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Anaesthesiologists Working in Emergency Medicine in India: A Nationwide Cross-Sectional Survey of Self-Rated Competencies, Challenges, Training Needs, and Career Perspectives

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Abstract

Background and aims

Anaesthesiologists possess several acute-care competencies relevant to Emergency Medicine (EM), but their broader preparedness, training needs, and workplace experiences in Indian emergency departments (EDs) are poorly characterised. We aimed to evaluate self-rated clinical competencies, perceived gaps, workplace challenges, training priorities, and career perspectives among anaesthesiologists working in EM in India.

Methods

This nationwide, non-probability cross-sectional online survey included qualified anaesthesiologists with current or previous EM/trauma practice in India. Self-rated competency and training-priority items were scored on five-point scales; scores of 4-5 were classified as high. Descriptive statistics, Wilson 95% confidence intervals, Mann-Whitney U tests with Benjamini-Hochberg false-discovery-rate adjustment, and exploratory logistic regression were used. Free-text responses underwent inductive Strengths, Weaknesses, Opportunities, and Threats (SWOT) thematic analysis.

Results

Eighty anaesthesiologists from 20 States/Union Territories participated. High self-rated competence was reported for rapid sequence intubation and difficult-airway management (76/80 (95.0%) each), cardiac-arrest leadership (75/80 (93.8%)), and central venous access (71/80 (88.8%)), whereas high self-rated competence was less frequently reported for extended focused assessment with sonography for trauma (eFAST) (42/80 (52.5%)), cardiac/lung point-of-care ultrasonography (POCUS) (38/80 (47.5%)), and chest-drain insertion (34/80 (42.5%)). Workplace violence was reported by 64/80 (80.0%). Paediatric EM (56/80 (70.0%)) and disaster/prehospital care (51/80 (63.8%)) were the leading training priorities. Longer EM experience and formal EM qualification were associated with higher self-rated competence in selected domains. In exploratory multivariable analysis, higher job satisfaction was associated with definite recommendation of an EM career pathway (adjusted OR 7.59, 95% CI 3.15-18.31).

Conclusion

Anaesthesiologists working in EM reported high self-rated competence in several transferable resuscitation domains but important perceived training needs in diagnostic, POCUS, procedural, paediatric, and prehospital/disaster domains. These findings support the development and evaluation of structured competency-based transition pathways, alongside appropriate institutional governance and workplace-safety measures. However, voluntary-response sampling and the modest sample size (n=80) limit the national representativeness and generalisability of these findings.

Categories: Emergency Medicine, Anesthesiology
Keywords: anesthesiology, clinical competence, emergency medicine, workforce, workplace violence

Introduction

Emergency Medicine (EM) requires rapid assessment and stabilisation of undifferentiated patients, management of time-critical conditions, life-saving interventions, and multidisciplinary coordination. In India, EM continues to evolve, but formal training capacity remains limited relative to workforce needs [1]. Anaesthesiologists possess several transferable competencies, including airway management, cardiopulmonary resuscitation, haemodynamic stabilisation, mechanical ventilation, vascular access, pain management, and critical care, which are directly relevant to emergency practice. Their experience in

managing rapidly changing physiological conditions involves making time-critical clinical decisions, such as recognising impending airway compromise and determining the need for emergency intubation, selecting appropriate ventilatory strategies in respiratory failure, identifying and managing haemodynamic instability through fluid resuscitation and vasoactive support, and initiating immediate resuscitative interventions during cardiac arrest or other life-threatening emergencies. These decision-making skills, acquired through the management of critically ill patients in perioperative and intensive care settings, provide a strong foundation for EM practice. In India, anaesthesiologists may transition into EM practice through additional training through EM fellowships, short-term training, workshops, or diploma programmes. However, these pathways differ in the extent of structured training, clinical exposure, supervision, and competency assessment. Consequently, anaesthesiologists entering EM may possess varying levels of preparedness for managing undifferentiated emergency presentations. Understanding their existing competencies, perceived training gaps, and professional challenges is therefore essential for developing structured, competency-based transition pathways appropriate to the Indian healthcare setting [2].

However, transferability of acute-care skills does not imply competence across the entire scope of EM. Emergency physicians routinely evaluate undifferentiated presentations, formulate broad differential diagnoses, prioritise investigations, initiate treatment before diagnostic certainty, and determine disposition across medical, surgical, neurological, paediatric, toxicological, and traumatic emergencies [2]. Additional exposure may therefore be required in diagnostic reasoning, prehospital and disaster medicine, and selected emergency procedures. Point-of-care ultrasonography (POCUS) is another relevant domain; an Indian survey of EM training programmes identified substantial interest in POCUS but important gaps in dedicated training and access, supporting the need for structured competency-oriented education [3].

The challenges of transition also extend beyond clinical competence. Emergency departments (EDs) frequently face overcrowding, bed shortages, investigation delays, staffing constraints, and transfer-related bottlenecks [4]. Similar administrative and system-level stressors, together with interpersonal conflict and workplace violence, have been reported among EM personnel in India [5]. In addition, shift work and fatigue are important occupational concerns in EM, while anaesthesiologists themselves are exposed to substantial acute occupational stress, and chronic circadian disruption may adversely affect health and well-being [6-8].

Despite the conceptual overlap between anaesthesiology and EM, empirical evidence describing the experiences of anaesthesiologists already working in Indian EDs remains limited. There is a need to identify which competencies are perceived as transferable, which require further development, and how workplace conditions, professional well-being, and career opportunities influence this transition.

Accordingly, this nationwide survey aimed to evaluate the personal and professional experiences of anaesthesiologists functioning in EM in India. The objectives were to characterise perceived clinical strengths and competency gaps, identify priority training needs, assess occupational and system-level challenges, explore opportunities for professional growth, and determine factors associated with recommending EM as a career pathway.

Materials And Methods

This nationwide cross-sectional online survey was conducted among qualified anaesthesiologists with current or previous experience in emergency or trauma services in India. The study was coordinated by the Department of Trauma and Emergency Medicine, All India Institute of Medical Sciences, Bhopal, and data were collected from 01 January 2026 to 30 June 2026 (six months) following ethical approval. The protocol was approved by the Institutional Human Ethics Committee, AIIMS Bhopal (IHEC-LOP/2025/IP207; 22 December 2025), and the study adhered to the Declaration of Helsinki. Electronic informed consent was obtained before survey access. Participation was voluntary, no incentives were offered, and no direct personal identifiers were collected.

Eligible participants held a recognised postgraduate qualification in anaesthesiology (MD, DNB, or DA) and were currently working in, or had previously worked in, an ED or trauma and emergency service in India. Those not providing consent were excluded. Because no comprehensive national sampling frame was available, non-probability voluntary-response sampling was used. The survey link was circulated through professional anaesthesiology and EM networks, associations, WhatsApp/e-mail groups, and professional social-media platforms. All eligible consenting responses received during recruitment were included. No formal hypothesis-based sample-size calculation was undertaken because the study was designed as an exploratory nationwide survey without a predefined primary comparative hypothesis. The study aimed to include all eligible consenting responses received during the predefined six-month recruitment period; accordingly, all 80 eligible responses were analysed.

