

ORIGINAL ARTICLE

Community-Based Interprofessional Training for Undergraduate Medical Students Through Family Adoption Programme centering on Infant and Young Child Feeding

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ABSTRACT

Background: The Family Adoption Programme (FAP), introduced by the National Medical Commission (NMC) for MBBS students, to connect medical education with community health by engaging students in rural settings. This study assesses the effectiveness of a community-based interprofessional training program integrated into the FAP, focusing on Infant and Young Child Feeding (IYCF) practices. **Methods:** This was a community-based single-arm interventional study, involving 150 first-year MBBS students, alongside healthcare workers. Baseline and post-intervention assessments were conducted to evaluate students' knowledge of IYCF, mothers' understanding, and changes in child nutrition status. Communication skills were assessed using a validated checklist. **Results:** The intervention significantly improved first-year students' knowledge of IYCF practices, with median scores increasing from 18 to 23 out of 25 ($p<.001$). Mothers' knowledge also improved, with median scores rising from 6 to 10 out of 12 ($p<.001$). Significant improvements were observed in meal frequency and dietary diversity among children. However, anthropometric changes, while positive, were not statistically significant. Students' communication skills showed substantial enhancement, with positive attitudes towards communication increasing from 86.7% to 98% post-intervention. **Conclusions:** The interprofessional training program effectively enhanced MBBS students' knowledge and communication skills, benefiting both their educational experience and community health outcomes.

KEYWORDS

Communication Skills, Family Adoption Programme, Infant and Young Child Feeding, Interprofessional Training, Medical Education

INTRODUCTION

Community engagement in medical teaching is a powerful approach that enhances the education of medical students while benefiting the communities they serve. This opportunity is provided by the family adoption program (FAP) which involves integrating community-based experiences into the medical curriculum, allowing students to learn

directly from and with the community (1,2). Interprofessional Collaboration (IPC) is a key strategy for incorporating community engagement by forming Community Health Team (3,4) which encourages collaboration between medical students and other health professionals, such as Auxillary Nurse Midwife (ANM), Medical Social Worker (MSW), Accredited Social Health Activist

(ASHA) and Anganwadi Worker (AWW) to provide comprehensive care in community settings (5). Integrating Infant and Young Child Feeding (IYCF) into the FAP aligns with both the curriculum's objectives and the pressing need to combat malnutrition. (6)

Therefore, this study was undertaken to:

- assess the effectiveness of an Interprofessional IP team in training the medical undergraduates regarding Infant and Young Child Feeding practices through FAP.
- evaluate the impact of IPC on improving competencies among medical students pertaining to IYCF counselling, growth monitoring, and community health education, and thereby analyse changes in knowledge, attitudes, and practices due to such interventions among adopted families.

MATERIAL & METHODS

Study Setting and design: The study was a community-based single arm Quasi-experimental design, involving first year medical undergraduates, health team of varied inter-professionals- MSWs from department of Community Medicine, ANMs, ASHAs, and AWWs. The study was conducted in Manzoorgarhi village of Aligarh district of Uttar Pradesh under Family Adoption Program (FAP) of department of Community Medicine, JN Medical College, Aligarh Muslim University from November 2023 to August 2024.

Study participants: The first-year 150 MBBS undergraduates who joined in the year 2023 and all the available mothers/caregivers of children from 0-23 months of age (in the adopted families) were included in the study. Medical Social Workers, ASHAs, ANMs and AWWs of study area were part of interprofessional team under the study. All children above the age of 23 months and those having any congenital malformation were excluded from the study. A total of 66 children of 0-23 months of age and their mothers/caregivers from the adopted families were included in the study.

Study plan: The IP team discussed the role of each member in the study and the need and necessity of IP collaboration. To assure that the IP team members have adequate knowledge and skills to train the medical students, their knowledge regarding IYCF was assessed using a questionnaire and after the assessment a session was held to reinforce the guidelines.

A baseline assessment of undergraduates- their knowledge of IYCF, and attitudes towards communication were evaluated utilizing the

validated Communication Skills Attitude Scale (CSAS). (7,8)

The students were then trained by the health workers in IYCF and counselling on the field during their interaction with the families. Live demonstration sessions were conducted in the villages from which the students got real-time, real-life demonstrations of the counselling sessions. The routine family adoption visits happened simultaneously with these sessions.

