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Developing And Implementing The M.O.R.E. Ipe Training: Multidisciplinary Obstetric Fistula Response And Education In Lmics For Optimized Healthcare Delivery

Ambreen Ghori[1*], Shazia Rani[1], Najma Dalwani[2], Darakshan Shaikh[3], Naeema Talpur[2], Sadia Kanwal[4].

[1*]Dept. of Obstetrics & Gynecology, Liaquat University of Medical & Health Sciences
[2]Dept. of Obstetrics & Gynecology, Indus Hospital
[3]Dept. of Obstetrics & Gynecology, PNS Shifa International
[4]Dept. of Obstetrics & Gynecology, Al-Nafees Medical College & Hospital

***Corresponding Author:** Dr. Ambreen Ghori
*Designation: Senior Registrar, Affiliation: Liaquat University of Medical & Health Sciences, Jamshoro,
Email:Drambreenghouri@gmail.com, Contact: +92-336-3035567

ABSTRACT

Background: Obstetric fistula is a severe childbirth injury that disproportionately affects women in Low- and Middle-Income Countries (LMICs). Effective management of this condition requires a multidisciplinary approach, yet healthcare professionals in LMICs often lack the interprofessional education (IPE) necessary to collaborate effectively. The M.O.R.E. (Multidisciplinary Obstetric Fistula Response and Education) IPE Training module was developed to address this gap and optimize healthcare delivery for obstetric fistula patients.

Objective: This study aimed to develop, implement, and evaluate the effectiveness of the M.O.R.E. IPE Training module in improving multidisciplinary collaboration, healthcare delivery, and patient outcomes in the management of obstetric fistulas across three major healthcare institutions in Pakistan.

Methodology: A multi-center, prospective cohort study was conducted from January 2022 to December 2023 at Liaquat University Hospital, Indus Hospital, and Shifa International Hospital. A total of 150 healthcare professionals, including gynecologists, surgeons, nurses, and allied health professionals, participated in the study. The intervention consisted of the M.O.R.E. IPE Training module, which included didactic sessions, simulation-based training, and on-the-job mentorship. Data were collected at baseline, immediately post-training, and six months post-implementation, including assessments of multidisciplinary collaboration, healthcare delivery outcomes, and patient outcomes.

Results: The implementation of the M.O.R.E. IPE Training module resulted in a significant improvement in multidisciplinary collaboration, as evidenced by a 24.4% increase in CPAT scores ($p < 0.001$). Healthcare delivery outcomes also improved, with a significant reduction in surgical complications (14.9% to 7.1%, $p < 0.01$), a decrease in hospital stay duration (10.2 days to 8.1 days, $p < 0.01$), and increased adherence to clinical guidelines (74.4% to 92.1%, $p < 0.001$). Patient outcomes were enhanced, with an increase in successful fistula repairs (82.4% to 91.0%, $p < 0.001$) and a reduction in recurrence rates (12.1% to 6.1%, $p < 0.01$). Stakeholder feedback indicated strong support for the program, with suggestions for integration into existing curricula to ensure sustainability.

Conclusion: The M.O.R.E. IPE Training module significantly improved multidisciplinary collaboration, healthcare delivery, and patient outcomes in the management of obstetric fistulas in Pakistan. These findings support the broader adoption of interprofessional education as a strategy for enhancing the quality of care in LMICs, particularly for complex and stigmatized conditions like obstetric fistulas. Further research is needed to explore the long-term impact and scalability of the M.O.R.E. IPE module in other healthcare settings.

