

Impact of interprofessional education on enhanced teamwork in ob-gyn emergency: results from a mixed-methods study

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Abstract

Objective: To evaluate the impact of a 6-week interprofessional education programme on the teamwork perceptions of healthcare providers.

Method: The mixed-method, quasi-experimental study was conducted at the Department of Obstetrics and Gynaecology, Jinnah Postgraduate Medical Centre, Karachi, from January to April 2022, and comprised healthcare professionals of either gender. Six interprofessional teaching sessions were conducted with as many diverse groups. The groups comprised obstetrician/gynaecologists, anaesthetists, midwives, operation theatre nurses, anaesthesia technicians, and emergency physicians. Baseline and post-intervention assessment was done using the Teamwork Perception Questionnaire. Qualitative data was collected through in-depths interviews and focussed group discussions. Data was analysed using SPSS 26.

Results: Of the 60 participants, 36(60%) were females and 24(40%) were males. The overall mean age was 35.46±5.93 years. There were 10(20%) subjects in each of the six groups. At baseline, emergency physicians had the highest score 84.00±15.78, while post-intervention, anaesthetists had the highest mean score 178.00±16.26. The highest difference between baseline and post-intervention scores was noted for midwives 136.00±0.12. The difference was significant across all the subscales for operation theatre nurses ($p < 0.05$). In the other five groups, the difference post-intervention was significant for all aspects ($p < 0.05$) except situation monitoring ($p > 0.05$). Qualitative data noted effective communication and good leadership as the most important core components, and highlighted that various factors could fortify interprofessional education implementation.

Conclusion: Interprofessional education and training sessions were found to be well accepted, signifying positive engagements towards teamwork, with the participants exhibiting a good grasp of teamwork skills, including leadership, management and communication, in obstetric crises.

Key Words: Communication, Interprofessional education, Leadership, Teamwork.

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Introduction

Interprofessional education (IPE) is an interactive strategy that the Institute of Medicine recommends be used to transform healthcare students into future members of interprofessional teams.¹ IPE is defined as the learning with, from, and about one another of members or students of two or more professions related to health or social care. To address the interest of a wide range of interprofessional stakeholders in a collaborative model, some credible metrics are required to assess the effectiveness of IPE in actual clinical settings.²

Despite the fact that pregnant and postpartum women's

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urgent care requirements are the focus of only Obstetrics Emergency Departments (OB-EDs), there are so many different types of medical and surgical issues that might arise during pregnancy and after giving birth that Obstetrics and Gynaecology (OB-GYN) specialists cannot provide these treatments on their own.³ It must include a broader spectrum of healthcare professionals, involving not only doctors from different specialties, such as Internal Medicine, General Surgery, Anaesthesia, Infectious Diseases and Psychiatry, but also other health professional cadres from different specialties, such as laboratory technicians, transfusion units, operating theatres (ORs), nursing and midwifery, and biochemical and forensic laboratories.⁴⁻⁶ Obstetric care encompasses not just the expectant mother, but also the neonate and the family as a whole.^{7,8}

Data has demonstrated the effectiveness of interdisciplinary and cross-functional collaboration aiding OB-ED care in healthcare settings.⁹ Healthcare professionals have seen the need for more efficient communication across various levels of care providers.

The current study was planned to evaluate the impact of an IPE programme on the teamwork perceptions of healthcare providers in tertiary care OB-GYN setting.

Subjects and Methods

This mixed-methods, quasi-experimental study was conducted at the OB-GYN department of the Jinnah Postgraduate Medical Centre (JPMC), Karachi, from January to April 2022, after approval from the institutional ethics review board. Those included were healthcare professionals having varying backgrounds, experience levels, genders, age groups and professions to ensure generalisability. Those unwilling to participate were excluded. The sample size was determined based on the selection of 10 participants from each of the 6 professional groups; obstetrician/gynaecologists, anaesthetists, midwives, OT nurses, anaesthesia technicians, and emergency physicians. No statistical method or formula was used for sample size calculation. Instead, the sample size was chosen to represent a range of healthcare professionals while allowing for the evaluation of the study's quantitative aspects. Purposive sampling technique was applied, focussing on selecting participants with diverse backgrounds, experience levels, gender, age groups and professions. The participants were specifically selected for in-depth interviews (IDIs) using purposive sampling technique, and focussed group discussions (FGDs) using simple random sampling, respectively, for qualitative part of the study.

After taking informed consent from the participants, quantitative evaluation was done using the Team Strategies and Tools to Enhance Performance and Patient Safety (T-STEPPS) Teamwork Perception Questionnaire (TTPQ),¹⁰ which was applied at baseline and after the teaching sessions.

