Pre-hospital care providers' perspective and associated factors towards pre-hospital emergency care in Addis Ababa, Ethiopia, 2022

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Research Article

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Abstract

Background: The pre-hospital emergency care is a system that provides emergency care to critically ill and injured patients in the field. Pre-hospital emergency care aims to deliver care on time to sufferers of sudden, life-threatening injuries and avoid unnecessary death or long-term morbidity. Accidental trauma, cardiac arrest, stroke, and obstetric emergencies are common causes of premature mortality and disability in low and middle-income countries. In these countries, most early deaths are the result of inadequate pre-hospital care provision.

The objective of this study was to assess pre-hospital care providers' perspectives and associated factors toward pre-hospital emergency medical care.

Result: In this study, the majority of participants' work experience was from 6-10years 40.6%(71), and 20%(35) above 10-years of work experience. The majority of care providers in the prehospital institution were 79.4% (139) nurses and 8.6% (15) emergency and critical nurses. The finding of this study showed that 96 (54.9%) of study participants had a good perspective and 45.1%(79) of the study participants had a poor perspective toward the pre-hospital emergency care. More than half of the participants of the study 52%(91) agreed that there is no proper documentation in prehospital care provider institutions. This study also indicated that there were no adequate basic life support equipment and drugs to provide emergency care in an ambulance. Eighty-seven (49.7%) of study participants replied that there were no the pre-hospital care guidelines and protocols that help care providers to give appropriate care in the ambulance service

Conclusion: The finding of this study showed that more than half of the study participants had a good perspective on the hospital emergency care. Pre-hospital care providers who had master's educational status were 1.17 times more likely to have a good perspective towards pre-hospital emergency care as compared to pre-hospital care providers who had diploma educational status. Therefore, the ministry of health of Ethiopia, the Addis Ababa health bureau, and all other stakeholders have to increase the training level of pre-hospital care providers to increase the quality care of prehospital service.

1. Background

The pre-hospital emergency care is a system that provides emergency care to critically ill and injured patients in the field (1). Pre-hospital emergency care aims to deliver care on time to sufferers of sudden, life-threatening injuries and avoid unnecessary death or long-term morbidity. It is an important component of the health system that helps to improve outcomes of injuries and illnesses. A well-functioning prehospital emergency care system offers opportunities for effective emergency preparedness and response capability within a broader disaster risk reduction strategy (2, 3, 4).

The pre-hospital care can be delivered by emergency medical technicians (EMT), paramedics, emergency physicians, emergency nurses, and other health professionals. Providing emergency care outside the hospital and immediate transfer of patients to emergency units are important measures that promote the

survival rate of the patients (5). Emergency medical service systems exist in one-third of African countries which is very low (6). Pre-hospital emergency services (PEMS) are established to serve diverse, multicultural, and multilingual populations of varying socioeconomic strata (7). PEMS in Ethiopia has been started in 1935 by the Ethiopian Red Cross society. It is the first service provider institution in society that started the service with free ambulance service on a 24-hour schedule (8).

PEMS system is well built and advanced widely in developed countries whereas a still slow development in low and medium-income countries (9). This is why the global burden of trauma and medical illness continues to be the main cause of morbidity and mortality in developing countries. This is due to poor PEMS, no uniform emergency medical service communications, and dispatching for the entire country (10).

A study in Uganda indicated that PEMS provision was overwhelmed by poor coordination and communication. There was also the absence of the utmost basic equipment and medicines desired to monitor and treat emergency conditions in ambulances and at emergency units (11). In Ethiopia, there are limited EMTs, untrained ambulance crews, poor ambulance systems and there is no medical oversight by experienced emergency physicians and nurses as a consultant as well as there are no coordinated systems from the institutions during transportation (12).

