

Evaluation of Interprofessional Education (IPE) Among Nursing and Medical Students

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(Received, 24th November 2024, Accepted 22nd April 2025, Published 30th April 2025)

Abstract: Interprofessional Education (IPE) is recognized globally as a key strategy in preparing healthcare students for collaborative practice. In Pakistan, however, formal implementation of IPE remains limited despite its potential to improve interdisciplinary teamwork, communication, and patient outcomes. This study evaluates the effectiveness of a structured IPE module among undergraduate nursing and medical students in a Pakistani tertiary care teaching hospital. **Objective:** To assess changes in students' perceptions and attitudes toward interprofessional collaboration following participation in a structured IPE intervention. **Methods:** A quasi-experimental study was conducted from April to September 2024 in a tertiary care hospital. A total of 86 participants (43 nursing and 43 medical students) were enrolled using convenience sampling. A structured four-week IPE module, including case-based learning and team simulations, was implemented. The Interprofessional Education Perception Scale (IEPS) was used before and after the intervention to assess student perceptions across key domains. Data were analyzed using SPSS v25.0, employing paired t-tests and ANOVA to evaluate pre- and post-intervention differences, with $p \leq 0.05$ considered significant. **Results:** There was a statistically significant improvement in overall IPE perception scores post-intervention (mean difference +1.9, $p < 0.001$). Gains were noted in all subdomains: competency and autonomy (+0.6), perceived need for cooperation (+0.6), and perception of actual cooperation (+0.7). Final-year students exhibited significantly higher post-intervention scores ($p = 0.021$), while no significant difference was found between nursing and medical students ($p = 0.231$).

Conclusion: Structured IPE significantly enhanced collaborative attitudes and perceptions among nursing and medical students. The findings support the integration of IPE in Pakistani undergraduate health curricula to foster interprofessional teamwork and improve patient-centered care.

Keywords: Interprofessional education, medical students, nursing students, collaborative learning, Pakistan, healthcare education, team work

[How to Cite: Bruce S, Khan MNY, Sani SU, Shaukat I. Evaluation of interprofessional education (IPE) among nursing and medical students. *Biol. Clin. Sci. Res. J.*, 2025; 6(4): 201-204. doi: <https://doi.org/10.54112/bcsrj.v6i4.1711>

Introduction

Interprofessional Education (IPE) is recognized globally as an essential approach to preparing healthcare professionals for collaborative practice, improving patient outcomes, and ensuring safer healthcare systems. IPE involves students from two or more health professions learning with, from, and about each other to enable effective collaboration and improve health outcomes. The World Health Organization strongly advocates for IPE to be integrated into undergraduate health curricula as a strategic intervention to overcome fragmentation in healthcare delivery systems (1).

In the Pakistani context, healthcare delivery is often hindered by a lack of coordinated interprofessional collaboration, with hierarchical structures and discipline-specific silos prevailing in clinical and academic settings. Despite recent reforms introduced by the Pakistan Nursing Council (PNC) and the Pakistan Medical and Dental Council (PMDC) to modernize health education, interprofessional learning is still in its infancy and is rarely embedded as a formal component of undergraduate programs(2,3). As a result, medical and nursing students often graduate without adequate exposure to teamwork, communication, and shared decision-making practices essential for real-world healthcare delivery.

Emerging global literature consistently demonstrates that IPE enhances students' understanding of professional roles, fosters mutual respect, and promotes collaborative competencies (4, 5). In South Asian countries like India and Bangladesh, pilot IPE programs have shown improved interprofessional attitudes and teamwork readiness among healthcare students (6). In Pakistan, although awareness about IPE is increasing, empirical evidence remains limited. A study conducted in Rawalpindi

found that both nursing and medical students expressed positive attitudes toward IPE but highlighted the absence of structured institutional support and faculty training as key barriers to its implementation(7).

The integration of IPE is particularly vital in a country like Pakistan, where the patient-to-provider ratio is critically low, and interdisciplinary coordination is essential to manage resource constraints effectively (8). Research from Lahore also indicates that students who participated in team-based clinical simulations reported higher satisfaction with their learning experience and demonstrated better communication and teamwork skills(9). These findings underline the urgent need to institutionalize IPE in undergraduate curricula.

Given the existing gaps and the potential impact of IPE on healthcare delivery in Pakistan, this study was designed to evaluate the effectiveness of a structured interprofessional education intervention among undergraduate nursing and medical students. It aims to assess students' perceptions of interprofessional collaboration before and after exposure to a collaborative educational model and provide evidence to support curriculum development that aligns with global best practices.