Data were collected using a structured, self-administered Google Forms (Google LLC, Mountain View, CA, USA) questionnaire developed for the study. It assessed demographic and professional characteristics, EM experience, prior training, self-rated clinical competence, diagnostic challenges, prehospital/disaster exposure, workplace barriers, medico-legal experience, workplace violence, professional well-being, career perceptions, training needs, and preferred training formats. Open-ended questions explored perceived Strengths, Weaknesses, Opportunities, and Threats (SWOT) and recommendations for transition to EM.

The questionnaire was developed specifically for the objectives of the study based on predefined domains and relevant literature. It was reviewed by a panel of six experts comprising anaesthesiologists and emergency physicians for relevance, clarity, and appropriateness of the included items. The experts did not recommend any substantive modifications, and the questionnaire was therefore retained in its original form. No formal psychometric validation or pilot testing was performed. As the questionnaire assessed heterogeneous descriptive domains rather than a single latent construct, no aggregate competency or training-needs score was generated. The complete questionnaire, including all survey domains and response options, is presented in Appendix 1 (Tables *8*-*17*).

Self-rated clinical competence was assessed using five-point Likert-type scales across airway management, resuscitation, vascular access, ventilation, shock management, extended focused assessment with sonography for trauma (eFAST), POCUS, chest-drain insertion, percutaneous tracheostomy, and selected emergency conditions. For descriptive analysis, scores of 4-5 were pragmatically classified as high self-rated competence. This analytical threshold was used to facilitate presentation and interpretation and does not represent a validated standard of clinical competency. Original ordinal responses were retained for subgroup analyses. Training needs were similarly rated on a five-point scale, with scores of 4-5 classified as high priority. No aggregate competence or training-needs score was calculated. Formal EM qualification was defined as a fellowship/diploma or MD/DNB in EM; EM experience was categorised as >3 versus ⩽3 years for exploratory analyses.

Workplace safety assessment included verbal and physical violence during the preceding 12 months and adequacy of institutional security. Medico-legal exposure included previous notice/complaint and confidence in documentation. Participants selecting “prefer not to say” were excluded only from the binary medico-legal analysis. Professional well-being was assessed using the World Health Organization Five Well-Being Index (WHO-5), transformed from 0-25 to 0-100; internal consistency was assessed using Cronbach’s alpha [9]. Burnout was assessed separately using a categorical self-report item and was not interpreted as a clinical diagnosis or prevalence estimate. Career recommendation was recorded as “Yes,” “Maybe,” or “No” and dichotomised as “Yes” versus “Maybe/No” for exploratory logistic regression.

Free-text responses were analysed using inductive content analysis within the predefined SWOT domains. All responses were reviewed and assigned descriptive codes based on recurrent concepts within each domain. Related codes were grouped into broader themes. Multiple themes could be assigned to a single response, and similar or identical responses from different participants were retained as independent observations rather than deduplicated. Theme frequencies therefore represent the number of participants mentioning each concept and are non-mutually exclusive. No independent second-coder verification or formal inter-coder agreement assessment was performed.

Before analysis, data were checked for eligibility, completeness, duplicates, internal consistency, and coding accuracy. Multiple-response items were converted to binary indicators. Where the questionnaire did not enforce the intended maximum number of selections, all submitted responses were retained. Missing data were not imputed; descriptive analyses used available denominators, and inferential analyses used complete observations.

Categorical variables were summarised as frequencies and percentages, with Wilson 95% confidence intervals for key proportions. Normality was assessed using the Shapiro-Wilk test; ordinal and non-normally distributed variables were summarised as median and interquartile range. Exploratory subgroup analyses compared participants by EM experience and formal EM qualification for six selected outcomes using Mann-Whitney U tests with rank-biserial correlations. Benjamini-Hochberg false-discovery-rate adjustment was applied across 12 comparisons.

Exploratory binary logistic regression evaluated factors associated with definitely recommending EM. Univariable models assessed job satisfaction, work-life balance, WHO-5 score, EM experience >3 years, and formal EM qualification. A parsimonious multivariable model included job satisfaction, EM experience >3 years, and formal EM qualification; work-life balance and WHO-5 were omitted to limit conceptual overlap and model complexity. Adjusted odds ratios with 95% confidence intervals were reported. The regression analysis was exploratory and was intended to examine associations rather than to develop or validate a prediction model. Multicollinearity and descriptive model characteristics were assessed using variance inflation factors, receiver operating characteristic area under the curve, Brier score, and the Hosmer-Lemeshow test. These measures were calculated in the same study sample and were not internally or externally validated. All tests were two-sided, with $p < 0.05$ considered statistically significant. Statistical analysis was performed using IBM SPSS Statistics for Windows, Version 21.0 (Released 2012; IBM Corp., Armonk, NY, USA) and Microsoft Excel (Microsoft Corporation, Redmond, WA, USA).

Results

Participant characteristics and clinical competencies

Eighty eligible anaesthesiologists from 20 States/Union Territories were included. The median age was 46 years (IQR 37-53); 34/80 (42.5%) had >3 years of EM experience, 21/80 (26.3%) had a formal EM

qualification, and 56/80 (70.0%) were working full-time in EM/trauma services. Sixty participants (60/80 (75.0%)) worked ⩾36 hours/week in the ED, and 47/80 (58.8%) managed ⩾6 critical resuscitations/week. Detailed demographic, professional, and workload characteristics are presented in Table *1*.

Characteristic	Category/summary	n (%)
Demographics		
Age, years	Median (IQR)	46 (37-53)
	Range	29-66
Gender	Female	39 (48.8)
	Male	37 (46.3)
	Prefer not to say	4 (5.0)
Geographical coverage	States/Union Territories represented	20
Institutional setting		
Institution type	Government medical college/hospital	24 (30.0)
	Central institute	20 (25.0)
	Private medical college/hospital	30 (37.5)
	Corporate hospital	6 (7.5)
Professional experience		
Years since anaesthesiology training	<1 year	3 (3.8)
	1-3 years	3 (3.8)
	4-6 years	18 (22.5)
	7-10 years	20 (25.0)
	10-20 years	10 (12.5)
	>20 years	26 (32.5)
Formal EM qualification	None	59 (73.8)
	Fellowship/diploma	19 (23.8)
	MD/DNB Emergency Medicine	2 (2.5)
Duration working in ED/Trauma	<3 months	5 (6.3)
	3-12 months	9 (11.3)
	1-3 years	32 (40.0)
	>3 years	34 (42.5)
Employment and workload		
Employment pattern	Full-time	56 (70.0)
	Rotational	18 (22.5)
	On-call/locum	3 (3.8)
	Other/mixed trauma-emergency role	3 (3.8)
Average weekly ED duty	<24 h	9 (11.3)
	24-36 h	11 (13.8)
	36-48 h	30 (37.5)
	48-60 h	30 (37.5)
	0-2	24 (30.0)

Night shifts/month	3-5	40 (50.0)
	6-8	7 (8.8)
	>8	9 (11.3)
Critical resuscitations/week	0-2	14 (17.5)
	3-5	19 (23.8)
	6-10	21 (26.3)
	>10	26 (32.5)
Previous emergency/trauma training*		
ACLS/BLS		62 (77.5)
NELS		34 (42.5)
ATLS		33 (41.3)
PALS		18 (22.5)
POCUS certificate course		13 (16.3)
EM/Trauma/Critical Care fellowship		9 (11.3)
None		10 (12.5)

TABLE 1: Demographic and professional characteristics of study participants

Values are n (%) unless otherwise stated. *Previous emergency/trauma training was a multiple-response item; therefore, percentages do not sum to 100%.

