

Perception of the Family Adoption Programme Among Undergraduate Medical Students of Three Successive Admission Cohorts at a Medical College in Western India: A Cross-sectional Study

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ABSTRACT

Background: The Family Adoption Programme (FAP) was introduced by the NMC in the undergraduate MBBS curriculum as a community-based healthcare learning. Advantages of learning in the community as a Classroom include achieving communication skills and understanding the role of customs and cultural factors affecting health. The aim was to assess the perception of students of SMIMER Medical College towards the FAP.

Material and Methods: An assessment of the perception of students of admission years 2021, 2022 & 2023 of SMIMER Medical College was collected by online data collection tool. Perception on the functionality of equipment they used, how the assigned family behaved, teaching quality & guidance, transportation arrangements and helpfulness of FAP included in the questionnaire. Perception was assessed using a Likert scale of one to ten.

Results: Final 485 responses were used to analyse. The average perception of students about their weight measurement skill was 9.2 ± 1.3 with median 9 (8-10). Students found the average helpfulness of FAP in MBBS was 8.8 ± 1.6 with median 9 (8-10) and the average overall experience of students was 8.9 ± 1.5 with median 9 (8-10).

Conclusions: The study indicates that students from SMIMER Medical College have a positive perception for the FAP.

Keywords: Education, Medical, Undergraduate, Community Medicine, Perception, Family Adoption Programme

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INTRODUCTION

Medical education is increasingly expected to prepare graduates not only to diagnose and treat disease but also to understand the social, cultural, environmental and economic circumstances that influence health. Community-based education provides opportunities for students to encounter individuals and families within their usual social environment and to connect theoretical knowledge with real-world healthcare experiences. Such exposure can facilitate understanding of patient-centred care, continuity of care, primary healthcare and social determinants of health.[1] Systematic reviews of community-based medical education have reported educational benefits related to understanding patients' circumstances, continuity of care and primary healthcare.[2]

India's competency-based medical education (CBME) framework seeks to develop Indian Medical Graduates (IMGs) who possess appropriate knowledge, skills, attitudes, values and professional competencies. The National Medical Commission (NMC) introduced the Family Adoption Programme (FAP) as part of this framework to provide longitudinal community exposure to undergraduate medical students. The FAP curriculum describes the programme as an opportunity for authentic learning, sensitization to real-life health inequities and understanding of social factors contributing to health and illness. The current NMC curriculum provides for continuation of FAP across the undergraduate phases, with structured activities and documentation through a family-adoption logbook.[3]

The longitudinal nature of FAP differentiates it from conventional short-term community postings. Students are expected to maintain contact with adopted families and progressively develop an understanding of their health, socioeconomic circumstances, health-seeking behaviour and interaction with health services. Such repeated exposure may provide opportunities for experiential learning, communication practice and development of socially responsive professional attitudes.[4]

Early evaluations of FAP in Indian medical colleges have generally reported favourable perceptions among students. Yalamanchili V et al. identified early community exposure, understanding of family health and long-term interaction as important perceived strengths, while lack of transportation, inadequate supportive staff, scheduling difficulties and faculty workload were identified as important implementation challenges.[4] Shikha S et al. similarly described opportunities for early community exposure and holistic understanding of family health while highlighting operational issues in programme implementation.[5]

However, student perception is a subjective educational outcome and should be distinguished from objectively demonstrated competency. Evidence from medical education research indicates that self-assessment does not always correspond closely with externally assessed performance.[6] Therefore, a study based on student rat-

ings can establish how students perceive their learning experience and confidence, but cannot by itself demonstrate improvement in actual clinical competence.

There is also a need for institution-specific evaluation because FAP implementation can differ according to student strength, geographical setting, transportation arrangements, faculty availability, community characteristics and institutional resources. Recent studies from different regions of India have demonstrated variation in the perceived benefits and challenges of FAP.[7] Assessment across successive student cohorts within the same institution can additionally identify components of the programme that may require administrative or educational attention.

The present study was therefore undertaken to assess the perception of undergraduate medical students regarding different components of FAP at SMIMER Medical College, Surat and to compare perceptions among students from three successive admission batches.

MATERIALS AND METHODS

Study design and setting: A cross-sectional questionnaire-based study was conducted among undergraduate MBBS students of Surat Municipal Institute of Medical Education and Research (SMIMER) Medical College, Surat, Gujarat, India. Data collection was undertaken during December 2023. SMIMER Medical College provides undergraduate medical education within the CBME framework, with the Department of Community Medicine responsible for implementation and supervision of community-based curricular activities including FAP.

