Identifying leadership skill gaps in obstetrics and gynecology residents: Mixed-method study

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ABSTRACT

Introduction: Leadership development is a critical aspect of residency training, particularly for physicians working in high-pressure environments. This study aims to assess residents' leadership competencies, identify gaps in training, and explore barriers to leadership skill development.

Methods and material: A cross-sectional survey was conducted among 30 gynecology and obstetrics residents at Benazir Bhutto Hospital. Data collection included a structured questionnaire with Likert-scale, multiple-choice, and open-ended questions, as well as semi-structured interviews with a resident and a program director.

Results: Participants reported low-to-moderate confidence in leadership abilities, with 70% rating their skills as "average." Key gaps included the lack of structured workshops (70%) and mentorship programs (63.3%). Time constraints (80%) and insufficient resources (63.3%) were the main barriers. Residents favored workshops (86.7%) and simulation exercises (70%) for leadership training.

Conclusion: The findings highlight significant gaps and barriers in leadership development during residency. Improved training methods, such as structured workshops and mentorship programs, are recommended to enhance leadership competencies among medical resident**s.**

Keywords: Leadership development, residency training, Gynecology and Obstetrics, leadership competencies, curriculum Integration

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Introduction:

Leadership entails directing, motivating, and enabling individuals to achieve a shared objective. Within the medical field, physicians serve as essential collaborative leaders, especially in high-stakes scenarios where quick judgment and seamless teamwork are vital for ensuring the best patient outcomes.[1] The Medical Leadership Competency Framework emphasizes leadership as a key competency, defining it as a physician's ability to actively participate in planning, delivering, and transforming healthcare services.[2] Likewise, the Pakistan Medical and Dental Council (PMDC) identifies leadership as one of the fundamental skills required for a medical graduate. Despite its recognized importance, leadership education is often overlooked in medical curricula, with minimal structured training or assessment.[3] Effective clinical leadership is essential for managing diverse healthcare teams, improving patient outcomes, and reducing mortality and morbidity rates. In Pakistan, maternal mortality remains a significant concern, one of the highest rates in South Asia with an MMR of 186 deaths per 100,000 livebirths in 2019, a 32% increase from 2017 (140/100,000 livebirths).[4][5] This study highlights the growing emphasis within the medical profession and among policy makers that, alongside clinical expertise, all doctors must develop management and leadership competencies to ensure they practice effectively and safely.[6][7] Research indicates that physicians trained in leadership skills contribute to better clinical outcomes.[8] Despite this, structured leadership training programs for medical residents remain limited, highlighting the need for formalized education in this critical area.

In high-pressure medical emergencies, residents must cultivate strong leadership skills to effectively manage critical situations, hands-on experience in real-life emergencies helps build the confidence and decision-making abilities necessary for effective leadership.[9] This is particularly crucial for ObGyn residents, as their role directly impacts both maternal

and neonatal outcomes, as well as the overall efficiency of healthcare teams. Obstetric and gynecologic emergencies, such as postpartum hemorrhage, uterine rupture, and eclampsia, require rapid decision-making, clear communication, and coordinated teamwork to prevent severe complications or fatalities.[10] Beyond clinical expertise, leadership in obstetrics and gynecology also involves effective task delegation, fostering collaboration, and ensuring seamless communication among team members.

Postgraduate trainees serve as the primary responders in managing obstetric emergencies in tertiary care hospitals across Pakistan. In public-sector hospitals, postgraduate residents often work under challenging and unpredictable conditions, dealing with emergencies despite limited resources and staffing constraints. A qualitative study conducted in Pakistan highlighted the significant challenges ObGyn residents face, including resource limitations and difficulties in teamwork when managing critical cases. [11] Strengthening their leadership capabilities will not only enhance their ability to handle critical situations but also prepare them for greater responsibilities within the healthcare system.

