Emergency Medical Services and Quality of Pre-Hospital Care: Knowledge, Attitude and Intended Practices among Medical Students at a University Hospital of Nepal

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ABSTRACT

Introduction: Emergency Medical Services are essential for managing urgent health conditions, and their effectiveness depends on public understanding and willingness to use these services. This study evaluated medical students' knowledge, attitude, and intended practices related to emergency medical services and pre-hospital care at a university hospital in Nepal.

Methods: This descriptive cross-sectional survey was conducted among 335 medical students from 1st November to 6th December, 2025. Data were collected using a validated, self-administered online questionnaire. All eligible students who provided informed consent were included in the analysis. Descriptive statistics were used to summarize the findings.

Results: Among 335 respondents, a total of 242 (72.24%) participants were aware that Nepal has a three-digit emergency medical assistance number and 128 (38.21%) correctly identified the number. A total of 309 (92.23%) participants reported that patients with life-threatening injuries should reach a hospital within one hour. Ambulance services were considered beneficial by 304 (90.75%) participants, and 333 (99.40%) participants reported that ambulances staffed with trained paramedics improve patient care. Regarding ambulance response time, 177 (52.84%) participants reported expected ambulance arrival within 5–30 minutes. During emergencies at home, 248 (74.03%) participants preferred private or public vehicles, whereas 87 (25.97%) preferred calling an ambulance

Conclusions: Medical students were aware of emergency medical services and valued timely pre-hospital care, yet many still preferred private or public transport in emergencies.

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INTRODUCTION

Emergency Medical Services (EMS) represent the system responsible for delivering urgent pre-hospital care through ambulances, dispatch centres, and trained responders.[1] Effective EMS systems, common in high-income countries, improve trauma outcomes by enabling rapid assessment, stabilization, and transport to definitive care.[2] In Nepal, however, the EMS model remains poorly structured, with limited regulations, low public awareness, and inadequate integration into the national emergency care framework.[2]

The study is necessary because Nepal faces high trauma burdens typical of low- and middle-income countries yet lacks a functional EMS system.[3,4] Most patients still rely on taxis or private vehicles, resulting in delayed care and preventable deaths.[5] Understanding knowledge, attitudes, and practices related to EMS is essential for strengthening pre-hospital care, informing policies, and guiding national EMS development.

The objective of this study was to assess the knowledge, attitudes, and practices of medical students regarding EMS and the quality of pre-hospital care in a University Hospital of Nepal.

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METHODS

This descriptive cross-sectional study was conducted to assess medical students' knowledge, attitude, and intended practices related to Emergency Medical Services (EMS) and pre-hospital care. The study was conducted at Dhulikhel Hospital; Kathmandu University Hospital, a community-based teaching hospital in Kavrepalanchok, Nepal, from 1st November to 6th December, 2025.

Ethical approval was obtained from the Nepal Health Research Council (Reg. No. 288/2023) and institutional authorities prior to data collection. Electronic informed consent was obtained from all participants before questionnaire access. Confidentiality and anonymity of participant information were maintained throughout the study.

Medical students enrolled at the university teaching hospital during the study period who provided informed consent were included in the study. Students who declined consent or submitted incomplete responses were excluded from the analysis.

A census sampling (total enumeration) approach was used. All eligible medical students meeting the inclusion criteria were invited to participate through institutional communication channels and class-based online messaging groups. Considering the level of intermediate knowledge among medical students of 72.8% derived from a previous multicentre cross-sectional study.[6] With a 95% confidence level and 5% margin of error, the sample size was calculated as: $n= z^2*p*(1-p)/e^2 = (1.96)^2*0.728*0.272/(0.05)^2=305$. Where, z= 1.96 at 95% confidence interval p=72.8% prevalence of intermediate knowledge regarding emergency medical services from a previous multicentre study.[6]

After adding 10% for non-response, the minimum calculated sample size became 335. A total of 335 students completed the questionnaire and were included in the final analysis.

