



Perceived Educational Discrimination among Emergency Medical Services Students in Southeastern Iran: A Multicenter Cross-Sectional Study

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Abstract

Background: Educational discrimination and structural inequities in clinical learning environments may hinder EMS students' training, professional identity, and preparedness for practice. This study assessed perceived educational discrimination and associated factors, focusing on gender disparities and access to clinical settings.

Materials and Methods: In this descriptive–analytical cross-sectional study, 217 EMS students from Mashhad University of Medical Sciences and Kerman University of Medical Sciences completed a structured questionnaire (range 7–35; midpoint 21) assessing perceived educational discrimination, developed from prior qualitative work and literature review. Content validity was high (CVI = 0.94) and reliability acceptable (Cronbach's $\alpha = 0.85$). Data were analyzed with descriptive statistics, t-tests, and effect sizes.

Results: A total of 217 EMS students participated (mean age 22.3 ± 2.8 years; 73.7% male). The mean perceived educational discrimination score was 27.03 ± 3.96 (95% CI: 26.50–27.56), above the theoretical midpoint. Item-level analysis showed consistently high scores across domains, with the highest means for unequal access to training facilities (4.60 ± 0.69), limited access to clinical environments (4.55 ± 0.81), and inappropriate interactions with clinical staff (4.54 ± 0.81). Female students reported significantly higher discrimination than males (28.65 ± 2.47 vs. 26.46 ± 4.20 ; $t = 3.96$, $p < 0.001$; Cohen's $d = 0.57$). No significant differences were observed by marital status, academic degree, or university type (all $p > 0.05$).

Conclusion: EMS students report high perceived educational discrimination, particularly in access to clinical training and staff interactions. Female students are disproportionately affected. Interventions to ensure equitable clinical access, improve staff–student interactions, and strengthen institutional safeguards are recommended.

Key Words: Clinical education, Educational discrimination, Emergency Medical Services students, Learning environment, Iran.

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1- INTRODUCTION

The clinical learning environment (CLE) is a key determinant of professional identity formation and clinical competence in Emergency Medical Services (EMS) education. An effective CLE should ensure equitable access to diverse clinical experiences; however, structural inequities and perceived educational discrimination can undermine learning outcomes and preparedness for practice (1, 2). In health professions education, discrimination—ranging from unequal resource allocation to interpersonal mistreatment—is increasingly recognized as a significant threat to student well-being and a contributor to burnout and disengagement (1, 3).

Obstetric and gynecological emergencies are among the most critical and time-sensitive situations encountered in prehospital care, requiring rapid assessment and intervention. Conditions such as eclampsia, placental abruption, and postpartum hemorrhage remain leading causes of maternal morbidity and mortality worldwide (4, 5). As frontline responders, EMS personnel must be adequately trained to manage such emergencies; however, evidence suggests that EMS education programs often provide inconsistent exposure to maternity-related clinical settings, particularly in labor and delivery units (6, 7).

In sociocultural contexts such as Iran, where the EMS workforce is predominantly male, gender-related norms and institutional policies may restrict access to female-specific clinical environments. These constraints can limit students' hands-on experience in obstetric care and create unequal learning opportunities (8, 9). Qualitative evidence from Iran indicates that such limitations contribute to reduced confidence and preparedness among EMS personnel when managing prehospital childbirth and related emergencies (10, 11).

Moreover, discrimination in clinical training is frequently embedded within the hidden curriculum, whereby unequal opportunities, feedback, and support are distributed along gender or social lines (1, 12). Although prior studies in Iran have explored general aspects of the educational environment and theory–practice gaps, there is limited quantitative evidence specifically examining perceived educational discrimination among EMS students and its implications for training quality (10, 13).

Addressing these perceptions is essential to foster an inclusive educational environment and ensure EMS students have equitable opportunities to develop competencies for prehospital practice. This multicenter study sampled undergraduate EMS students from Kerman University of Medical Sciences, Islamic Azad University (Kerman branch), Mashhad University of Medical Sciences, and Islamic Azad University (Mashhad branch) to capture a diverse cohort. It examined perceived educational discrimination and related training challenges, with a particular focus on structural barriers that may restrict access to clinical learning opportunities.

