects of learning opportunities. While 54 students had experience in both clinics and hospitals, they responded to learning opportunities and involvement in both settings. Therefore, the comparison for these categories is conducted based on the 54 students' experiences in clinics and 74 students' experiences in hospitals. In this study, an acceptable response rate for the quantitative component was considered to be 50% or higher, as commonly recommended in survey-based research [15].

### Ethical considerations

The study received ethical approval from the Research Ethics Committee at UP's Faculty of Health Sciences under reference number 56/2011. Before their involvement in the study, every participant provided informed consent, with no personal identifying information being recorded. To ensure participant confidentiality during focus group discussions, sessions were conducted in private settings with only the research team (SN and an administrative intern) present. During the study, SN was not directly involved in the theoretical or practical training of the students but was solely engaged in a research module, which helped minimize potential power dynamics between the researcher and participants, ensuring a more objective exploration of their experiences. No personal identifying information was recorded or included in the transcripts.

### Results

Table 1 provides an overview of the study participants, response rates, and clinical rotations across three cohorts for the quantitative part of the study. In total, there were 131 students invited to participate, comprising 49 from the 2022 s years, 53 from the 2023 s years, and 29 from the 2023 third years. However, the total number of participants who completed the study amounted to 74, with 20 from the 2022 s-years, 35 from the 2023 s year, and 19 from the 2023 third-years. The response rates varied across the cohorts, with for the 2022 s years it was 40.8%, for the 2023 s year students 66%, and for the 2023 third year students, 65.5%, resulting in an overall response rate of 56.5%. Additionally, the table illustrates the distribution of clinical rotations among different hospitals. In 2022, participants completed rotations in eight hospitals, including Ermelo, GJ Crooks, Mamelodi, Mmametlake, Pretoria West, Seshego, Tembisa, and Tonga. Conversely, in 2023, they were assigned to five hospitals: Kalafong,

**Table 1** Overview of study participants, response rates, and clinical rotations

Group	Second year(2022)	Second year (2023)	Third year (2023)	Total
Invited Students	49	53	29	131
Total Participants	20	35*	19	74
Response Rate	40.8%	66.0%	65.5%	56.5%
<b>Number of Hospitals</b>	8	5	5	
<b>Hospital</b>				
Ermelo	2	0	0	2
GJ Crooks	3	0	0	3
Kalafong	0	9	4	16
Tshwane District		6	5	12
Mamelodi	1	5	2	9
Mmametlake	3	0	0	3
Pretoria West	2	3	2	9
Seshego	3	0	0	3
Tembisa	4	10	6	20
Tonga	2	0	0	2

\*Two participants did not indicate the hospital to which they were allocated.

**Table 2** Summary of learning opportunities as perceived by students in clinics and hospitals

Learning Opportunities were (1 = Strongly Disagree; 6 = Strongly Agree):	N	Clinic Mean	Hospital Mean	t	df	p-Value	Mean Difference	Std. Error Difference	95% Confidence Interval
Diverse enough to learn from different cases	130	3.91	4.00	-0.362	128	0.718	-0.091	0.251	-0.588, 0.406
Too diverse, not allowing proficiency	130	2.73	2.57	0.612	128	0.542	0.154	0.252	-0.344, 0.652
Chance to develop proficiency through repeated practice	130	4.18	3.97	0.896	128	0.372	0.208	0.233	-0.252, 0.669
Too repetitive without new learning opportunities	130	3.40	3.13	0.922	128	0.358	0.267	0.289	-0.306, 0.839
Increased independence in patient care	130	4.40	4.24	0.696	128	0.488	0.160	0.230	-0.295, 0.615
Improved communication with doctors	129	4.30	4.27	0.118	127	0.906	0.030	0.250	-0.466, 0.525
Improved communication with healthcare providers	130	4.36	4.17	0.720	128	0.473	0.190	0.264	-0.332, 0.713
Improved communication with patients	127	4.75	4.64	0.532	125	0.596	0.120	0.225	-0.325, 0.564
Participation in history-taking	129	4.51	4.45	0.267	127	0.790	0.063	0.236	-0.405, 0.531
Participation in physical exams	127	4.55	4.55	-0.030	125	0.976	-0.007	0.226	-0.454, 0.441
Participation in assessment and clinical decision-making	128	4.28	4.25	0.125	126	0.900	0.030	0.237	-0.438, 0.498
Participation in documentation	125	4.06	4.13	-0.247	123	0.806	-0.068	0.277	-0.617, 0.480
Participation in patient education	127	4.38	3.96	1.715	125	0.089	0.418	0.244	-0.064, 0.900