Keywords

- Obstetric Fistula
- Interprofessional Education
- Multidisciplinary Collaboration
- Patient Outcomes
- LMICs
- Healthcare Delivery
- M.O.R.E. IPE Training Module

INTRODUCTION

Obstetric fistula remains one of the most devastating childbirth injuries, disproportionately affecting women in Low- and Middle-Income Countries (LMICs) where access to timely and quality maternal healthcare is often limited. Characterized by

an abnormal connection between the vagina and bladder or rectum, obstetric fistulas are typically caused by prolonged, obstructed labor without adequate medical intervention. The condition not only results in chronic incontinence and severe physical complications but also leads to significant social stigma, isolation, and psychological trauma for the affected women. [1]

Despite global efforts to eradicate obstetric fistula, it continues to be a significant public health issue in many LMICs, where healthcare systems often struggle with resource constraints, a shortage of skilled healthcare providers, and inadequate infrastructure. [2] Addressing the complex needs of fistula patients requires a multidisciplinary approach, involving gynecologists, surgeons, urologists, nurses, and other healthcare professionals working collaboratively to provide comprehensive care, from prevention and timely surgical repair to rehabilitation and reintegration into society. [3] However, the complexity of managing obstetric fistulas is exacerbated by the fragmented nature of care delivery in LMICs, where professionals from different specialties often work in silos, leading to gaps in communication and coordination that can negatively impact patient outcomes. [4]

Interprofessional Education (IPE) has emerged as a crucial strategy for enhancing the collaboration and communication skills of healthcare providers, enabling them to work effectively in multidisciplinary teams. [5] By training professionals from various disciplines together, IPE fosters a deeper understanding of each other's roles and responsibilities, ultimately leading to more coordinated and patient-centered care. [6] The World Health Organization (WHO) and other global health bodies have recognized the importance of IPE in improving healthcare delivery, particularly in resource-limited settings where the efficient use of limited resources is paramount. [7] However, the implementation of IPE in LMICs, particularly in the context of obstetric fistula management, has been limited, with few structured programs designed to address the unique challenges faced in these settings. [8, 9]

The M.O.R.E. (Multidisciplinary Obstetric Fistula Response and Education) IPE Training module was developed to fill this gap, aiming to optimize healthcare delivery for obstetric fistula patients in LMICs. This innovative training program is designed to equip healthcare providers with the knowledge, skills, and collaborative competencies necessary to effectively manage obstetric fistulas, even in resource-limited environments. The M.O.R.E. IPE module focuses not only on clinical skills but also on enhancing the teamwork and communication needed to provide holistic care, including psychosocial support and community reintegration for affected women. By focusing on both clinical and non-clinical aspects of care, the M.O.R.E. IPE module seeks to improve patient outcomes while ensuring efficient use of available resources.

This study aims to develop, implement, and evaluate the M.O.R.E. IPE Training module in selected LMIC settings, with a focus on its impact on healthcare delivery and patient outcomes. The research will explore the effectiveness of this training in enhancing multidisciplinary collaboration, reducing the incidence of complications, and improving the quality of life for women affected by obstetric fistula. Additionally, the study will assess the feasibility of scaling the M.O.R.E. IPE module across different healthcare settings in LMICs, with the goal of establishing a sustainable model for obstetric fistula care.

OBJECTIVE

The primary objective of this study is to develop, implement, and evaluate the M.O.R.E. (Multidisciplinary Obstetric Fistula Response and Education) IPE Training module in selected Low- and Middle-Income Countries (LMICs). The study aims to achieve the following specific objectives:

1. **Enhance Multidisciplinary Collaboration**: To improve collaboration and communication among healthcare professionals from different disciplines, including gynecology, surgery, urology, nursing, and social work, in the management of obstetric fistulas.
2. **Optimize Healthcare Delivery**: To assess the effectiveness of the M.O.R.E. IPE module in optimizing healthcare delivery for obstetric fistula patients by reducing the incidence of surgical complications, improving patient outcomes, and ensuring efficient use of limited healthcare resources.
3. **Improve Patient Outcomes**: To evaluate the impact of the M.O.R.E. IPE training on patient outcomes, including the rate of successful fistula repairs, reduction in fistula recurrence, and enhancement of psychosocial well-being and quality of life for women affected by obstetric fistulas.
4. **Assess Scalability and Sustainability**: To determine the feasibility of scaling the M.O.R.E. IPE Training module across various healthcare settings in LMICs and to explore strategies for ensuring the sustainability of the training program within different healthcare infrastructures.
5. **Contribute to Global Health Goals**: To contribute to the broader global health objectives of improving maternal health, reducing obstetric fistula prevalence, and supporting the achievement of Sustainable Development Goals (SDGs) related to health and gender equality in LMICs.

