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Evaluation of the Preparedness and Responses for Medical Emergencies in Edo State

Charles Omheaka Okpere[1]*, Christopher Ehis Okaka[2], Innocent Osi Alenoghena[3], Daniel Aromeh Odekina[4]

[1]*School of Public Health, Texila America University, Georgetown, Guyana*
[2]*Department of Animal and Environmental Biology, and former Dean of the Faculty of Sciences, University of Benin, Benin City, Nigeria*
[3]*Department of Community Medicine, Ambrose Alli University, Ekpoma, Nigeria*
[4]*Primary Health Care Development Agency, Edo State, Nigeria*

Abstract

This article helps evaluate the preparedness and response to medical emergencies within the Edo State healthcare system. Having a functional emergency medical response could reduce deaths in low and middle-income countries by about 25%. This entails efficient pre-hospital care, functional ambulance services, a prompt and designated emergency call centre and number, trained first responders, efficient transportation to a ready healthcare facility, and more. This study was conducted in the three senatorial regions of Edo State. The study design was cross-sectional, with data collected via a semi-structured questionnaire. Five hundred and twenty-four people were sampled in the research, and the analysis was conducted using SPSS software. The research revealed that three-quarters of the participants have no available call centre and/or call number in their location. More than four-fifths of the respondents reported having no ambulance services and no available Automated External Defibrillators (AEDs) in their localities. Two-thirds of the participants are unable to carry out CPR, and only about one–fourth had training in CPR in the last two years. To have an effective preparedness and prompt response to medical emergencies, the following are recommended: 1. The government needs to set up a functional emergency response centre in every Local Government Area. 2. The government should provide functional ambulance vehicles and position them in strategic locations across the state. 3. The training of the first responders should be prioritized to shorten response time.

Keywords: *Edo-State, Medical-Emergency, Preparedness-Response.*

Introduction

There is a high burden of deaths and disabilities from non-communicable diseases in several regions of the world. Despite the perennial exposure of populations to diseases, medical emergencies, and environmental disasters, many countries lack the institutional capacity to manage health emergencies. Notably, countries with well-developed emergency medical response systems have consistently recorded low morbidity and mortality rates from health emergencies, while nations lacking functional EMS infrastructure have worrisome mortality and morbidity rates [1, 2].

Medical Emergencies are indeed major contributing factors to premature deaths in Low and Middle-Income Countries (LMICs), including Nigeria. It is estimated that a

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****Corresponding Author: okpere@hotmail.com***

functional Emergency Medical Services/ Response (EMS/R) could reduce these death rates by as much as 25% [3] Studies equally show that in up to 75% of Road Traffic Accidents (RTA), patients die before they get to a hospital or within six hours of admission, mainly due to poor pre-hospital Medicare, poor infrastructure, inadequate/ inefficient transportation system to the hospital, and lack of training [4]. The International Medical Corps emphasizes that a disaster can occur at any time and in any place, and therefore a timely and effective emergency response is essential to saving lives [5].

EMS entails providing an efficient medical response service for urgent pre-hospital treatment and stabilization of patients with severe or life-threatening medical emergencies. This encompasses a functional, coordinated emergency call centre and number, a robust ambulance system with a Mobile Intensive Care Unit (MICU), trained first responders, prompt transportation to the hospital, a ready health facility with an efficient triage system, and an adequate workforce for immediate treatment.

A critical component of EMS is emergency preparedness (EP). Emergency preparedness encompasses plans implemented before an emergency occurs, while Emergency Response, or ER, entails actions taken to save lives. Thus, EMS boils down to putting preparedness into action. Both EP and ER form part of the four phases of emergency management, encompassing mitigation, preparedness, response, and recovery [6].