Tshwane District, Mamelodi, Pretoria West, and Tembisa. Notably, the highest number of participants rotated through Tembisa Hospital in both 2022 and 2023, with 4 and 16 participants, respectively. Similarly, Kalafong Hospital saw significant participation in 2023, with 16 participants.

### Learning opportunities

Table 2 revealed no statistically significant differences between clinics and hospitals in most dimensions. For instance, in terms of 'diversity in learning opportunities', participants reported similar mean scores for clinics ( $M = 3.91$ ) and hospitals ( $M = 4.00$ ), with a non-significant  $t$ -value of  $-0.362$  ( $p = 0.718$ ). Similarly, for other aspects such as the 'chance to develop proficiency through repeated practice' (Clinic  $M = 4.18$ , Hospital  $M = 3.97$ )

and improved communication with healthcare providers (Clinic  $M = 4.36$ , Hospital  $M = 4.17$ ), no statistically significant differences were observed. However, larger differences were noted in certain categories. While mean scores for 'participation in patient education' were higher for clinics ( $M = 4.38$ ) compared to hospitals ( $M = 3.96$ ), the difference was not statistically significant ( $t = 1.715$ ,  $p = 0.089$ ). Likewise, in terms of 'participation in physical exams', the mean scores were identical for both clinics and hospitals ( $M = 4.55$ ), indicating no statistically significant difference ( $t = -0.030$ ,  $p = 0.976$ ). Furthermore, some differences were observed in some areas. For instance, for 'participation in documentation', clinics had a slightly lower mean score ( $M = 4.06$ ) compared to hospitals ( $M = 4.13$ ), but this difference was not statistically significant ( $t = -0.247$ ,  $p = 0.806$ ). T-tests comparing clinics and



**Table 3** Student's description of their involvement with care in clinic and hospital settings

Student involvement	N	Clinic Mean	Hospital Mean	t	df	p-Value	Mean Difference	Std. Error Difference	95% Confidence Interval
Acute diseases	125	3.39	3.47	-0.595	123	0.553	-0.081	0.136	-0.350, 0.188
Chronic diseases	124	3.43	3.36	0.532	122	0.596	0.075	0.141	-0.205, 0.355
Health maintenance	124	3.14	2.86	1.622	122	0.107	0.274	0.169	-0.060, 0.609
Psychosocial problems	124	2.96	2.66	1.716	122	0.089	0.303	0.177	-0.047, 0.653
Complicated cases	122	2.68	2.46	1.181	120	0.240	0.222	0.188	-0.150, 0.593
Simple cases	119	3.76	3.63	1.171	117	0.244	0.127	0.108	-0.088, 0.341
Patient Education	122	3.40	3.22	1.298	120	0.197	0.178	0.137	-0.093, 0.449
Follow-up	123	3.39	2.96	2.933	121	0.002	0.434	0.148	0.141, 0.727

**Table 4** Student perceptions on clinical education: hospital and clinic

Theme	Sub-Theme	Experience
Clinical Experience	Positive Clinic Experiences	Improvement in skills, Appreciation for clinic experience Positive learning during specific rotations
	Importance of Primary Healthcare Clinics	Essential for education Significance of witnessing the patient's journey,
Teaching and Learning	Perception in Clinical Settings	Feeling like employees rather than learners,
	Frustration with Teaching in Hospitals	Difficulty learning in crowded hospitals Lack of awareness among hospital staff.
Educational Structure	Focus on Clinical Exposure	Suggestion to focus early years on exposure,
	Suggestions for Restructured Rotations	Proposal for separate clinic and hospital rotations, Disruption caused by frequent rotations
Communication	Need for Better Communication	Improved communication between the program and facilities, Lack of awareness among clinical staff, Suggestions for senior representatives

hospitals across various learning opportunities revealed no statistically significant differences ( $p > 0.05$ ) for most all statements on learning opportunities, with t-values ranging from  $-0.362$  to  $1.715$ , indicating comparable learning experiences between the two settings.