EM, Emergency Medicine; ED, Emergency Department; ACLS, Advanced Cardiovascular Life Support; BLS, Basic Life Support; NELS, National Emergency Life Support; ATLS, Advanced Trauma Life Support; PALS, Pediatric Advanced Life Support; POCUS, Point-of-Care Ultrasonography

Self-rated competence was highest in airway and resuscitation-related domains. Rapid sequence intubation and difficult-airway management were rated highly by 76/80 (95.0%) participants each, followed by cardiac-arrest leadership (75/80 (93.8%)). In contrast, fewer participants reported high self-rated competence in eFAST (42/80 (52.5%)), cardiac/lung POCUS (38/80 (47.5%)), and chest-drain insertion (34/80 (42.5%)). The complete competency profile with Wilson 95% confidence intervals is shown in Figure *1*.

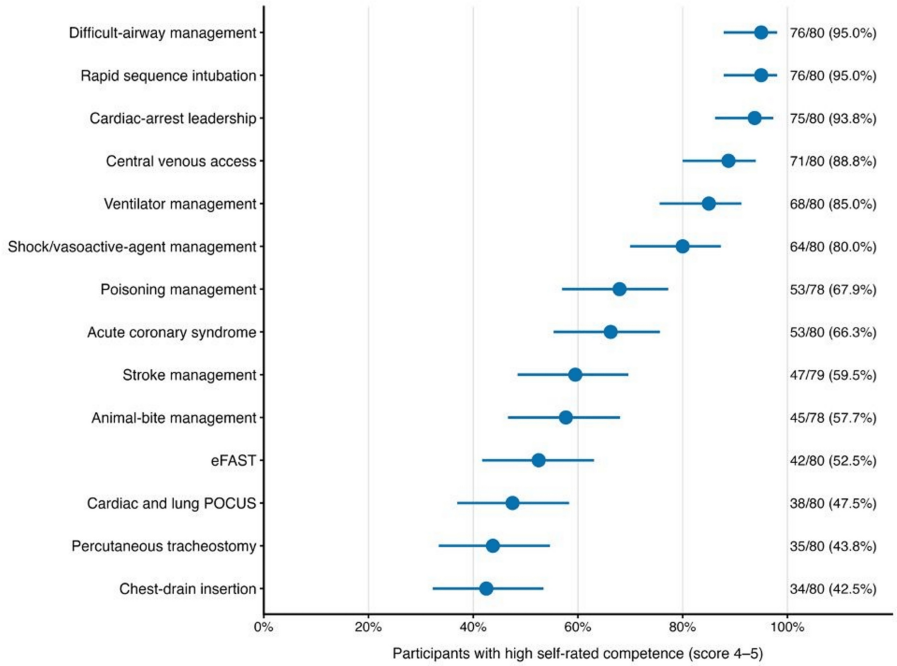

FIGURE 1: Self-rated clinical competencies of anaesthesiologists working in Emergency Medicine

Points indicate the proportion of respondents reporting high self-rated competence (score 4-5 on a 5-point scale), with horizontal whiskers representing Wilson 95% confidence intervals. Estimates were calculated using available responses for each competency.

ACLS, Advanced Cardiovascular Life Support; POCUS, Point-of-Care Ultrasonography; eFAST, extended Focused Assessment with Sonography in Trauma

Workplace environment, well-being, and training needs

High comfort with undifferentiated presentations was reported by 48/80 (60.0%), whereas 60/77 (77.9%) considered their prehospital/disaster-medicine exposure limited. The leading barriers to timely ED care were overcrowding and bed shortages (54/80 (67.5%) each), followed by imaging/laboratory delays (51/80 (63.8%)) and staffing shortages (50/80 (62.5%)).

Workplace violence during the preceding 12 months was reported by 64/80 participants (80.0%; 95% CI 70.0-87.3%), predominantly verbal. Only 39/80 (48.8%) considered institutional security adequately implemented. Among 71 participants who disclosed their medico-legal history, 33/71 (46.5%) had experienced a previous notice or complaint. The median transformed WHO-5 score was 60 (IQR 40-68) with high internal consistency (Cronbach's α=0.916); 48/80 (60.0%) reported high job satisfaction. Detailed workplace, medico-legal and well-being findings are presented in Table *2*.

Domain/item	Valid n	Median (IQR)	High score or event: n/N (%)	95% CI
A) Diagnostic breadth and workflow				
Comfort with undifferentiated presentations (1-5)	80	4 (2.75-5)	48/80 (60.0%) (score 4-5)	49.0-70.0%*
Perceived limited exposure to prehospital/disaster medicine	77	-	60/77 (77.9%)	67.5-85.7%
Decision-support resources†				
Departmental protocols/algorithms	80	-	63/80 (78.8%)	68.6-86.3%
EM textbooks/applications	80	-	60/80 (75.0%)	64.5-83.2%
Senior/peer consultation	80	-	31/80 (38.8%)	28.8-49.7%
Hospital order sets/clinical practice guidelines	80	-	19/80 (23.8%)	15.8-34.1%
No decision-support resource	80	-	3/80 (3.8%)	1.3-10.5%

Barriers to timely ED care†				
Overcrowding	80	-	54/80 (67.5%)	56.6-76.8%
Bed shortages	80	-	54/80 (67.5%)	56.6-76.8%
Delays in imaging/laboratory reports	80	-	51/80 (63.8%)	52.8-73.4%
Staffing shortages	80	-	50/80 (62.5%)	51.5-72.3%
Limited equipment	80	-	39/80 (48.8%)	38.1-59.5%
Medico-legal/process-related delays	80	-	37/80 (46.3%)	35.7-57.1%
Violence/abuse towards staff	80	-	22/80 (27.5%)	18.9-38.1%
B) Workplace safety and medico-legal exposure				
Verbal violence only in preceding 12 months	80	-	62/80 (77.5%)	67.2-85.3%
Physical violence with/without verbal violence	80	-	2/80 (2.5%)	0.7-8.7%
Any verbal or physical violence in preceding 12 months	80	-	64/80 (80.0%)	70.0-87.3%
Security protocol adequate and implemented	80	-	39/80 (48.8%)	38.1-59.5%
Security protocol exists but poorly implemented	80	-	41/80 (51.3%)	40.5-61.9%
Confidence in medico-legal documentation (1-5)	80	3 (2-4)	28/80 (35.0%) (score 4-5)	25.5-45.9%*
No previous medico-legal notice/complaint	80	-	38/80 (47.5%)	36.9-58.3%
Previous notice/complaint - resolved	80	-	22/80 (27.5%)	18.9-38.1%
Previous notice/complaint - pending	80	-	11/80 (13.8%)	7.9-23.0%
Prefer not to disclose medico-legal history	80	-	9/80 (11.3%)	6.0-20.0%
Any previous notice/complaint among those disclosing history	71	-	33/71 (46.5%)	35.4-58.0%
C) Professional well-being				
Enjoy work/no burnout symptoms	80	-	43/80 (53.8%)	42.9-64.3%
Stressed but not burned out	80	-	26/80 (32.5%)	23.2-43.4%
Definitely experiencing burnout	80	-	3/80 (3.8%)	1.3-10.5%
Persistent work-related frustration/burnout symptoms	80	-	8/80 (10.0%)	5.2-18.5%
Derived definite/persistent burnout indicator‡	80	-	11/80 (13.8%)	7.9-23.0%
WHO-5 raw score (0-25)	80	15 (10-17)	-	-
WHO-5 transformed score (0-100)	80	60 (40-68)	-	-
Job satisfaction with ED role (1-5)	80	4 (3-5)	48/80 (60.0%) (score 4-5)	49.0-70.0%*
Work-life balance (1-5)	80	4 (3-4)	43/80 (53.8%) (score 4-5)	42.9-64.3%*
Factors affecting well-being†				
Interpersonal/team issues	80	-	49/80 (61.3%)	50.3-71.2%
Resource limitations	80	-	47/80 (58.8%)	47.8-68.9%
High patient load/overcrowding	80	-	37/80 (46.3%)	35.7-57.1%
Shift timings/night duties	80	-	24/80 (30.0%)	21.1-40.8%
Medico-legal stress	80	-	24/80 (30.0%)	21.1-40.8%
Pay/compensation	80	-	19/80 (23.8%)	15.8-34.1%
Commute/housing	80	-	7/80 (8.8%)	4.3-17.0%
D) Training preferences and career perspectives				