The anthropometry of eligible children were conducted at baseline and at the end of the study (after 6 months) by the students. The IYCF indicators, knowledge of mothers regarding IYCF, and practices were evaluated at baseline and at the end. IYCF knowledge of students' post-intervention was also evaluated. [Flowchart 1]

Intervention

Training of Medical students on history taking and communication skills was done through interprofessional (IP) team of MSW/ASHA/ANM/AWW-five teams of 30 students, IP team members consisting MSW/HI, ANM, AWW, ASHA each were made. The IP team demonstrated the interpersonal-communication (IPC) technique in the allotted families using verbal and non-verbal techniques with use of standard flip chart to medical undergraduates (9).

Training of students in assessment of nutrition status of children- the IP team taught anthropometric techniques by performing anthropometry and students learnt by observing and then performing independently under supervision (10).

Counselling of mothers by students- students counselled the mothers on IYCF practices under supervision of IP team during FAP visits in the allotted families. After the FAP visit, students were provided with same questionnaire for assessing their IYCF knowledge (11).

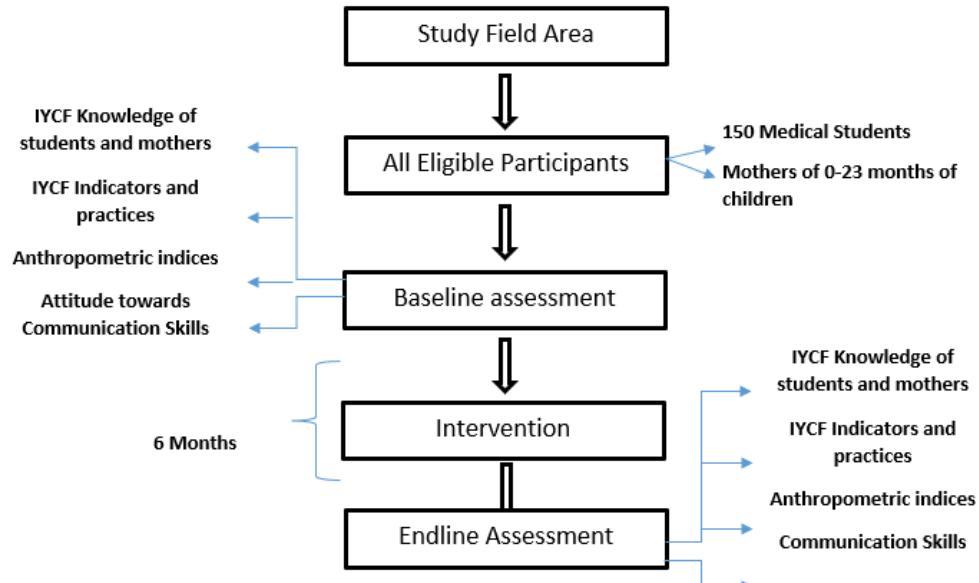
Outcome Measures: The outcomes measured are change in mothers IYCF knowledge, Child feeding practices, anthropometric indices (weight/age, height/age and weight/height) of enrolled children, students IYCF knowledge and their communication skills.

Study Tools: Assessment of mothers' and students' knowledge of IYCF was done through standard FAO questionnaire (12) . Attitude of medical students regarding communication skills was assessed by communication skills attitude scale (CSAS) questionnaire (8) scored using 5 point Likert scale. The Questionnaire for assessing IYCF indicators was based on MICS6 questionnaire and WHO IYCF indicators (9,13). Communication skills of Undergraduates were assessed through Validated checklist for assessing communication skills in

undergraduate medical students using pre-validated scale (14,15). Anthropometric measurements were calculated using WHO (version 2, 2005) Anthro software and macros (16). A ten-

point questionnaire compared the logbook completion of intervention batch with the non-intervention previous batch.

Flowchart 1: Flow chart showing the study plan



Ethical considerations: Approval for the study was obtained from the Institutional ethics committee, JNMCH, Aligarh in December 2023. Written and informed consent was taken from the participants of the study. Sufficient assurance was provided to all the participants of the study regarding confidentiality. During study, if we encountered any sick child then appropriate treatment was given and referral was done where required.

Statistical Analysis: Data was entered in MS Excel (2010) and was imported to IBM SPSS Version 26.0 for analysis. Results are presented with help of tables and figures. Categorical variables are described as frequencies and percentages while continuous data are summarised with mean and standard deviation for normally distributed data and with median and IQR for non-normal distribution. For pre-post comparison of categorical outcomes McNemar test was used. For comparison of pre-post scores, Wilcoxon signed rank test was used.