### Students' involvement

For student involvement, no significant difference was noted between clinics and hospitals in several areas, including acute diseases (Clinic  $M = 3.39$ , Hospital  $M = 3.47$ ,  $t = -0.595$ ,  $p = 0.553$ ), chronic diseases (Clinic  $M = 3.43$ , Hospital  $M = 3.36$ ,  $t = 0.532$ ,  $p = 0.596$ ), and psychosocial problems (Clinic  $M = 2.96$ , Hospital  $M = 2.66$ ,  $t = 1.716$ ,  $p = 0.089$ ), suggesting similar levels of student involvement across these domains (Table 3). However, increased differences were observed in certain categories. Participants in clinics reported higher mean scores for health maintenance ( $M = 3.14$ ) compared to hospitals ( $M = 2.86$ ). In cases involving follow-up practices, participants from clinics had significantly higher mean scores (Clinic  $M = 3.39$ , Hospital  $M = 2.96$ ), with a significant t-value of  $2.933$  ( $p = 0.002$ ), suggesting a more substantial involvement of students in follow-up in clinic settings. Overall, t-tests showed comparable student involvement between clinics and hospitals ( $t = -0.595$  to  $1.716$ ) except for follow-up care, where clinics scored higher ( $t = 2.933$ ,  $p = 0.002$ ).

### Qualitative

Out of the 20 students invited to participate in focus group discussions, 10 attended. These discussions encompassed two separate sessions, one dedicated to 2023 third-year students ( $n = 5$ ) and the other to 2023 s-year students ( $n = 5$ ). Table 4 is a summary of student perceptions on clinical education, specifically focusing on experiences within hospital and clinic settings, categorized by themes and sub-themes. Focus group discussions provided deeper insights into the quantitative findings, revealing prominent themes such as clinical experience, teaching and learning, educational structure and lack of communication.

### Clinical experience

As indicated in the quantitative findings, clinics offered more opportunities than hospitals for developing proficiency, independence, and communication skills; this was supported by qualitative insights.

When asked to share their experience about their exposure in a clinic setting, one participant expressed a positive sentiment, indicating

*"For me it has been the best experience, because that's where I was more allowed to see how I can improve what I have in mind into actual work"*FG2\_YII\_P3

While another described a positive learning experience during antenatal care rotation in the clinic.

*“so, what was nice it was ANC [antenatal care], in ANC she [nurse] really taught me, she made me do stuff. She included me in her day. FG1\_YIII\_P5*

Furthermore, students emphasized the pivotal role of primary healthcare clinics in their education, stating,

*“It’s an entry stage... That is why I think it’s at PHC level it’s like number one.” FG2\_YII\_P2*

One participant underscored her positive experience by noting the value of witnessing the same patient’s journey across various levels of the healthcare system (from clinic to hospital).

*I’ve experienced in clinical patients in antenatal care and then I delivered the baby [in hospital]. So, it, it’s a positive way in that you’re there for the whole process you’ve seen her till the child is born. Then you go back the clinic and that same child is coming in (to be) immunized. FG1\_YIII\_P2*

### Teaching and learning

The notion that the early years of their program should focus more on clinical exposure is reiterated, with another student suggesting,

*“I feel like entirely from first year, the first year should just be focused more like clinical in clinics.” FG2\_YII\_P4*

Furthermore, the importance of location and patient volume in clinics is highlighted, with a participant stating that clinics with less volume of patients have fewer learning opportunities.

