

Longitudinal community-based education and perceived preparedness for primary healthcare: a qualitative study of final-year Physician Associate students in Kerala, India

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Research Article

Keywords: Community-based education, Longitudinal learning, Primary healthcare, Physician Associate education, Perceived preparedness, Reflexive thematic analysis, India

Posted Date: October 5th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-11229314/v1>

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Additional Declarations: Competing interest reported. The authors declare the following non-financial competing interests. EVA implemented the curriculum, coordinates the programme evaluated in this study, and conducted all coding and initial theme development. PVG contributed to programme implementation, analytical discussions and critical review of developing interpretations, and MVT contributed to programme approval and logistical support. SI provided doctoral supervision and contributed to the study concept and conceptual refinement as a critical friend; he read full transcripts, reviewed the evolving codebook and a selection of codes and candidate themes, and questioned

assumptions, without independently coding. These educational, administrative and supervisory roles may influence interpretation of the programme. The authors declare no financial competing interests.

Abstract

Background

Longitudinal community-based education may help health-professions students connect clinical learning with people's social circumstances, prevention, primary-care services and relationships over time. However, evidence concerning how Physician Associate students in India interpret such education in relation to preparedness for primary healthcare is limited. This study explored final-year students' experiences of a structured longitudinal community-based programme and the educational conditions they considered important for meaningful preparation.

Methods

A qualitative interview study was conducted with 13 final-year Physician Associate students in one programme in Kerala, India. Individual face-to-face semi-structured interviews were conducted in English and audio-recorded. Data were analysed using Braun and Clarke's reflexive thematic analysis, informed by an experiential orientation within a contextualist framework. Participants' accounts were treated as situated interpretations of learning and perceived preparedness, not as measures of competence.

Results

Five interrelated themes were developed: (1) Seeing health differently—from disease episodes to people, places, populations and systems; (2) Learning to enter and engage—from uncertainty to adaptive communication; (3) Recognising care as relational—trust, listening and emotional presence; (4) Envisioning a collaborative PA role while recognising the limits of readiness; and (5) Making longitudinal learning consequential—continuity, participation and reciprocity. Students described a layered reorientation in what they noticed about health, how they approached community encounters, what they understood as care and where they imagined PAs might contribute. Perceived preparedness was uneven and task-specific, with stronger confidence for repeatedly practised activities and continuing uncertainty about complex management and independent decisions. Students valued connected encounters and supervised participation. Two participants raised reciprocity-related concerns about survey-centred encounters.

Conclusions

Students described contextual, relational and bounded readiness for primary healthcare. Their accounts are consistent with the educational value of continuity and supervised participation and raise questions about reciprocity in community learning. These findings do not establish clinical competence,

autonomous readiness, professional scope, causality or community benefit; direct assessment and wider stakeholder evidence are needed.

Background

Preparing health professionals for primary healthcare involves more than relocating conventional clinical teaching beyond hospital walls. Learners need opportunities to understand illness within people's living, familial, social and environmental circumstances; communicate across varied settings; participate in teams; and recognise when supervision or escalation is required. Community-based education can support such learning through authentic contact with people, households and services. However, programmes described as community based vary substantially in duration, setting, activities, learner participation, assessment and depth of community engagement [1]. Meaningful learning therefore depends on educational design—including authentic tasks, progressive participation, role modelling, feedback and curricular alignment—rather than on the setting alone [2].

Longitudinal approaches may strengthen community-based learning by connecting encounters over time, but repetition and duration are not sufficient indicators of educational quality. Early longitudinal community engagement has been associated with students' accounts of adaptive communication, confidence and reflection [3]. Nevertheless, integration, continuity and longitudinality are distinct and multidimensional constructs [4]. Learning in longitudinal placements is shaped by connectivity, workplace participation and relationships [5], while placement quality also depends on preparation, supervision, resources, infrastructure and safety [6]. Longitudinality should therefore be understood as a deliberately connected educational relationship, not simply as accumulated placement time or repeated attendance.

Existing literature reports that community engagement can make social determinants, prevention and resource constraints more visible to learners. Yet the evidence also exposes important limits. A large scoping review found that social-determinants curricula more often addressed awareness than adjustment of care, organisational action or assessed performance [7]. Indian programmes involving supervised household visits and structured community activities have reported greater awareness of social influences, prevention and communication [8, 9], but these outcomes were largely based on learner reports and arose from different professions, programme designs and stages of training. More broadly, research on rural and remote placements is dominated by self-assessed confidence and perceived preparedness and lacks standardised measures [10]. Perceived preparedness is therefore best treated as a task- and context-specific self-appraisal that may include willingness and help-seeking [11]; it is not equivalent to demonstrated competence, and confidence may not align with assessed performance [12]. Likewise, educational value for learners cannot be assumed to establish benefit for participating communities, whose outcomes remain infrequently evaluated [13].

Evidence specific to Physician Associate (PA) education in primary care is comparatively limited and comes mainly from outside India. A qualitative evaluation of a nine-month UK primary-care placement

found that PA students valued longitudinal participation while encountering role uncertainty, unrealistic expectations and anxiety about readiness [14]. PA-focused educational literature proposes modelling, coaching, scaffolding, collaboration and reflection as mechanisms for learning in primary care [15]. Research on practising PAs also shows that primary-care contribution is shaped by teamwork, role clarity, organisational arrangements and professional acceptance [16]. These studies support attention to supervised participation and collaborative practice, but their regulatory, workforce and educational contexts cannot define PA scope or readiness in India. To our knowledge, limited empirical research has examined how final-year Indian PA students interpreted longitudinal community-based education in relation to their perceived preparedness for primary healthcare.

India's primary-healthcare reforms increasingly emphasise comprehensive, team-based care and complementary workforce strategies. The National Health Policy 2017 identifies the development of mid-level service providers as one human-resource strategy for expanding comprehensive primary care, particularly in underserved settings [17]. The Physician Associate profession has followed a distinct trajectory in India: introduced in 1992, it developed predominantly within specialty-oriented tertiary-care settings before more recent movement towards broader generalist preparation [18, p. 30]. International experience indicates that PAs can contribute to primary care within collaborative models, although these regulatory and service arrangements cannot be transferred directly to the Indian context [14, 16]. This transition therefore raises an important educational question: how should PA students be prepared to understand community context, prevention, continuity, teamwork and the limits of collaborative primary-care practice?