Data were collected using a structured, self-administered online questionnaire developed after reviewing relevant literature and previously published studies related to EMS and pre-hospital care. The questionnaire was distributed electronically using Google Forms. The survey consisted of four sections: sociodemographic characteristics, knowledge, attitude, and intended practices regarding EMS and ambulance utilization. The knowledge section included seven factual items, the attitude section included four items measured using a five-point Likert scale, and the intended practice section included three items assessing preferred care-seeking behavior during emergency situations. The questionnaire was prepared in both English and Nepali; however, the English version was used for data collection. Prior to the final survey, the questionnaire was reviewed by experts in emergency medicine and public health to assess content validity. A pilot test was conducted among a small group of medical students who were not included in the final study. Internal consistency reliability was assessed for the attitude domain using Cronbach's alpha, with a coefficient of ≥0.70 considered acceptable. Reliability testing was not performed for the knowledge items because they consisted of independent factual questions rather than items measuring a single latent construct.

The primary outcome variables were knowledge, attitude, and intended practices related to EMS and pre-hospital care. Knowledge variables assessed awareness of emergency contact numbers, ambulance services, and Basic Life Support (BLS). Attitude variables evaluated perceptions regarding ambulance efficiency and pre-hospital care. Intended practice variables assessed preferred emergency response behavior during hypothetical emergency situations. Sociodemographic characteristics were included as independent variables.

Data were exported to Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS), version 25.0 for Windows (IBM Corp., Armonk, NY, USA). Descriptive statistical analysis was performed using frequency, percentage, mean, and standard deviation to summarize the study findings. Data were securely stored and accessed only by the research team.

RESULTS

A total of 335 medical students participated in the study. Among them, 188 (56.12%) were female and 147 (43.88%) were male. The mean age of the participants was 20.16±1 years. Among 335 participants, 199 (59.40%) participants belonged to the Brahmin/Chhetri ethnicity (Table 1).

Table 1. Socio-demographic characteristics of the study population (n=335).

Variables	n(%)
Gender	
Male	147(43.88)
Female	188(56.12)
Age (Mean±SD)	20.16±1
Ethnicity	
Brahmin/Chhetri	199(59.40)
Janajati	83(24.78)
Madhesi	32(9.55)
Muslim	14(4.18)
Dalit	7(2.09)

Out of 335 participants surveyed using the validated questionnaire, 242 (72.24%; 95% CI: 67.11-76.97) reported awareness of the existence of a dedicated three-digit emergency medical assistance number in Nepal, 25 (7.46%) reported that no such number exists and 68 (20.30%) did not know about its existence. Among all participants, 161 (48.06%) reported knowing the specific three-digit emergency medical assistance Among all participants, 128 (38.21%) correctly identified 102 as the emergency medical assistance number. Among the 161 participants who reported knowing the emergency number, 128 (79.50%) identified 102 as the emergency medical assistance number (Table 2).

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Table 2. Study population knowledge regarding emergency medical services and pre-hospital care (n=335).

Response	n(%)
K1. Awareness of 3-digit emergency medical assistance number	
Yes	242(72.24)
No	25(7.46)
Do not know	68(20.30)
K2. Knowledge of specific 3-digit emergency number	
Yes	161(48.06)
No	174(51.94)
K3. Identified emergency number (among those aware, n=161)	
102	128(79.50)
101	10(6.19)
112	5(3.13)
100	5(3.13)
103	3(1.86)
911	10(6.19)
K4. Appropriate time to reach hospital after life-threatening injury	
Within 1 hour	309(92.23)
1–3 hours	21(6.27)
Do not know	5(1.50)
K5. Ambulance provides benefit to sick or injured patients	
Yes	304(90.75)
No	10(2.99)
Do not know	21(6.27)
K6. Benefit of having trained paramedics in ambulance	
Yes	333(99.40)
No	2(0.60)
K7. Knowledge of Basic Life Support (BLS)	
Yes	260(77.61)
No	75(22.39)

Regarding timely access to hospital care, 309 (92.23%) participants reported that patients with life-threatening injuries should reach a hospital within one hour, while 21 (6.27%) reported one to three hours and 5 (1.50%) reported not knowing the appropriate time. Out of 335 participants, 304 (90.75%) reported that ambulances provide benefit to sick or injured patients, 10 (2.99%) reported no benefit, and 21 (6.27%) were unsure.

A total of 333 (99.40%) participants reported that having trained paramedics in ambulances is beneficial. Knowledge regarding Basic Life Support (BLS) was reported by 260 (77.61%) participants, while 75 (22.39%) reported no knowledge of BLS (Table 2).

Regarding ambulance response time, 5 (1.49%) participants reported ambulance arrival in less than five minutes, 177 (52.84%) reported arrival within five to thirty minutes, and 111 (33.13%) reported arrival within thirty-one to sixty minutes. Ambulance arrival within one to two hours and two to three hours was reported by 24 (7.16%) and 7 (2.09%) participants, respectively (Figure 1).