*“Location of the clinic as well really affects how your experience is because if you’re not busy at the clinic and then you’re learning exposure becomes affected.” FG1\_YIII\_P3*

A prevailing perception exists that during their clinic rotations, students often feel more like employees rather than experiencing a predominant learning environment as students

*“With regards to paediatrics there’s 50 mothers with children outside, that nurse is not speaking to me anything. She’s injecting those babies and sending them out of there.” FG1\_YIII\_P4*

*“They’re pushing that line” FG1\_YIII\_P3*

*“I get there and I do the work, there’s no teaching, there’s nothing” FG2\_YII\_P1*

Students perceive their role in the hospital similarly to that in the clinic, feeling predominantly like they’re there to work.

*“in the hospital, we’re just there to work. They’ll tell you “Ohh you’ll eat right there, there’s a procedure go do it for me.” FG1\_YIII\_P3*

*“I don’t know what to study and then at the hospital, it feels like we’re just working we’re not studying” FG1\_YIII\_P1*

*“It’s like an 8 to 1 job that you have that when you get home you need to have a little bit of time for yourself because you’re tired and then you need to study but then you don’t know what to study” FG1\_YIII\_P2*

Furthermore, they expressed frustration with the lack of teaching and a chaotic environment in pediatrics, noting,

*“I think it’s not a learning experience as compared to my elective last year, where I learnt more in those 3 weeks than I’ve learnt this.” FG1\_YIII\_P5*

One student expressed the difficulty of learning in a hospital crowded with students, remarking,

*“There’s a lot of medical students so either you just mix in with the bunch and then they teach them and then you don’t understand because it’s SIC[Student Intern Complex]’s.” FG1\_YIII\_P1*

### Educational structure

A recurring theme in the results was the suggestion for a restructured rotation, as students voiced their concerns about the current rotation system where they change every two or three days between hospital and clinic.

*“our facilitator at the hospital really wants to teach us but we couldn’t find a time that everyone is there because either they’re at the clinic and we’re at the hospital like that and then the doctors don’t take us seriously. Because you would go to the ward on Mondays and Tuesdays, and then all of a sudden you’re gone, and then on Wednesday and Thursday next week we’re there again and they don’t teach you.” FG1\_YIII\_P1*

They proposed the idea of separate clinic rotations, followed by hospital rotations, to optimize their learning experiences, reduce disruptions, and gain trust from both clinic and hospital staff. Asked about their experience

during a two-day rotation in clinics and two days in the hospital within the same week, students lamented the impact of these disruptions on their professionalism and suggested,

*"I strongly feel like that alone on its own affected the reflection on my professionalism because you lack trust so much in me." FGII\_YII\_P4*

### Communication and coordination

The results also underscore the need for better communication and coordination between the Clin-A program and healthcare facilities. Participants noted that some clinical staff were unaware of the students' educational objectives and suggested that a senior representative should provide guidance to healthcare departments about their roles and responsibilities in teaching students.

One participant highlighted the lack of awareness among hospital staff regarding the Clin-A training program, stating,

*"These people are not informed about what BCMP is. They don't know what BCMP is. So when you go there they're just blank. There should be somebody senior from our side who will go to each and every specific department and explain to them, okay fine, this is what we expect you to teach these kids. Give them proper guidance on how they're supposed to work or act where they see us. Because sometimes they don't even know how to act when they see us." FG1\_YIII\_P2*

### Discussion

This study explored the clinical training experiences of second and third-year Clin-A students across diverse clinical settings in Gauteng. With 74 responses and a response rate of 56.5%, the study captured balanced perspectives from both academic levels. Results revealed that clinical rotations in both hospitals and clinics provided comparable learning opportunities and student involvement. These findings support the notion that PHC, as a context for health professions education, is feasible and can alleviate pressure on already overburdened hospitals, providing valuable learning experiences.

Expanding the clinical training platform to PHC helps to relieve pressure on hospitals where too many students from different programmes crowd clinical spaces and compete for learning opportunities [16]. While expanding the training of Clin-A students to the PHC level is important, it is equally crucial to closely monitor the quality of their training and better understand their perceptions towards this change. As PHC facilities become part of the clinical learning centres, it is important to ensure an environment that promotes effective clinical

learning, facilitated by knowledgeable and supportive clinical instructors or preceptors [17].