It is estimated that over half of deaths in LMICs can be averted by an effective and efficient emergency healthcare system [7], and that could translate to over 3000 lives saved daily [8, 9]. Several developed nations with a robust Emergency Medical Response include the USA, the UK, Australia, the Netherlands, and Canada, among others. The USA is generally regarded as the country with the highest EMR service, with a Global Health Security Index (GHSI) score of 83.5 compared to the global average of 40.2 and 51.9 for high-income countries [10]. The 2019 GHSI also showed that Nigeria ranked very low, scoring only 12.5% in emergency preparedness and response planning [10, 11]. Despite Nigeria having a national framework for disaster management, implementation is defective, and medical emergencies are not given the desired attention, especially at the Primary Health Care level.

In most advanced nations, once a medical emergency occurs and Emergency Medical Response is activated, you will see a prompt and coordinated multipronged action as the police, firefighters, and ambulance service all will come for rescue within seven minutes of activation in an urban area, and fourteen minutes in a rural setting [12, 13]. On the contrary, in Nigeria, this level of preparedness and response is tragically hindered by numerous challenges, including a lack of emergency call centres and numbers, inefficient ambulance services, a shortage of personnel, and a lack of postgraduate training in emergency medicine. Other factors include non-motorable road networks, non-functioning traffic systems, ambulances not given the right of way, and lots more [14, 15]. This is in line with the T.C. Health Survey, which revealed that three out of every four Nigerians have experienced at least one medical emergency in the last five years, while numerous problems plague the Emergency Medical Response system [16].

Nigeria has several agencies empowered by law to manage emergencies, including the National Emergency Management Agency, State Emergency Management Agencies, the Ministry of Health, Local Government Emergency Management Committees, the Fire Service, and the Nigeria Police Force. The preparedness and response of these agencies are questionable as they often struggle to foster strong collaboration and frequently fail to respond promptly and effectively [17]. Inadequate resources, weak institutional

capacity, poor communication and information sharing, increased urbanization, inadequate budgetary planning, insecurity, and numerous other factors primarily contribute to this issue.

The non-prioritization of emergency medical care in Nigeria often results in delayed responses of over one hour, leading to adverse socio-economic and financial effects. Addressing these challenges, therefore, will not only enhance prompt EMR services but could also reduce the economic burden by about 54% [18].

There is no gainsaying that the rapid medical response system is becoming a global public health phenomenon, mainly due to the increasing mortality from accident trauma and medical emergencies. It has become imperative to address issues relating to inappropriate responses and unnecessary delays in emergency medical services, which entail emergency calls for help, first-aid Medicare, training of first responders, transportation to a ready medical facility, delays in rendering prompt Medical Care, and overall system preparedness.

To this end, the Lagos state government has taken the lead in emergency preparedness and response in Nigeria since March 2021 when it launched the Lagos State Emergency Medical Services (LASEMS) and Lagos State Ambulance Services (LASAMBUS) initiative, which has a MICU operated by trained personnel; and this has a significant positive impact on the morbidity and mortality indexes [19]. These services operate 24 hours a day and are involved in awareness campaigns, personnel training, improving the communication network, linking LASEMS and LASAMBUS to a dedicated line -123, establishing 15 ambulance points, a marine rescue unit, and a pre-hospital Medicare service.

The above is laudable compared to other parts of Nigeria, where EMR is still in its primordial stage, lacking integration, rapid response teams, ambulances, and trained paramedics [20]. Moreover, the few ambulance vehicles available lack necessary resuscitation equipment, and they are not given priority on our roads.

Recently, the Edo State Government, in collaboration with Emergency Response Africa (ERA), launched a technologically driven Emergency Medical Services (EMS) program in three Local Government Areas (LGAs) – Oredo, Egor, and Ikpoba-Okhae, with plans to extend the services to other LGAs [21]. The goals of the EDO-EMS / ERA program are as follows:

1. Save lives by providing emergency ambulance services for quick response.
2. Raising public awareness regarding the use of emergency call numbers - 112 and 739.
3. Train a Community-Based First Responders (CBFR) network to provide first aid at emergency scenes.
4. Help promote the linkage of emergency care to the Edo–Health Insurance Scheme (Edo-HIS), which could lead to increased enrollment in HIS.

Edo State EMS also recently graduated the second batch of Community-Based First Responders (CBFR). The CBFR play a vital role in strengthening emergency response within their local community as the first line of defence during health crises, thereby serving as a critical link between life and death [22].