METHODOLOGY

Study Design: This study employed a multi-center, prospective cohort design to develop, implement, and evaluate the M.O.R.E. (Multidisciplinary Obstetric Fistula Response and Education) IPE Training module. The study was conducted from January 2022 to December 2023 across three major healthcare institutions in Pakistan: Liaquat University Hospital (Hyderabad), Indus Hospital (Karachi), and Shifa International Hospital (Islamabad). These institutions were selected to

represent diverse healthcare settings within Low- and Middle-Income Countries (LMICs), allowing for a comprehensive assessment of the training module's effectiveness and scalability.

Study Population: The study targeted healthcare professionals from various disciplines involved in the management of obstetric fistulas, including gynecologists, surgeons, urologists, nurses, social workers, and allied health professionals. Participants were selected based on the following inclusion criteria:

- Active involvement in the care of obstetric fistula patients within the participating institutions.
- Willingness to participate in the M.O.R.E. IPE Training module and related study activities.
- At least two years of professional experience in their respective fields.

Exclusion criteria included healthcare professionals not directly involved in obstetric fistula management or those unable to commit to the full duration of the training program and study follow-up.

Sample Size: A total of 150 healthcare professionals were recruited for the study, with 50 participants from each of the three participating institutions. This sample size was determined to provide sufficient statistical power to detect significant changes in multidisciplinary collaboration, healthcare delivery outcomes, and patient outcomes across the different settings.

Intervention: The intervention consisted of the implementation of the M.O.R.E. IPE Training module, a structured program designed to enhance multidisciplinary collaboration in the management of obstetric fistulas. The training module included:

- **Didactic Sessions**: Covering key clinical and non-clinical aspects of obstetric fistula care, including surgical techniques, post-operative care, psychosocial support, and community reintegration.
- **Simulation-Based Training**: Utilizing high-fidelity simulators and case-based scenarios to practice multidisciplinary teamwork and communication in a controlled environment.
- **Workshops and Group Discussions**: Facilitated sessions aimed at fostering interprofessional understanding and collaboration, with a focus on role clarification, effective communication, and coordinated care planning.
- **On-the-Job Training**: Participants applied the skills learned during the didactic and simulation sessions in their respective clinical settings, with ongoing mentorship and feedback from experienced facilitators.

The training module was delivered over a six-month period, with participants receiving continuous support and feedback to reinforce learning and promote the integration of new skills into their clinical practice.

Data Collection: Data were collected at multiple time points: baseline (before the implementation of the training module), immediately after the completion of the training, and six months post-implementation. The following data were collected:

- **Multidisciplinary Collaboration**: Assessed using the Collaborative Practice Assessment Tool (CPAT), which measures perceptions of teamwork, communication, and role understanding among healthcare professionals.
- **Healthcare Delivery Outcomes**: Metrics included the incidence of surgical complications, duration of hospital stay, and adherence to clinical guidelines in the management of obstetric fistulas.
- **Patient Outcomes**: Evaluated through clinical indicators such as the success rate of fistula repairs, recurrence rates, and patient-reported outcomes related to quality of life and psychosocial well-being, measured using validated instruments such as the WHOQOL-BREF.
- **Feasibility and Sustainability**: Assessed through qualitative interviews with key stakeholders, including hospital administrators, training facilitators, and participants, to explore the perceived benefits, challenges, and potential for scaling the M.O.R.E. IPE Training module.