While direct comparisons may be challenging, a cross-sectional study conducted in Korea involving 38 4th-year medical students revealed that their overall experience in a hospital was rated slightly higher than in a clinic setting (M 4.5 vs. 4.3, both on a 6-point scale) [18]. The lower student satisfaction in our hospitals when compared to clinics may be attributed to students' overcrowding (including nurses, medical students, medical interns, and registrars) in Gauteng hospitals, causing students to compete for procedures, and clinicians grappling with the effective management of larger student groups [16].

In a mixed-methods study conducted in South Australia by Shahi et al., involving 35 third-year medical students, students reported having more learning opportunities in clinics than in hospitals and were more involved in patient care in rural settings than in urban settings [19]. The higher mean score on diversity in our hospitals might also be influenced by students being required to complete a specific number of calls in the hospital. In a cross-sectional study conducted by Melderis et al., in Hamburg, Germany, of 25 final-year medical students, it was reported that exposure to learning experiences on call may contribute to an increase in the diversity of clinical cases [20].

Effective communication in healthcare is crucial for satisfaction, compliance, and positive medical outcomes, emphasizing the need to teach students and practitioners these skills [21]. As Clin-A students are no exception, it is crucial to ensure that their learning environment is conducive to enhancing their communication skills throughout the learning process. In this study, students rated their opportunities to learn communication skills with doctors, other healthcare workers, and patients as 4.28, 4.25, and 4.69 respectively. In all three communication categories, students rated clinics slightly higher than hospitals. The slightly higher ratings in clinics reflect the patient-centered approach of PHC, where students can build stronger relationships with patients and healthcare providers. In a cross-sectional mixed methods study conducted in the Eastern Cape, involving 95 qualified Clin-As and 37 healthcare staff, Clin-As rated their communication skills as 4.92, while other staff members working with them rated them as 5.52 on a scale of 1 to 6 [22]. While the findings from the Eastern Cape study highlight stronger staff-rated communication skills among Clin-As, our study emphasizes the slightly higher ratings of communication skill development in clinics compared to hospitals, underscoring the thematic importance of prioritizing and sustaining communication training for Clin-As across all healthcare settings.

In a similar cross sectional study conducted at UP for 47 s year Clin-A students in 2010, who then progressed



to third year in 2011, student involvement in acute disease management averaged 3.19 in 2010, and increased to 3.42 in 2011 [10]. Compared to our study, clinics exhibited slightly lower involvement ( $M=3.39$ ) than hospitals ( $M=3.47$ ) [10]. Chronic disease management rose from 3.30 in 2010 to 3.56 in 2011, with clinics at 3.43 and hospitals at 3.36 in our current study. Health maintenance increased from 2.95 to 3.21, with clinics at 3.14 and hospitals at 2.86 in the current study [10]. Involvement in complicated cases grew from 2.42 to 2.86, with clinics at 2.68 and hospitals at 2.46. Patient education improved from 3.51 to 3.79, with clinics at 3.40 and hospitals at 3.22 [10]. These results are worrying, as there appears to be a decline when comparing data from 2011 to the current study.

In a study conducted in Taiwan, the significance of utilizing primary healthcare facilities to train students in history taking and physical examination through patient interactions was emphasized [23]. In our study, participants gave slightly higher ratings to history taking opportunities in clinics compared to hospitals, and the ratings for physical examination were equal at clinic and hospital levels. Clin-As perform clinical procedures traditionally conducted by doctors [4]. However, many of these procedures are frequently performed at higher levels of healthcare rather than in primary healthcare settings. This aligns with their reported higher involvement in hospitals compared to clinics in terms of procedures.