Time, however, will tell how effective these set goals and collaboration will be in fostering an improved and efficient emergency medical response in Edo State, given the current reality of the emergency response system.

The justification/ purpose of the study includes the following**:**

1. To ascertain the level of readiness of the Edo State emergency medical response services during emergencies for both the individual victim and the larger population.
2. Secondly, Edo State appears to lack a functional and centrally coordinated emergency response system.
3. Furthermore, the study also aims to identify the salient challenges that hinder the

effectiveness of emergency medical responses.

This study aims to understand the status of Edo EMS, identify significant gaps in emergency medical response and equally examine the preparedness and response of the Edo State healthcare system to medical emergencies.

Methodology

Study Area/ Population

The study was conducted in Edo State. Edo State has an estimated population of approximately 5 million people, a land area of 19,187 km², and a population density of 168 persons per km². It has 18 Local Government Areas (LGAs), with the major ethnic groups being Binis, Esan, Afemai, Etsako, and Owan. There are three senatorial districts: Edo South, Edo Central, and Edo North.

Research Design

A descriptive cross-sectional study was conducted using a semi-structured questionnaire to assess information from the participants. The questionnaire was pilot-tested, and those who assisted in administering it received training before the pilot study. The data obtained, however, were not included in the final survey. Regarding the validation process, the questionnaire tool underwent a substantial degree of pilot testing and expert review.

Exclusion-Inclusion Criteria

To select respondents from households, all houses in the community were assigned numbers. Respondents' households were drawn from the pool of numbered houses, and eligible persons were administered the questionnaire. The participants included the general public, families, and public institutions. However, hospital patients and those under -15 years were excluded from the study.

Sample Size

600 questionnaires were distributed using the formula outlined below:

N = Z2Pq/d2, since the estimated sample size is more than 10,000 [23]

N = desired sample size

Z = standard normal deviate (1.96) at 95% confidence level

P = proportion of target population

q = 1 - P

d = degree of accuracy, assume it is 0.05

N = 1.962x50%x0.5/0.052

N = 400

N = 440. Four hundred and forty questionnaires were, therefore, the minimum that should be distributed, assuming 10% is voided.

Sampling Techniques

The multistage sampling method was employed. First, the stratified method was applied for the three ecological zones- Edo North, Edo Central, and Edo South. After that, simple random sampling was used to select the local government area of study, wards, communities, and, eventually, households, using a home-numbering sampling frame. The same approach was applied to institutions and other sampled locations. For robust information, 200 questionnaires were distributed in each senatorial zone, making a total of 600 questionnaires.

Data Collection and Analysis

Data collection was conducted using a semi-structured questionnaire. The answered questionnaires were assembled, and the information therein was extracted, noting the target variables. Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 26 software and the Excel package. The statistical protocols employed in the analysis included descriptive measures, such as percentages, as well as Chi-square tests and p-values to assess associations.

Expected Output

The following expectations are expected to be achieved at the end of the research:

1. It will help identify significant gaps in Emergency Medical Response and preparedness within the Edo state health care system.
2. It is expected to provide the needed data and information to advocate to the various stakeholders on EMR reforms. Some stakeholders include the Edo State Emergency Management Service (EDO-EMS), the Edo State Primary Health Care Development Agency, the Edo State House of Assembly's Health Committee, the Edo State Government, and international health partners such as the WHO, UNICEF, and UNFPA.
3. It is expected to accelerate the prompt establishment of an efficient and well-coordinated EMR system in Edo State.
4. It will help initiate regular training and certification of health personnel in emergency medical response, with an initial focus on first aid training, BLS, CPR, the use of Personal Protective Equipment, and infection control measures.
5. To ensure triage stations are correctly set up in emergency centres to avert unnecessary third-stage delays.

Ethical Considerations

Consent was obtained from the ethical board of the Edo State Ministry of Health and the local government authority. The participants were also assured of absolute confidentiality before the commencement.