2- MATERIALS AND METHODS

2-1. Study Design and Setting

This multicenter analytical cross-sectional study was conducted during the 2025–2026 academic year among undergraduate Emergency Medical Services (EMS) students. Data were collected at four institutions: Kerman University of Medical Sciences and Islamic Azad University (Kerman branch) in Kerman, Kerman Province (southeastern Iran), and Mashhad University of Medical Sciences and Islamic Azad University (Mashhad branch) in Mashhad, Razavi Khorasan Province (northeastern Iran). The study was designed and reported in accordance with the STROBE (Strengthening the Reporting

of Observational Studies in Epidemiology) statement (14).

2-2. Participants and Sampling Strategy

The target population comprised undergraduate EMS students enrolled at the participating universities. Participants were recruited by convenience sampling through the EMS departments of each institution.

The minimum sample size was estimated using Cochran's formula:

$$n = \frac{Z^2 \cdot p(1 - p)}{d^2}$$

Assuming a conservative response distribution ($p=0.50$), a 95% confidence level ($Z=1.96$), and a margin of error ($d=0.07$), the minimum required sample size was 196. To account for a possible 10% non-response rate, 230 questionnaires were distributed. Of these, 217 were fully completed and included in the analysis, corresponding to a response rate of 94.3%. Cochran's formula is widely used in survey-based research to determine minimum sample size under specified precision assumptions (15).

Inclusion criteria were active enrollment in an associate or bachelor's degree EMS program and completion of at least one clinical rotation or clerkship. Exclusion criteria were refusal to participate, transfer enrollment from another medical discipline, and return of questionnaires with more than 10% missing critical data.

2-3. Instrument

Data were collected using a self-administered questionnaire with two sections. The first section assessed socio-demographic characteristics, including age, gender, marital status, academic degree, and university type. The second section included a 6-item Perceived Educational Discrimination Scale developed from the literature on discrimination in educational and clinical

settings and adapted from prior measures of perceived discrimination in healthcare environments (16, 17).

Each item was rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Total scores ranged from 6 to 30, with a theoretical midpoint of 18. Higher scores indicated a greater perception of educational discrimination.

2-4. Instrument Development and Psychometrics

Item generation was informed by themes identified in a preliminary qualitative study exploring clinical learning challenges among Iranian EMS students, including structural discrimination, limited access to clinical learning opportunities, and suboptimal interactions with clinical staff.

Content validity was assessed by a panel of 10 experts in medical education, emergency medicine, and bioethics. The Content Validity Ratio (CVR) was calculated using Lawshe's method (18), and items with CVR values below 0.62 were revised or removed. The Content Validity Index (CVI) was evaluated for simplicity, clarity, and relevance using the Waltz and Bausell criteria (19). Item-level CVIs exceeded 0.79, and the scale-level CVI (S-CVI/Ave) was 0.94, indicating excellent content validity.

Face validity was examined qualitatively through cognitive interviews with 10 EMS students and quantitatively using item impact scores; all retained items exceeded the acceptable threshold of 1.5. Internal consistency was assessed in a pilot study of 30 EMS students, who were excluded from the final analysis. The scale demonstrated high reliability, with a Cronbach's alpha of 0.85.

2-5. Data Collection

Data were collected in classroom settings by trained researchers. To minimize social desirability bias, the questionnaires were

completed anonymously and deposited in sealed collection boxes. Before administration, the purpose of the study was explained to participants, and they were assured that participation was voluntary and would not affect their academic evaluation.