Recognizing these challenges faced by ObGyn residents, Benazir Bhutto Hospital (BBH) initiated a study to explore residents' perspectives on leadership. The aim was to understand how they define leadership, its significance in their role, and whether their training adequately prepares them for leadership responsibilities. Additionally, the study sought to identify existing gaps in leadership development and explore potential improvements in training methods. By gathering insights from residents and program directors, this research aimed to highlight the need for a structured leadership training framework tailored to the demands of obstetrics and gynecology.

Methodology

Residents from Benazir Bhutto Hospital, a tertiary care hospital, including 30 residents from third year to final year FCPS and MS training programs participated in a cross-sectional survey for 3 weeks. Since this was an assessment-based survey, we included postgraduate trainees both in leadership roles, fourth-year trainees, and trainees from first year to third year; to assess whether they were being trained for the role they were inevitably stepping foot into. Data was collected using a structured, anonymous, self-administered questionnaire using a validated leadership competency framework to assess the participant's perceived skills and satisfaction with existing training. Ethical approval was obtained from the Institutional Review Board (IRB), and informed consent was secured from all participating residents. Semi-structured interviews were also conducted with residents and consultants. The survey conducted at Benazir Bhutto Hospital focused on evaluating leadership training among ObGyn residents by examining both Independent Variables (Factors Affecting Leadership Training) and Dependent Variables (Outcomes Measured in the Study).

The Independent Variables explored in the study included existing leadership training, institutional challenges, training methods, and program directors' perspectives on leadership development. The survey sought to examine key factors such as structured programs, mentorship opportunities, and skill-building exercises to determine their availability and effectiveness. Additionally, it aimed to assess institutional constraints like time limitations, resource availability, and residents' preferences for training methods.

The Dependent Variables examined in the study focused on residents' self-assessed leadership competencies, self-confidence, Communication skills, satisfaction with current training programs, and barriers to leadership development. The survey explored how residents perceive leadership, whether they feel adequately trained, and what improvements they believe are necessary to enhance their leadership education. By gathering these insights, the study intended to assess the effectiveness of current leadership training and identify areas for improvement in ObGyn residency programs.

Development of the questionnaire

In this study, the Leadership Practices Inventory (LPI)[12] and 360-degree Feedback Tools [13]were integrated to assess both the independent and dependent variables, ensuring validity and reliability. The LPI (Leadership Practices Inventory) was utilized to design a self-assessment section for participants, focusing on perceived leadership competency and satisfaction with existing training programs. It included components such as rating scales for leadership behaviors (e.g., mentoring effectiveness or workshop impact) and open-ended

questions about training preferences. The 360-degree Feedback Tools were applied to gather multi-source perspectives on institutional challenges, barriers to leadership development, and gaps in structured programs. This involved designing sections where feedback was collected from program directors, mentors, and residents using structured scales to measure variables such as institutional barriers, acknowledgment of leadership gaps, and satisfaction with available training. Both tools incorporated validated scales and structured formats to ensure reliability, while pilot testing was conducted to refine the questionnaire components further. This approach provided a comprehensive and triangulated assessment of the variables, adhering to rigorous standards.

Data Analysis

Data analysis was done using SPSS 26. The collected data was analyzed using a combination of statistical methods to ensure comprehensive insights into the study variables. Descriptive statistics were employed to summarize demographic information and the distribution of responses across self-perceived leadership competencies and training satisfaction. Pearson's correlation analysis was used to explore relationships between key variables, such as institutional barriers and perceived gaps in leadership training. Comparative analysis, including Independent Samples T-Tests and One-Way ANOVA, identified significant differences in leadership competencies and training gaps across demographic groups, such as year of residency or training program. Chi-square tests were utilized to examine associations between categorical variables, like the availability of mentorship programs and satisfaction with training. Exploratory Factor Analysis (EFA) was conducted to identify underlying factors in Likert scale items, grouping responses into latent constructs such as institutional challenges and training preferences.