Results

Table 1 indicates that 524 respondents participated in this study. The largest proportion of respondents, 194 (37.0%), came from the Edo South Senatorial zone. The highest proportion of respondents live in rural areas, 206 (39.3%). The highest proportion of respondents came from Esan North East LGA, with 137 (26.2%), followed by Akoko-Edo with 92 (17.6%), Ikpoba-Okha with 77 (14.7%), and Orhionmwon with 73 (13.9%). The mean age of respondents was 39.27 ± (11.45) years. The highest proportions of respondents who participated in the research were female (59.5%), married (70.6%), and tertiary educated (71.2%). The highest proportion of respondents was Esan, at 151 (28.9%), followed by Bini, at 127 (24.2%). The highest proportion of respondents was 155 (29.6%) civil servants.

Table 1. Sociodemographic characteristics of respondents (N=524)

Variable	Frequency	Percentage
Senatorial zone		
Edo South	194	37.0
Edo Central	179	34.2
Edo north	151	28.8
Type of Community		
Urban	104	19.8
Semi-urban	214	40.8
Rural	206	39.3
Local Government Area		
Ikpoba-Okha	77	14.7
Esan North East	137	26.2
Oredo	19	3.6
Orhionmwon	73	13.9

Egor	14	2.7
Akoko edo	92	17.6
Esan central	64	12.2
Etsako west	14	2.7
*Others	34	6.4
Age		
15 – 30	125	23.9
31 – 45	253	48.3
46 – 60	137	26.1
61 – 75	8	1.5
> 76	1	0.2
Mean age = 39.27 ± (11.45)		
Sex		
Male	212	40.5
Female	312	59.5
Marital Status		
Single	143	27.3
Married	370	70.6
Separated/Divorced	8	1.5
Widow/Widower	3	0.6
Level of Education		
No formal education	6	1.1
Primary	25	4.8
Secondary	120	22.9
Tertiary	373	71.2
Tribe		
Bini	127	24.2
Esan	151	28.9
Etsako	26	4.9
Urhobo	17	3.2
Igbanke	11	2.1
Akoko edo	17	3.2
Igarua	8	1.5
Ekpe	3	0.5
Edo	19	3.6
Ishan	49	9.4
Owan	11	2.1
Afemai	18	3.4
Igbo	7	1.3
Others	60	11.5
Occupation		
Civil servant	155	29.6
Health worker	85	16.2
Doctor/nurse	31	5.9

Self-employed	124	23.7
Student	82	15.6
Teacher	23	4.4
Unemployed	5	1.0
Engineer	5	1.0
Accountant	1	0.2
Electrician	1	0.2
Others	12	2.3

Table 2 shows respondents' previous experiences with emergency services. Less than half of the respondents, 250 (47.7%), had observed or experienced sickness requiring urgent attention. The highest proportion of respondents went to the hospital when sick 207 (39.5%), followed by health centre 188 (35.9%), then Patent Medicine Store 64 (12.2%). Of the 250 respondents who needed urgent medical attention, 207 (82.8%) met health worker(s) and received quick attention; the highest proportion of self-reported time to a health facility response to the emergency was 81 (39.1%) as immediately and between 5-10 minutes. Most respondents, 452 (89.5%), had not learned of an emergency response team in the locality. 414 (79.0%) did not know any phone number to call in an emergency, and only 0.6% called an emergency no. Of the 73 respondents aware of an ambulance service in their locality, 44 (60.3%) were privately owned, with the majority of the ambulance type, 49 (67.1%) being a bus. The highest proportion of respondents, 25 (34.3%), reported the EMR team's response time as 10 to 15 minutes, and 5.5% of respondents took less than 10 minutes to respond. Only 18 (3.4%) respondents had ever been taken to the hospital with an ambulance. Among the respondents, 64.3% indicated they cannot do CPR. 86.5% of the respondents stated there were no ambulances in their locality. The principal means of transportation during an emergency were motorbikes (32.8%) and private vehicles (32.4%). Regarding the availability of EMR, only 13.9% of the respondents had available ambulances, of which 60.3% were privately owned. The ambulance lacked essential resuscitation equipment as only 6.8% of the respondents indicated AEDs were available, and another 4.1% stated radio-communication systems were available in the ambulances.