In India, the National Commission for Allied and Healthcare Professions (NCAHP) approved a competency-based Physician Associate curriculum in 2025. It describes community-based learning from the first year, progressively increasing clinical interactions and preparation for participation in primary healthcare teams [18, p. 36]. The local initiative examined here began in 2023 and therefore preceded this national curriculum. Its educational experience may inform implementation discussions, but this study does not evaluate national curriculum implementation or establish a uniform professional scope of practice.

Accordingly, this qualitative study explored how final-year PA students experienced and interpreted the contribution of longitudinal, structured community-based education to their understanding of health and primary care, their perceived preparedness for primary healthcare roles, and their views of the educational conditions required for meaningful preparation in India. The inquiry focused on students' accounts of learning, confidence, uncertainty and possible collaborative contribution.

Methods

Study design

This qualitative interview study explored how final-year Physician Associate students experienced and interpreted the contribution of longitudinal community-based education to their understanding of primary care and perceived preparedness for primary healthcare roles. The study used Braun and Clarke's reflexive thematic analysis [19–21].

An experiential orientation within a contextualist framework guided the analysis. Participants' accounts were treated as situated interpretations of their educational experiences rather than as direct evidence of clinical competence. The analysis examined how students made meaning of community-based learning within their educational and institutional context. The study is reported in accordance with the Consolidated Criteria for Reporting Qualitative Research (COREQ), a 32-item checklist for qualitative interview and focus-group studies [22]. The completed COREQ checklist is provided as Additional file 1.

Study setting and educational context

The study was conducted within the Bachelor of Science in Physician Associate programme at the Amrita Centre for Allied Health Sciences, Amrita Vishwa Vidyapeetham, Kochi, Kerala, India. In 2023, the programme introduced a structured longitudinal community-based learning initiative in collaboration with the Department of Community Medicine, Amrita School of Medicine. The initiative provided community learning across six semesters in urban and rural settings. The programme's structured six-semester longitudinal community-based curriculum provided a bounded setting for in-depth examination of a clearly defined cohort completing the full educational sequence; the study sought contextually situated insights rather than statistical representativeness. Activities included visits to community health centres and households, community surveys, interactions with older adults and Anganwadi centres, health education, outreach activities and community-based projects.

These experiences occurred alongside hospital-based clinical education and were intended to connect biomedical and clinical learning with prevention, population health, social and environmental influences on health, primary-care service delivery and the circumstances in which people managed illness. This locally developed six-semester pathway, termed SAHAYĀTRA, progressed through three broad phases: Orientation and Observation (Semesters I–II), Active Participation (Semesters III–IV), and Research and Reflection (Semesters V–VI). Early activities introduced students to communities, primary-care services and determinants of health; subsequent semesters incorporated household and community encounters, communication, surveys, health education and supervised participation; and later semesters emphasised more integrated community engagement, epidemiological inquiry, community-based projects and reflection. All students followed the same scheduled pathway across urban and rural settings, although the specific households, patients, encounters and learning experiences naturally differed.

Participants and recruitment

All 22 eligible final-year Physician Associate students who had completed the relevant longitudinal community-based learning activities were female and were invited to participate. The interview sample was self-selected from this eligible cohort, rather than selected through criterion-based sampling. Written informed consent was required for participation.

The principal researcher, who was the programme coordinator, introduced the study to all 22 eligible students during a scheduled batch session. Fourteen students volunteered, provided written informed consent and were interviewed. One interview was used as a pilot to assess and refine the interview guide and was excluded from analysis; the final analysed dataset comprised 13 interviews. Reasons why the remaining eight eligible students did not volunteer were not collected. Written informed consent was obtained by the principal researcher before each interview. During recruitment and informed consent, students were informed that participation was voluntary, responses would be treated confidentially, and participation or non-participation would not affect academic standing.

Data generation

Fourteen individual face-to-face semi-structured interviews were conducted, including one pilot interview excluded from analysis. The 13 interviews included in analysis were conducted between 19 February and 5 March 2026 in a seminar room at the college. The 13 analysed interviews lasted 31–90 minutes (median 42 minutes; IQR 35–45 minutes), were conducted in English—the programme’s medium of instruction—and were audio-recorded with participants’ permission. Only the interviewer and participant were present. No repeat interviews or focus groups were conducted. Students produced reflective notes after community postings, but these were not included in the analysed dataset; the findings reported here are based exclusively on the 13 interviews. Brief handwritten field notes were made during or immediately after interviews to record contextual observations and support reflexivity and subsequent interviewing; they were not coded or included in the analysed dataset.

The semi-structured interview guide was developed specifically for this study and had not been previously published. Development was informed by the study aim, research question and literature on community-based education, primary-care preparation and PA education. A preliminary version was reviewed by six individuals with complementary expertise in qualitative research, PA education, clinical education, community integration and doctoral research supervision; feedback was obtained through in-person and remote discussion and used to refine clarity, wording, sequencing and probing. One consenting eligible student from the same final-year cohort then completed an audio-recorded pilot interview. Following expert review and pilot testing, questions were simplified where needed, unclear wording was revised, the opening question was broadened and additional probes were incorporated. The pilot interview was excluded from the analysed dataset. The final guide used open-ended questions covering longitudinal community learning across semesters and settings; contrasts between hospital and community encounters; understandings of patients, communities and primary care; communication, prevention and health education; perceived preparedness for selected activities; possible PA contribution; areas of lower confidence; and perceived strengths and limitations of the programme.

During the study, the guide was used flexibly: questions were not necessarily asked verbatim or in a fixed order, and follow-up probes were adapted to participants' responses to elicit clarification, examples and reflection. The final English-language interview guide is provided as Additional file 2.