There is a huge problem of non-communicable illnesses and injuries in Addis Ababa due to the growth of the city and the way of life modifications of the tenants. A lot of factors intensified this condition including the absence of an interconnected PEMS, the deficiency of doomed substantially developed emergency center, the insufficient human and material resources to provide care for injured or acutely ill patients, the lack of medical training on rationales of triage and emergency management, and the shortage of sustainable funding for emergency service (13). In Addis Ababa, there is a less developed pre-hospital emergency medical service system and a scantiness of studies on the existing level of pre-hospital emergency medical service system, and the subsidizing factors were not addressed (14).

Every year, closely 5 million people internationally pass away from accidental injuries (15). Unintentional injuries, cardiac halt, stroke, and obstetric emergencies are usually the causes of early mortality and disability in low and middle-income countries. In these countries, most premature deaths are the consequence of poor pre-hospital care services (3). Pre-hospital injuries are the top reason for death between 1 and 44 years of age (16). Even in the UK, the most developed country, pre-hospital care for major injured patients is given by emergency medical technicians and paramedics but their expertise and the enactment of these clinicians confines the range of life-keeping interferences which can be given to the patient before they arrived the hospital (17).

A study conducted in Afghanistan indicated that the pre-hospital facility is not directed through any type of scheme protocols. Respondents sensed that the present number of ambulances is inadequate to cater to the demands of the population. Besides, there is no strategy to ensure that ambulance service givers have adequate supplies in ambulances to manage patients. Moreover, there is no methodical process of communication for healthcare facilities to help them with the handover of information and the pre-

hospital care process in Kabul lacks a protocol for triage of the severely injured patients which hits the outcome of care negatively (18).

A study employed in Thailand showed that lack of medical devices and collaboration with other organizations were core concerns in the pre-hospital situations (5). A study in Uganda found that an unstructured emergency medical services system stumbled by a lack of national policy, guidelines, and standards; funding; medical products, and coordination (20). Another study in South Africa showed that the deficiency of paramedics and EMTs that were the main factor that affects the PEMS (21). In Ethiopia, the study showed that there are resource constraints, and cost-efficient emergency medical services affect the pre-hospital service (2).

There were limited studies of documentation quality in the pre-hospital emergency care services that were delivered during "the golden hour". Crucial information on the mechanism of trauma and preliminary patient physiology can only be assembled at the trauma scene, where numerous emergency services with differing objectives interact. A study in USA result showed that the multivariate analysis discovered that patients missing one or more evaluates of patient physiology at the scene had a heightened risk of death (22, 23).

The level of complete medical documentation as well as the presence of protocols and guidelines in Ethiopia was lower. Even though low, there was variability in medical record documentation practice in Ethiopia regarding time, place, and institutions (23).

2. Methods

2.1 Study Design and setting

The institutional-based cross-sectional design was conducted from January- to February 2022 in Addis Ababa pre-hospital service provider institutions. Addis Ababa is the capital city of Ethiopia and the African Union and is located in the foothills of the Entoto Mountains. In Addis Ababa, the pre-hospital emergency medical care is provided by governmental and non-governmental institutions which include the Addis Ababa city administration fire and disaster risk management commission, Ethiopian Red Cross society in Addis Ababa, Tebita ambulance service, and Nebiela ambulance.

2.2 Study Participants

Pre-hospital care providers working in pre-hospital service providers both governmental and non-governmental institutions, in Addis Ababa city administration

2.3 Operational definitions

- **Good perspective**: is the response of health care professionals towards pre-hospital care providers' perspective questions and scored above the mean (25).

- **Poor perspective**: is the response of health care professionals towards pre-hospital care providers' perspective questions and scored below the mean (25).
- **Pre-hospital care provider**: A health worker who provides care services in a prehospital setup.

2.4 Data collection tool and procedure

A pretest was done before the study in 5% of the population at the Nordic ambulance service to ensure reliability and validity. The Cronbach's alpha of the tool had been calculated and had a value of 0.8. Depending on the pretest, the questionnaire had been corrected to ensure clarity. The questionnaire was carefully designed in English. During data collection, the supervisors monitored the data collection process by checking completeness. The data collectors explained the purpose of the study to the respondents corresponding to their predefined criteria.