2-6. Ethical Considerations

The study adhered to the ethical principles of the Declaration of Helsinki (20). Ethical approval was obtained from the Ethics Committee of Kerman University of Medical Sciences (Ethics Code: IR.KMU.REC.1405.051). All eligible participants received a written information sheet describing the study objectives, voluntary participation, the right to withdraw at any time without penalty, and the measures taken to protect data security. Written informed consent was obtained before questionnaire distribution. To preserve anonymity and confidentiality, no personally identifiable information, including names, student identification numbers, or contact details, was collected. Questionnaires were assigned unique alphanumeric codes for data management. Hard-copy forms were stored in a locked cabinet accessible only to the principal investigator, and electronic data were encrypted and stored on password-protected secure servers. The study received no institutional funding, and no conflicts of interest influenced the design, conduct, or reporting of the study.

2-7. Statistical Analysis

Data were analyzed using IBM SPSS Statistics for Windows, version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were assessed for normality using the Kolmogorov–Smirnov and Shapiro–Wilk tests and are reported as mean $\pm$ standard deviation (SD) when normally distributed. Categorical variables are presented as frequencies and percentages.

Independent-samples t-tests were used to compare mean perceived discrimination scores between dichotomous groups such as gender and university type. For statistically significant comparisons, effect sizes were calculated using Cohen's *d* to estimate the magnitude of between-group differences (21). A *p*-value of less than 0.05 was considered statistically significant.

3- RESULTS

3-1. Participant Characteristics

A total of 217 Emergency Medical Services (EMS) students participated in the study. Most participants were male (73.7%), single (81.1%), enrolled in bachelor's degree programs (83.4%), and studying at public universities (85.7%). The mean age of the participants was 22.32 ± 2.84 years (**Table 1**).

Table-1: Demographic characteristics of EMS students (n = 217).

Variables	Category	n (%)
Gender	Male	160 (73.7)
	Female	57 (26.3)
Marital status	Single	176 (81.1)
	Married	41 (18.9)

Variables	Category	n (%)
Academic degree	Bachelor's degree	181 (83.4)
	Associate degree	36 (16.6)
University type	Public	186 (85.7)
	Private	31 (14.3)

Note. n = Number of participants.

3-2. Descriptive Statistics of Perceived Educational Discrimination

The perceived educational discrimination scale comprised six items rated on a 5-point Likert scale, yielding total scores ranging from 6 to 30. The theoretical midpoint of the scale was 18, with higher scores indicating greater perceived

educational discrimination. The mean total score was 27.03 ± 3.96 (95% CI: 26.50–27.56), which was well above the midpoint and indicated a high level of perceived discrimination among EMS students. The mean item score was 4.51 ± 0.66 (**Table 2**).

Table-2: Descriptive statistics of age and perceived educational discrimination scores among Emergency Medical Services (EMS) students (n = 217).

Variables	Possible range	Theoretical midpoint	Mean $\pm$ SD	95% CI
Age (years)	—	—	22.32 ± 2.84	—
Total perceived educational discrimination score	6–30	18	27.03 ± 3.96	26.50–27.56
Average item score	1–5	3	4.51 ± 0.66	—

Note. EMS = Emergency Medical Services; SD = Standard deviation; CI = Confidence interval.

3-3. Item-Level Analysis of Perceived Educational Discrimination

Item-level analysis demonstrated consistently high levels of agreement across all six items. The highest mean score was observed for unequal access to training facilities across regions (4.60 ± 0.69), followed by insufficient access to clinical environments tailored to educational needs (4.55 ± 0.81) and inappropriate interactions with clinical staff negatively affecting educational

experiences (4.54 ± 0.81). The lowest mean score, although still high, was observed for perceived discrimination compared with students in other academic disciplines (4.38 ± 0.95). The proportion of participants who selected “agree” or “strongly agree” exceeded 80% for all items, ranging from 83.9% to 91.7%, indicating a pervasive perception of educational discrimination across structural and interpersonal domains (**Table 3**).

Table-3: Item-level responses to the perceived educational discrimination scale among EMS students (n = 217).