Table 2. Previous experiences of Emergency services

Variable	**Frequency**	**Percentage**
Observed or experienced severe unexpected sickness requiring urgent attention		
Yes	250	47.7
No	274	52.3
During sickness, where do you/your relation go for care?		
Health centre	188	35.9
Hospital	207	39.5
Medicine store	64	12.2
Call emergency number	3	0.6
Nil	62	11.8
Who called the emergency number (n = 3)		

A friend/relative	3	100.0
Encounter when you observed or experienced a serious unexpected sickness requiring urgent attention (n = 250)		
Met health worker, received quick attention	207	82.8
Met health worker did not receive quick attention	26	4.9
Met health worker, patient sent away	2	0.4
Health centre/hospital locked	6	1.2
No response	9	54.0
How quickly the health facility responded to an emergency (n = 207)		
Immediately	81	39.1
Between 5 to 10 minutes	81	39.1
10 to 30 minutes	24	11.6
More than 30 minutes	14	6.8
Can't recall	7	3.4
Knowledge of any Emergency Medical Response team in the locality?		
Yes	55	10.5
No	452	89.5
State the time to get to you from their location (n = 55)		
1 – 10 minutes	3	5.5
11 – 20 minutes	12	21.8
21 – 30 minutes	10	18.2
Above 30 minutes	30	54.5
Knowledge of any phone number you can call in case of any life-threatening emergency		
Yes	110	21.0
No	414	79.0
Emergency numbers called		
Stated various private GSM nos	77	47.5
Nurse/Doctor/Health worker	78	48.2
Family member/relation	7	4.3
Can you give a cardiopulmonary resuscitation?		
Yes	187	35.7
No	337	64.3
Had any formal training in cardiopulmonary resuscitation (n = 187)		
Yes	143	76.5
No	44	23.5
Can anyone in your house perform CPR (n = 337)		
Yes	26	7.7
No	311	92.3

*** Response in times of sudden collapse**		
Carry out CPR	124	23.7
Rush to the hospital/health centre	205	39.1
Call for help/medical personnel	52	9.9
Increase ventilation	47	9.0
BLS	1	0.2
Prayer	1	0.2
Pour water on the body	26	5.0
Availability of medical ambulance in case of medical emergency		
Yes	71	13.5
No	453	86.5
Contact/phone no. (n = 71)		
Stated various private GSM nos	60	84.5
Do not have the number	11	15.5
Means of transportation to the health facility in case of emergency		
Walking	17	3.2
Bicycle	2	0.4
Motorcycle	172	32.8
Private vehicle	170	32.4
Commercial vehicle	125	23.9
Government ambulance	4	0.8
No response	34	6.8
Availability of Emergency medical response ambulance service in the locality		
Yes	73	13.9
No	451	86.1
Ownership of ambulance (n = 73)		
Government-owned	29	39.7
Private owned	44	60.3
Type of ambulance (n = 73)		
Bus	49	67.1
Keke	14	19.2
Others	10	13.7
How early does the EMR team respond to your emergency call (n = 73)		
Immediately (less than 10 minutes)	6	8.2
10 to 15 minutes	25	34.3
15 to 30 minutes	21	28.8
More than 30 minutes	15	20.5
Can’t recall	6	8.2
***Equipment contained in the ambulance (n = 73)**		