RESULTS

1. Knowledge of First-Year Medical Students About IYCF

The understanding of first-year medical students regarding breastfeeding and complementary feeding was measured using a 25-question assessment form conducted before and after training by an interprofessional team. The median correct responses increased significantly from 18

(IQR, 13-23) pre-intervention to 23 (IQR, 20-24) post-intervention ($p < .001$; Wilcoxon Signed Rank test). [Figure 1 a]

2. Knowledge of Mothers Regarding IYCF and Its Practices

Mothers' knowledge of Infant and Young Child Feeding (IYCF) practices improved markedly from median score of 6 (IQR, 3-9) pre-intervention to 10 (IQR, 8-12) post-intervention ($p < .001$; Wilcoxon Signed Rank test). [Figure 2 a]

3. Changes in Practices of Mothers After the Intervention

The intervention led to significant improvements in mothers' IYCF practices. The percentage of mothers ensuring adequate meal frequency for their children rose from 72.7% to 87.9% ($p = .028$; McNemar test), while those providing adequate dietary diversity increased from 34.8% to 54.5% ($p = .022$; McNemar test). (Figure 2-b)

4. Nutritional Status of Children

Children aged 6–23 months were evaluated for nutrition

nal status using standard anthropometric measures such as weight-for-age, weight-for-height, and height-for-age. While reductions in underweight, wasting, and stunting prevalence were observed, these changes did not reach statistical significance ($p > .05$; McNemar test). The prevalence of underweight children decreased from 24.2% to 19.7%, and severely underweight cases dropped from 10.6% to 4.5%. Similarly, wasting decreased

from 15.1% to 12.1%, and stunting declined from 31.8% to 22.7%. [Figure 3]

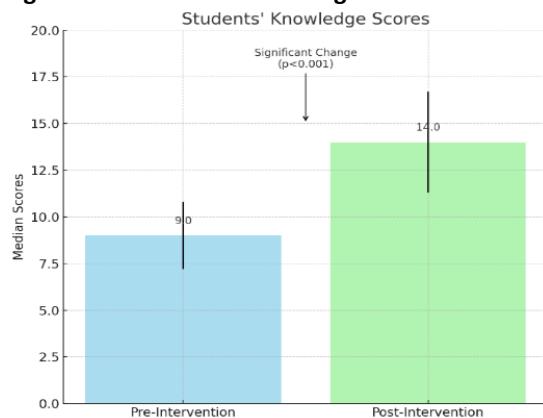
5. Completion of Logbook

The completeness of student logbooks was assessed using a 10-point scale and compared to a senior cohort that did not undergo the intervention. The intervention batch achieved a significantly higher median score of 144.5 (IQR, 137-147) compared to 127 (IQR, 123-136) in the prior cohort ($p = .001$; Wilcoxon Signed Rank test). [Figure 1 b]

6. Evaluation of Communication Skills of Medical Undergraduates

The following radar chart represents the assessment of communication skills in eight domains, where the percentage describes the level of performance. Participants were strong in skills such as Rapport Building, Introduction, and Clarity, close to 90-100%. Their performance was weaker in Empathy and Responsiveness, below 70%, indicating areas of improvement. Scores in the areas of Support and Summarization were moderate, with room for refinement. [Figure 4]

Figure 1 a: Students' Knowledge Score



1 b: Logbook completion scores

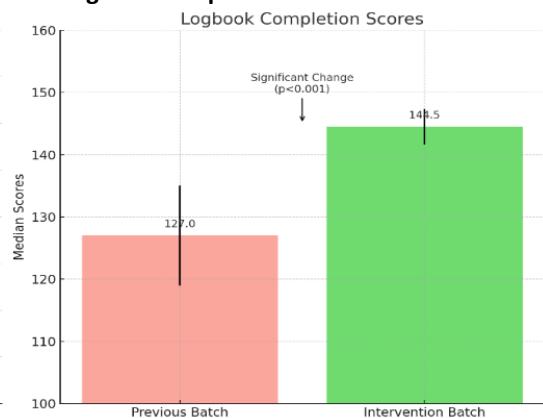
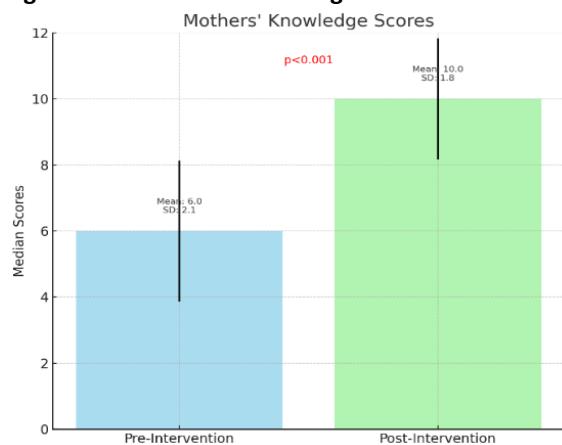