Study population: The study population comprised undergraduate medical students admitted during the 2021, 2022 and 2023 admission years who had participated in FAP. These cohorts represented students at different stages of the undergraduate medical curriculum. The 2021 admission cohort corresponded broadly to the third professional year during the study period, the 2022 cohort to the second professional year and the 2023 cohort to the first professional year.

As all eligible students across the three admission cohorts were invited to participate (complete enumeration) through institutional communication channels, no separate sample-size calculation was performed. Students who were willing to participate and provided electronic informed consent were included. Students who did not provide consent or submitted incomplete questionnaires were excluded from the analysis. Duplicate electronic submissions were identified and removed before analysis.

A total of 710 students were eligible across the three admission cohorts. There were 208 eligible students in the 2021 cohort, 251 in the 2022 cohort and 251 in the 2023 cohort. Of these, 485 complete responses were included in the analysis. The final numbers of respond-

ents were 158, 155 and 172 included for 2021, 2022 and 2023 cohort respectively.

Family Adoption Programme at the study institution: At SMIMER Medical College, FAP was implemented as a longitudinal community-based learning activity in accordance with the broad framework of the NMC curriculum. Students were oriented to the objectives of the programme, communication with families, basic family health assessment and appropriate conduct during community visits. Students were allocated adopted families and were expected to establish rapport and undertake repeated interactions with the family during their curricular exposure.

The programme provided opportunities for students to obtain information regarding family composition, socio-economic and environmental circumstances, health problems, health-related behaviour and utilization of healthcare services. Students also participated in basic health assessment and screening-related activities under faculty supervision. Field visits involved use of basic instruments including weighing scales, stadiometers, sphygmomanometers and glucometers.

For the purpose of the present study, programme exposure was considered adequate when the student had participated in at least two FAP visits.

Questionnaire development and face validation: A structured questionnaire was developed by the investigators after reviewing the objectives of FAP, the institutional programme activities and published literature on student perceptions of FAP and community-based medical education.[7-10] The questionnaire included items assessing teaching and faculty guidance, usefulness of FAP in the MBBS curriculum, communication, cooperation of adopted families, transportation arrangements, self-reported confidence in selected skills and functionality of field instruments.

The questionnaire was face validated by three senior faculty members with experience in community medicine and undergraduate medical education. The faculty members independently reviewed the items for clarity, relevance, comprehensibility and appropriateness to the educational level of the participants. Minor modifications were made to wording and sequencing following their review. Because the instrument was primarily intended as an institutional perception survey and did not represent a previously validated psychometric scale, formal construct validation was not undertaken.

A 10-point rating scale was used for the perception items, where 1 represented the least favourable perception and 10 represented the most favourable perception. The instrument was administered electronically.

Study variables: The primary outcome was students' perception of FAP. The domains assessed included overall experience, perceived usefulness of FAP within the MBBS curriculum, teaching quality and faculty guidance, cooperation and support from the adopted family, transportation arrangements, self-reported confidence in

height measurement, weight measurement, blood pressure measurement, blood glucose measurement and communication as well as perceived functionality of the stadiometer, weighing scale, sphygmomanometer and glucometer.

Participant characteristics included age, sex, admission batch and place of residence. Programme exposure variables included number of FAP visits and received of orientation before field visits.

Data collection: The questionnaire was circulated through official institutional communication channels. The purpose of the study was explained on the introductory page of the electronic questionnaire. Participation was voluntary and students were required to provide electronic informed consent before proceeding to the questionnaire.

Students were instructed to submit the questionnaire only once. The electronic dataset was screened for incomplete responses and duplicate submissions. The final dataset was transferred to Microsoft Excel for cleaning and subsequently analysed statistically.

To minimize selection and data-quality bias, the online questionnaire was circulated to eligible undergraduate students from all three participating admission batches (2021, 2022, and 2023), thereby providing an opportunity for all students to participate. Duplicate responses were identified and removed before analysis. The response rates were 76%, 62% and 69% for the 2021, 2022, and 2023 cohorts respectively, with 485 valid responses included in the analysis. A formal comparison of responders and non-responders was not performed because individual-level information on students who did not participate was not available in the dataset. Reasons for non-response were also not systematically collected. Therefore, the possibility of non-response bias cannot be completely excluded.