Interviews were conducted by the principal researcher, Ebin V Abraham (EVA), a male PA educator and programme coordinator who implemented the curriculum and coordinated its community-based activities. He held a Master of Science (Physician Assistant), a Master of Business Administration (MBA) – Healthcare Management, and a Postgraduate Diploma in Public Health & Hospital Administration from the Public Health Foundation of India (PHFI), and was a PhD scholar. His preparation included formal qualitative-research training at NIMHANS Bengaluru, doctoral research-methodology training, institutional qualitative-research workshops, previous supervision of two undergraduate qualitative studies involving interviewing and thematic analysis, mentoring from experienced qualitative researchers, and self-directed study of Braun and Clarke. Participants knew him as their programme coordinator and PA educator and knew that the study formed part of his doctoral research. They were told that the study aimed to understand their experience of the community-based curriculum and perceived preparedness for primary care. He did not disclose preferred findings or personal expectations about the curriculum. Although he was programme coordinator, he had no role in the participants' examinations, grading or academic assessment; these responsibilities were undertaken by other faculty members. His coordinating role nevertheless involved institutional authority. This familiarity supported context-sensitive questioning but also created a power relationship and the possibility of socially desirable responses. At the start of each interview, participants were reminded that there were no right or wrong or preferred answers. Neutral prompts were used, and participants were encouraged to discuss critical and less-positive experiences.

Transcription and data management

The principal researcher produced the initial English transcripts and checked every transcript against its audio recording. Readability edits were limited to non-substantive corrections, while preserving participants' substantive meaning and analytically relevant wording. Direct identifiers were removed from the reporting extracts, including replacement of a named faculty member with "[faculty member]", and participants were assigned codes P01–P13, which are used for quotations throughout the manuscript. The verified transcripts formed the dataset imported into ATLAS.ti 26.

Audio recordings, transcripts, consent documentation and analytical materials were stored in password-protected electronic locations accessible to the research team. Consent documentation was maintained separately from de-identified research data in accordance with institutional requirements.

Reflexive thematic analysis

EVA conducted all coding and initial theme development using reflexive thematic analysis, with ATLAS.ti 26 used to organise transcripts, quotations, codes, analytic comments and relationships between codes;

the software did not perform the interpretation. Analysis was recursive rather than a rigid linear sequence. It involved repeated familiarisation with the full dataset; iterative coding of explicit descriptions and meanings suggested by contrasts, changes and tensions; development of candidate themes around central organising concepts; review of candidate themes against coded extracts and complete transcripts; definition and naming of themes; and continued refinement during writing [19–21].

Coding remained inclusive during early analysis to preserve varied interpretations. Candidate themes were not predetermined by the interview-guide topics, code frequency or the number of participants expressing a view. The semi-structured guide nevertheless shaped the broad areas invited for discussion, and this influence was considered reflexively during analysis. Theme boundaries were refined through comparison across cases, and accounts that qualified or contradicted the developing interpretation were actively considered. Quotations were selected for analytical relevance, clarity, participant variation and their capacity to illustrate supportive, qualified or divergent accounts.

The coding system evolved from 108 initial codes to 72 consolidated codes while retaining 608 coded quotations. The codebook functioned as an evolving organisational and interpretive record rather than a fixed instrument for testing agreement. Themes were actively developed through the researcher's engagement with the data. Independent duplicate coding and inter-rater reliability calculations were not undertaken because these procedures are not conceptually aligned with reflexive thematic analysis. Supervisor discussions were used to question assumptions and strengthen interpretive coherence rather than to establish coding consensus. SI did not independently code; he acted as a critical friend, read full transcripts, reviewed the evolving codebook and a selection of codes and candidate themes, questioned assumptions and contributed to conceptual refinement. PVG participated in analytical discussions and critical review of developing interpretations.

Reflexivity and analytical quality

The principal researcher's position as a PA educator, programme coordinator and curriculum implementer provided contextual knowledge while also shaping what he noticed, asked and interpreted. Reflexive attention was maintained throughout interviewing, coding, theme development and writing. Reflexive memos, coding decisions, code-consolidation records and theme-development workbooks documented the analytical process. Supervisor discussions supported critical examination of theme boundaries, alternative interpretations and possible overstatement of educational or professional outcomes.

Analytical quality was supported by sustained engagement with the complete dataset; recursive comparison of codes, extracts and full participant accounts; attention to negative, less-positive and qualified cases; separation of perceived preparedness from demonstrated competence; transparent documentation of analytical decisions; and alignment among the research question, analytical argument and theme boundaries. Thematic importance was judged by coherence, explanatory value and contribution to the research question rather than frequency alone.

After completion of all interviews, transcripts were returned to all 13 participants in the analysed dataset following correction of obvious transcription and minor grammatical errors without alteration of substantive meaning. Participants were given approximately 15–20 days to identify errors or provide clarifications. No participant returned corrections or comments.

Transcript review supported transcript accuracy and was not treated as validation of the researchers' thematic interpretation.

Ethical considerations

Ethical approval

was obtained from the Ethics Committee – Amrita School of Medicine (ECASM) (approval reference: ECASM-AIMS-2025-443; approval date: 23 September 2025). All methods were carried out in accordance with relevant guidelines and regulations, including the Declaration of Helsinki.

All participants received information about the study before participation. Written informed consent, including permission for audio-recording, was obtained by the principal researcher before each interview. Participation was voluntary, and students could decline or withdraw without academic consequences.

Names and other identifying details were removed from transcripts and manuscript materials, and quotations are attributed only to participant codes. Because the interviewer was a faculty member within the participants' programme, particular attention was given to voluntariness, confidentiality and the potential influence of the educator–student relationship.

Results

The analysed dataset comprised interviews with 13 final-year Physician Associate students; all were female, with a median age of 22 years (range 21–24 years). All 13 had the same scheduled community-posting exposure in urban and rural settings. The analysis generated five interrelated themes: (1) Seeing health differently: from disease episodes to people, places, populations and systems; (2) Learning to enter and engage: from uncertainty to adaptive communication; (3) Recognising care as relational: trust, listening and emotional presence; (4) Envisioning a collaborative PA role while recognising the limits of readiness; and (5) Making longitudinal learning consequential: continuity, participation and reciprocity.

Together, the themes represented a layered reorientation rather than a uniform progression towards confidence or competence. Repeated encounters with households, communities and primary healthcare services changed what students noticed about health, how they approached people, what they understood as care and where they imagined Physician Associates might contribute. However, perceived preparedness remained uneven, task-specific and related to repeated practice, supervision and opportunities for meaningful participation. Although presented in an order that conveys this analytical movement, the themes were interconnected and were not experienced identically by every participant.