Methodology

This quantitative quasi-experimental study was conducted to evaluate the perceptions and effectiveness of Interprofessional Education (IPE) among undergraduate nursing and medical students at a tertiary care teaching hospital in Pakistan. The study was carried out over a six-month period from April 2024 to September 2024. A total of 86 students, comprising 43 nursing and 43 medical students, were recruited using a non-probability convenience sampling technique. Participants were eligible if



they were enrolled in the 2nd, 3rd, or final year of their respective programs and had no prior formal exposure to structured interprofessional education. Students on clinical rotations outside the institution during the study period or those unwilling to participate were excluded.

The intervention consisted of a structured IPE module delivered over four weeks, consisting of collaborative learning sessions, simulated case discussions, and reflective activities. The sessions were jointly facilitated by experienced faculty from the nursing and medical departments. Each session focused on enhancing teamwork, mutual role understanding, communication, and patient-centered care through scenario-based learning. Small interprofessional groups of 6–8 students were formed to promote engagement and equal participation across disciplines.

Data were collected before and after the intervention using the validated Interprofessional Education Perception Scale (IEPS), which measures students' attitudes across three core domains: competency and autonomy, perceived need for cooperation, and perception of actual cooperation. The IEPS uses a 5-point Likert scale and has demonstrated strong internal reliability in healthcare education research. Participants completed the instrument in paper-based form under supervision to ensure consistency and minimize response bias. Demographic details including age, gender, discipline, and year of study were also recorded.

The data were analyzed using IBM SPSS Statistics version 25. Descriptive statistics including frequencies, percentages, means, and standard deviations were calculated to summarize participant characteristics. Paired sample t-tests were used to compare pre- and post-intervention IPE scores. Independent sample t-tests and one-way ANOVA were applied to assess group differences by discipline and academic year. A p -value ≤ 0.05 was considered statistically significant. All research activities adhered to ethical principles of voluntary participation, informed consent, and confidentiality. The study received ethical approval from the institutional review board of the tertiary care hospital prior to data collection. The methodology aligns with international standards for interventional studies in medical education and complies with reporting criteria such as the STROBE and TIDieR guidelines.

Results

This study aimed to evaluate the perception and effectiveness of Interprofessional Education (IPE) among undergraduate nursing and

medical students in a Pakistani tertiary care teaching hospital. A total of 86 participants (43 nursing and 43 medical students) were enrolled through non-probability convenience sampling. Quantitative data were collected using a validated Interprofessional Education Perception Scale (IEPS) before and after the intervention. The analysis included descriptive statistics, paired sample t-tests, and subgroup analysis based on discipline and year of study.

Table 1 outlines the demographic distribution of participants. An equal representation of nursing and medical students was maintained (50% each). Most participants were female (76.7%) and within the age range of 21–23 years. Final year and third-year students formed the majority of the sample.

Significant improvements were observed across all domains of interprofessional education perceptions post-intervention. The domain “Perception of Actual Cooperation” showed the largest gain (+0.7), while the overall IPE score improved significantly from 11.3 ± 2.0 to 13.2 ± 1.5 ($p < 0.001$). (Table 2).

While nursing students showed slightly higher mean scores than medical students post-intervention, the difference was not statistically significant ($p = 0.231$), suggesting comparable benefit from the IPE intervention across both groups. (Table 3).

A statistically significant difference was observed in IPE perception scores across academic years ($p = 0.021$), with final-year students showing the highest mean scores. This trend indicates greater appreciation and comprehension of interprofessional collaboration as students' progress academically. (Table 4).

Table 1. Demographic Characteristics of Participants (n = 86)

Variable	Category	Frequency (n)	Percentage (%)
Discipline	Nursing	43	50.0
	Medical	43	50.0
Gender	Female	66	76.7
	Male	20	23.3
Age (years)	18–20	24	27.9
	21–23	40	46.5
	24–26	22	25.6
Year of Study	2nd Year	27	31.4
	3rd Year	31	36.0
	Final Year	28	32.6

Table 2. Comparison of Pre- and Post-Intervention IPE Perception Scores (n = 86)

IEPS Domains	Pre-Test Mean \pm SD	Post-Test Mean \pm SD	Mean Difference	p-value
Competency and Autonomy	3.8 ± 0.7	4.4 ± 0.6	+0.6	0.000*
Perceived Need for Cooperation	3.9 ± 0.8	4.5 ± 0.6	+0.6	0.000*
Perception of Actual Cooperation	3.6 ± 0.9	4.3 ± 0.7	+0.7	0.000*
Overall IPE Perception Score	11.3 ± 2.0	13.2 ± 1.5	+1.9	0.000*