Statistical analysis: Categorical variables were summarized as frequencies and percentages. Continuous variables such as age were summarized as mean, deviation, median and interquartile range (IQR). Because the perception items were measured using an ordered 10-point rating scale and normality could not be assumed, the inferential analysis used the Kruskal-Wallis test to compare the three admission cohorts.

For each perception item, median and IQR were used as the principal descriptive measures in the analysis. Mean and standard deviation were also retained to permit comparison with the analysis and with previously published FAP studies that have reported mean perception scores.

For variables demonstrating a statistically significant Kruskal-Wallis test, Dunn's post-hoc test with Bonferroni adjustment was used for pairwise comparisons. Epsilon-squared (ϵ^2) was used as an effect-size measure for the Kruskal-Wallis analysis. Effect sizes were interpreted in conjunction with the actual difference in perception scores rather than statistical significance alone. Because

several domains were assessed, the possibility of type I error due to multiple comparisons was considered. Bonferroni-adjusted post-hoc testing was used for pairwise comparisons following significant omnibus tests. In the analysis, a two-sided significance threshold of $p < 0.05$ was used. The statistical analysis was performed using SPSS version 29.

Ethical considerations: Permission to conduct the study was obtained from the concerned institution before commencement of data collection. Electronic informed consent was obtained from all participants prior to their participation. Participation was voluntary, and confidentiality and anonymity of the respondents were maintained throughout the study.

RESULTS

A total of 710 students were eligible for participation, of whom 485 provided complete responses and were included in the final analysis, giving an overall response rate of 68.3%. The response rates were 76% for the 2021 cohort, 61.8% for the 2022 cohort and 68.5% for the 2023 cohort. The mean age of participants was 20.1 ± 1.1 years. Females constituted 257 (53%) participants and males 228 (47%). Most participants reported an urban place of residence. (Table 1)

The majority of participants reported having received orientation before their first FAP visit. Almost all students had participated in at least two FAP visits, with the number of completed visits increasing with the year of study. Third-year students had the greatest cumulative FAP exposure, whereas first-year students had relatively limited exposure because they had only recently entered the programme.

Overall perception of FAP was favourable. The median rating for overall experience was 9 (IQR 8-10). The lowest overall median rating among the principal programme domains was observed for transportation, at 8 (IQR 7-10). Despite being the lowest-rated domain, the majority of students still rated transportation favourably. (Table 2)

The mean overall experience score was 8.7 ± 1.6 among the 2021 cohort, 8.9 ± 1.4 among the 2022 cohort and 9.0 ± 1.5 among the 2023 cohort. The difference was not statistically significant. (Table 2)

Transportation demonstrated the largest difference between cohorts. The mean scores were 8 ± 2.4 , 8.5 ± 1.8 and 7.4 ± 1.6 among the 2021, 2022 and 2023 cohorts, respectively. The Kruskal-Wallis test demonstrated a statistically significant difference. (Table 2)

Table 1: Sociodemographic and Family Adoption Programme characteristics of participants

Characteristic	2021 batch (n=158)	2022 batch (n=155)	2023 batch (n=172)	Total (n=485)
Age, mean $\pm$ SD, years	20.9 $\pm$ 0.8	20.0 $\pm$ 0.7	19.4 $\pm$ 0.6	20.1 $\pm$ 1.1
Female sex (n, %)	82 (51.9)	84 (54.2)	91 (52.9)	257 (53)
Male sex (n, %)	76 (48.1)	71 (45.8)	81 (47.1)	228 (47)
Urban residence (n, %)	118 (74.7)	116 (74.8)	130 (75.6)	364 (75.1)
Rural residence (n, %)	40 (25.3)	39 (25.2)	42 (24.4)	121 (24.9)
Received FAP orientation (n, %)	151 (95.6)	149 (96.1)	167 (97.1)	467 (96.3)
≥ 2 FAP visits completed (n, %)	152 (96.2)	152 (98.1)	172 (100)	476 (98.1)
Median number of FAP visits (IQR)	5 (4-6)	3 (3-4)	2 (2-2)	3 (2-5)

SD: standard deviation; IQR: interquartile range; FAP: Family Adoption Programme

Table 2: Perception of different components of the Family Adoption Programme according to admission batch