Short workshops (1-2 days)†	80	-	54/80 (67.5%)	56.6-76.8%
Simulation-based courses†	80	-	45/80 (56.3%)	45.3-66.6%
Self-paced online modules†	80	-	45/80 (56.3%)	45.3-66.6%
Fellowships (6-12 months)†	80	-	30/80 (37.5%)	27.7-48.5%
Observerships/rotations†	80	-	22/80 (27.5%)	18.9-38.1%
Other training format†	80	-	3/80 (3.8%)	1.3-10.5%
Comfort teaching EM trainees (1-5)	77	4 (3-5)	49/77 (63.6%) (score 4-5)	52.5-73.5%*
Would recommend EM pathway: Yes	80	-	42/80 (52.5%)	41.7-63.1%
Would recommend EM pathway: Maybe	80	-	29/80 (36.3%)	26.6-47.2%
Would recommend EM pathway: No	80	-	9/80 (11.3%)	6.0-20.0%

TABLE 2: Diagnostic breadth, workplace environment, safety, medico-legal exposure, professional well-being and career perspectives

* Confidence interval refers to the proportion scoring 4-5.

† Multiple-response items; categories are non-mutually exclusive and percentages therefore do not sum to 100%.

‡ The combined definite/persistent burnout category is a descriptive self-report measure and should not be interpreted as a diagnostic prevalence of burnout. Participants selecting “prefer not to say” for medico-legal history were excluded only from the binary analysis of any previous notice/complaint. Ordinal variables are presented as median (IQR).

WHO-5, World Health Organization Five Well-Being Index; EM, Emergency Medicine; ED, Emergency Department; CI, Confidence Interval; SD, Standard Deviation

Paediatric EM was the most frequently identified high-priority training domain (56/80 (70.0%)), followed by disaster/prehospital care (51/80 (63.8%)). EM protocols/pathways and medico-legal documentation/communication were each prioritised by 46/80 (57.5%). The complete training-priority profile is presented in Figure 2.

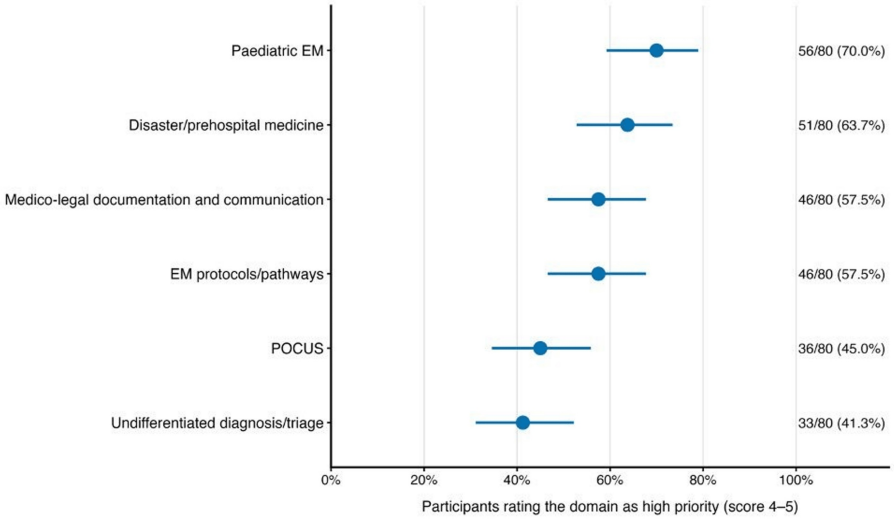

FIGURE 2: Priority training needs among anaesthesiologists working in Emergency Medicine

Points indicate the proportion of respondents rating each training domain as a high priority (score 4-5 on a five-point scale), with horizontal whiskers representing 95% Wilson confidence intervals.

EM, Emergency Medicine; POCUS, Point-of-Care Ultrasonography

Short workshops were the most commonly preferred training format (54/80 (67.5%)). Forty-two participants (52.5%) would definitely recommend EM as a career pathway, 29 (36.3%) responded “Maybe” and nine (11.3%) “No” (Table 2).

Qualitative findings

All 80 participant records were retained for qualitative content analysis. The leading perceived Strengths were airway/ventilatory expertise, resuscitation/critical-care competence, and leadership/teamwork. The most frequent Weaknesses were POCUS/imaging gaps, limited diagnostic breadth, and interdepartmental coordination/recognition. Career growth and expansion into critical/acute-care roles were prominent Opportunities, whereas interdepartmental conflict/transfer difficulties and workplace violence/security concerns were the leading Threats. Structured EM bridge training or certification was the most frequent transition recommendation (59/80 (73.8%)). The complete thematic analysis is shown in Table 3.

SWOT domain	Theme	n (%)
Strengths	Airway and ventilatory expertise	43 (53.8)
	Resuscitation, shock and critical-care competence	37 (46.3)
	Leadership, teamwork and communication	31 (38.8)
	Calm performance and adaptability under pressure	17 (21.3)
	Broad anaesthesiology/intensivist foundation	12 (15.0)
	Procedural and vascular-access skills	10 (12.5)
Weaknesses	POCUS, ultrasound and imaging gaps	25 (31.3)
	Limited diagnostic breadth and medical-emergency exposure	21 (26.3)
	Interdepartmental coordination, recognition and autonomy	20 (25.0)
	Resource, staffing and infrastructure limitations	18 (22.5)
	Trauma and non-airway procedural gaps	17 (21.3)
	Medico-legal, documentation and protocol gaps	16 (20.0)
	Workflow, follow-up and continuity-of-care challenges	9 (11.3)
	Prehospital and disaster-medicine exposure gaps	2 (2.5)
Opportunities	Career growth, employment and advancement	30 (37.5)
	Critical-care, acute-care and resuscitation roles	24 (30.0)
	Broader Emergency Medicine skill development	23 (28.8)
	POCUS, procedures, trauma and pain-care expansion	20 (25.0)
	Teaching, research and academic development	15 (18.8)
	Service development and infrastructure building	12 (15.0)
	Leadership and administrative roles	9 (11.3)
Threats	Interdepartmental conflict, recognition and transfer delays	36 (45.0)
	Workplace violence and security threats	28 (35.0)
	Overcrowding, bed and resource constraints	20 (25.0)
	Clinical complexity and diagnostic uncertainty	17 (21.3)
	Medico-legal and litigation risk	11 (13.8)
	Professional role ambiguity and career insecurity	6 (7.5)
	Workload, stress and work-life imbalance	3 (3.8)
	Academic and professional-development pressure	2 (2.5)
	Structured EM bridge training/certification	59 (73.8)