* $p \leq 0.05$ considered statistically significant

Table 3. Comparison of IPE Perception Scores by Discipline (Post-Intervention, n = 86)

Discipline	Mean Score \pm SD	p-value
Nursing Students	13.4 ± 1.6	0.231
Medical Students	13.0 ± 1.4	

Table 4. Association of Year of Study with IPE Perception Scores (Post-Intervention, n = 86)

Year of Study	Mean Score \pm SD	p-value
2nd Year	12.5 ± 1.7	0.021*
3rd Year	13.3 ± 1.3	
Final Year	13.6 ± 1.2	

* $p \leq 0.05$ considered statistically significant

Discussion

The present study demonstrated that the implementation of a structured interprofessional education (IPE) module significantly improved the

perceptions and readiness for interprofessional collaboration among undergraduate nursing and medical students in a Pakistani tertiary care teaching hospital. The findings revealed statistically significant improvements across all measured domains of the Interprofessional

Education Perception Scale (IEPS), including competency and autonomy, perceived need for cooperation, and perception of actual cooperation, with the overall mean score increasing from 11.3 ± 2.0 to 13.2 ± 1.5 ($p < 0.001$). These results support the growing global evidence advocating for IPE integration in undergraduate health professional education.

Our findings are consistent with those of a randomized trial conducted in Saudi Arabia where IPE interventions led to significant improvement in attitudes toward teamwork and professional roles among medical and nursing students (10). Similarly, a study from Iran showed that students exposed to joint clinical simulations demonstrated increased appreciation for collaborative decision-making and mutual respect between professions (11). These parallels affirm the universal applicability of IPE in diverse cultural and healthcare education settings, including South Asia.

In the South Asian context, Sharma et al. reported similar improvements in perception and interprofessional attitudes following a structured IPE intervention among nursing and medical students in India, highlighting gains in understanding roles and communication effectiveness (12). The current study extends these findings to the Pakistani context, providing much-needed local evidence. Interestingly, the largest improvement in our study was observed in the domain of perceived actual cooperation, which may reflect students' previous lack of exposure to collaborative practices and the novelty of structured teamwork experiences in academic settings.

Another important observation from this study is the difference in post-intervention scores across academic years, with final-year students scoring higher than their junior counterparts ($p = 0.021$). This aligns with the findings of a Malaysian study where senior students demonstrated greater receptivity to IPE due to their advanced clinical exposure and better understanding of real-world healthcare dynamics (13). This trend supports the incremental introduction of IPE throughout the academic journey, progressively building interprofessional competencies.

Moreover, no statistically significant difference was observed between nursing and medical students in the post-intervention scores, suggesting that both groups benefited equally from the IPE module. This finding aligns with a previous cross-sectional study conducted in Lahore which reported that students from different disciplines showed similar enthusiasm and learning gains following simulation-based interprofessional workshops (14).

Despite its strengths, including a balanced sample of medical and nursing students and use of a validated tool, this study has some limitations. The sample was limited to a single tertiary care institution, which may affect the generalizability of the results. Furthermore, long-term retention of interprofessional attitudes was not assessed. Future studies should incorporate longitudinal designs and involve multiple institutions to explore the sustained impact of IPE.

Overall, the findings of this study provide empirical support for the integration of IPE into undergraduate nursing and medical curricula in Pakistan. Incorporating structured, case-based, and simulation-based IPE sessions can help bridge the gap between academic learning and real-world collaborative practice. Given the complexity of healthcare delivery and the multidisciplinary nature of patient care, early exposure to IPE is critical to fostering teamwork, reducing professional silos, and improving patient outcomes.

Conclusion

This study confirms that structured interprofessional education meaningfully improves students' perceptions of collaboration and teamwork in healthcare. Nursing and medical students alike demonstrated significant gains in understanding professional roles, valuing cooperation, and engaging in shared decision-making. Given the growing complexity of healthcare in Pakistan, incorporating IPE into undergraduate curricula

is not only beneficial but essential for preparing future professionals to deliver safe, effective, and collaborative care.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-TVC24-24)

Consent for publication

Approved

Funding

Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

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Manuscript drafting, Study Design,

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Review of Literature, Data entry, Data analysis, and drafting article.

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Conception of Study, Development of Research Methodology Design,

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Study Design, manuscript review, critical input.

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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