Figure 2 a: Mothers' Knowledge Scores



2b: Mothers' IYCF Practices

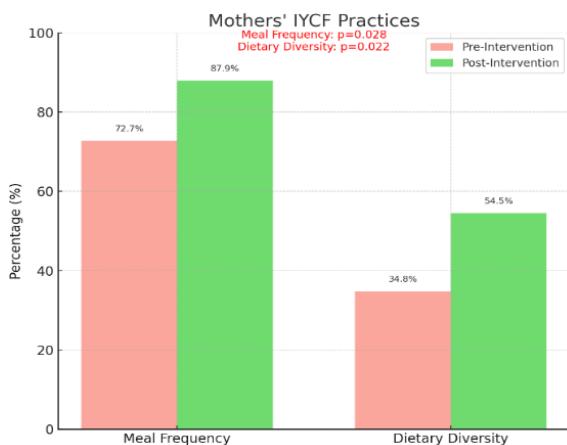


Figure 3: Comparison of pre and post Anthropometric Indices

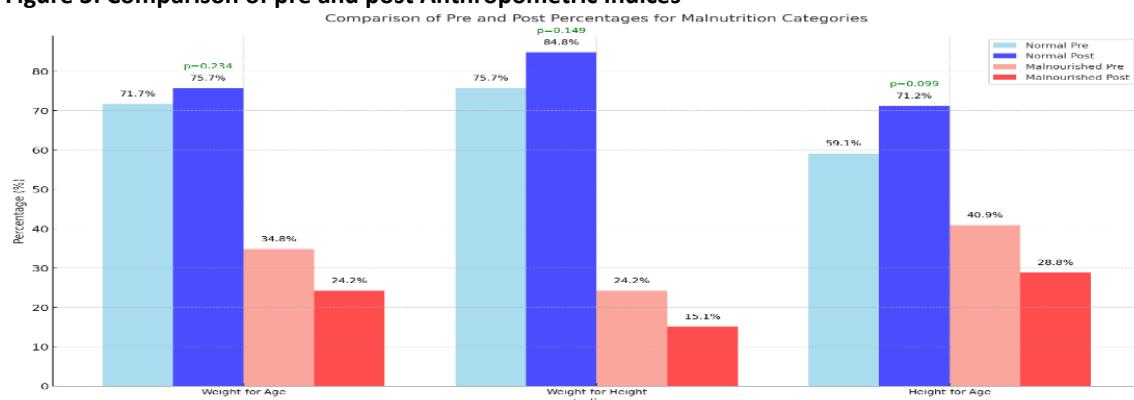
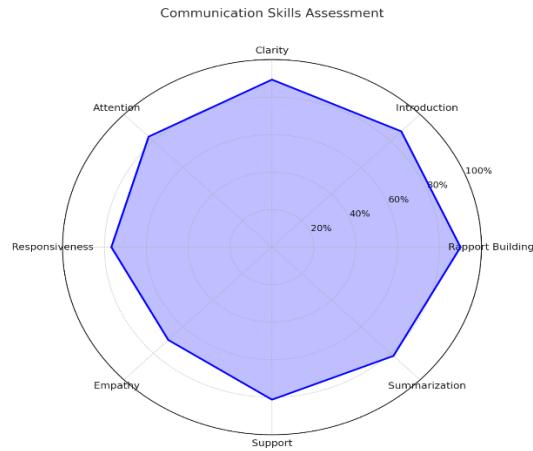


Figure 4: Communication Skills Assessment of Students



DISCUSSION

This study evaluated the impact of a structured, community-based interprofessional education (IPE) programme—delivered through the Family Adoption Programme (FAP)—on first-year medical undergraduates, with the primary focus on infant and young child feeding (IYCF) practices in a rural setting. The results demonstrate significant improvements in students' knowledge, attitudes, and communication skills, as well as notable gains in maternal knowledge and child feeding practices. These findings have important implications for medical education and public health practice in India.