2.5 Data processing and analysis

The researchers checked the data for its completeness during data entry and the cleaning process. The data were entered into Epi data version 3.1 for data entry, recording, and cleaning, and then transferred to SPSS version 26 for analysis. Descriptive statistics such as frequencies and proportions were calculated. Binary logistic regression was fitted to identify statistically significant independent variables and variables with a p-value < 0.25 in the bi-variable logistic regression analysis were entered into the multivariable logistic regression. The level of significance was determined at a p-value of < 0.05. The strength of association was interpreted using the adjusted odds ratio (AOR) with its 95% confidence intervals.

3. Results

3.1 Socio-demographic characteristics

A total of 190 questionnaires were distributed to all health care providers who were available during data collection. The respondent rate was 92.1%(n = 175) of which the 175 participants,56%(98) were females and 44%(77) were males. The majority of participants' work experience was from 6-10years 40.6% (71), 2–5 years 39. 4% (69), and 20%(35) above 10-years of work experience. Regarding the educational level of the participants more than half 52.6% (92) bachelor's degrees, 45.1% (79) diplomas, and 2.3% (4) master's degrees in health-related fields. Concerning the types of care providers79.4% (139) nurses and 8.6% (15) were emergency and critical nurses as shown in(Fig. 1).

The majority of participants were working in government organizations 77.1% (135) and 22.9% (40) working in private organizations. 82.3%(144) were working in ambulance service, 10.3%(18) in a call center, and7.4% (13) were in a leadership role. Regarding the training status of the participants, 23.4% (41) had no pre-hospital service training as shown in (Fig. 2).

3.2 Care providers' perspective on prehospital emergency care

3.2.1 Care providers toward Organizational factors

Concerning organization factors, 4 8%(84) participants responded that their institution had proper documentation and a standardized dispatch center. Only eighty-seven (49.6%%) of care providers got the scope of practice or job description from their institutions whereas, 60%(105) of prehospital study participants not participated and knew about their organizational planning, budget, and human resource recruitment and staffing.

3.2.2 Care Provider perspective on Leadership and financing

The majority of study participants 82 (46.9%) strongly agreed that inappropriate management and leadership affect the pre-hospital emergency care and 65(37.1%) of participants agreed that their salary demotivated them to change the pre-hospital emergency care.

3.2.3 Care providers' perspectives on ambulance service

Regarding basic life support equipment and drugs to give the necessary emergency care at the emergency site and in an ambulance, 45.1%(79) of study participants answered that there were not enough supplies. In addition, 49.7% (87) of study participants replied that there were no pre-hospital care management guidelines and protocols that help care providers to give appropriate care in the ambulance service. Also, about 26.9%(47) of care providers agreed that there was not sufficient staff according to the national standard and 80(45.7%)of participants agreed that poor staff qualification and competencies can affect the ambulance service as shown in (Table1).

Table 1
Care providers' perspective on ambulance service (n = 175),2022

Variable	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
Do you think your institution has enough pre-hospital staff according to the national standard?	13(7.4)	36(20.6)	45(25.7)	47(26.9)	34(19.4)
Do you think your institution has management guidelines and protocols for ambulance use?	35(20)	87(49.7)	39(22.3)	12(6.9)	2(1.1)
Do you think there is enough basic life support equipment to give emergency care at the emergency site and in an ambulance?	29(16.6)	79(45.1)	38(21.7)	7(4)	22(12.6)
Do you think there is Full Advanced life support care (such as intubation, ECG monitoring, and respiratory and cardiovascular medications) given in your ambulance service?	92(52.6)	54(30.9)	14(8)	7(4)	8(4.6)
Do you think there is a knowledge/skill gap in pre-hospital care providers to give proper ambulance service?	14(8)	37(21.1)	46(26.3)	60(34.3)	18(10.3)
Do you think there is a lack of collaboration with other organizations during the ambulance service?	8(4.6)	41(23.4)	63(36)	42(24)	21(12)
Do you think there is miss use of ambulances in your institution?	28(16)	43(24.6)	53(30.3)	38(21.7)	13(7.4)
Do you think a patient follow sheet is important during pre-hospital care all the time?	0	291.1)	16(9.1)	62(35.4)	95(54.3)
Do you think poor staff qualifications and competencies are the factors that affect the pre-hospital ambulance service?	5(2.9)	4(2.3)	24(13.7)	62(35.4)	80(45.7)