Item	Strongly disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly agree n (%)	Agree/Strongly agree n (%)	Mean $\pm$ SD
Insufficient access to clinical environments tailored to educational needs	3 (1.4)	4 (1.8)	15 (6.9)	43 (19.8)	152 (70.0)	195 (89.8)	4.55 $\pm$ 0.81
Lack of appropriate educational/recreational amenities in hospitals	0 (0.0)	4 (1.8)	24 (11.1)	47 (21.7)	142 (65.4)	189 (87.1)	4.51 $\pm$ 0.76
Perceived discrimination compared with students in other disciplines	4 (1.8)	8 (3.7)	23 (10.6)	49 (22.6)	133 (61.3)	182 (83.9)	4.38 $\pm$ 0.95
Insufficient attention to the EMS discipline causing reduced academic motivation	1 (0.5)	7 (3.2)	20 (9.2)	53 (24.4)	136 (62.7)	189 (87.1)	4.46 $\pm$ 0.82
Unequal access to training facilities across regions causing discrimination	0 (0.0)	4 (1.8)	14 (6.5)	46 (21.2)	153 (70.5)	199 (91.7)	4.60 $\pm$ 0.69
Inappropriate interactions with clinical staff negatively affecting training/educational experiences	1 (0.5)	7 (3.2)	17 (7.8)	41 (18.9)	151 (69.6)	192 (88.5)	4.54 $\pm$ 0.81

Note. EMS = Emergency Medical Services; SD = Standard deviation.

3-4. Comparison of Perceived Educational Discrimination across Demographic Groups

Perceived educational discrimination differed significantly by gender. Female students reported higher mean scores than male students (28.65 ± 2.47 vs. 26.46 ± 4.20), with a mean difference of 2.19 (95%

CI: 1.27 to 3.11; $t = -4.43$; $p < 0.001$). The effect size was moderate (Cohen's $d = 0.57$). No significant differences were observed according to marital status ($p = 0.843$; Cohen's $d = 0.03$), university type ($p = 0.151$; Cohen's $d = 0.31$), or academic degree ($p = 0.218$; Cohen's $d = 0.23$) (**Table 4**).

Table-4: Comparison of total perceived educational discrimination scores across demographic groups among EMS students (n = 217).

Variables	Category	n	Mean $\pm$ SD	Mean difference	95% CI of difference	t	P-value	Cohen's <i>d</i>
Gender	Male	160	26.46 $\pm$ 4.20	—	—	-4.43	<0.001	0.57
	Female	57	28.65 $\pm$ 2.47	2.19	1.27 to 3.11			
Marital status	Single	176	27.06 $\pm$ 3.89	—	—	0.20	0.843	0.03
	Married	41	26.93 $\pm$ 4.18	0.13	-1.21 to 1.47			
University type	Public	186	27.23 $\pm$ 3.77	—	—	-1.44	0.151	0.31
	Private	31	25.90 $\pm$ 4.77	1.33	-0.52 to 3.18			
Academic degree	Bachelor's	181	26.89 $\pm$ 3.99	—	—	1.24	0.218	0.23
	Associate	36	27.78 $\pm$ 3.66	0.89	-0.55 to 2.33			

Note. SD = Standard deviation; CI = Confidence interval; t = t-test statistic; n = Number of participants; EMS = Emergency Medical Services.

4- DISCUSSION

This study explored perceived educational discrimination among EMS students and identified notable inequities in access to clinical training opportunities, particularly in obstetric care. Our findings revealed that female students reported significantly higher perceived discrimination scores than their male counterparts (28.65 $\pm$ 2.47 vs. 26.46 $\pm$ 4.20). The magnitude of this difference was moderate (Cohen's *d* = 0.57), suggesting a robust gender-based disparity within the clinical learning environment. These results are consistent with recent global evidence indicating that gender remains a primary axis of discrimination in medical education, often undermining the professional identity of female trainees (22, 23).