For qualitative analysis, a qualitative exploratory design was used to understand participants' values and perceptions of their experience, as well as the development of improved teamwork skills and attitudes following the IPE. All interviews were audio-recorded with the participants' permission, and the transcripts were sent to the interviewees for member-checking to confirm the accuracy of their ideas and responses.

The intervention was based on the T-STEPPS framework,¹⁰ tailored to obstetric emergency settings. It was conducted over six consecutive weeks and comprised both in-person and online synchronous sessions, each lasting approximately 90 minutes. The weekly sessions were designed and delivered by faculty members with expertise in obstetrics, midwifery and emergency medicine, under the supervision of a medical

educationist. In Week 1, the participants were introduced to T-STEPPS principles and the importance of IPE in OB-GYN emergencies. Week 2 focussed on team structure and function, outlining the roles and responsibilities within an emergency healthcare team. Week 3 covered communication strategies, including Situation, Background, Assessment and Recommendation (SBAR) method,¹¹ call-outs, and handoff techniques. In Week 4, leadership and delegation principles in high-pressure clinical settings were discussed. Week 5 addressed situation monitoring, workload redistribution, and mutual support strategies. Finally, in Week 6, the participants engaged in simulation-based role plays involving three obstetric emergency scenarios; postpartum haemorrhage, eclampsia and maternal sepsis. This was followed by structured debriefing and reflective discussions. Each session used interactive discussions, video demonstrations, and real-time role-playing to support active learning, and the participants were provided with feedback and formative assessments at the end of every session. A standardised training manual and facilitator guide were used to ensure fidelity and consistency across the sessions.

The role-play sessions involved baseline and post-intervention assessment for each of the three distinct case scenarios. Each group's evaluation was carried out without participant mixing. Using the TTPQ, three assessors evaluated each group, and each participant and group received an average score derived from the three assessments. As part of the intervention, face-to-face and online T-STEPPS module training sessions were held to enhance attitudes and develop teamwork knowledge and abilities. The training sessions were created by faculty members with expertise in obstetrics, midwifery and emergency. A medical educationist supervised the process. The focus was on collaborative care in OB-ED, and the training sessions targeted team function, communication, leadership, situation monitoring, and mutual support.

In Weeks 5 and 6, FGDs with different professional groups were conducted, along with IDIs with one participant from each group. All the interviews took place either in person or online. Each FGD and interview lasted 25-30 minutes.

Quantitative data was analysed using SPSS 26. Cronbach's alpha value was computed to check inter-consistency of TTPQ. Data normality was checked using Shapiro-Wilk test. Paired sample t-test was applied to compare baseline and post-intervention scores. $P < 0.05$ was taken as significant.

For qualitative part of the data, a manual analysis was conducted to ensure full comprehension and interpretation. To guarantee rigour, two researchers went through transcribed narratives line-by-line, and categorised pertinent statements into codes. Sub-codes were created by further coding the text data under these open codes, and the sub-codes were then compared to one another to create axial codes. The two researchers then collaboratively debated and combined these axial codes to create themes.

Results

Of the 60 participants, 36(60%) were females and 24(40%) were males. The overall mean age was 35.46±5.93 years. There were 32(53.4%) participants aged 25-35 years, and 26(43.3) had clinical experience <5 years (Table 1). There were 10(20%) subjects in each of the six groups.

Table-1: Demographic characteristics (n=60).

Characteristics		Frequency (%)
Gender	Male	24 (40.0)
	Female	36 (60.0)
Age (years)	<25	11 (18.3)
	25-35	32 (53.4)
	>35	17 (28.3)
Years in clinical practice	<5	26 (43.3)
	5-10	18 (30.0)
	>10	16 (26.7)
Sessions attended	≥5	30 (50.0)
	<5	30 (50.0)

The inter-reliability of the questionnaire and its domains was confirmed (Table 2).

Table-2: Inter-reliability of TTPQ and its domains.

TTPQ model	Cronbach's alpha	
	Pre-assessment	Post-assessment
Overall	0.78	0.89
Team function	0.69	0.80
leadership	0.71	0.72
Situation monitoring	0.51	0.51
Mutual support	0.71	0.77
Communication	0.72	0.74

TTPQ: Team Strategies and Tools to Enhance Performance and Patient Safety (T-STEPPS) Teamwork Perception Questionnaire.