Theme 1: Seeing health differently—from disease episodes to people, places, populations and systems

Community-based learning widened students' frame of reference. Participants contrasted the clinical visibility of disease in hospitals with the social, environmental and familial circumstances made visible through household visits. Community exposure did not simply relocate clinical teaching outside the hospital; it enabled students to situate illness within people's everyday lives and within broader patterns of prevention, access and service delivery.

Seeing the person and circumstances behind the disease

Hospital encounters were described as tending to foreground symptoms, diagnosis and immediate management. In homes, students could observe living conditions, family relationships, resources and daily challenges that were difficult to recognise during a consultation. P01 described a change in the focus of their attention:

"Earlier, I used to focus mainly on the disease itself.

Now, I think more about the person's life and the factors that may have contributed to their illness." — P01

This was not simply an increase in empathy. The object of students' attention had expanded from the presenting condition towards the circumstances in which illness developed and was managed. P11 used the metaphor of an iceberg:

"It reminds me of the iceberg concept.

In hospitals, we often see only the visible part of a person's health problem.

When we visit homes, we can understand many of the hidden factors that influence health and wellbeing." — P11

Participants described recognising influences including sanitation, housing, occupation, lifestyle, food availability, financial constraints and family support. P08, for example, observed water sources, ventilation, overcrowding and mosquito-breeding sites, while P09 connected financial limitations with the quality and variety of food available to households. These conditions were no longer encountered solely as abstract determinants; they became relevant to understanding particular people and what they could realistically do to manage their health.

Extending attention towards prevention, populations and systems

Observing the circumstances contributing to illness encouraged students to think beyond treatment. P10 explained:

“One thing I realised is that many diseases can be prevented before they become serious.

Community healthcare provides opportunities to identify problems early and intervene before complications develop.

I began to understand that prevention is often more effective than treatment.” — P10

Prevention was connected with health education, recognition of risk and earlier access to care. Survey activities also allowed some participants to recognise recurring conditions and variations in healthcare needs across households, extending their perspective from individual cases towards population patterns.

Exposure to community health centres broadened this understanding further. P07 observed that these centres operated as accessible first points of contact and that established relationships helped staff understand the social and financial circumstances affecting patients. Participants described primary care as involving initial assessment, prevention, follow-up, referral and collaboration rather than a single episode of treatment.

The degree of change nevertheless varied. P06 resisted describing the experience as transformative:

“Not significantly.

I would not say that my entire perspective changed.

However, I became more aware of how lifestyle factors and environmental conditions can contribute to illness.” — P06

For some students, community education therefore deepened or made concrete an existing understanding rather than replacing it. Hospital learning also remained important for clinical knowledge and patient assessment. Community exposure extended and contextualised that learning by making people’s circumstances, population needs and primary-care systems more visible.

Theme 2: Learning to enter and engage—from uncertainty to adaptive communication

Entering unfamiliar households required students to communicate without the established roles and routines of a hospital. Participants initially described anxiety, dependence on questionnaires and uncertainty about introducing themselves, asking personal questions and responding to reluctance. Through repeated encounters, they became more able to judge how an interaction was unfolding and adapt their approach.

From task-focused encounters to adaptive conversations

P04 described how early anxiety narrowed the purpose of household visits:

“In the first year, we were tense. We focused only on finishing the questionnaire. We would ask the questions on the form, record the answers, and move on.

But later, we started having real conversations.” — P04

The questionnaire initially offered structure but could also constrain engagement when its completion took priority over the person. With experience, students described explaining the purpose of visits more clearly, using less formal language and allowing conversations to move beyond the sequence of questions.

P07 connected this development directly with repetition:

“At the beginning, communication was one of my biggest challenges.

I am naturally an introverted person, so I initially found it difficult to approach strangers and start conversations. I did not know how to introduce myself or how to begin interacting with people.

However, repeated exposure gradually changed that. As I visited more households and interacted with more people, my confidence increased.” — P07

Adaptation involved more than speaking confidently. Students learned that age, language, emotional state, educational background and willingness to participate affected how an encounter could proceed. P12 initially struggled with a regional Malayalam dialect but became more familiar with it as the posting continued. This experience showed that communication confidence remained context-dependent.

Learning to respect refusal and uncertainty

Community members did not always welcome the students. Participants encountered suspicion, survey fatigue, concerns about confidentiality and questions about why information was being collected. P11 described learning not to interpret refusal as personal failure:

“Initially, I found those situations difficult because I would take the rejection personally.

If someone changed their attitude or refused to cooperate, I felt disappointed and discouraged.

However, with experience, I learned that refusals are a normal part of community work.

I became more comfortable handling these situations and learned not to take them personally.” — P11

Learning to engage therefore included recognising when not to continue. Students described explaining their purpose, answering questions and respecting decisions when people remained unwilling. This represented ethical development alongside communication development: community members were not obliged to participate merely because the visit had an educational or health-related purpose.

Progression towards more independent participation also required caution. P12 recalled:

“I was alone during that visit, and initially I felt nervous because I did not know what to expect.

The situation felt unfamiliar to me.

Although nothing serious happened, I felt uncomfortable because it was a situation I had never experienced before.” — P12

P12’s account combined growing experience with continued unease during an unfamiliar individual household visit.

Theme 2 therefore represents movement from task dependence towards more adaptive and ethically aware participation—not a simple transition from anxiety to mastery.

Theme 3: Recognising care as relational—trust, listening and emotional presence

As students became less preoccupied with completing assigned tasks, they began to reconsider what counted as care. Participants described recognising that clinical assessment, treatment and health information represented only part of what people sometimes needed. Trust, attentive listening, reassurance and emotional presence became meaningful components of primary healthcare.

Listening as more than information gathering

Community encounters sometimes revealed that people wanted an opportunity to speak rather than an immediate clinical response. P07 reflected:

“Although the situation was unexpected and initially made me feel uncomfortable, I gradually realised that she simply wanted someone to talk to.

She was looking for emotional support and someone who would listen without judgement.

Looking back, the experience taught me that healthcare is not always about asking questions and collecting information.

Sometimes people simply need someone to listen to them.” — P07

Listening was therefore reinterpreted as more than a technique for obtaining an accurate history. It became an active form of presence through which a person’s concerns could be acknowledged.