Statistical Analysis: Statistical analyses were conducted using SPSS software (version 25.0). Descriptive statistics were used to summarize participant demographics and baseline characteristics. Paired t-tests and chi-square tests were employed to compare pre- and post-intervention scores on the CPAT and patient outcome measures. Multivariate regression analyses were conducted to control for potential confounding variables, such as participant experience level and institutional differences.

The feasibility and sustainability of the M.O.R.E. IPE Training module were analyzed using thematic analysis of qualitative data from stakeholder interviews. The findings were used to identify key factors influencing the successful implementation and potential scalability of the training program.

Ethical Considerations: Written informed consent was obtained from all participants prior to enrollment. Participants were informed of their right to withdraw from the study at any time without any impact on their professional responsibilities or standing. Confidentiality of all personal and professional information was maintained throughout the study.

RESULTS

Participant Demographics and Baseline Characteristics: A total of 150 healthcare professionals were enrolled in the study, with 50 participants each from Liaquat University Hospital (LUH), Indus Hospital, and Shifa International Hospital. The participants included a mix of gynecologists, surgeons, urologists, nurses, and allied health professionals. The majority of participants had over five years of experience in their respective fields, with a mean professional experience of 7.8 years (SD = 3.2 years). Baseline assessments showed no significant differences in the demographic characteristics or prior exposure to interprofessional education (IPE) among participants across the three centers (Table 1).

Table 1: Baseline Characteristics of Study Participants

Characteristic	LUH (n=50)	Indus Hospital (n=50)	Shifa International (n=50)	p-value
Mean Age (years)	34.2 ± 5.1	33.8 ± 5.4	34.0 ± 5.2	0.88
Female Participants (%)	62%	64%	60%	0.82
Mean Experience (years)	7.6 ± 3.3	8.0 ± 3.1	7.8 ± 3.2	0.75
Prior IPE Training (%)	18%	20%	22%	0.67

Impact on Multidisciplinary Collaboration: The implementation of the M.O.R.E. IPE Training module resulted in significant improvements in multidisciplinary collaboration across all three participating institutions. Scores on the Collaborative Practice Assessment Tool (CPAT) increased significantly from baseline to post-training assessments, indicating enhanced perceptions of teamwork, communication, and role understanding among participants (Table 2). The mean CPAT score increased by 24% (from 68.4 to 85.1) across the three centers, with no significant differences in the degree of improvement between the institutions ($p > 0.05$).

Table 2: CPAT Scores Before and After M.O.R.E. IPE Training

CPAT Score	LUH (n=50)	Indus Hospital (n=50)	Shifa International (n=50)	Overall (n=150)
Baseline (Mean ± SD)	67.8 ± 7.5	69.2 ± 7.1	68.2 ± 7.3	68.4 ± 7.3
Post-Training (Mean ± SD)	84.6 ± 6.8	85.9 ± 7.2	84.8 ± 7.0	85.1 ± 7.0
Percentage Increase (%)	24.8%	24.1%	24.3%	24.4%
p-value	<0.001	<0.001	<0.001	<0.001

Healthcare Delivery Outcomes: The enhanced multidisciplinary collaboration observed following the M.O.R.E. IPE Training was associated with significant improvements in healthcare delivery outcomes. The incidence of surgical complications related to obstetric fistula repairs decreased significantly in the post-training period across all three institutions ($p < 0.01$). The average duration of hospital stay for fistula patients was also reduced, from a mean of 10.2 days pre-training to 8.1 days post-training ($p < 0.01$). Adherence to clinical guidelines for obstetric fistula management improved significantly, with the percentage of cases managed according to protocol increasing from 74% to 92% ($p < 0.001$) (Table 3).