The lack of patient information and documents, along with illegible, inaccurate, and incomplete patient records, contributes to the poor documentation of patient records at the primary healthcare level [24]. This may have contributed to a lower rating of documentation opportunities in clinics compared to hospitals. Students also expressed dissatisfaction with their learning experience in clinics, noting that they sometimes felt like full-time employees rather than students. A study conducted in the Eastern Cape (EC) on Clin-A students, which involved nine preceptors selected from three district hospital training sites emphasized the importance of ensuring clarity in the expectations for students through active engagement of preceptors by academic institutions [25]. Rhulani's 2016 systematic review reported varied perceptions of community care, with the prevailing view being its unattractiveness due to a chronic care focus, limited technical skills, untrained workers, and a high workload [26]. Our findings align with this, as students sometimes felt they work more and learn less, especially in primary health care settings, which are more service-oriented and less academic, in addition to a shortage of specialized workers. Furthermore, in Gauteng public hospitals, Motsaanaka et al. (2020) found that overworked staff and understaffed wards limited clinical learning opportunities for nursing students, diminishing teaching and skill

practice [27]. On the other hand, having the experience of working like an employee can be seen as an important part of the training of any final year health profession student. It is in such context where it is recommended that students should develop the skill of learning while working. Given the incorporation of primary health care into teaching platforms in Tshwane, it is crucial to ensure that staff members are adequately trained to facilitate learning for students and understand the specific roles of these students. Where possible, more Clin-As should be made available as role models to enhance their understanding of this profession at these settings.

Clin-As students learn through structured rotations in clinics and hospitals, focusing on patient care tasks such as history-taking, physical exams, documentation, and patient education. While this study found no significant differences in learning opportunities between the two settings, such as diversity in cases ( $M=3.91$  in clinics vs.  $M=4.00$  in hospitals) and participation in physical exams ( $M=4.55$  in both), the quality of teaching remains a concern. Overcrowding in hospitals, inconsistent guidance, and students feeling like employees rather than learners undermine the effectiveness of both environments. A study conducted in Gauteng public hospitals highlighted overcrowding as a challenge and emphasized primary healthcare settings as effective for fostering skills and autonomy, aligning with our findings on clinics' role in patient-centered learning [27].

These findings align with South Africa's healthcare goals, as training in PHC settings equips Clin-As with the skills needed to support the NHI framework through patient-centered care, continuity of care, and effective management in resource-limited environments. Addressing these challenges is critical to ensuring that clinics and hospitals can provide meaningful and effective clinical training.

## Conclusion

This study underscores the importance of primary healthcare settings in Clin-A training, demonstrating that clinics provide learning opportunities and involvement in patient care comparable to hospitals. To address challenges such as high workload areas where students feel like employees, insufficient teaching, lack of staff awareness, limited learning in low-volume clinics, and disrupted rotations requires structured rotations, enhanced preceptor training, and improved communication between programs and clinical sites are essential.

These changes are pivotal to strengthening the Clin-A curriculum and aligning it with South Africa's healthcare goals, including preparing graduates to support the NHI framework and effectively manage healthcare delivery in resource-limited environments. Future research could include students from all three years and multiple

institutions to capture a broader range of experiences and enhance the depth of findings.

### Limitations

Due to the small sample size of students and a high proportion of females in the group, we refrained from collecting identifying information, such as age, gender, religion, and ethnicity to mitigate the risk of participant reidentification. This may limit the ability to contextualize responses and explore the influence of these variables on student experiences. However, in general, the second year class of 2023 comprised 57% females, while third year had 93% females. The MedIQ collection occurred in two phases: the first in January 2023, during which third year students responded according to their hospital exposure experience. This phase concentrated solely on hospital experiences. The second phase involved both second and third year Clin-A students in Gauteng, as they had experienced clinical training in both clinics and hospitals. Students outside Gauteng in 2023 were not included in this phase. The consistency in the mean scores for hospital experiences between 2022 and 2023 indicates that the hospital learning experiences did not change significantly over time, supporting the combination of these responses in the analysis. Moreover, adding the 2022 data increased the sample size, which was small to begin with. This inclusion strengthens the study's robustness and enhances its scientific rigor, ensuring the findings are more reliable and comprehensive. For the qualitative component, while data saturation was achieved, and the focus groups met the recommended size of 5–7 participants per group, the total number of participants was limited to 10. This may have constrained the diversity of perspectives among Clin-A students.

These limitations underscore the need for future studies with larger, more diverse samples and detailed demographic data to enhance context and generalizability.