	POCUS and imaging training	9 (11.3)
	Broader medical-emergency diagnostic training	8 (10.0)
	Standardised protocols, SOPs and policies	6 (7.5)
Transition recommendations	Staffing, infrastructure, safety and resources	6 (7.5)
	Multidisciplinary team integration and recognition	6 (7.5)
	Formal fellowship/degree pathway	5 (6.3)
	Reservations regarding transition into EM	4 (5.0)
	Positive endorsement of transition/career opportunity	3 (3.8)

TABLE 3: Participant-level content analysis of perceived Strengths, Weaknesses, Opportunities, Threats and transition recommendations (N=80)

All 80 participant records were retained as independent qualitative observations. Multiple themes could be assigned to each response; therefore, percentages within each SWOT domain are non-mutually exclusive and do not sum to 100%. Percentages were calculated using the total study sample (N=80); participants with missing or non-informative responses within a domain contributed no theme for that domain.

EM, Emergency Medicine; POCUS, Point-of-Care Ultrasonography; SOP, standard operating procedure

Exploratory subgroup and regression analyses

After false-discovery-rate adjustment, participants with >3 years of EM experience reported greater comfort with undifferentiated presentations, teaching confidence and self-rated chest-drain competence. Formal EM qualification was associated with higher teaching confidence, self-rated cardiac/lung POCUS competence and self-rated chest-drain competence. Other subgroup comparisons are presented in Table *4*.

Grouping variable	Outcome	Group 1 median (IQR) (n)	Group 2 median (IQR) (n)	Mann-Whitney U	Rank-biserial r	p-value	FDR q
EM experience	Comfort with undifferentiated presentations	≤3 years: 3.5 (2-4) (46)	>3 years: 4 (3.25-5) (34)	537.5	0.31	0.014	0.028
	Comfort teaching EM trainees	≤3 years: 3 (2-4.5) (43)	>3 years: 5 (4-5) (34)	346.0	0.53	<0.001	<0.001
	Self-rated cardiac/lung POCUS competence	≤3 years: 3 (2-4) (46)	>3 years: 4 (3-5) (34)	602.0	0.23	0.073	0.097
	Self-rated chest-drain insertion competence	≤3 years: 2 (1-4) (46)	>3 years: 4 (3-4) (34)	465.5	0.40	0.002	0.005
	Job satisfaction	≤3 years: 4 (3-4) (46)	>3 years: 4 (3-5) (34)	630.0	0.19	0.120	0.131
	WHO-5 transformed score	≤3 years: 60 (37-64) (46)	>3 years: 60 (44-84) (34)	614.0	0.21	0.102	0.122
Formal EM qualification	Comfort with undifferentiated presentations	No: 4 (2-4.5) (59)	Yes: 4 (4-5) (21)	438.5	0.29	0.041	0.071
	Comfort teaching EM trainees	No: 4 (2-5) (58)	Yes: 5 (4.5-5) (19)	303.5	0.45	0.002	0.005
	Self-rated cardiac/lung POCUS competence	No: 3 (2-4) (59)	Yes: 4 (4-5) (21)	329.0	0.47	0.001	0.005
	Self-rated chest-drain insertion competence	No: 2 (2-4) (59)	Yes: 4 (3-5) (21)	329.0	0.47	0.001	0.005
	Job satisfaction	No: 4 (3-5) (59)	Yes: 4 (4-4) (21)	569.5	0.08	0.568	0.568
	WHO-5 transformed score	No: 52 (40-68) (59)	Yes: 64 (60-80) (21)	447.5	0.28	0.060	0.090

TABLE 4: Exploratory subgroup comparisons according to Emergency Medicine experience and formal Emergency Medicine qualification

Exploratory subgroup comparisons were performed using two-sided Mann-Whitney U tests. The U statistic and rank-biserial correlation are reported; a positive rank-biserial r indicates higher scores in the second-listed subgroup. Benjamini-Hochberg false-discovery-rate adjustment was applied across the 12 comparisons.

EM, Emergency Medicine; POCUS, Point-of-Care Ultrasonography; WHO-5, World Health Organization Five Well-Being Index; FDR, False Discovery Rate

In the multivariable model, job satisfaction remained independently associated with definite recommendation (aOR 7.59, 95% CI 3.15-18.31; p<0.001), whereas EM experience >3 years and formal EM qualification were not independently associated. The fitted model had an area under the curve (AUC) of 0.857, a Brier score of 0.152 and a Hosmer-Lemeshow χ^2=9.59 (df=6; p=0.143); detailed regression estimates are presented in Tables *5*-*7*.

Predictor	Scale/comparison	OR (95% CI)	Wald χ^2	p-value
Job satisfaction	Per 1-point increase	6.23 (2.81-13.82)	20.30	<0.001
Work-life balance	Per 1-point increase	3.43 (1.86-6.30)	15.72	<0.001
WHO-5 score	Per 10-point increase	1.38 (1.09-1.75)	7.27	0.007
EM experience >3 years	Yes versus No	0.84 (0.35-2.04)	0.15	0.700
Formal EM qualification	Yes versus No	0.77 (0.28-2.08)	0.27	0.602

TABLE 5: Univariable logistic regression for definite recommendation of an Emergency Medicine pathway

Univariable binary logistic regression was performed for definite recommendation for an EM pathway ("Yes") versus "Maybe/No". Regression coefficients were tested using two-sided Wald χ^2 tests with 1 degree of freedom.

OR, Odds Ratio; CI, Confidence Interval; EM, Emergency Medicine; WHO-5, World Health Organization Five Well-Being Index

Predictor	Adjusted OR (95% CI)	Wald χ^2	p-value	VIF
Job satisfaction, per 1-point increase	7.59 (3.15-18.31)	20.36	<0.001	2.01
EM experience >3 years	0.41 (0.12-1.42)	1.97	0.160	1.85
Formal EM qualification	0.64 (0.18-2.25)	0.49	0.483	1.39

TABLE 6: Parsimonious multivariable logistic regression for definite recommendation of an Emergency Medicine pathway

The multivariable binary logistic regression model included job satisfaction, EM experience >3 years and formal EM qualification. Regression coefficients were tested using two-sided Wald χ^2 tests with 1 degree of freedom. The outcome was definite recommendation of an EM pathway ("Yes") versus "Maybe/No"; N=80, with 42 "Yes" and 38 "Maybe/No" responses. The analysis was exploratory and intended to assess associations rather than to develop a prediction model.

OR, Odds Ratio; CI, Confidence Interval; VIF, Variance Inflation Factor; EM, Emergency Medicine

Metric	Result
ROC AUC	0.857
Brier score	0.152
Hosmer-Lemeshow test	χ^2=9.59, df=6; p=0.143

TABLE 7: Descriptive diagnostics of the multivariable logistic regression model

Model diagnostic measures were calculated in the same study sample and were not internally or externally validated; therefore, they should not be interpreted as validated predictive performance.