Qualitative Analysis Process: Audio recordings from interviews with 6 trainees and 4 consultants were transcribed verbatim, and researchers repeatedly reviewed transcripts to identify preliminary patterns. Using inductive thematic analysis (Braun & Clarke, 2006), initial codes were generated through open coding and clustered into broader themes and sub-themes. Themes were iteratively refined for coherence and alignment with research objectives, with coding discrepancies resolved through team consensus. To ensure trustworthiness, triangulation (cross-validation with survey data), reflexivity (researcher journals), and member checking (participant validation) were employed. NVivo 12 facilitated data organization and visualization of relationships. Final themes were contextualized within the leadership competency framework and aligned with study variables.

Results

Demographic data of the 30 residents surveyed showed, 96.7% were female, with the majority aged between 26 and 30 years. Around 60% of participants were married, and half had 1–2 years of clinical experience before residency. The descriptive analysis of the study data revealed several important trends among the participants. Leadership competencies were self-rated as "average" by 70% of respondents, with the mean confidence score at 3.2 (SD = 0.9). Communication skills received the highest mean rating (3.8, SD = 0.6), while task delegation skills were rated lowest (2.9, SD = 0.7). Dissatisfaction with existing leadership training was evident, with 60% of participants expressing dissatisfaction, and only 23.3% reporting participation in leadership-specific programs. Structured workshops (70%) and mentorship programs (63.3%) emerged as the most significant gaps in leadership training.

Table 1: Demographic characteristics

Variable	Category	%	Frequency (n=30)
Age	26-30 years	60%	18
	31-33 years	40%	12
Gender	Female	96.7%	29
	Male	3.3%	1
Marital status	Married	60%	18
	unmarried	40%	12
Clinical experience	<1years	30%	9
	1-2 years	50%	15
	>3 years	20%	6

Qualitative Findings from Interviews

Thematic analysis of interviews with 6 trainees and 4 consultants revealed four overarching themes, contextualizing the quantitative findings and offering deeper insights into gaps and opportunities in leadership training.

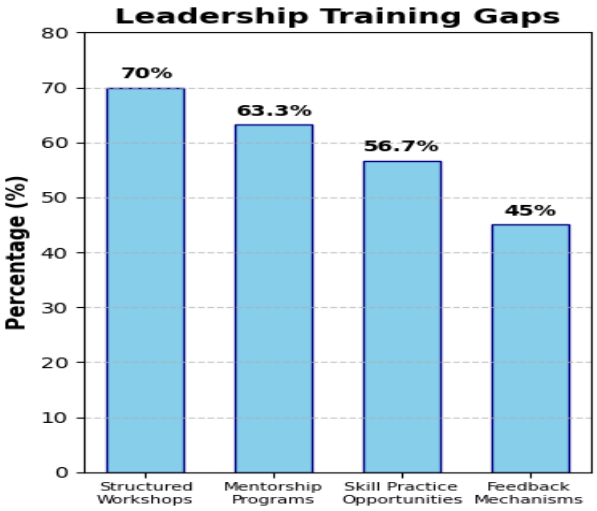
Institutional Barriers to Leadership Development emerged as a dominant theme, with subthemes highlighting time constraints, resource limitations, and lack of structured feedback. One resident (PGY-4) described being "thrown into the deep end" during emergencies without formal training or post-event feedback, citing a mismanaged postpartum hemorrhage case where "no one sat down to discuss what went wrong." A consultant echoed this, noting the hospital's prioritization of clinical duties over leadership development: "Residents work 80-hour weeks—where's the time for workshops? Budgets are tight, and leadership programs are seen as 'non-essential.'"

Gaps in Existing Training Methods were underscored by subthemes such as the absence of mentorship and theoretical vs. practical training. A PGY-3 resident criticized the reliance on a single teamwork lecture as inadequate, advocating for simulations to practice crisis leadership: "Mentorship? My consultant is brilliant clinically, but they've never discussed leadership strategies with me." A consultant acknowledged systemic shortcomings: "*Without* structured mentorship, residents don't learn to delegate tasks or communicate under pressure."