Domain	2021 Mean $\pm$ SD	2022 Mean $\pm$ SD	2023 Mean $\pm$ SD	Overall Mean $\pm$ SD	Overall Median (IQR)	Kruskal-Wallis (p-value)
Overall experience	8.7 $\pm$ 1.6	8.9 $\pm$ 1.4	9.0 $\pm$ 1.5	8.9 $\pm$ 1.5	9 (8-10)	0.141
Helpfulness in MBBS curriculum	8.7 $\pm$ 1.8	9.0 $\pm$ 1.3	8.8 $\pm$ 1.6	8.8 $\pm$ 1.6	9 (8-10)	0.656
Teaching quality and guidance	8.6 $\pm$ 1.9	8.8 $\pm$ 1.6	8.9 $\pm$ 1.5	8.8 $\pm$ 1.7	9 (8-10)	0.798
Family cooperation/support	8.3 $\pm$ 2.2	8.6 $\pm$ 1.5	8.8 $\pm$ 1.5	8.6 $\pm$ 1.8	9 (8-10)	0.251
Transportation	8.0 $\pm$ 2.4	8.5 $\pm$ 1.8	7.4 $\pm$ 1.6	8 $\pm$ 2.3	8 (7-10)	<0.001*
Height measurement skill	8.9 $\pm$ 1.6	8.9 $\pm$ 1.4	9.1 $\pm$ 1.3	9 $\pm$ 1.4	9 (8-10)	0.078
Weight measurement skill	9.1 $\pm$ 1.4	9 $\pm$ 1.3	9.3 $\pm$ 1.3	9.2 $\pm$ 1.3	9 (8-10)	0.010*
Blood pressure measurement skill	8.8 $\pm$ 1.7	8.6 $\pm$ 1.5	8.8 $\pm$ 1.6	8.7 $\pm$ 1.6	9 (8-10)	0.072
Blood glucose measurement skill	8.6 $\pm$ 1.8	8.6 $\pm$ 1.4	8.4 $\pm$ 1.7	8.6 $\pm$ 1.7	9 (8-10)	0.213
Communication	8.5 $\pm$ 1.6	8.5 $\pm$ 1.7	8.7 $\pm$ 1.7	8.5 $\pm$ 1.7	9 (8-10)	0.285
Stadiometer functionality	8.7 $\pm$ 1.8	8.7 $\pm$ 1.6	8.8 $\pm$ 1.7	8.7 $\pm$ 1.7	9 (8-10)	0.440
Weighing-scale functionality	8.6 $\pm$ 2.1	8.8 $\pm$ 1.7	8.7 $\pm$ 1.8	8.7 $\pm$ 1.9	9 (8-10)	0.812
Sphygmomanometer functionality	8.5 $\pm$ 2	8.7 $\pm$ 1.6	8.3 $\pm$ 1.8	8.5 $\pm$ 1.8	9 (8-10)	0.024*
Glucometer functionality	8.0 $\pm$ 2.6	8.7 $\pm$ 1.6	8.1 $\pm$ 2	8.3 $\pm$ 2.1	9 (7-10)	0.010*

SD: standard deviation; IQR: interquartile range; *Statistically significant, $p < 0.05$

Table 3. Effect sizes and post-hoc analysis for domains with statistically significant between-batch differences (2022 vs 2023)

Domain	Kruskal-Wallis (H value)	p value	ϵ^2	Adjusted p value
Transportation	22.84	<0.001*	0.044	<0.001*
Weight measurement	9.18	0.010*	0.019	0.008*
Sphygmomanometer functionality	7.48	0.024*	0.013	0.021*
Glucometer functionality	9.24	0.010*	0.019	0.009*

ϵ^2 : epsilon-squared effect size; *Statistically significant, $p < 0.05$.

Dunn's post-hoc analysis indicated a significant difference between the 2022 and 2023 cohorts after Bonferroni adjustment. (Table 3)

Students reported high levels of confidence across all assessed skills. Weight measurement had the highest overall mean rating at 9.2 ± 1.3 and communication had lowest mean ratings of 8.5 ± 1.7 , respectively. The difference in self-reported weight-measurement confidence across batches was statistically significant. (Table 2)

Students generally rated the functionality of the instruments favourably. The highest overall ratings were observed for the stadiometer and weighing scale, with mean scores of 8.7 ± 1.7 and 8.7 ± 1.9 , respectively. Significant differences between admission cohorts were observed for perceived sphygmomanometer functionality and glucometer functionality. (Table 2) The relatively small effect sizes suggest that although between-batch (2022 vs 2023) differences achieved statistical significance, the magnitude of the differences was limited. (Table 3)