ROC, Receiver Operating Characteristic; AUC, Area Under the Curve

Discussion

This nationwide survey characterises the competencies, training needs, workplace experiences and career perspectives of anaesthesiologists working in EM in India. Respondents reported strong self-rated competence in airway management, resuscitation, vascular access, ventilation and haemodynamic stabilisation, but comparatively greater developmental needs in diagnostic POCUS, selected trauma procedures, broader diagnostic reasoning, paediatric emergencies and prehospital/disaster medicine.

Workplace challenges, including overcrowding, bed and staffing constraints, interdepartmental difficulties, workplace violence and medico-legal exposure, were also prominent, while respondents strongly favoured structured training for transition into EM.

The concentration of high self-rated competence around airway and resuscitation supports the recognised overlap between anaesthesiology and EM. Ramesh et al. highlighted airway management, resuscitation, critical care and rapid physiological decision-making as transferable competencies of anaesthesiologists entering emergency practice [2]. Our findings suggest that this overlap is strongest in physiological rescue, i.e. airway control, ventilation, circulatory stabilisation and immediate resuscitation, rather than across the entire spectrum of EM. Accordingly, transition programmes should recognise established competencies rather than uniformly retraining clinicians in domains already well developed through anaesthesiology.

A key transition challenge is diagnostic breadth. Anaesthesiology often operates within a relatively defined perioperative diagnosis, whereas EM begins with undifferentiated symptoms and requires broad differential diagnosis, investigation prioritisation, treatment before diagnostic certainty and disposition across multiple clinical domains [2,10]. Greater comfort with undifferentiated presentations among participants with longer EM experience suggests that diagnostic reasoning may depend on longitudinal clinical exposure, feedback and progressive responsibility rather than procedural training alone.

POCUS illustrates this distinction. Anaesthesiologists may be familiar with ultrasound through vascular access, regional anaesthesia and focused cardiac assessment [11], yet self-rated competence in diagnostic emergency ultrasonography was less uniform. POCUS/imaging limitations were also the most frequently reported qualitative weakness, consistent with previous Indian EM data showing interest in POCUS but gaps in dedicated training and equipment access [3]. The association between formal EM qualification and higher self-rated cardiac/lung POCUS competence is hypothesis-generating and may reflect structured training, although differences in motivation, institutional resources, supervision and clinical exposure may also contribute. Selected non-airway procedures showed a similar pattern, and simulation-based mastery learning may be useful for addressing such competency gaps [12].

Paediatric EM and prehospital/disaster medicine were prominent training priorities. Previous studies have identified gaps in paediatric emergency preparedness, particularly neonatal, critical-care and procedural skills, with simulation frequently proposed as a useful educational strategy [13,14]. Similarly, the high frequency of limited prehospital/disaster exposure supports dedicated training in mass-casualty triage, incident-command systems, resource allocation and prehospital decision-making; simulation-based mastery learning, and frequent well-spaced continuing education workshops may be useful [15].

The subgroup findings suggest complementary roles for clinical exposure and structured education. Longer EM experience was associated with greater comfort in undifferentiated presentations, teaching confidence and higher self-rated chest-drain competence, whereas formal EM qualification was associated with teaching confidence, higher self-rated cardiac/lung POCUS and chest-drain competence after correction for multiple testing. These associations should not be interpreted causally because potential confounders include seniority, duration and intensity of ED exposure, institutional type, access to equipment and supervision, prior critical-care experience and motivation to pursue formal EM training. Nevertheless, the observed heterogeneity supports competency-based education that recognises prior learning and directs supervision towards demonstrated gaps [16].

Several challenges identified were system-level rather than speciality-specific. Overcrowding, bed shortages, investigation delays, staffing constraints and interdepartmental/transfer difficulties parallel findings among Indian EM personnel and the broader literature on ED crowding [4,5]. Individual training therefore cannot substitute for institutional measures addressing staffing, patient flow, referral processes, diagnostic turnaround and disposition. Workplace violence was another major concern; Indian data similarly identify emergency and intensive-care environments as vulnerable settings [17]. Institutional responses should include security, crowd management, reporting and escalation pathways and administrative support. Medico-legal exposure and limited confidence in documentation also support explicit training in emergency documentation and communication.

Professional well-being requires cautious interpretation. The WHO-5 measures general subjective well-being rather than burnout [9], and the study's burnout indicator was a categorical self-report measure rather than a validated diagnostic instrument. Nonetheless, systematic reviews demonstrate substantial occupational stress and burnout among emergency physicians, influenced by organisational factors, critical incidents and aggression [18,19]. Shift-related fatigue and circadian disruption may contribute further [6,8].

Job satisfaction remained strongly associated with definite recommendation of an EM career pathway, whereas longer EM experience and formal EM qualification were not independently associated. This association should be considered exploratory and hypothesis-generating because the cross-sectional design cannot establish temporality or directionality. In addition, both job satisfaction and career recommendation were self-reported within the same survey, introducing the possibility of common-method bias. Both constructs may also be influenced by workload, workplace safety, professional recognition, staffing,

institutional support and work-life balance. Similar organisational factors have been linked with physician satisfaction and burnout [20,21].

The role of anaesthesiologists in emergency care should not be framed as replacing specialist emergency physicians. Rather, clinicians from an adjacent acute-care speciality who are already working in emergency services require transparent competency expectations, appropriate supervision and institutional credentialing. Anaesthesiology expertise may be particularly valuable at the interface of resuscitation, EM and critical care [22]. A structured competency-based transition approach should therefore recognise existing strengths while addressing diagnostic reasoning, diagnostic POCUS, selected procedures, paediatric EM, prehospital/disaster medicine and medico-legal practice, and should complement rather than substitute for formal specialist EM training. Competency-based transition programmes incorporating supervised clinical exposure, simulation-based training and structured workplace assessments may help address identified gaps in diagnostic reasoning, POCUS, emergency procedures and paediatric care [12,16]. While these challenges may be particularly relevant to anaesthesiologists transitioning into EM, systemic issues such as overcrowding, staffing shortages, resource limitations and workplace violence affect emergency healthcare professionals more broadly and require institutional interventions [4,5,17].

This study included respondents from 20 States/Union Territories and diverse institutional settings and integrated quantitative findings with qualitative SWOT responses. However, voluntary non-probability online sampling limits national representativeness and a conventional response rate could not be calculated. Competencies were self-reported and may not reflect objectively demonstrated performance. Although the questionnaire underwent expert review for relevance and clarity, it was not formally psychometrically validated or pilot tested; therefore, competency and training-need responses should be interpreted as self-reported perceptions rather than validated measures of clinical performance or educational need. The cross-sectional design precludes causal inference, and subgroup and regression analyses remain susceptible to residual confounding. The regression analysis was exploratory, and model diagnostic measures were derived from the same sample without internal or external validation; they should therefore not be interpreted as measures of validated predictive performance. The modest sample size limited the precision of some estimates. Dichotomisation of Likert responses reduced ordinal information; the burnout indicator was not validated; and brief free-text responses without independent second-coder verification limited qualitative depth. No patient-level outcomes were assessed.

Future multicentre research should move from perceived to demonstrated competence using objective diagnostic, POCUS, procedural, simulation and workplace-based assessments. Prospective studies should evaluate whether structured transition programmes improve sustained competence, clinical processes and patient outcomes, while multidisciplinary consensus may help define core competencies, supervision requirements and entrustment thresholds.