At baseline, emergency physicians had the highest score 84.00±15.78, while post-intervention, anaesthetists had the highest mean score 178.00±16.26. The highest difference between baseline and post-intervention scores was noted for midwives 136.00±0.12 (Figure 1). The difference was significant across all the subscales for OT

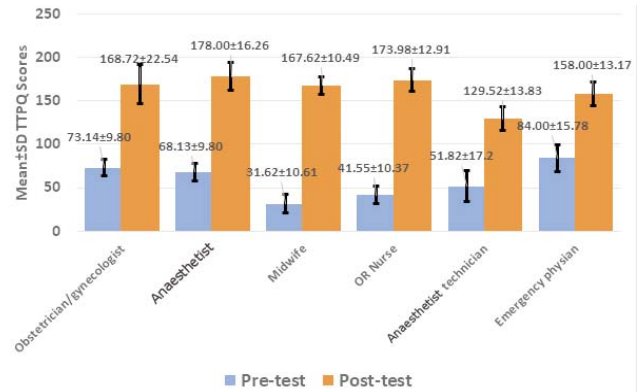


Figure-1: Mean baseline and post-intervention scores among different professions. OR: Operation room.

Table-3: Baseline and post-intervention Assessment.

Profession	TTPQ	Mean±SD scores		p Value
		Pre-test	Post-test	
Obstetrician/gynaecologist	Team function	1.82±0.54	4.82±0.24	<0.001
	Leadership	1.84±0.42	3.85±0.23	<0.001
	Situation monitoring	1.86±0.55	1.98±0.55	0.276
	Mutual support	1.87±0.53	4.66±0.21	<0.001
	Communication	1.75±0.44	4.64±0.22	<0.001
Anaesthetist	Team function	2.14±0.45	4.72±0.20	<0.001
	Leadership	1.90±0.26	4.06±0.13	<0.001
	Situation monitoring	2.12±0.58	2.28±0.53	0.276
	Mutual support	2.05±0.52	4.64±0.24	<0.001
	Communication	1.74±0.14	4.63±0.29	<0.001
Midwife	Team function	1.69±0.49	4.77±0.12	<0.001
	Leadership	1.75±0.34	2.99±0.11	<0.001
	Situation monitoring	1.67±0.42	1.72±0.46	0.174
	Mutual support	1.76±0.50	4.74±0.17	<0.001
	Communication	1.61±0.34	4.85±0.12	<0.001
Operation theatre (OT) nurse	Team function	2.22±0.72	4.80±0.24	<0.001
	Leadership	2.23±0.68	3.33±0.23	<0.001
	Situation monitoring	2.17±0.44	2.44±0.54	0.001
	Mutual support	2.19±0.64	4.76±0.28	<0.001
	Communication	2.05±0.43	4.72±0.16	<0.001
Anaesthesia technician	Team function	1.84±0.58	4.84±0.14	<0.001
	Leadership	1.75±0.34	3.55±0.15	<0.001
	Situation monitoring	1.64±0.32	1.76±0.46	0.124
	Mutual support	1.85±0.27	4.70±0.11	<0.001
	Communication	1.85±0.52	4.84±0.12	<0.001
Emergency physician	Team function	2.04±0.76	4.61±0.27	<0.001
	Leadership	2.03±0.60	2.82±0.12	<0.001
	Situation monitoring	1.99±0.44	1.99±0.50	1
	Mutual support	1.97±0.58	4.74±0.15	<0.001
	Communication	1.93±0.63	4.65±0.10	<0.001

TTPQ: Team Strategies and Tools to Enhance Performance and Patient Safety (T-STEPPS) Teamwork Perception Questionnaire, SD: Standard deviation.



Figure-2: Major themes and codes extracted from qualitative data.

nurses ($p < 0.05$), while in the other five groups, the difference post-intervention was significant for all aspects ($p < 0.05$) except situation monitoring ($p > 0.05$) (Table 3).

Qualitative data led to the generation of five overarching themes (Figure 2). The first theme was Motivated and Empowered. The participants said the scenarios were very similar to their real-life practices, and expressed positive opinions about diversity in the expert teams handling emergency cases.

The second theme was Role Identification. The participants placed a high value on clear and concise descriptions of their responsibilities during simulations. Throughout these sessions, there was a widespread notion that taking responsibility for one's roles and actions would improve the quality of patient care. The participants appreciated structured and effective communication, and were adamant about the fact that even in a clinical setting with relatively few human resources, having a diversified, willing-to-work and suitably qualified team of diversified professionals is adequate to handle the duties at hand.

The third theme was Shared Mindset. The participants

were appreciative of the non-threatening environment in which exchanging of thoughts and emotions was welcomed, and they were of the opinion that assisting team members, particularly those with less experience, can significantly enhance the environment further.

Those fourth theme was Effective Leadership.

The leadership strategies were thought to be prime features for performing successfully. The participants, particularly those in the non-physician groups, emphasised the importance of healthcare leaders' mutual development for enhanced team performance, and saw it as crucial for clinical treatment. The participants also felt strongly about self-awareness as a crucial skill for teamwork, and they stressed its importance for leaders.