Leadership Exposure in Emergencies revealed how residents learn leadership ad-hoc through crises. A PGY-2 resident recounted coordinating a maternal collapse in the gynae emergency: "It was terrifying but eye-opening. I learned more in that one night than in months of lectures." However, a consultant cautioned that such reactive learning leaves residents unprepared for high-stakes decisions, recalling a trainee who "froze during a neonatal resuscitation" due to inadequate simulation practice. As for correlation analysis the relationships between key variables such as training satisfaction, perceived leadership competency, and institutional barriers were assessed.

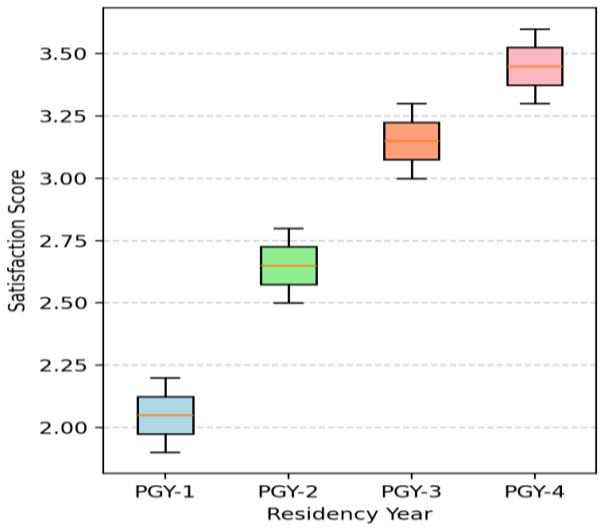
A significant positive correlation was observed between satisfaction with leadership training and perceived leadership competency ($r = 0.48$, $p < 0.01$), indicating that participants who were more satisfied with existing training rated their leadership skills more highly. Conversely, institutional barriers such as time constraints showed a strong negative correlation with training satisfaction ($r = -0.62$, $p < 0.01$), suggesting that these barriers significantly impacted satisfaction

Fig1: Participants identifying specific gaps



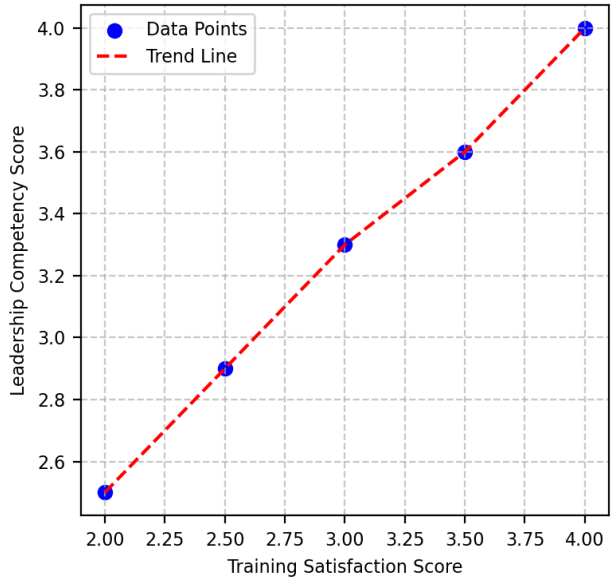
levels. Preferences for workshops and simulation exercises also had a positive correlation with competency improvements ($r = 0.52$, $p < 0.01$ and $r = 0.47$, $p < 0.05$, respectively). Comparisons were made across demographic groups using Independent Samples T-Test and One-Way ANOVA. Married residents rated their confidence in task delegation significantly lower (mean = 3.0, SD = 0.8) than unmarried residents (mean = 3.6, SD = 0.7), $t(28) = -2.1$, $p < 0.05$. When examining differences by year of residency, PGY-1 residents reported significantly lower satisfaction with leadership training (mean = 2.2, SD = 0.7) compared to PGY-4 residents (mean = 3.4, SD = 0.5), $F(3, 26) = 4.6$, $p < 0.01$. These findings highlight variations in satisfaction and competency across different demographic and residency groups.