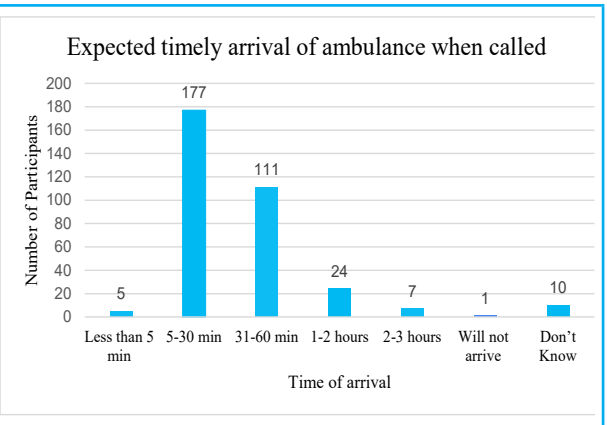

Figure 1. Study population attitude regarding timely arrival of ambulance when called (n=335).

Regarding ambulance transport efficiency, 120 (35.82%) participants strongly agreed and 153 (45.67%) agreed that ambulances are an efficient means of patient transport (Table 3).

When asked about seeking medical care for severely ill or injured family members at home, 248 (74.03%) participants reported preference for private or public transportation, while 87 (25.97%) reported preference for calling an ambulance. During emergencies occurring outside the home, 220 (65.67%) participants reported preference for private or public transportation, whereas 115 (34.33%) reported preference for calling an ambulance.Regarding acceptance of pre-hospital care, 330 (98.51%) participants reported willingness to allow trained health personnel to provide care during ambulance transport, 4 (1.19%) reported refusal, and 1 (0.30%) was unsure (Table 4).

DISCUSSION

This study assessed knowledge, attitudes, and intended practices regarding EMS and pre-hospital care among medical students in Nepal. The findings demonstrated awareness regarding several aspects of EMS and positive perceptions toward ambulance services and pre-hospital care. However, preference for private or public transportation during emergencies remained common, indicating a gap between awareness of EMS and intended utilization of ambulance services.

In this study, about three-quarters of participants were aware that a dedicated three-digit emergency medical number exists in Nepal. Similar levels of awareness have been reported among healthcare workers and students in Pakistan and India, where emergency numbers have been in use for a longer time.[7] However, less than half of the participants in the present study were able to correctly identify the emergency number as 102. This proportion is lower than that reported in Pakistan, where correct identification of the emergency number was higher.[7] This difference may be due to the relatively recent introduction and limited nationwide promotion of the 102-emergency number in Nepal. Lower awareness has also been reported in studies from Saudi Arabia, suggesting that limited public education

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affects emergency number utilization across different settings.[8] Knowledge regarding the importance of reaching a hospital within one hour after a life-threatening injury was high in this study.

Table 3. Study population attitude regarding emergency medical services and pre-hospital care (n=335).

	Attitude Statement	Strongly Agree n(%)	Agree n(%)	Neutral n(%)	Disagree n(%)	Strongly Disagree n(%)
A2	Ambulance is an efficient means of transporting patients to the hospital.	120(35.82)	153(45.67)	50(14.93)	5(1.49)	7(2.09)
A3	Trained health personnel in ambulances are adequate to manage patients until hospital arrival.	52(15.52)	144(42.99)	83(24.78)	54(16.12)	2(0.60)
A4	Treatment provided during ambulance transport is as important as treatment provided at the hospital.	195(58.21)	127(37.91)	12(3.58)	1(0.30)	0(0.00)

Table 4. Study population practice regarding emergency medical services and pre-hospital care (n=335).

Response	n(%)
P1. Mode of hospital transfer during emergency at home	
Private/Public vehicle	248(74.03)
Call ambulance	87(25.97)
P2. Mode of hospital transfer during emergency outside home	
Private/Public vehicle	220(65.67)
Call ambulance	115(34.33)
P3. Acceptance of pre-hospital care by trained personnel in ambulance	
Yes	330(98.51)
No	4(1.19)
Not sure	1(0.30)

This finding is consistent with studies conducted among medical and nursing students in South Asia, where awareness regarding the "golden hour" has also been reported to be high.[9] The medical background of the participants may explain this level of awareness and may not reflect the understanding of the general population.