Table 3: Healthcare Delivery Outcomes Before and After M.O.R.E. IPE Training

Outcome	LUH (n=50)	Indus Hospital (n=50)	Shifa International (n=50)	Overall (n=150)
Surgical Complications (%)	15.2%	14.6%	15.0%	14.9%
Post-Training Complications (%)	7.8%	6.4%	7.2%	7.1%
p-value	0.01	0.003	0.005	<0.01
Mean Hospital Stay (days)	10.1 ± 2.5	10.3 ± 2.7	10.2 ± 2.6	10.2 ± 2.6
Post-Training Hospital Stay (days)	8.2 ± 1.9	8.0 ± 2.0	8.1 ± 1.9	8.1 ± 1.9
p-value	0.02	0.01	0.01	<0.01
Adherence to Clinical Guidelines	73.8%	75.2%	74.2%	74.4%
Post-Training Adherence (%)	91.4%	93.2%	91.6%	92.1%
p-value	<0.001	<0.001	<0.001	<0.001

Patient Outcomes: The improvements in multidisciplinary collaboration and healthcare delivery were reflected in positive patient outcomes. The rate of successful fistula repairs increased significantly, with the overall success rate rising from 82% pre-training to 91% post-training ($p < 0.001$). The recurrence rate of obstetric fistulas decreased from 12% to 6% ($p < 0.01$), indicating better long-term outcomes for patients. Additionally, patient-reported outcomes related to quality of life, measured using the WHOQOL-BREF, showed significant improvements in physical, psychological, and social domains post-training (Table 4).

Table 4: Patient Outcomes Before and After M.O.R.E. IPE Training

Outcome	LUH (n=50)	Indus Hospital (n=50)	Shifa International (n=50)	Overall (n=150)
Successful Repairs (%)	81.8%	83.4%	82.0%	82.4%
Post-Training Success (%)	91.2%	90.8%	91.0%	91.0%
p-value	<0.001	<0.001	<0.001	<0.001
Recurrence Rate (%)	12.4%	11.8%	12.0%	12.1%
Post-Training Recurrence (%)	6.4%	5.8%	6.2%	6.1%
p-value	0.01	0.005	0.008	<0.01

WHOQOL-BREF Physical Domain	58.2 ± 8.5	59.4 ± 8.7	58.8 ± 8.6	58.8 ± 8.6
Post-Training Physical Domain	68.4 ± 7.2	69.0 ± 7.0	68.6 ± 7.1	68.7 ± 7.1
p-value	<0.01	<0.01	<0.01	<0.01
WHOQOL-BREF Psychological Domain (Mean)	57.6 ± 7.8	58.2 ± 8.0	58.0 ± 7.9	57.9 ± 7.9
Post-Training Psychological Domain (Mean)	67.8 ± 7.0	68.6 ± 6.9	68.4 ± 6.8	68.2 ± 6.9
p-value	<0.01	<0.01	<0.01	<0.01

Feasibility and Sustainability: Qualitative interviews with key stakeholders revealed strong support for the M.O.R.E. IPE Training module, with participants citing improved teamwork, enhanced patient care, and increased job satisfaction as key benefits. Hospital administrators at all three institutions expressed a willingness to continue and expand the program, noting its alignment with broader goals of improving maternal health outcomes in LMICs. However, challenges related to resource constraints, particularly in maintaining high-fidelity simulation training, were identified as potential barriers to long-term sustainability. Stakeholders recommended the integration of the M.O.R.E. IPE module into existing training programs and curricula to ensure its ongoing impact.

The M.O.R.E. IPE Training module significantly improved multidisciplinary collaboration, healthcare delivery, and patient outcomes across the three participating institutions. The program was well-received by healthcare professionals and stakeholders, with strong potential for scaling and sustainability in other LMIC settings. The findings suggest that the M.O.R.E. IPE Training module could serve as a model for enhancing the management of obstetric fistulas and other complex healthcare issues in resource-limited environments.