Conclusions

Anaesthesiologists practising EM in India reported high self-rated competence in airway management, resuscitation and haemodynamic stabilisation, but perceived training gaps in diagnostic reasoning, POCUS, selected emergency procedures, paediatric emergencies and prehospital/disaster medicine. Workplace challenges further highlight the need for institutional support alongside structured competency-based transition programmes. Future prospective multicentre studies incorporating objective competency assessments and patient-level outcomes are needed to validate these perceived training requirements and evaluate the effectiveness of such programmes.

Appendices

Appendix 1

Q.	Question	Response format	Response options / rating scale
1	Are you a trained anesthesiologist currently working in an Emergency/Trauma	Single choice	YES; No
2	Do you voluntarily agree to participate in this study?	Single choice	Yes, I give my informed consent; No, I do not wish to participate.

TABLE 8: Supplementary Table S1. Eligibility and informed consent (Questions 1-2)

Eligibility and informed consent questions used single-choice responses. Required-item asterisks have been omitted.

Q., Original Questionnaire Item Number

Q.	Question	Response format	Response options / rating scale
3	Age(years)	Free-text response	Open-ended answer
4	Gender	Single choice	Male; Female; Prefer not to say
5	State/UT of current workplace	Single choice	Assam; Bihar; Chhattisgarh; Delhi; Goa; Gujarat; Haryana; Himachal Pradesh; Jammu & Kashmir; Jharkhand; Karnataka; Madhya Pradesh; Maharashtra; Manipur; Meghalaya; Mizoram; Nagaland; Odisha; Punjab; Rajasthan; Sikkim; Tamil Nadu; Telangana; Tripura; Uttar Pradesh; Uttarakhand; West Bengal; Andaman & Nicobar; Dadra & Nagar Haveli; Daman & Diu; Lakshadweep; Puducherry; Ladakh; Arunachal Pradesh; Andhra Pradesh
6	Type of institution	Single choice	Government Medical College/Hospital; Central Institute (AIIMS/ PGI/ JIPMER ect); Private Medical College/Hospital; Corporate Hospital; Other (specify)
7	Years since completion of Anesthesiology training (MD/DNB/DA)	Single choice	<1 year; 1 - 3 years; 4 - 6 years; 7 - 10 years; 10 - 20 years; >20 years
8	Do you hold any officially recognized Emergency Medicine qualification?	Single choice	Yes – MD/DNB (EM); Yes – Fellowship/Diploma; No
9	Working in Emergency/Trauma since	Single choice	<3 months; 3 - 12 months; 1 - 3 years; > 3 years
10	Employment pattern in ED/Trauma	Single choice	Full-time EM/Trauma posting; Rotational (OR + EM); On-call/locum; Other (specify)
11	Average weekly duty hours in ED/Trauma	Single choice	<24 h; 24-36 h; 36-48 h; 48-60 h; <60 h
12	Night shifts per month (approx.)	Single choice	0-2; 3-5; 6-8; >8
13	Nature of Night Duties in ED/Trauma	Single choice	On-floor duty (physically present in ED for entire shift); On-call duty (called in as required); Mixed (part on-floor, part on-call); Varies depending on roster

TABLE 9: Supplementary Table S2. Demographics and work setting

Single-choice responses permit one selection.

Q., Original Questionnaire Item Number; ED, Emergency Department; EM, Emergency Medicine; OR, Operating Room; AIIMS, All India Institute of Medical Sciences; PGI, Postgraduate Institute; JIPMER, Jawaharlal Institute of Postgraduate Medical Education and Research

Q.	Question	Response format	Response options / rating scale
14	Do you feel the anaesthesiology training has help in leadership and team coordination in ED?	Single choice	YES; NO
15	Do you feel the anaesthesiology training helps in adaptability in high stress environment in ED?	Single choice	Yes; NO
16	Do you fee the anaesthesiologist training helps in managing difficult airway scenarios?	Single choice	Yes; No
17	Typical ED area(s) you cover	Multiple choice (select all that apply)	Red triage/Resuscitation; Yellow triage/Observation; Pediatric ED; Trauma bay; Minor OT/Procedure room; Prehospital/EMS interface; Trauma and Emergency OT; Other (specify)
18	Common clinical roles you perform	Multiple choice (select all that apply)	Airway & ventilatory support; Hemodynamic stabilization/shock management; Procedural sedation/analgesia; POCUS for diagnosis/procedures; Resuscitation team leader; Disposition decisions (admit/ICU/ward/discharge); Medico-legal documentation; Other (specify)
19	Average number of critical resuscitations you manage per week	Single choice	0-2; 3-5; 6-10; >10
20	ED-relevant training and fellowships completed	Multiple choice (select all that apply)	ATLS; ACLS/BLS; PALS; NELS; Fellowship/Diploma in EM/Trauma/Critical Care; POCUS certificate course; None; Other (specify)

TABLE 10: Supplementary Table S3. Clinical exposure and roles (Questions 14-20)

Multiple-choice items permit more than one selection.

Q., Original Questionnaire Item Number; ED, Emergency Department; EM, Emergency Medicine; EMS, Emergency Medical Services; OT, Operating Theatre; POCUS, Point-of-Care Ultrasonography; ACLS, Advanced Cardiovascular Life Support; BLS, Basic Life Support; ATLS, Advanced Trauma Life Support; PALS, Pediatric Advanced Life Support; NELS, National Emergency Life Support

21	Rapid sequence intubation	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
22	Difficult airway (bougie/video/supraglottic/surgical airway)	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
23	Percutaneous Tracheostomy	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
24	Ventilator setup & troubleshooting in ED	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
25	Vasoactive agents & shock protocols	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
26	POCUS – eFAST	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
27	POCUS – cardiac (Tamponade, LV Function) and Lung (pneumothorax, edema)	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
28	Central venous access	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
29	Chest drain insertion	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
30	Management of cardiac arrest (ACLS leadership)	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
31	Recognition and initial management of acute coronary syndromes	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
32	Initial management of acute stroke (including triage/window identification)	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
33	Recognition and management of poisoning	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
34	Recognition and management of animal bite	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
35	Do you feel comfortable teaching Emergency Medicine (MD/Fellowship trainees)?	Single choice	1-5 rating scale (1 = Not confident; 5 = Expert)
36	Procedures you perform most often in ED	Multiple choice (select all that apply)	Intubation; NIV and Mechanical ventillator setup; Central line; Arterial line; Chest tube; Regional block for trauma; Procedural sedation; Percutaneous tracheostomy; POCUS; Cardioversion and defibrillation; Other (specify)

TABLE 11: Supplementary Table S4. Self-rated clinical competencies (Questions 21-36)

Self-rated clinical competence used a five-point scale, from 1 (not confident) to 5 (expert); intermediate response categories were beginner, competent, and proficient. Question 36 permitted multiple selections.