While female students reported higher overall discrimination, male students more frequently highlighted limited access to obstetric units, reflecting a distinct pattern of inequity shaped by sociocultural norms

and structural constraints within Iranian EMS education (8, 10, 11). This finding is particularly important because Iranian prehospital providers may be required to manage high-risk obstetric emergencies despite reported gaps in formal education and practical preparation for childbirth care (6, 10). Our findings are also consistent with evidence from Iranian healthcare and maternity settings indicating that gender-related sociocultural norms can complicate cross-gender care and limit male learners' participation in maternity wards (9, 24). In EMS education, such restrictions may contribute to a competency gap by reducing male students' opportunities to acquire supervised, hands-on experience in essential obstetric skills (10, 25).

The high levels of perceived discrimination among female students ($p < 0.001$) reflect broader challenges observed in healthcare education. Consistent with the "hidden curriculum" theory, discriminatory encounters and perceived mistreatment can lead to a breakdown of

the supportive social environment required for safe and effective learning (22, 26, 27). Our results demonstrate that Iranian EMS students experience similar patterns, often exacerbated by the male-dominated nature of the prehospital profession (13, 22).

Furthermore, participants highlighted inconsistent mentorship and limited supervision during clinical rotations. These findings resonate with international evidence suggesting that paramedic trainees worldwide face barriers to high-quality clinical placements, including restricted engagement in real-life emergencies and suboptimal feedback mechanisms (7, 28). Reluctance to report such mistreatment—often due to fear of academic repercussions or hierarchical constraints—further perpetuates this culture of silence (12, 29).

Addressing these disparities requires structural and educational reforms. Implementing standardized clinical rotations, ensuring equitable access to obstetric procedures regardless of student gender, and utilizing high-fidelity simulation can bridge the training gap. Simulation-based training has been proven to improve readiness and decision-making in obstetric emergencies when real-world exposure is restricted (30, 31). Additionally, establishing clear anti-discrimination policies and safe, confidential reporting mechanisms is essential for fostering an inclusive learning environment (12, 29).

4-1. Strengths and Limitations

A primary strength of this study is its focus on a less-explored area within EMS education—perceived discrimination—using a validated instrument. By calculating effect sizes (Cohen's *d*), we provided a more nuanced understanding of the magnitude of gender-based disparities beyond mere statistical significance (21). Furthermore, the inclusion of participants from diverse university types increases the

external validity of the findings within the context of Iran's medical education system (13).

However, several limitations should be acknowledged. First, the cross-sectional design precludes any causal inferences regarding the sources of discrimination. Second, although the perceived discrimination scale is validated (16, 17), the findings rely on self-reported data, which may be subject to recall bias or social desirability bias. Students might underreport experiences of mistreatment due to the sensitive nature of the topic in a hierarchical academic environment (12, 29). Lastly, while the study highlights significant gender disparities, it does not account for other intersecting factors such as socioeconomic status or clinical site-specific cultures, which could further influence student perceptions.

5- CONCLUSION

This study demonstrates that perceived educational discrimination is a prevalent problem among undergraduate EMS students in Iran, with mean scores significantly above the theoretical midpoint and a moderate gender effect (Cohen's $d = 0.57$). Female students report higher overall levels of perceived discrimination, while male students identify structural and cultural barriers that impede acquisition of obstetric competencies. Item-level results point to unequal access to regional training facilities and inappropriate interactions with clinical staff as primary drivers. To address these systemic issues, EMS programs should: integrate gender-sensitive training, expand use of high-fidelity simulation for maternal and neonatal emergencies, ensure equitable distribution of clinical training opportunities, and implement transparent, anonymous reporting systems alongside interventions to reduce unprofessional conduct. These steps are necessary to

promote equitable competency development and improve educational outcomes for all prehospital providers.

6- AUTHORS' CONTRIBUTIONS

Study conception or design: AM, ZB; Data analyzing and draft manuscript preparation: PG, MRM, MM, FT, FM, and MG; Critical revision of the paper: ZB; Supervision of the research: AM and MG; Final approval of the version to be published: AM, PG, MRM, MM, FT, FM, MG, and ZB.

7- CONFLICT OF INTEREST: None.

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