A high proportion of participants recognized the benefits of ambulance services and the importance of trained paramedics during patient transport. Similar findings have been reported from Nepal, Pakistan, and Bangladesh, where respondents acknowledged the importance of ambulances in emergency care.[7,10,11] Despite these positive perceptions, many participants expected ambulance arrival to take more than thirty minutes or were uncertain regarding response times. Previous studies from Nepal have reported delayed ambulance response times, traffic-related barriers, and limited ambulance availability, which may influence public confidence in EMS systems.[12,13]

Although many participants agreed that ambulances are an efficient mode of patient transport, preference for ambulance utilization during emergencies remained low. In this study, only 87 (25.97%) participants preferred calling an ambulance during emergencies occurring at home, while 115 (34.33%) preferred ambulance utilization during emergencies occurring outside the home. Similar discrepancies between awareness and intended ambulance utilization have been reported in Nepal, where only a limited proportion of emergency department patients arrived by ambulance.[12] Comparable patterns have also been reported in Pakistan, where private vehicle transportation remained common despite awareness regarding EMS services.[7]

Low ambulance utilization has also been documented in large-scale Asian studies. Data from the Pakistan National Emergency Departments Surveillance (Pak-NEDS) showed that only 4.1% of patients arrived at emergency departments by ambulance, with ambulance utilization largely restricted to critically ill or elderly patients.[14] These findings are consistent with the present study and suggest that perceived delays, limited ambulance availability, cost concerns, and doubts regarding service quality may discourage EMS utilization across the region.

Regarding pre-hospital care, some participants expressed uncertainty regarding the adequacy of trained paramedics in managing patients during ambulance transport. Similar concerns have been reported in studies from Pakistan, where doubts regarding paramedic training and pre-hospital care quality were common.[7] Comparable challenges in access to and quality of pre-hospital care services have also been described in Nepal, particularly related to limited trained personnel and emergency medical service preparedness.[15] However, almost all participants in this study reported willingness to allow trained health personnel to provide care during ambulance transport. This finding suggests general acceptance of pre-hospital care despite concerns regarding service quality. In contrast, studies from Saudi Arabia have reported lower acceptance of pre-hospital care due to sociocultural factors, highlighting variation across different settings. The findings of this study should be interpreted in light of certain limitations. The study was conducted at a single university teaching hospital, which may limit generalizability to all medical students or the general population of Nepal. Data were collected using self-reported responses through an online questionnaire, which may be subject to recall bias and social desirability bias. Additionally, the study assessed intended emergency response behaviour rather than actual utilization practices during real emergency situations.

CONCLUSION

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This study demonstrated that medical students had awareness regarding Emergency Medical Services (EMS) and positive perceptions toward the importance of timely and skilled pre-hospital care. However, preference for private or public transportation during emergencies remained common despite recognition of the benefits of ambulance services.

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Author's Contribution: **Subash Neupane:** Conceptualization, design, analysis, literature review, manuscript; **Prakash Budhathoky:** Analysis, data collection, literature review, manuscript; **Samir Kumar Adhikari:** Analysis, data collection, literature review, manuscript; **Narbada Thapa:** Analysis, data collection, literature review, manuscript; **Sonu Basnet:** Analysis, data collection, literature review; **Shrijana Singh:** Analysis, data collection, literature review, validation of resources; **Bimal Singh Bist:** Literature review, validation of resources; **Bigyan Prajapati:** Literature review, validation of resources; **Gaurav Devkota:** Literature review; **Sanu Krishna Shrestha:** Literature review; **Amit Kumar Singh:** Conceptualization, design, methodology, literature review, manuscript, analysis.

Conflict of Interest: None.

Data Availability Statement: The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethical Consideration: Ethical issues (including plagiarism, data fabrication, and double publication) have been completely observed by the authors.