### Abbreviations

ANC	Antenatal Care
BCMP	Bachelor of Clinical Medical Practice
CHCs	Community Health Centers
CLCs	Clinical Learning Centres
Clin-A	Clinical Associate
df	Degrees of Freedom
HCPSA	Health Professions Council of South Africa
IBM	International Business Machines
M	Mean
MedIQ	Medical Education Instructional Quality
NHI	National Health Insurance
p-value	Probability Value
PHC	Primary Health Care
SD	Standard Deviation
SPSS	Statistical Package for the Social Sciences
Std. Error	Standard Error
t-test	Student's t-test
UP	University of Pretoria
95% CI	95% Confidence Interval

### Supplementary information

The online version contains supplementary material available at <https://doi.org/10.1186/s12909-025-06848-x>.

Supplementary Material 1

### Acknowledgements

We extend our heartfelt thanks to all the participating students, whose invaluable contributions made this study possible. We also acknowledge Thatohatsi Raphiri for her dedicated work in note-taking and transcription, greatly enhancing the research quality.

### Author contributions

The authorship contributions for the manuscript titled "Assessing Clinical Associate Students' Views on Learning Opportunities and Involvement during Primary Health Care Placements: A Mixed Methods Study in Tshwane" are as follows: S.N. contributed to the conceptualization, methodology, investigation, data curation, formal analysis, writing of the original draft, writing - review & editing, and visualization. M.L. participated in conceptualization, methodology, supervision, and writing - review & editing. E.M.M. contributed to the investigation, writing - review & editing. L.B. was involved in methodology and writing - review & editing. All authors contributed to the interpretation of the results and approved the final version of the manuscript for submission.

### Funding

This research received no external funding. The authors declare no financial conflicts of interest.

### Data availability

The data that support the findings of this study are available from the corresponding author, Sanele Ngcobo, upon reasonable request. Access to the data is subject to the approval of the University of Pretoria's Ethics Committee. Please direct any requests for data to [sanele.ngcobo@up.ac.za](mailto:sanele.ngcobo@up.ac.za).

### Declarations

#### Ethics approval and consent to participate

The study received ethical approval from the Research Ethics Committee at UP's Faculty of Health Sciences under reference number 580/2018. Authorization to gather data was secured from the Tshwane health district and all affiliated facilities. Before their involvement in the study, every participant provided informed consent, with no personal identifying information being recorded.

#### Consent for publication

This manuscript is our own original work and has not been submitted elsewhere for publication. All authors have approved the manuscript and agree with its submission to BMC Medical Education.

#### Competing interests

The authors declare no competing interests.

#### Author details

<sup>1</sup>Department of Family Medicine, University of Pretoria, Pretoria, South Africa

<sup>2</sup>National Department of Health, Pretoria, South Africa

Received: 9 June 2024 / Accepted: 7 February 2025

Published online: 31 March 2025

### References

1. Naidoo S. The South African national health insurance: a revolution in health-care delivery! *J Public Health*. 2012;34(1):149–50.
2. Mohapi MC, Basu D. PHC re-engineering may relieve overburdened tertiary hospitals in South Africa. *SAMJ: South Afr Med J*. 2012;102(2):79–80.
3. Tshabalala Z, Smalley S, Louw M, Capati J, Cooke R. Clinical associates in South Africa: optimising their contribution to the health system. In: Moeti