3.2.4 Care providers' perspective on call center

About 44.6% (78) of pre-hospital care providers disagree that the presence of communication protocols and guidelines in the dispatch center/call center. In addition, seventy-eight (44.6%) of the participants agreed that there was no modern communication system in the dispatch center as shown in (Table 2)

Table 2
Care Providers' perspective toward communication/call center (n = 175),2022

Variables	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Do you think there are communication protocols and guidelines in the dispatch center?	31(17.7%)	78(44.6%)	45(25.7%)	18(10.3%)	3(1.7%)
Do you think there are modern communication systems in the dispatch center?	32(18.3%)	78(44.6%)	43(24.6%)	18(10.3%)	4(2.3%)
Do you think there is no contact with the hospital before the patient is transferred to the ambulance?	24(13.7%)	41(23.4%)	55(31.5%)	40(22.9%)	15(8.6%)
Do you think all dispatchers are certified in radio or phone communications?	31(17.7%)	66(37.7%)	54(30.9)	20(11.4%)	4(2.3%)
Do you think some factors affect the communication system?	2(1.1%)	20(11.4%)	66(37.7%)	87(49.7)	0%
Do you think a computer-aided dispatch center is necessary to develop a pre-hospital emergency medical service system?	0%	0%	12(6.9%)	69(39.4%)	94(53.7%)

3.2.5 Factors associated with provider’s perspective

In binary logistic regression showed that age group, training in pre-hospital service, educational status, and proper documentation were significantly associated with the provider's perspective for pre-hospital emergency care at a p-value less than 0.25. The variables that were significantly associated at a p-value less than 0.25 were candidates for multi-variable logistic regression analysis. The multivariable logistic regression model showed that the age of the respondents and the educational status of the participant were significantly associated with the provider's perspectives for the pre-hospital emergency care with a p-value less than 0.05 and a 95% confidence interval. The participant's ages between 20 and 25 years were almost 23% (AOR = 0.77(95% CI: 0.24, 0.98)) decrease to have had good perspective towards pre-hospital emergency care as compared to pre-hospital care providers' age group between 26 and 30 years. The Pre-hospital care providers who had master's degrees were also 1.17 times more likely (AOR = 1.17(95% CI: 1.08, 2.98) to have a good perspective for pre-hospital emergency care as compared to diploma educational status as shown in (Table 3).

Table 3
Multiple logistic regression factors associated with provider's perspective (n = 175),2022

Variable	Providers perspective		COR(95%CI)	AOR(95%CI)	P –value
	Good	Poor			
Age of participant					
20–25	22	30	1	1	
26–30	34	37	2.85(0.29, 7.9)	0.77(0.24,0.98)	0.04*
31–40	38	12	2.1(0.2, 12.3)	0.51(0.14,8.2)	0.62
> 41	2	0	1.3(0.12, 4.87)	0.5(0.45,10.2)	0.45
Marital status					
Single	42	53	1	1	
Married	52	25	2.63(1.4,4.91)	2.11(0.96,4.22)	0.15
Divorced	2	1	2.52(0.22,2.79)	2.05(0.65,1.89)	0.19
Educational status					
Diploma	39	40	1	1	
Degree	55	37	1.53(0.83,2.81)	1.35(0.71,1.94)	0.28
Masters	2	2	1.33(0.14,7.65)	1.17(1.08–2.98)	0.02*
Work experience					
< 2 years	21	29	1	1	
2_5 years	37	32	1.6(0.77,3.32)	1.4(0.44,2.54)	0.08
5–10 years	38	17	3.1(1.34,6.88)	2.6(0.54,4.53)	0.11
> 10 years	1	0	0.32(0.45,3.2)	0.21(0.32,2.2)	0.18
Working organization					
Governmental	81	54	0.35(0.16,0.78)	0.31(0.12,0.56)	0.32
Non-governmental	11	21	0.67(0.16,2.78)	0.56(0.13,2.48)	0.21
Private	4	4	1	1	
Working unit					
Dispatch center	14	4	1	1	
leadership role	8	5	0.46(0.14,2.21)	0.32(0.19,2.18)	0.41