This understanding was particularly evident in encounters with older adults. P12 described meeting an elderly couple living with little family support:

“What affected me most was that they simply wanted someone to talk to.

They were eager to share their feelings, experiences, and concerns.

I realised that their greatest need was not necessarily medical treatment.

They needed companionship, attention, and someone who was willing to listen.” — P12

These accounts did not suggest that conversation could replace clinical or psychological care. Instead, students recognised social isolation and emotional wellbeing as health-related concerns that might be overlooked in narrowly task-focused encounters.

P01 captured the expanded meaning succinctly:

“Healthcare is not only about medicines and treatment.

People also need emotional support.” — P01

Trust as necessary but not automatic

Participants observed that people sometimes spoke more openly when they felt respected and unhurried. Established relationships between community healthcare workers and residents also demonstrated how familiarity could support disclosure, continuity and help-seeking.

Trust nevertheless remained fragile. Some household members required identification and a clear explanation before speaking; others remained unwilling. Relational care could not be assumed or produced by communication techniques alone. It required transparency, patience and respect for boundaries.

Relational development was also not uniformly described as a transformation of self. P05 stated:

“I would not describe myself as a highly empathetic person, but I think I developed more sympathy and understanding through these experiences.” — P05

This qualification prevents an assumption that community exposure automatically produces empathy. The stronger finding was that students increasingly recognised the relational conditions through which care was experienced and information could be shared.

Theme 4: Envisioning a collaborative PA role while recognising the limits of readiness

Community and primary-care exposure broadened students’ perceptions of where Physician Associates might contribute. Participants initially associated the profession predominantly with tertiary hospitals and specialist departments. They subsequently imagined possible contributions involving health education, history-taking, basic assessment, follow-up, documentation and communication within primary-care teams.

Broadening the imagined field of practice

P09 described this expansion directly:

“Before community exposure, I mainly thought of Physician Associates working within hospitals.

I did not really think about Physician Associates working in community health settings.

After the posting, I realised that Physician Associates can also contribute significantly within Primary Health Centres and community healthcare services.

Community exposure helped me understand that the PA role is not limited to hospital practice.” — P09

The change was not simply discovering another employment setting. Students connected the PA role with preventive, educational and coordinating activities that had become visible through community learning.

P12 linked confidence in health education, history-taking, vital-sign assessment and routine follow-up to repeated practice:

“I would feel confident providing health education to patients and community members.

I would also feel comfortable taking patient histories, checking vital signs, and conducting routine follow-up assessments.

These are activities that we practiced repeatedly during our clinical and community postings.” — P12

Confidence was associated with repeated participation rather than exposure to a setting alone. Students who had undertaken particular activities described greater readiness for them, while those with predominantly observational experience remained less certain.

Collaborative and bounded readiness

Teamwork was linked to recognition of limits in students’ imagined PA contributions. P07 described seeking experienced guidance, while P13 distinguished administrative and communication activities from treatment-room responsibilities.

P07 explained:

“In those situations, I do not always feel fully confident.

I feel that my knowledge is still developing, and I may not have enough experience to provide detailed medication advice independently.

If someone asks complex questions about medications or treatment decisions, I would prefer to seek guidance from a doctor or another experienced healthcare professional.” — P07

Other participants similarly reported lower confidence in prescribing, procedures, treatment-room responsibilities and complex decision-making. P13 felt more prepared for documentation, registration

and communication than for independent work in treatment areas.

These accounts describe an expansion of professional possibilities accompanied by task-specific confidence and recognition of limits.

Community exposure also influenced where some participants could imagine working after graduation. However, students described changing perceptions of the PA role more clearly than a completed transformation of professional identity. Role orientation is therefore treated as a secondary interpretation rather than evidence of full professional identity formation.

Theme 5: Making longitudinal learning consequential—continuity, participation and reciprocity

Students valued repeated community exposure, but their accounts showed that elapsed time or repeated visits alone did not guarantee meaningful learning. Community education became consequential when experiences were connected over time, students assumed appropriately increasing responsibility and their activities had some relevance for participating communities.

From brief exposure towards continuity

Some placements were too short to support sustained engagement. P02 explained:

“Most of our postings were only until noon.

Because of that, we had limited time to interact with the community and become fully involved in their activities.

I felt that if we had more time in the community, we could learn much more and build stronger relationships with the people there.” — P02

Participants distinguished repeated visits from continuity. Returning to the same community could allow students to recognise changing health needs, follow earlier concerns and build relationships. P03 stated:

“When students visit an area only once or twice, they gain some understanding, but there are limits to what they can learn.

If they return to the same community multiple times, they begin to understand how people’s health changes over time.

They also develop stronger relationships with the community.” — P03

Continuity therefore involved connected encounters rather than simply accumulating visits.

Learning through guided participation

Students valued opportunities to move beyond observation. Active participation required them to apply knowledge, communicate with families and recognise when guidance was necessary. P08 described a supervised household encounter:

“I remember one house visit where a patient appeared to have symptoms suggestive of chickenpox.

The family had several questions about the condition and wanted to know how they should take care of the patient.

Along with [faculty member], I visited the house and helped explain the condition.

That experience was different from hospital postings because we were not simply observing treatment.

Instead, we were directly interacting with the family and helping them understand how to manage the condition within their home environment.” — P08

P08 described contributing to a household encounter with faculty guidance, while P13 distinguished activities they felt prepared to undertake from treatment responsibilities for which they felt less prepared.

Questioning the value of survey-centred encounters

Two participants reported community responses that raised reciprocity-related concerns. P06 described a family asking students to assess a bedridden relative, but the students had no equipment because their assigned activity was limited to data collection.

P13 additionally reported some residents explicitly questioning what benefit they would receive from survey participation:

“People frequently asked us whether we could check their blood pressure or blood sugar levels.

Some individuals questioned what benefit they would receive from participating in the survey.

I think future community activities could include simple health assessments alongside surveys.

Providing basic screening services may make the interaction more beneficial for community members.” — P13

P06 and P13 interpreted these encounters as a mismatch between a data-collection activity and the practical assistance residents appeared to expect. These accounts from two participants suggest a qualified programme-design consideration rather than a prevalent community response; they were students’ reports, rather than accounts collected directly from community members.