DISCUSSION

The results of this multi-center study demonstrate the significant impact of the M.O.R.E. (Multidisciplinary Obstetric Fistula Response and Education) IPE Training module on improving multidisciplinary collaboration, healthcare delivery, and patient outcomes in the management of obstetric fistulas across three major healthcare institutions in Pakistan. These findings underscore the critical importance of interprofessional education in enhancing the quality of care in Low- and Middle-Income Countries (LMICs), particularly for complex medical conditions such as obstetric fistulas.

The significant improvement in CPAT scores across all three centers following the implementation of the M.O.R.E. IPE Training module highlights the effectiveness of interprofessional education in fostering better teamwork and communication among healthcare professionals. Prior research has shown that multidisciplinary collaboration is essential for the successful management of obstetric fistulas, as it requires coordinated efforts from gynecologists, surgeons, nurses, and social workers to address the multifaceted needs of patients. [10] The improvement in collaboration observed in this study aligns with previous findings, which suggest that IPE can break down professional silos and improve role clarity, leading to more integrated and patient-centered care. [11]

The reduction in surgical complications and hospital stay duration observed in this study suggests that the M.O.R.E. IPE Training module not only improved collaboration but also translated into tangible improvements in healthcare delivery. These findings are consistent with other studies that have demonstrated the positive impact of IPE on clinical outcomes, particularly in surgical and high-risk settings. [12] The increased adherence to clinical guidelines further underscores the value of standardized training programs in ensuring that all team members are aligned with best practices, which is particularly important in resource-constrained settings where deviations from protocol can have serious consequences. [13]

The significant increase in successful fistula repairs and the reduction in recurrence rates provide strong evidence of the clinical effectiveness of the M.O.R.E. IPE Training module. These improvements in patient outcomes are particularly noteworthy given the challenging nature of obstetric fistula repair, which requires specialized surgical skills and postoperative care. [14] The enhancement of patient-reported outcomes related to quality of life further supports the holistic approach of the M.O.R.E. IPE module, which emphasizes not only the physical repair of the fistula but also the psychosocial and emotional well-being of the patient. [15] This comprehensive approach is critical in LMICs, where the social stigma associated with obstetric fistulas can have a profound impact on a woman's quality of life. [16]

The positive feedback from stakeholders and the willingness of hospital administrators to continue and expand the M.O.R.E. IPE Training module suggest that the program is both feasible and sustainable in LMIC settings. However, the challenges related to resource constraints, particularly in maintaining high-fidelity simulation training, should not be overlooked. Previous studies have highlighted the importance of adapting IPE programs to local contexts, ensuring that they are not only effective but also scalable and sustainable in resource-limited environments. [17] The recommendation to integrate the M.O.R.E. IPE module into existing training programs and curricula aligns with best practices for scaling up successful interventions in LMICs. [18]

The findings of this study have important implications for both clinical practice and healthcare policy in LMICs. The demonstrated effectiveness of the M.O.R.E. IPE Training module suggests that similar interprofessional education programs

could be implemented in other healthcare settings to improve the management of complex conditions like obstetric fistulas. Policymakers should consider incorporating IPE into national health strategies, particularly in countries with high rates of maternal morbidity and mortality. Additionally, the study highlights the need for ongoing investment in training and capacity-building initiatives to ensure that healthcare professionals are equipped with the skills and knowledge necessary to provide high-quality care. **[19]**

CONCLUSION

In conclusion, the M.O.R.E. IPE Training module significantly improved multidisciplinary collaboration, healthcare delivery, and patient outcomes in the management of obstetric fistulas across three major healthcare institutions in Pakistan. The program's success underscores the critical role of interprofessional education in enhancing the quality of care in LMICs, particularly for complex and stigmatized conditions like obstetric fistulas. Further research is needed to explore the long-term impact of the M.O.R.E. IPE module and to assess its scalability in other healthcare settings. However, the findings of this study provide strong evidence to support the broader adoption of IPE as a key strategy for improving maternal health outcomes in resource-limited environments.

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