Variable	Providers perspective		COR(95%CI)	AOR(95%CI)	P –value
	Good	Poor			
Ambulance	74	70	0.3(0.11,0.96)	0.23(0.16,0.88)	0.23

4. Discussion

This study assessed pre-hospital care providers' perspectives and associated factors toward the pre-hospital emergency care in Addis Ababa, Ethiopia. The finding of this study showed that 96 (54.9%) of study participants had a good perspective and seventy-nine (45.1%) of the study participants had a poor perspective toward the pre-hospital emergency care. In this study, 52%(91) of study participants replied that there is no proper documentation in prehospital care provider institutions. A study conducted in Ethiopia also revealed that there was variability in documentation practice in Ethiopia concerning time, place, and institutions. Currently, besides improving the healthcare quality through providing proper information, documentation has also become part of the legal document for the protection of patient's safety (25).

Almost half of the study participants 49.7% (87) agreed that there were no pre-hospital care management guidelines and protocols that help care providers to give appropriate care in the ambulance service. This finding was in line with the study employed in Afghanistan which showed that the pre-hospital service was not governed by any kind of protocols and guidelines (18).

In this study, forty-two (42%) of pre-hospital health care providers agreed that there was a lack of collaboration with other organizations during the ambulance service. The study conducted in Thailand also indicated that the absence of collaboration with other organizations was the main issue in the pre-hospital situations (5).

The age of the respondent was significantly associated with the provider's perspective on the pre-hospital emergency medical service system. Pre-hospital care providers' age between 20 and 25 years were almost 23% (AOR = 0.77(95%CI: 0.24, 0.98)) decrease have had a good perspective towards pre-hospital emergency care as compared to pre-hospital care providers aged between 26 and 30 years.

The educational status of the participants was significantly associated with the provider's perspective on the pre-hospital emergency medical service system. Pre-hospital care providers who had a master's educational status were 1.17 times more likely (AOR = 1.17 (95% CI: 1.08, 2.98) to have a good perspective toward pre-hospital emergency care as compared to pre-hospital care providers who had diploma educational status. This finding could be explained as; the level of knowledge increases with the level of education and perspective towards pre-hospital emergency care also could increase along with knowledge about this service.

Strength and limitations of the study

The strength of this study was including all pre-hospital care provider health professionals both from public and private institutions that were found in the Addis Ababa city administration. The limitation of this study did not include the community perspective towards prehospital emergency care and since the study was conducted only in Addis Ababa the result cannot be generalized to the entire country.

5. Conclusion And Recommendations

This study was intended to assess the pre-hospital care providers' perspective and associated factors regarding pre-hospital emergency care in Addis Ababa, Ethiopia. The finding of this study showed that more than half of the study participants had a good perspective on the hospital emergency medical service system. The age of the respondent was significantly associated with the provider's perspective on pre-hospital emergency care. Pre-hospital care providers who had master's educational status were 1.17 times more likely to have a good perspective towards pre-hospital emergency care as compared to pre-hospital care providers who had diploma educational status.

We suggest that the Ministry of the health of Ethiopia, the Addis Ababa health bureau, and all other stakeholders have to increase the training level of pre-hospital care providers to increase the quality care of prehospital service. We recommend also the researchers study the community's perspectives on prehospital emergency care.