P13 suggested adding basic assessments to survey activities as a possible way of responding to these expectations.

Across these accounts, students distinguished repeated attendance from connected encounters and active participation; accounts from two participants raised reciprocity-related concerns about survey-centred visits.

Discussion

Principal findings

The transferable insight from this single-institution study is that students distinguished the duration of community exposure from the connections and supported participation that made it educationally meaningful. This distinction is relevant to programmes introducing longitudinal community learning, including emerging PA programmes and other health-professions courses. The five themes connect contextual understanding, adaptive communication and relational care with collaborative role expectations and task-specific limits of readiness. The contribution lies in this situated account of how Indian PA students linked these dimensions, rather than a claim that community placements or their educational benefits are new.

We interpret this pattern as contextual, relational and bounded perceived readiness. Contextual readiness concerned understanding health within living conditions, family relationships, community patterns and health-system constraints. Relational readiness concerned respectful entry, adaptive communication, listening, trust and collaboration. Bounded readiness concerned confidence in particular activities alongside expressed uncertainty and a need for experienced guidance. This terminology describes students' accounts of limits without suggesting measured confidence–competence alignment.

Students distinguished connected, supervised and participatory learning from repeated attendance that remained observational or centred on data collection. Their accounts are consistent with understanding longitudinality as a designed educational relationship, rather than accumulated placement time alone. Reciprocity-related concerns reported by two participants also suggest that reciprocal purpose merits attention as a qualified programme-design consideration.

The five interrelated themes contribute to an interpretive understanding of perceived preparedness as contextual, relational and bounded. Connecting lines indicate conceptual relationships rather than temporal sequence, hierarchy or causality. Reciprocity reflects students' interpretations of community responses rather than direct community testimony.

Seeing health in context: extending clinical reasoning beyond the disease episode

Homes and neighbourhoods expanded the informational field through which students interpreted health. Sanitation, housing, occupation, food, finances, family support, access to services and the feasibility of

advice became visible in relation to particular people, while community and primary-care encounters drew attention towards prevention, population patterns, follow-up and referral. This is consistent with experiential literature showing that direct community engagement can make social determinants concrete and prompt learners to examine assumptions [7, 23]. A qualitative study from Kerala similarly reported greater awareness of patient circumstances, prevention, communication and resource constraints after structured community training [9]. The present study extends this literature to final-year Physician Associate students in India and connects contextual noticing with their anticipated contribution to primary healthcare.

This contribution should not be described as a uniform transformation from a biomedical to a complete biopsychosocial perspective. Some participants described refinement rather than fundamental change, and hospital learning remained important for clinical knowledge and assessment. Moreover, social-determinants curricula more often develop awareness than adjustment of care or assessed action [7], and authentic community exposure does not consistently produce actionable understanding [24]. The defensible claim is therefore that community encounters broadened or concretised students' accounts of health. Guided reflection and feedback are needed to connect observation with clinical reasoning, feasible responses and health-system constraints.

From repeated contact to adaptive and relational practice

The findings distinguish two connected dimensions of development. The first was learning to enter and navigate unfamiliar encounters: introducing oneself, explaining purpose, adapting language and pace, asking sensitive questions, responding to mistrust and accepting refusal. Repetition appeared useful because students encountered interpersonal variation rather than rehearsing a single communication formula. This is compatible with longitudinal family-interaction research describing movement from uncertainty towards adaptive communication and confidence [3]. However, confidence remained situated; language differences, household willingness and personal safety continued to shape what students felt able to do. Placement quality depends on preparation, supervision, connection, resources and safety rather than exposure alone [6].

The second dimension was recognising listening, reassurance, emotional presence and trust as substantive aspects of care. Longitudinal patient-perspective studies suggest that students may provide companionship, explanation and communication support, while recurring primary-care encounters can support responsibility and patient-centred learning [25, 26]. The present study adds the perspective of Indian Physician Associate students who came to regard listening as more than information gathering. Yet trust was not automatic, community exposure did not uniformly produce empathy, and the data came only from students. Evidence that longitudinal student relationships improve patient outcomes remains limited [27]. Relational learning can therefore be valued without claiming therapeutic effect or community benefit.

These findings make consent, privacy, refusal, linguistic and cultural variation, sensitive questioning, personal safety and respectful closure central educational concerns rather than peripheral soft skills. Developing preparedness for community engagement did not mean becoming more persuasive; it included greater composure when participation was uncertain, respect for autonomy and recognition of when support was needed.

Envisioning a collaborative Physician Associate contribution while recognising limits

Community and primary-care exposure broadened the activities in which students could envisage a Physician Associate contribution, particularly health education, history-taking, basic assessment, prevention, follow-up, documentation and team communication. PA students in UK primary-care placements have likewise valued meaningful responsibility while encountering role uncertainty and unrealistic expectations [14]. Constructivist accounts of PA learning emphasise modelling, scaffolding, coaching, collaboration and reflection [15], and studies of practising PAs show that role integration depends on shared understanding, supervisory relationships, teamwork and organisational adaptation [28, 29]. These mechanisms are potentially transferable, but the UK and Canadian professional and regulatory settings differ from India.

The present study adds a situated account of how final-year Indian PA students imagined collaborative contributions to primary healthcare within their local programme and health-system context. Changing perceptions of possible contribution were more evident than a completed transformation of professional identity.

Students' accounts described uneven, task-specific perceived readiness. P12 linked confidence to repeated practice, whereas P07 and P13 described uncertainty about more complex clinical responsibilities. Confidence should be interpreted alongside demonstrated competence [12], because self-confidence and assessed clinical performance may be poorly aligned [30]. Reviews of placement preparedness also show that the evidence is dominated by self-assessment and lacks standardised measures [10].

As an educational implication, readiness could be assessed in relation to specific activities, settings, resources and supervision. Combining task-specific self-appraisal with observed performance could assess contextual reasoning, collaboration and appropriate help-seeking. Formal escalation arrangements are a programme-design recommendation, rather than an outcome demonstrated by these interviews.