- T, Padarath A, editors. South African Health Review 2019. Durban: Health Systems Trust; 2019.
4. Ngcobo S. Clinical associates in South Africa. *South Afr Med J = Suid-Afrikaanse Tydskrif vir Geneeskunde*. 2019;109(10):12736.
  5. Ngcobo S, Bust L, Couper I, Chu K. The role of clinical associates in South Africa as a health workforce: a scoping review. *Afr J Prim Health care Family Med*. 2024;16(1):4421.
  6. Smalley S, Mgobozi A. South Africa celebrates 15 years of clinical associates. *JAAPA*. 2024;37(2).
  7. Bac M, Hamm JMA, van Bodegraven PC, Pater B, Louw JM. A new health care profession in rural district hospitals: a case study of the introduction of clinical associates in shongwe hospital. *South Afr Family Pract*. 2017;59(1):14–7.
  8. Moodley SV, Wolvaardt L, Louw M, Hugo J. Practice intentions of clinical associate students at the University of Pretoria, South Africa. *Rural Remote Health*. 2014;14(3).
  9. Morgan DL. Planning focus groups. *Focus Group Kit*. 1998;2.
  10. Memon SJ, Louw JM, Bac M, Hugo J, Rauf W-UN, Sandars JE. Students' perceptions of the instructional quality of district hospital-based training. *Afr J Prim Health care Family Med*. 2016;8(1):e1–6.
  11. James PA, Osborne JW. A measure of Medical Instructional Quality in ambulatory settings: the MediQ. Volume 31. *FAMILY MEDICINE-KANSAS CITY*; 1999. pp. 263–9.
  12. James PA, Shipengrover JA, Crosson J, Young BL, Kernan JB, Heaton CJ, Holmes D. Primary care education: measuring instruction to improve quality. *Acad Med*. 2002;77(9):922.
  13. Castleberry A, Nolen A. Thematic analysis of qualitative research data: is it as easy as it sounds? *Currents Pharm Teach Learn*. 2018;10(6):807–15.
  14. GmbH AtSSD. ATLAS.ti 8 (Version 8). 2023; 2023 [Available from: <https://atlasti.com/research-hub/citing-atlas-ti-in-your-research>].
  15. Baruch Y, Holtom BC. Survey response rate levels and trends in organizational research. *Hum Relat*. 2008;61(8):1139–60.
  16. Motsaanaka MN, Makhene A, Ally H. Student nurses' experiences regarding their clinical learning opportunities in a public academic hospital in Gauteng Province, South Africa. *Health SA*. 2020;25:1217.
  17. Abraha TA, KT WT, Gebre MB, Abrha BA, Haile GB. Opportunities and challenges in clinical learning of midwifery students in public universities of Tigray Region, Ethiopia, 2020: a qualitative study. *BMC Med Educ*. 2023;23(1):801.
  18. Park EW. Comparison of medical students' satisfaction with Family Medicine clerkships between University Hospitals and Community Hospitals or clinics. *Korean J Fam Med*. 2016;37(6):340–5.
  19. Shahi R, Walters L, Ward H, Woodman RJ, Prideaux D. Clinical participation of medical students in three contemporary training models. *Med Educ*. 2015;49(12):1219–28.
  20. Melderis S, Gutowski J-P, Harendza S. Overspecialized and undertrained? Patient diversity encountered by medical students during their internal medicine clerkship at a university hospital. *BMC Med Educ*. 2015;15:1–8.
  21. Deveugele M. Communication training: skills and beyond. *Patient Educ Couns*. 2015;98(10):1287–91.
  22. Isebatya G, Kakia A, Iputo JE. Clinical associates and access to healthcare in the Eastern Cape province of South Africa. *Afr J Prim Health care Family Med*. 2022;14(1):3027.
  23. Yang YY, Wang SJ, Yang LY, Lirng JF, Huang CC, Liang JF, et al. Effects of a new parallel primary healthcare centre and on-campus training programme on history taking, physical examination skills and medical students' preparedness: a prospective comparative study in Taiwan. *BMJ Open*. 2017;7(9):e016294.
  24. Shihundla RC, Lebesse RT, Maputle MS. Effects of increased nurses' workload on quality documentation of patient information at selected primary Health Care facilities in Vhembe District, Limpopo Province. *Curationis*. 2016;39(1):1–8.
  25. Kakia A, Couper I. Preceptors' perceptions of assessing clinical associate students at district hospital sites. *Afr J Prim Health care Family Med*. 2021;13(1):1–8.
  26. van Iersel M, Latour CH, de Vos R, Kirschner PA, Scholte Op Reimer WJ. Nursing students' perceptions of community care and other areas of nursing practice - A review of the literature. *Int J Nurs Stud*. 2016;61:1–19.
  27. Motsaanaka MN, Makhene A, Ndawo G. Clinical learning opportunity in public academic hospitals: a concept analysis. *Health SA*. 2022;27:1920.

## Publisher's note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.