The final themes was Collaborative Learning. The participants agreed that improved collective learning arises from a willingness to learn while collaborating. There was a belief that learning occurred more effectively when done in groups, and that each person could benefit from the experiences of the others in the pursuit of improved patient care in a timely manner which is the shared objective.

Discussion

The current demonstrated the feasibility, acceptability and effectiveness of a structured IPE intervention in a resource-limited public-sector tertiary care setting in Pakistan, a country with limited data on team-based training in OB-GYN emergencies. The simulation involving team members with diverse backgrounds enabled a merged thought mechanism to function for better clinical outcomes. Researchers worldwide have gathered data that unambiguously supports the handling of obstetric crises through interprofessional simulation-based training.^{12,13} The cadres of healthcare professionals in the current study reported considerably improved situation monitoring and teamwork after receiving simulation-based strategy education. A major theme that emerged from the qualitative analysis was collaboration towards a shared goal. OB-GYN emergencies might present an ethical dilemma because they are demanding and erratic.¹⁴ Experts demand hasty choices that can be outside the expertise and training of their workers.¹⁵ Data from the developed world has shown challenges in addressing the OB-GYN crisis because of a lack of skilled staff.¹⁶ According to the surveillance body's data regarding obstetric misconduct in one Western institution, 31% of bad incidents were attributed to communication obstacles.¹⁷ The study's qualitative analysis brought these difficulties to light as well. One factor cited as impacting patient care was "ineffective communication". The only things that participants other than doctors indicated were inadequate fundamental understanding of the subject, and insufficient language proficiency in English. This means that effective communication is essential to ensuring that everyone in the team understands the task at hand.^{14,18} Shaw-Battista et al. reported on the benefits of their trainees' use of case-based seminars, virtual learning modules, and practical training workshops to enhance their performance during obstetric crises under astute observation.¹⁹ Avery et al. recently conducted an IPE intervention for OB-GYN residents and midwifery students. The results showed that the participants could collaborate more effectively overall, valued teamwork and team experiences, improved their communication skills, and respected each other's area of practice.¹⁵ The current study's qualitative findings are in line with such findings as the participants had improved TTPQ scores for mutual support, confidence in teamwork, and respect for those in different professions across all the groups.

Although only 50% of the participants attended five or more of the six training sessions, baseline and post-intervention comparisons using the TTPQ were still

conducted for all the enrolled participants to evaluate overall impact. Attendance data was recorded, and subgroup analysis was done to assess differences in score changes based on session exposure. Since each session was designed as a self-contained module with overlapping themes (communication, leadership, mutual support), even participants who attended fewer sessions were still exposed to core principles through simulation role plays and structured debriefings, which reinforced learning across the six weeks. The formative feedback provided at each session helped bridge knowledge gaps for those with partial attendance.

The results of the FGDs demonstrated how IPE interventions inspired and enabled the participants to collaborate with one another using a common perspective on the basis of clearly-defined responsibilities. The coronavirus disease-2019 (COVID-19) pandemic is a prime illustration of the necessity of a multidisciplinary team efforts.²⁰ The findings of the current study are likely to function as a model for fostering an atmosphere of IPE and cooperation in other comparable healthcare environments. It might make healthcare professionals more aware of the requirements and needs of patients with multidisciplinary issues, and extend the scope of their management strategy to cover all medical, psychological, and social facets of patient care.²¹ Despite resource constraints, the adoption of T-STEPPS is feasible in Pakistani healthcare settings due to its low cost and adaptable training structure. It does not require advanced simulation tools, and can be implemented through interactive case discussions, role plays and modular teaching.

The current study has limitations as the relatively short duration and small sample size may have limited the generalisability of the findings. Only 50% of the participants attended five or more training sessions, which could have influenced the consistency of post-intervention outcomes. The study relied on the TTPQ, which captures self-reported perceptions rather than observed behavioural changes. As such, the improved post-test scores do not necessarily confirm actual improvement in collaborative clinical performance. Besides, the study was conducted in a simulated environment, and did not evaluate real-world patient outcomes or team dynamics in clinical settings. Finally, there was no long-term follow-up to assess the retention or application of teamwork skills over time. Despite the limitations, however, the study provides a valuable foundation for further IPE research in resource-limited healthcare settings.

Conclusion

The IPE and training sessions were well-received, indicating positive engagement towards teamwork. The participants reported an improved understanding of teamwork skills across all domains, including leadership, management, and communication, during OB-GYN crises. When implemented correctly and inclusively, medical education can be cost-effective, enjoyable and crucial for improving patient outcomes.

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HY, SM & SMA: Concept, design, data acquisition, analysis,

interpretation, drafting, revision, final approval and agreement to be accountable for all aspects of the work.