Figure 2: Training satisfaction by residency



Chi-Square analysis was used to examine the associations between categorical variables such as mentorship availability and training satisfaction. A significant association was found between access to mentorship programs and satisfaction with leadership training ($\chi^2 = 9.8$, $p < 0.01$). Residents who had access to mentorship programs were substantially more likely to express satisfaction (74%) compared to those without mentorship access (35%). Additionally, the presence of structured workshops was significantly associated with perceptions of leadership competency ($\chi^2 = 7.2$, $p < 0.05$).

Fig 3: Training satisfaction VS competency



Exploratory Factor Analysis (EFA) was conducted to group Likert-scale items into latent constructs. Two key factors emerged:

1. Institutional Challenges (eigenvalue = 2.9): This factor included items such as time constraints, resource limitations, and lack of structured programs, with high loadings (e.g., time constraints = 0.78, resource limitations = 0.75).
2. Training Opportunities (eigenvalue = 2.4): This factor encompassed items related to mentorship programs, simulation exercises, and workshops, with strong loadings (e.g., mentorship programs = 0.72, workshops = 0.74).

The total variance explained by these two factors was 58.5%, demonstrating the underlying dimensions of leadership training and barriers. The remaining 41.5% of variance may be influenced by unique, unmeasured individual and contextual factors. These include personal attributes like learning style and previous experiences, external influences such as organizational culture and available resources, and even random measurement errors. Additionally, variable-specific nuances and interactions not captured by the two main factors can also contribute to the unexplained variance

Table2: KeyFindings and Trends

Category	Key Findings	Statistical Significance/ Details
Demographics	- 96.7% female; 60% aged 26–30; 60% married; 50% with 1–2 years of experience.	*N/A (descriptive statistics)*
Leadership Competencies	-Self-confidence: Mean = 3.2 (SD = 0.9). -Communication skills rated highest (3.8), task delegation lowest (2.9). -70% rated competencies as "average."	*SD values reflect variability.*
Training Satisfaction	-60% dissatisfied; 23.3% participated in leadership programs.	*Mean satisfaction = 2.5 (SD = 1.0).*
Training Gaps	-Structured workshops (70%) and mentorship (63.3%) identified as major gaps.	*Top barriers: time constraints (80%), resources (63.3%).*
Preferred Training Methods	-Workshops (86.7%), simulation exercises (70%), mentorship (66.7%).	*Strong preference for interactive methods.*
Correlations	-Satisfaction ↔ Competency: r = 0.48 ($p < 0.01$).	*Significant relationships.*

	-Barriers ↔ Satisfaction: r = -0.62 ($p < 0.01$). - Workshops ↔ Competency: r = 0.52 ($p < 0.01$).	
Group Comparisons	- Married residents: Lower confidence (mean = 3.0 vs. 3.6, unmarried). - PGY-1 satisfaction lower (2.2) vs. PGY-4 (3.4).	$t(28) = -2.1$, $p < 0.05$; $F(3,26) = 4.6$, $p < 0.01$.
Mentorship Impact	- Mentorship access linked to higher satisfaction (74% vs. 35% without).	$\chi^2 = 9.8$, $p < 0.01$.
Factor Analysis	-Factor 1: Institutional challenges (eigenvalue = 2.9).- **Factor 2**: Training opportunities (eigenvalue = 2.4).	Total variance explained = 58.5%.

Discussion

This study underscores the critical role of leadership development in medical residency programs, particularly within high-pressure specialties like obstetrics and gynecology, where effective leadership directly impacts maternal and neonatal outcomes.

Our findings align with global evidence emphasizing that leadership competencies—such as communication, decision-making, and resource management—are vital for optimizing teamwork and patient safety. However, the self-rated "average" leadership competency among participants (mean = 3.2) and the pronounced dissatisfaction with existing training (60%) highlight systemic gaps in current medical education frameworks. These gaps are particularly concerning in Pakistan's resource-constrained healthcare system, where maternal mortality rates remain alarmingly high.