List Of Acronyms And Abbreviations

BLS: Basic life support

ACLS: Advance cardiac life support

EMT: Emergency medical technician

IRB: Institution review board

PEMS: Prehospital emergency medical care

SPHMMC: Saint Paul’s hospital millennium medical college

Declarations

Ethics approval and consent to participate

The ethical approval and letter of cooperation for each institution for this study were obtained from the SPHMMC academic institution review board (IRB). The data collectors and supervisors provided the study participants with information about the aim and the process of the study and asked them to read the study informed consent form. After Informed consent was obtained from all participants, all participants knew the purpose of the study, the importance of their participation and if they were not

interested, they had a right to withdraw at any time. Privacy and confidentiality of information given by each respondent were kept properly and names did not record.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that this manuscript was approved by all authors in its form and that no competing interest exists.

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Author contribution

All authors contributed to the conception and design, gaining of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for significant intellectual content; agreed to submit it to the current journal; gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

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Figures

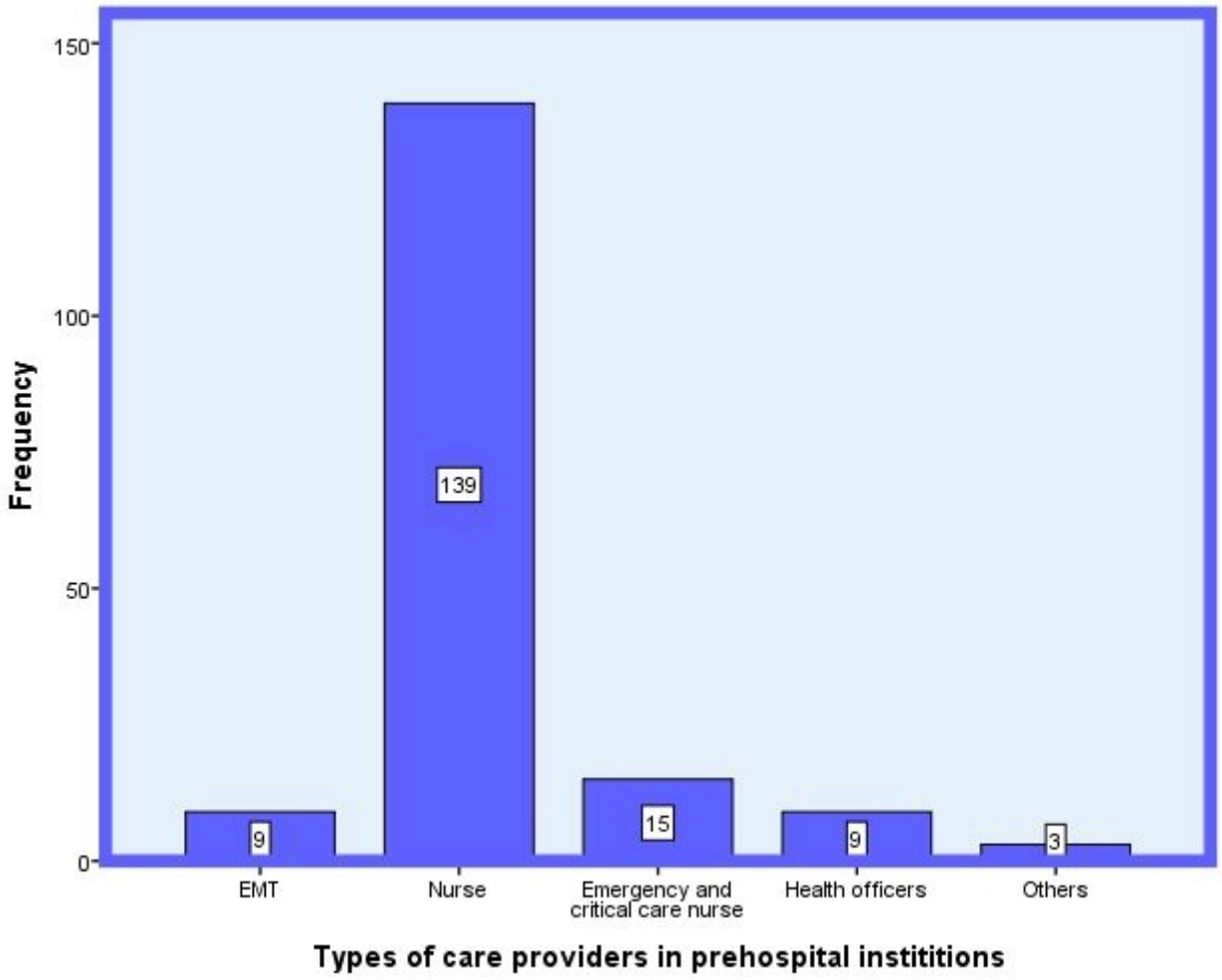

Figure 1

Types of care providers in PEMS provider institutions, (n=175), 2022.

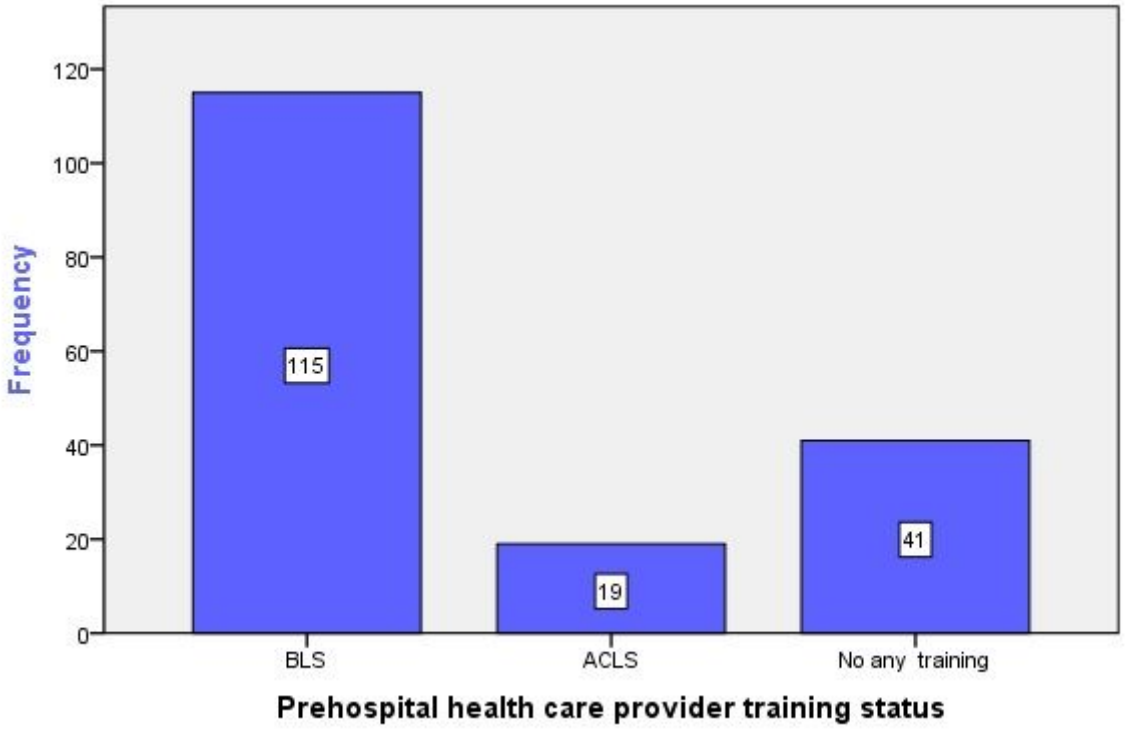

Figure 2

Status of pre-hospital health care provider training (n=175), 2022