DISCUSSION

The present study found that undergraduate medical students at SMIMER Medical College had generally favourable perceptions of the Family Adoption Programme. The overall experience, perceived usefulness within the MBBS curriculum, faculty guidance and cooperation of adopted families received high ratings. These findings are consistent with the growing Indian literature suggesting that FAP is perceived by undergraduate students as a useful platform for community exposure, experiential learning and understanding the family and social context of health.[7,9]

The findings are also consistent with the educational rationale underlying the NMC's FAP curriculum. The programme was introduced to provide authentic community-based learning and to help students understand health inequities, social determinants and the practical challenges associated with delivering healthcare in real-life settings.[3,11] The favourable ratings observed in the present study suggest that students recognized educational value in these experiences. However, because the present study measured perceptions rather than objective educational outcomes, the findings should be interpreted as evidence of perceived usefulness rather than proof of competency acquisition.

The overall experience score was high and did not differ significantly across the three admission cohorts. This suggests that students at different stages of undergraduate education generally viewed FAP favourably. Similar findings have been reported by Ganganahalli P et al., who found that approximately nine out of ten participating students perceived FAP as beneficial for personal and professional development.[8] Studies from other Indian settings have similarly reported favourable perceptions of the programme, although differences in instruments, student populations and programme implementation make direct numerical comparison difficult.[9,10,12,13]

The favourable rating for the usefulness of FAP within the MBBS curriculum is important because community-based education can provide educational experiences that are difficult to reproduce in a hospital environment. Students interacting with families can observe health-seeking behaviour, socioeconomic circumstances, environmental factors, family dynamics and preventive health practices in their natural context. Systematic reviews of community-based education have similarly reported benefits in understanding patient-centred care, continuity of care and primary healthcare.[1,2]

Faculty teaching and guidance received a high rating in the present study. Faculty involvement is likely to be particularly important during the early stages of FAP because students may have limited experience in approaching families, obtaining sensitive information and translating theoretical knowledge into community-based health assessment. Previous FAP studies have identified faculty engagement and mentorship as important facilitators of participation and learning. Ganganahalli P et al.[8] reported faculty engagement as an important motivating factor, while Yalamanchili V et al.[4] identified faculty and supportive staff as central to successful programme implementation.

The high rating for cooperation from adopted families also supports the importance of community participation in longitudinal medical education. The FAP model requires students to establish rapport and maintain relationships with families over time.[14] The NMC curriculum explicitly identifies rapport building, communication and trust as important learning objectives.[3] Similar observations have been reported in Indian studies, where most students described adopted families as cooperative and identified community interaction as a major strength of FAP.[9,15]

Transportation was the lowest-rated principal programme component and demonstrated the clearest difference between admission cohorts. The 2023 cohort reported a lower rating than the preceding cohorts. This finding is consistent with previous studies in which transport and logistics have been identified as important challenges to FAP implementation. Yalamanchili V et al.[4] found lack of transport and supportive staff to be prominent implementation barriers, while other institutional studies[5,7] have similarly identified logistical constraints as factors influencing students' experiences.

The lower transportation score among the 2023 cohort should nevertheless be interpreted cautiously. The present study did not collect detailed operational information regarding distance travelled, duration of travel, mode of transportation, number of students per vehicle or changes in transportation arrangements between academic years. Therefore, the study can identify a difference in perception but cannot establish the reason for that difference. Institutional review of transport arrangements may nevertheless be appropriate because logistical difficulties can reduce the efficiency and acceptability of community-based educational activities.

Students reported high confidence in the performance of basic field-based skills. Weight measurement received the highest rating, followed by height measurement. This finding is plausible because anthropometric measurements are relatively standardized procedures and may be repeatedly practised during community visits. However, these findings represent self-reported confidence rather than objective performance.

The significant difference observed for weight-measurement confidence across batches was small in magnitude. Although the p value was statistically significant, the mean scores differed only modestly between cohorts. The effect size was correspondingly small. This illustrates the importance of reporting effect size and educational relevance in addition to p values. The difference may represent variation in exposure, timing of assessment or individual perception rather than a meaningful difference in competence.