Q., Original Questionnaire Item Number; ED, Emergency Department; POCUS, Point-of-Care Ultrasonography; eFAST, extended Focused Assessment With Sonography for Trauma; ACLS, Advanced Cardiovascular Life Support; NIV, Non-invasive Ventilation

Q.	Question	Response format	Response options / rating scale
37	Comfort with undifferentiated presentations (e.g., chest pain, altered sensorium, SOB, polytrauma)	Single choice	1-5 rating scale (Not comfortable to Very comfortable)
38	Main decision supports you use (select all that apply)	Multiple choice (select all that apply)	Departmental protocols/algorithms; Senior/peer consults; EM textbooks/apps (EGDT/UpToDate/Medscape); Hospital order sets/CPGs; None; Other (specify)
39	Most frequent barriers to timely care in your ED (select up to 3)	Multiple choice (select all that apply)	Overcrowding; Bed shortages; Delays in imaging/lab reports; Limited equipment (ventilators/monitors); Staffing shortages; Medico-legal/process delays; Violence/abuse towards staff; Other (specify)
40	Do you feel Anesthesiologist have limited exposure to pre-hospital care and disaster management?	Single choice	Yes; No

TABLE 12: Supplementary Table S5. Diagnostic breadth and workflow (Questions 37-40)

Comfort was rated on a five-point scale. Questions 38 and 39 permitted multiple selections; question 39 requested up to three barriers.

Q., Original Questionnaire Item Number; ED, Emergency Department; EM, Emergency Medicine; SOB, Shortness of Breath; EGDT, Early Goal-Directed Therapy; CPG, Clinical Practice Guideline

Q.	Question	Response format	Response options / rating scale
41	In the last 12 months, have you experienced verbal or physical violence in ED?	Single choice	No; Verbal only; Physical (with or without verbal)
42	Availability of security protocols in your ED	Single choice	Adequate and implemented; Exists but poorly implemented; Not available/unsure
43	Medico-legal documentation confidence (MLC, consent, records)	Single choice	1-5 rating scale (Not comfortable to Expert)
44	Have you faced any medico-legal notice/complaint related to ED work?	Single choice	No; Yes (resolved); Yes (pending); Prefer not to say

TABLE 13: Supplementary Table S6. Workplace safety and medico-legal experience (Questions 41-44)

Medico-legal documentation confidence used a five-point ordinal scale; other items were single-choice questions.

Q., Original Questionnaire Item Number; ED, Emergency Department; MLC, Medico-Legal Case

Q.	Question	Response format	Response options / rating scale
45	Single-item burnout measure	Single choice	I enjoy my work. I have no symptoms of burnout.; I am under stress, but not burned out.; I am definitely burning out (symptoms won't go away).; The symptoms of burnout won't go away and I think about work frustrations a lot.; I feel completely burned out and may need help.
46	WHO-5 Well-Being Index (past 2 weeks)	Matrix (one response per statement)	Five statements: I have felt cheerful and in good spirits; I have felt calm and relaxed; I have felt active and vigorous; I woke up feeling fresh and rested; My daily life has been filled with things that interest me. Each statement rated 0-5 (0 = At no time; 1 = Rarely; 2 = Some of the time; 3 = More than half of the time; 4 = Most of the time; 5 = All of the time).
47	Overall job satisfaction in your current ED role	Single choice	1-5 rating scale (Very dissatisfied to Very satisfied)
48	Work-life balance	Single choice	1-5 rating scale (Very poor to Excellence)
49	Primary factors affecting your well-being (select up to 3)	Multiple choice (select all that apply)	Shift timings/night duties; High patient load/overcrowding; Resource limitations; Medico- legal stress; Interpersonal/team issues; Pay/compensation; Commute/housing; Other (specify)

TABLE 14: Supplementary Table S7. Well-being, burnout and job satisfaction (Questions 45-49)

Question 49 requested up to three selections. The burnout item is a self-report item, not a diagnostic assessment.

Q., Original Questionnaire Item Number; ED, Emergency Department; WHO-5, World Health Organization Five Well-Being Index. Each WHO-5 statement was rated 0-5 (0, at no time; 5, all of the time).

Q.	Question	Response format	Response options / rating scale
50	Need for training: Undifferentiated ED diagnostics & triage	Single choice	1-5 rating scale (1 = Not needed; 2 = Slight need; 3 = Moderate; 4 = High; 5 = Very high)
51	Need for training: EM protocols & pathways (sepsis, ACS, stroke, trauma)	Single choice	1-5 rating scale (1 = Not needed; 2 = Slight need; 3 = Moderate; 4 = High; 5 = Very high)
52	Need for training: POCUS (eFAST, cardiac, lung)	Single choice	1-5 rating scale (1 = Not needed; 2 = Slight need; 3 = Moderate; 4 = High; 5 = Very high)
53	Need for training: Pediatric EM	Single choice	1-5 rating scale (1 = Not needed; 2 = Slight need; 3 = Moderate; 4 = High; 5 = Very high)
54	Need for training: Disaster medicine & prehospital care	Single choice	1-5 rating scale (1 = Not needed; 2 = Slight need; 3 = Moderate; 4 = High; 5 = Very high)
55	Need for training: Medico-legal documentation & communication	Single choice	1-5 rating scale (1 = Not needed; 2 = Slight need; 3 = Moderate; 4 = High; 5 = Very high)
56	Preferred training format(s) (select all that apply)	Multiple choice (select all that apply)	Short workshops (1-2 days); Simulation-based courses; Online modules (self-paced); Observership/rotations; Fellowships (6-12 months); Other (specify)
57	Your top 3 strengths as an anesthesiologist working in ED	Free-text response	Open-ended answer
58	Top 3 weaknesses/gaps you feel in ED practice	Free-text response	Open-ended answer
59	Top 3 opportunities you see for career growth in EM	Free-text response	Open-ended answer
60	Top 3 threats/challenges you face in ED	Free-text response	Open-ended answer

TABLE 15: Supplementary Table S8. Training needs and SWOT (Questions 50-60)

Training needs were rated 1-5 (1, not needed; 5, very high). Question 56 allowed multiple selections; questions 57-60 were open-ended.

Q., Original Questionnaire Item Number; ED, Emergency Department; EM, Emergency Medicine; POCUS, Point-of-Care Ultrasonography; eFAST, extended Focused Assessment With Sonography for Trauma; ACS, Acute Coronary Syndrome; SWOT, Strengths, Weaknesses, Opportunities and Threats

Q.	Question	Response format	Response options / rating scale
61	Primary employment category	Single choice	Government (State); Central Institute; Private/Corporate; Mixed; Prefer not to say
62	Approximate monthly remuneration for ED role	Single choice	< ₹75,000; ₹75,000-1,25,000; ₹1,25,001-2,00,000; ₹2,00,001-3,00,000; ₹3,00,000; Prefer not to say
63	Would you recommend the EM pathway to other anesthesiologists?	Single choice	Yes; Maybe; No

TABLE 16: Supplementary Table S9. Compensation and career perspectives (Questions 61-63)

Employment category, remuneration and career recommendation were assessed using single-choice responses. Amounts are reported in Indian rupees (INR) as shown in the original questionnaire.

Q., Original Questionnaire Item Number; ED, Emergency Department; EM, Emergency Medicine

Q.	Question	Response format	Response options / rating scale
64	Please share any suggestions to improve the transition of anesthesiologists into EM (training, policy, staffing, safety, etc.)	Free-text response	Open-ended answer
65	Email address (optional - for receiving study results only)	Free-text response	Optional email address

TABLE 17: Supplementary Table S10. Open-ended feedback and optional follow-up (Questions 64-65)

These items were free-text questions; the email field was optional and was intended only for sharing a summary of study results.

Q., Original Questionnaire Item Number; ED, Emergency Department; EM, Emergency Medicine

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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Disclosures

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