Making longitudinal learning consequential: continuity, participation and reciprocity

Students did not attribute educational value to repetition alone. They valued returning when encounters were connected through people, place, learning objectives, responsibility or follow-up. Continuity and

longitudinality are multidimensional rather than simple programme labels [4], and social learning in longitudinal placements depends on connectivity, workplace participation and relationships [5]. The present study extends this argument by showing how students distinguished repeated attendance from consequential continuity: short or survey-centred visits could remain transactional even when they recurred.

Students also wanted progression from observation towards legitimate, bounded participation. Meaningful community education has been associated with authentic tasks, increasing participation, role modelling, feedback and teamwork [2], while primary-care learning can be strengthened by supervised responsibility, interprofessional work and reflection [31]. In the present study, stronger perceived preparedness was associated with activities students had repeatedly undertaken with support. Drawing on this literature, feedback and clear supervision and escalation arrangements are proposed design considerations; their effects were not evaluated in this study.

Two participants raised reciprocity-related concerns: P06 described residents expecting practical assistance during a survey-centred encounter, while P13 reported some residents explicitly questioning what benefit they received from survey participation. We interpret these accounts from two participants as a qualified programme-design consideration, rather than evidence of a prevalent community response or communities' experiences of the programme. Systematic reviews have shown that community priorities, reciprocal knowledge transfer and population outcomes are often weakly specified or evaluated in community-based education [13, 32]. Other evidence from low- and middle-income countries (LMICs) demonstrates that supervised students can contribute to health education, outreach and service delivery [33], and community feedback can shift programmes towards collaborative redesign [34]. Community partners nevertheless report burdens as well as benefits when expectations, schedules and course constraints are poorly aligned [35].

What counts as benefit should be determined with participating communities and services. Potential responses to the concerns reported by students include co-designed health education, appropriately supervised basic assessment and agreed follow-up. These are proposals for partnership development and evaluation, not findings about effective community services.

Implications for health-professions education

The findings, considered alongside the literature, suggest educational design considerations for programmes with comparable aims and resources. Programmes could plan continuity with communities, households or primary-care services and connect successive encounters through follow-up, feedback and progressive learning. Graduated participation could combine supported observation with appropriately supervised histories, basic measurements, health education, case discussion and navigation of referral pathways. Structured orientation should address consent, privacy, refusal, linguistic and cultural variation, sensitive questioning, personal safety and respectful closure. Guided reflection may help connect community observations with clinical reasoning, social determinants, population health and feasible action. P12's discomfort during an individual visit also raises a question for

programme design: increasing independence should be accompanied by orientation, safety planning and accessible support.

Role and partnership arrangements require equal attention. Learners, faculty, supervisors, service teams and community partners need shared expectations about learning objectives, permitted activities, supervision and escalation. Community partners could help define priorities, feasible student contributions and evaluation criteria. Evaluation could extend beyond satisfaction and perceived preparedness to observed learner performance, community-defined value, burdens, referral completion and the sustainability of partnerships. These principles may inform other health-professions programmes, but transferability depends on programme design, professional regulation, supervision, resources and community context.

Strengths and limitations

A strength of this study was its in-depth exploration of how 13 final-year PA students connected longitudinal community experiences with primary healthcare and anticipated professional contribution. Reflexive thematic analysis retained divergent evidence and supported distinctions between adaptive communication and relational care, and between confidence, perceived preparedness and demonstrated competence.

Several limitations constrain interpretation. The data were retrospective student accounts from one programme; competence, post-graduation behaviour, patient outcomes and community benefit were not observed. Other curricular and clinical experiences could not be separated from the perceived influence of community education, and identical scheduled community-posting exposure did not imply identical experiences or learning. Both the eligible cohort and the analysed sample were all female, limiting transferability to PA students of other genders. Community members, patients, supervisors and service teams were not interviewed. The findings are therefore contextually situated interpretations rather than prevalence estimates or evidence of causality. Finally, the themes were produced through the researchers' reflexive engagement with the data; educational roles, prior commitments and socially desirable accounts may have shaped the interviews and analysis. Participation was self-selected: students who volunteered may have differed from those who did not participate. Retrospective accounts were also vulnerable to recall and selective emphasis. The interviewer's programme-coordinator role could have influenced responses despite his lack of involvement in examinations, grading or academic assessment. Interview questions and probes may also have foregrounded some areas of participants' accounts.

Transferability rests on the relevance of the educational relationships and conditions described, rather than statistical representativeness. Readers can assess whether continuity, supported participation, role clarity and reciprocity offer useful insights for their own settings by comparing programme structure, learner stage, supervisory capacity, professional regulation and community circumstances. The single-institution setting limits claims that the same experiences would occur elsewhere.

Future research

Longitudinal studies should follow graduates into primary-care and community settings to examine whether perceived readiness corresponds with observable communication, contextual reasoning, teamwork and appropriate recognition of limits. Comparative research could test how continuity, duration, supervision, feedback and graduated participation shape learning. Co-designed evaluations should include communities, patients, supervisors and primary-care teams and examine community-defined value, burdens, referral completion and partnership sustainability.

Conclusions

Final-year PA students described contextual, relational and bounded perceived readiness arising from longitudinal community learning. Their accounts are consistent with the educational value of connected encounters, respectful relationships and supervised participation, and raise questions about reciprocity in survey-centred activities. These insights may inform comparable programmes, while clinical competence, autonomous readiness, professional scope and community benefit require direct assessment and broader stakeholder evidence.

Abbreviations

COREQ: Consolidated Criteria for Reporting Qualitative Research; LMICs: low- and middle-income countries; NCAHP: National Commission for Allied and Healthcare Professions; PA: Physician Associate; UK: United Kingdom.

Declarations

Ethics approval and consent to participate

Ethical approval was obtained from the Ethics Committee – Amrita School of Medicine (ECASM) (approval reference: ECASM-AIMS-2025-443; approval date: 23 September 2025). Written informed consent, including permission for audio-recording, was obtained from all participants. Participation was voluntary and did not affect academic evaluation. All methods were carried out in accordance with relevant guidelines and regulations, including the Declaration of Helsinki.

Consent for publication

Written informed consent included permission to publish de-identified interview quotations.

Availability of data and materials

The interview transcripts are not publicly available because of participant confidentiality and the risk of re-identification within a small, single-cohort study. Requests for access to de-identified transcripts may be directed to the corresponding author. Any access is subject to the scope of participants' consent and applicable institutional and ethical permissions.