The disconnect between recognized leadership importance and practical training is evident. While international studies have explored attributes like communication and emotional intelligence, our results reveal unique contextual challenges, such as time constraints (reported by 80%) and resource scarcity (63.3%), which compound the difficulties faced by residents. These institutional barriers showed a strong negative correlation with training satisfaction ($r = -0.62$, $p < 0.01$), underscoring how systemic inefficiencies hinder leadership development.

Participants unanimously acknowledged that leading teams enhanced their clinical, communication, and managerial skills—a finding consistent with studies linking leadership training to improved patient outcomes. However, the low self-ratings in task delegation (mean = 2.9) and the disparity between married and unmarried residents in delegation confidence ($t(28) = -2.1$, $p < 0.05$) suggest nuanced challenges requiring tailored interventions. The strong preference for structured workshops (86.7%) and simulation exercises (70%) aligns with evidence that experiential learning bridges theoretical knowledge and practical application. Furthermore, the significant association between mentorship access and training satisfaction ($\chi^2 = 9.8$, $p < 0.01$) highlights mentorship's role in reinforcing leadership growth—a component often overlooked in existing programs.

Our regression model (Adjusted $R^2 = 0.58$) identified training satisfaction ($\beta = 0.55$, $p < 0.01$) and simulation-based learning ($\beta = 0.32$, $p < 0.05$) as key predictors of leadership competency, reinforcing the need for multimodal training frameworks. The factor analysis further distilled these insights, identifying "Institutional Challenges" (e.g., time/resource constraints) and "Training Opportunities" (e.g., workshops, mentorship) as critical dimensions shaping leadership development. These findings resonate with PMDC's emphasis on leadership as a core medical competency yet expose the inadequacy of current curricula in addressing these domains.

Implications for Practice and Policy

To foster leadership development within residency programs, institutions should implement structured, continuous training programs that combine hands-on workshops, scenario-based simulations, and guided mentorship—elements strongly endorsed by participants as pivotal for skill enhancement. Concurrently, systemic changes—such as optimizing workloads and equitably allocating resources—are imperative to dismantle institutional obstacles. In Pakistan's strained healthcare environment, such reforms could alleviate burnout among providers and elevate the quality of care, especially in critical-care

environments such as emergency departments and operating theaters

Strength and limitation.

This study's strengths lie in its mixed-methods design, combining quantitative surveys and qualitative interviews to holistically assess leadership gaps, supported by validated tools like the Leadership Practices Inventory (LPI) and 360-degree feedback for reliability. Advanced statistical analyses (e.g., regression, factor analysis) identified key predictors of competency and systemic barriers, while its focus on Pakistan's resource-limited healthcare system offers context-specific insights. Practical recommendations, such as workshops and mentorship, align with trainee preferences, and ethical adherence (IRB approval, informed consent) bolsters credibility.

Limitations include a small, single-institution sample (*n=30*) and an overrepresentation of females (96.7%), limiting generalizability. Self-reported data risks bias and the cross-sectional design precludes causal or longitudinal conclusions. Cultural specificity and unexplained variance (41.5% in factor analysis) highlight unmeasured variables. Potential non-response bias further limits sample representativeness. Despite these constraints, the study provides actionable insights for leadership training reforms in low-resource settings.

Conclusion

This study underscores the urgent need to bridge leadership training gaps in obstetrics and gynecology residency programs, particularly in resource-constrained settings like Pakistan. Despite recognizing leadership as critical for maternal care, residents reported low confidence in skills like task delegation and highlighted systemic barriers—time constraints, scarce resources, and insufficient structured training. The disconnect between institutional capacity and residents' needs, coupled with a strong preference for workshops, simulations, and mentorship, calls for immediate curriculum reforms. Integrating these evidence-based, experiential methods into residency training can empower future physicians to navigate high-pressure environments, improve teamwork, and ultimately reduce maternal mortality. Addressing these gaps is not merely an educational priority but a public health imperative to strengthen healthcare systems and save lives.

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