Educational Framework and Theoretical Underpinnings

The implementation of the FAP aligns with contemporary frameworks in experiential and interprofessional medical education. Kolb's experiential learning theory posits that authentic experience, reflection, and active engagement form the foundation for effective learning, a model mirrored in the immersive FAP fieldwork (4,5). By positioning undergraduates in direct community engagement, the programme also draws on social learning theory, enabling students to acquire skills through observation and collaboration with experienced frontline health workers (FLWs) (4,5). Interprofessional collaboration is further supported by the National Medical Commission (NMC) guidelines, which emphasize the necessity for future Indian Medical Graduates to function not just as knowledgeable practitioners but as effective team members and leaders within the healthcare system (3,17,18).

Comparison with Existing Evidence

This study's findings are consistent with prior research demonstrating that community-oriented educational interventions can have measurable

impacts on both learner competencies and community health outcomes (1,2,6). Comparable models in other low- and middle-income countries have linked field-based, interprofessional learning to improved communication, cultural sensitivity, and professional identity among medical students (3,4). Furthermore, the observed improvements in maternal knowledge and feeding practices echo national and global evidence supporting the effectiveness of participatory, contextually relevant IYCF education in reducing knowledge–practice gaps and promoting optimal nutrition in early childhood (6,19,20,21).

Impact on Students and Communities

The marked improvement in students' IYCF knowledge and communication attitudes, as measured by validated tools (8,14,15,22,), highlights the value of IPE strategies that leverage the expertise of FLWs. The significant increase in logbook completeness supports both enhanced engagement and the reflective dimension of field-based learning. Direct supervision by FLWs—who possess established trust and a nuanced understanding of local cultural dynamics—ensured practical skill development in anthropometry, counseling, and data collection. This outcome supports existing literature that positions interprofessional mentorship as a key asset in the informal and formal medical curriculum (4,5).

From the public health perspective, the increase in maternal IYCF knowledge, meal frequency, and dietary diversity underscores the community benefit of integrating student-led counseling under FLW guidance. Such findings reinforce calls to embed medical students more deeply in community health promotion activities, aligning with national strategies for malnutrition reduction (6).

Anthropometric Outcomes and Program Duration

Notably, this study did not find statistically significant changes in anthropometric indices within the follow-up period. While reductions in undernutrition, stunting, and wasting were noted, these did not reach significance—likely owing to the relatively short Six month interval post-intervention and limited sample size (9,21,20). This aligns with existing research which emphasizes that anthropometric gains resulting from improved practices often emerge over longer timeframes, underscoring the need for longitudinal assessment (19,20).

Implementation Considerations and Generalizability

The success of the FAP intervention owes much to institutional support, motivated FLWs, and an established community interface. However,

variability in resource availability, infrastructure, and community receptivity across settings may affect scalability. Previous studies have noted that initial community mistrust and heterogeneity in team engagement can challenge implementation, though these were mitigated in the present study by the involvement of trusted FLWs (5,14,).

Additional potential sources of bias, such as reliance on self-reported logbook data and lack of randomization, must be acknowledged (8,11). While logbook completeness is an encouraging indicator of engagement, the possibility of over-reporting or variable record quality remains. To offset these limitations, future research should incorporate control cohorts, observational assessment, and triangulation with qualitative data such as student reflections and community narratives.

Implications for Curriculum and Policy

Our findings reinforce the merit of embedding community-oriented, interprofessional training within the undergraduate medical curriculum. As per NMC guidance, such methodologies not only build core clinical competence but also promote attitudinal and ethical development, as emphasized by initiatives like the Attitude, Ethics, and Communication (AETCOM) module (3,15). This approach can catalyze both immediate educational gains and longer-term public health benefits.

Recommendations for Future Research

Going forward, multi-institutional, longitudinal studies are needed to assess the sustained impact of IPE models like FAP on both learner outcomes and community health indicators. Incorporating mixed-methods approaches, larger and more diverse cohorts, and standardized evaluation of interprofessional competencies would strengthen the evidence base. These enhancements will help elucidate best practices for adapting and scaling such programmes in varied contexts.

CONCLUSION

In summary, this study contributes evidence that a community-based, interprofessional training programme embedded in the Family Adoption Programme can markedly enhance undergraduate medical education and contribute to improved community health behaviors. While the short-term anthropometric benefits were limited, the clear gains in knowledge, practice, and professional skills argue compellingly for the continued expansion and evaluation of such experiential, community-rooted educational models in India's medical institutions. Moreover, incorporating an interprofessional (IP) team into the FAP aligns with the National Medical Commission's (NMC) vision for the Indian Medical Graduate (IMG) to serve as both a leader and an

effective team member in healthcare settings. This collaborative approach may improve the learning experience of medical students but can also strengthen community health initiatives, creating a foundation for meaningful and lasting impact.