Perceived functionality of the sphygmomanometer and glucometer also differed between cohorts. These differences may reflect variation in equipment availability, maintenance, calibration or field circumstances. However, because equipment-level information was not independently assessed, causal explanations cannot be made. The findings nevertheless identify equipment functionality as a potentially useful domain for routine monitoring of FAP implementation.

The lack of statistically significant differences in most domains suggests broadly similar perceptions across the three cohorts. This should not, however, be interpreted as evidence that the educational programme was objectively equivalent across the three academic years. The study was cross-sectional rather than longitudinal and different cohorts may differ in their expectations, prior experiences and educational environment. In addition,

the first-year students had less cumulative exposure to FAP than the senior cohorts. Cohort comparisons therefore provide useful descriptive information but cannot substitute for longitudinal assessment of the same students over time.

The present findings are broadly consistent with studies conducted in different Indian medical colleges. Suwetha et al. reported favourable opinions and attitudes towards FAP among MBBS students,[7] while Shikha S et al.[5] highlighted the potential of the programme for early community exposure and holistic learning. More recent studies have also reported favourable perceptions of FAP while identifying challenges related to logistics, family cooperation, scheduling and implementation.[8-10,15,16] The consistency of these findings across different settings suggests that FAP is generally acceptable to students, but its educational value is likely to depend substantially on the quality of implementation.

From an educational evaluation perspective, the present study primarily addresses the learner's reaction and perceived educational experience. It does not directly establish learning, behavioural change or downstream professional outcomes. Future evaluations of FAP should therefore move beyond perception surveys and incorporate objective assessment of competencies, longitudinal follow-up and where feasible, feedback from community members and faculty.

The study also highlights the potential value of a multi-method approach. Recent Indian investigations have incorporated student, faculty and community perspectives and have identified both educational benefits and operational barriers.[15,17] Such approaches are likely to provide a more complete picture of whether FAP is fulfilling its intended curricular and community-oriented objectives.

STRENGTHS AND LIMITATIONS

The present study has several strengths. It included a relatively large number of undergraduate medical students from three successive admission cohorts within the same institution, thereby providing an opportunity to examine the consistency of student perceptions across different stages of undergraduate education. The response rate was reasonably high for an electronic institutional survey, although non-response bias remains possible. The questionnaire covered educational, interpersonal and logistical aspects of FAP rather than focusing exclusively on overall satisfaction. The use of a non-parametric statistical approach, effect-size estimation and post-hoc testing provides a more appropriate analytical framework for ordered rating-scale data than reliance on multiple independent mean comparisons alone.

The findings should be interpreted in light of several limitations. The cross-sectional design precludes assessment of temporal changes or causal relationships. Outcomes were primarily self-reported and may not reflect objectively demonstrated competency. Although the questionnaire was face validated by three senior faculty

members, formal construct and psychometric validation were not performed. Finally, the single-centre setting in Surat, Gujarat, limits generalizability to medical colleges with different student populations, community settings, infrastructure, and faculty resources.

IMPLICATIONS FOR MEDICAL EDUCATION

The findings suggest that FAP is positively perceived by undergraduate students and provides a meaningful platform for community-based learning. Continued implementation should address transportation, faculty supervision, scheduling, and field equipment availability, with periodic student feedback for programme improvement. However, perceptions alone should not determine educational effectiveness. Future evaluations should incorporate objective competency assessment, faculty evaluation, structured observation, and feedback from adopted families. Longitudinal studies across the first to third professional years may provide stronger evidence of changes in knowledge, confidence, and skills.

CONCLUSION

A cross-sectional study among undergraduate medical students at SMIMER Medical College, using self-reported questionnaires, found generally favourable perceptions of the Family Adoption Programme (FAP) across educational, interpersonal, and field-based domains. Students positively rated their overall experience, perceived usefulness of FAP within the MBBS curriculum, faculty guidance, and cooperation received from adopted families. Among the assessed components, transportation was rated relatively less favourably and showed significant variation across admission cohorts. Some differences were also observed between cohorts in selected self-reported skills and perceptions regarding the functionality of equipment used during field activities. However, the corresponding effect sizes were small, indicating that these differences were limited in practical magnitude despite statistical variation.

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Availability of data: The data that support the findings of this study are available from the corresponding author on reasonable request.

Declaration of Non-use of generative AI Tools: This article was prepared without the use of generative AI tools for content creation, analysis, or data generation. All findings and interpretations are based solely on the authors' independent work and expertise.

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