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REFERENCES

1. Al Shammari T, Jennings PA, Williams B. Emergency Medical Services Core Competencies: A Scoping Review. Health Professions Education. 2018 Dec 1;4(4):245-58. DOI : 10.1016/j.hpe.2018.03.009
2. Bhandari D, Yadav NK. Developing an Integrated Emergency Edical Service in a Low-income Country like Nepal: A Concept Paper. International Journal of Emergency Medicine. 2020 Dec;13(1):7. DOI: 10.1186/s12245-020-0268-1
3. Banstola A, Gautam P, Smart G, Sherpa F, Joshi SK, Mytton J. 132 Prehospital Emergency Care for Trauma Victims in Nepal: A Mixed-methods Study. Injury Prevention. 2024 Sep 1;30. DOI: 10.3310/TMTG2437
4. Peden MM, Khayesi M. Save LIVES technical package: 22 Interventions that could Make a Difference. Injury Prevention. 2018 Oct 1;24(5):381-3. DOI: 10.1136/injuryprev-2018-042873
5. Bhalla K, Sriram V, Arora R, Ahuja R, Varghese M, Agrawal G, et al. The Care and Transport of Trauma Victims by Layperson Emergency Medical Systems: A Qualitative Study in Delhi, India. BMJ Global Health. 2019 Nov 1;4(6): e001963. DOI: 10.1136/bmjgh-2019-001963
6. Alkarrash MS, Shashaa MN, Kitaz MN, Rhayim R, Ismail M, Swed S, et al. Basic Life Support Awareness among Medical Undergraduate Students in Syria, Iraq, and Jordan: A Multicenter Cross-sectional Study. International Journal of Emergency Medicine. 2023 Jul 24;16(1):44. DOI: 10.1186/s12245-023-00521-0
7. Javaeed A, Malik MN, Yaseen M, Abbasi T. Emergency Medical Services and Quality of Care in Emergency Departments: Knowledge, Attitude and Practices among General Population in Rawalpindi, Pakistan. South Asian Journal of Emergency Medicine. 2018;1(1):22-8. DOI: 10.5455/sajem.010102
8. EMSAT: The Emergency Medical Service Assessment Team group, Hamam AF, Bagis MH, AlJohani K, Tashkandi AH. Public Awareness of the EMS system in Western Saudi Arabia: Identifying the Weakest Link. International Journal of Emergency Medicine. 2015 Dec;8(1):35. DOI: 10.1186/s12245-015-0070-7
9. Rajapakshe W, Wickramasurendra AK, Amarasinghe RR, Kohilawatta Arachchige Wijerathne SL, Wijesinghe ND, Madhavika N. Application of the Health Belief Model (HBM) to Explore the Quality of Sexual and Reproductive Health (SRH) education in Sri Lanka. International Journal of Environmental Research and Public Health. 2024 Dec 20;21(12):1703. DOI: 10.3390/ijerph21121703
10. Regmi P, Paneru DP, Oli P, Baral U, Poudel D, Thapa DK. Ambulance Service in Kathmandu, Nepal: Service Delivery Constraints, Challenges, and Achievements during the COVID-19 Pandemic. Prehospital and Disaster Medicine. 2023 Feb;38(1):122-9. DOI: 10.1017/S1049023X22002242
11. Chowdhury AI, Haider R, Abdullah AY, Christou A, Ali NA, Rahman AE, et al. Using Geospatial Techniques to Develop an Emergency Referral Transport System for Suspected Sepsis Patients in Bangladesh. PLoS One. 2018 Jan 16;13(1): e0191054. DOI: 10.1371/journal.pone.0191054
12. Shrestha SK, Koirala K, Amatya B. Patient's Mode of Transportation Presented in the Emergency Department of a Tertiary Care Centre, Kavre, Nepal. Kathmandu Univ Med J. 2018 Jan 1;16(61):39-42. Available from: https://pubmed.ncbi.nlm.nih.gov/30631015/
13. Gongal R, Dhungana B, Regmi S, Nakarmi M, Yadav B. Need of Improvement in Emergency Medical Service in Urban Cities. JNMA; Journal of the Nepal Medical Association. 2009 Apr 1;48(174):139-43. DOI: 10.31729/jnma.230

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14. Zia N, Shahzad H, Baqir SM, Shaukat S, Ahmad H, Robinson C, Hyder AA, Razzak JA. Ambulance Use in Pakistan: An Analysis of Surveillance Data from Emergency Departments in Pakistan. BMC Emergency Medicine. 2015 Dec 11;15(Suppl 2):S9. DOI: 10.1186/1471-227X-15-S2-S9

15. Bhattarai N, Bhandary S, Pachya AT. Access to Pre-hospital Care among Patients Visiting Emergency Department of a Tertiary Hospital in Nepal: A Mixed Methods Pilot Study. Journal of General Practice and Emergency Medicine of Nepal. 2021 Aug 16;8(11):14-20. DOI: 10.59284/jgpeman60

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