This study sought to explore the impact of training MBBS students in community setting by an interprofessional team (including community health workers) focusing on Infant and Young Child Feeding (IYCF) but also included improvements in child anthropometric indices and students' communication skills.

Anthropometric assessments, while showing improvements, did not reach statistical significance. The reduction in the prevalence of underweight, wasted, and stunted children suggests a positive trend, although these changes were not statistically significant ($P>0.05$). The duration of follow-up was 3 months after intervention which could be less to improve any anthropometric changes. Further research in this area with a larger sample size and longer duration of follow up should be done to evaluate this impact. The study demonstrated significant improvements in the understanding of IYCF practices and communication skills among first-year MBBS students. The intervention led to a marked enhancement in students' knowledge, with the median correct responses on IYCF-related questions increasing from 18 to 23 out of 25, indicating a statistically significant improvement ($p<.001$), the completion of logbook entries by students, an indicator of their engagement and understanding, showed a significant improvement, with the median correct responses rising from 127 in the previous batch to 144.5 in the current intervention batch ($p<.001$). Thus, engagement with IP team also seems to positively influence students' sincerity and interest towards documenting their work in their log book.

The intervention had a positive impact on students' attitudes towards communication skills, with an increase from 86.7% to 98% of students demonstrating a positive attitude post-intervention. Additionally, the field-based training improved students' communication skills across various domains, particularly in rapport building, introduction, and clarity. However, areas such as empathy and responsiveness still show room for improvement. This also suggests that these domains require greater maturity and understanding on part of students, the training for the same needs to be incorporated in their curriculum throughout their MBBS course, an area which is currently being addressed with the introduction of AETCOM module.

The study provides insights into the effectiveness of interprofessional training programs in enhancing medical students' knowledge and skills in IYCF practices and communication. The significant improvements observed in both students' and mothers' knowledge underscore the importance of such community-based training approaches in medical education. The positive trends in meal frequency and dietary diversity highlight the potential for these programs to contribute to better child health outcomes, even though more robust interventions may be needed to achieve statistically significant changes in anthropometric indices.

RECOMMENDATION

This study makes a compelling case for incorporating structured interprofessional training into undergraduate medical education through community engagement programs. The research demonstrates that when medical students are mentored by frontline health workers in real-world community settings, they develop significantly enhanced knowledge and communication skills that are foundational to effective clinical practice. The measurable improvements in students' IYCF knowledge, logbook completion, and communication attitudes, coupled with tangible benefits to community health outcomes such as improved maternal knowledge and child feeding practices, suggest that this model successfully bridges the gap between classroom learning and practical application. This approach may be considered for wider adoption in medical colleges across India, as it not only fulfils the NMC's Family Adoption Programme mandate but transforms it into a robust educational intervention that serves dual purposes: developing competent, community-oriented physicians while simultaneously addressing critical public health challenges like childhood malnutrition.

LIMITATION OF THE STUDY

Despite the overall positive outcomes, few limitations are worth noting. First limitation is the potential variability in the implementation of the intervention across different interprofessional teams, which could affect consistency and generalizability of the results.

While the improvement in students' knowledge and skills was significant, the study did not assess the long-term retention of these skills or the sustained impact of the intervention on the communities involved.

The reliance on self-reported data and logbook entries, while useful for assessing student

engagement, may introduce biases that could affect the accuracy of the reported improvements. The lack of statistical significance in the anthropometric outcomes suggests that the duration or intensity of the intervention may have been insufficient to produce measurable changes in child growth metrics within the study period.

RELEVANCE OF THE STUDY

This study adds important empirical evidence to the growing body of literature on interprofessional education in medical training by demonstrating how frontline health workers can serve as effective mentors in field-based learning environments. While previous research has acknowledged the informal teaching role of nurses and other health professionals, this study uniquely quantifies the impact of a structured, community-based interprofessional collaboration on both learner outcomes and community health indicators in the Indian context. The research fills a critical gap by showing that integrating experiential learning through the FAP with IYCF-focused interventions can produce significant improvements in student competencies and maternal practices within an appropriate timeframe.

AUTHORS CONTRIBUTION

All authors have contributed equally.

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None

CONFLICT OF INTEREST

There are no conflict of Interest.

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DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors haven't used any generative AI/AI assisted technologies in the writing process.

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