Competing interests

The authors declare the following non-financial competing interests. EVA implemented the curriculum, coordinates the programme evaluated in this study, and conducted all coding and initial theme development. PVG contributed to programme implementation, analytical discussions and critical review of developing interpretations, and MVT contributed to programme approval and logistical support. SI provided doctoral supervision and contributed to the study concept and conceptual refinement as a critical friend; he read full transcripts, reviewed the evolving codebook and a selection of codes and candidate themes, and questioned assumptions, without independently coding. These educational, administrative and supervisory roles may influence interpretation of the programme. The authors declare no financial competing interests.

Funding

No specific funding was received for this study.

Authors' contributions

EVA (Ebin V Abraham) conceptualised the study, implemented the curriculum, coordinated with the Community Medicine and Public Health departments, developed the interview guide, conducted the interviews and programme evaluation, conducted all coding and initial theme development, and drafted the manuscript. PVG (Prasad V G) contributed to interview guide development, initial programme evaluation, overall programme implementation, analytical discussions, critical review of developing interpretations and manuscript revision. MVT (M V Thampi) contributed to the study concept, programme approval, logistical support and manuscript revision. SI (Subramaniya Iyer) provided doctoral supervision and contributed to conceptual refinement, interview guide development, programme evaluation and analytical refinement as a critical friend. SI read full transcripts, reviewed the evolving codebook and a selection of codes and candidate themes, and questioned assumptions; he did not independently code. All authors read and approved the final manuscript.

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Ebin V Abraham — Assistant Professor and Programme Coordinator; Prasad V G — Associate Professor and Programme Coordinator; M V Thampi — Chief Programme Administrator; Subramaniya Iyer —

Professor and Chairman.

EVA's combined educator, coordinator and researcher roles provided contextual familiarity and an investment in the programme. The implications of these relationships for recruitment, interviewing and interpretation are addressed in the Methods and competing-interests declaration.

Acknowledgements

Not applicable.

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Figures

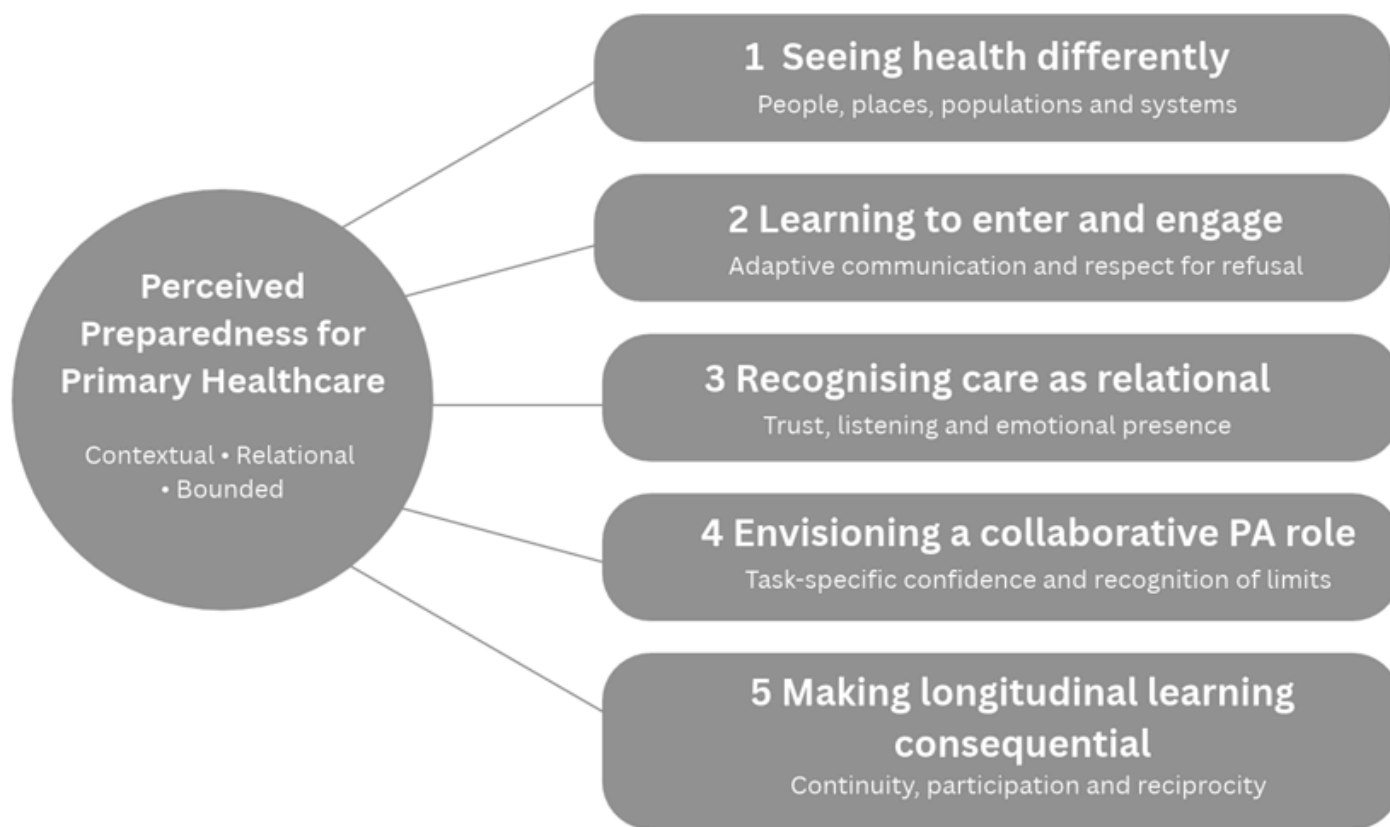


Figure 1

Interpretive synthesis of community learning and perceived preparedness for primary healthcare.

The five interrelated themes contribute to an interpretive understanding of perceived preparedness as contextual, relational and bounded. Connecting lines indicate conceptual relationships rather than temporal sequence, hierarchy or causality. Reciprocity reflects students' interpretations of community responses rather than direct community testimony.

Supplementary Files

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- [Additionalfile1COREQChecklistFinal.docx](#)
- [Additionalfile2EnglishInterviewGuideFinal.docx](#)