Oxygen supply	31	42.5
PPE	53	72.6
Trained driver	31	42.5
At least one trained medical personnel	19	26.0
AED	5	6.8
EMS guide book	6	8.2
Portable stretcher	33	45.2
Splints	7	9.6
Radio communication system	3	4.1
Automotive safety belt	10	13.7
Have you ever been taken to the hospital in an Ambulance?		
Yes	18	3.4
No	506	96.6
How clean was the ambulance? (n = 18)		
Very clean	2	11.1
Fairly clean	12	66.7
Not very clean	3	16.7
Don't know/can't remember	1	5.6
Did the ambulance come in a crew? (n = 18)		
Yes	14	77.8
No	4	22.2
***Members of the crew (n = 14)**		
Doctor	1	7.1
Nurse	7	50.0
Paramedics	14	100.0
Driver	1	7.1
Treated with respect and dignity by the crew? (n = 14)		
Yes, definitely	3	21.4
Yes, to some extent	7	50.0
Don't know/can't recall	4	28.6
Rate the care you received from the ambulance (n = 18)		
Very good	5	27.8
Good	7	38.9
Fair	6	33.3

**Multiple response type*

Figure 1 shows the availability of EMR ambulance services in the study area. It indicated that 59 (11.3%) of the participants reported EMR ambulance services, while 465 (88.7%) reported that no ambulance services were available in the study communities.

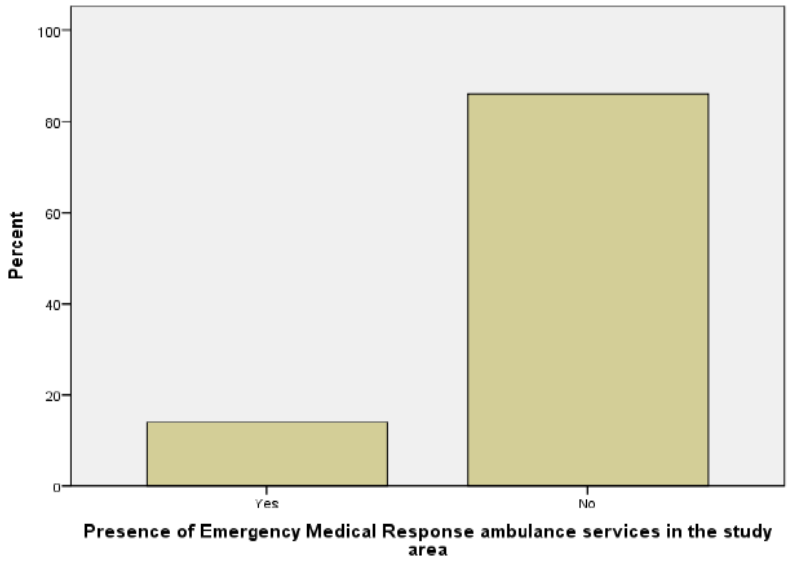

Figure 1. Availability of EMR ambulance services in the study area

Table 3 presents respondents' knowledge/previous training in Emergency Care. The highest proportion, 277 (52.9%), had previously participated in First Aid training, while 112 (21.4%) had participated in cardiopulmonary resuscitation training. Of the 112 respondents who self-reported CPR training, 73 (65.2%) had received it more than five years prior. Only 59 (11.3%) respondents had ever heard of an external defibrillator; among these, 83.1% had no AED available at their location.

Table 3. Knowledge/Previous Training on Emergency Care

Variable	Frequency	Percentage
***Training you have participated in:**		
First aid	277	52.9
CPR	112	21.4
Basic Life Support	59	11.3
Had training on Cardiopulmonary resuscitation?		
Yes	112	21.4
No	412	78.6
Date of last CPR training (n = 112)		
1 – 2 years	22	19.6
3 – 4 years	17	16.1
> 5 years	73	65.2
Have you heard of an Automated external defibrillator?		
Yes	59	11.3
No	465	88.7
State the nearest location to you: (n = 59)		
3 – 5 minutes away	10	16.9
None available around the location	49	83.1

**Multiple response*

Table 4 presents a contingency table illustrating the association between sociodemographic characteristics and CPR training among respondents. One-fifth of respondents (112, 21.4%) had received CPR training. The highest proportion of respondents who had received CPR training was from the Edo Central senatorial district, 34.6% (p<0.001). The highest proportion of respondents who had received CPR training lived in semi-urban communities (32.7%; p<0.001). The highest proportion of respondents who had received CPR training were male (30.2%; p < 0.001) and aged 46-60 years (41.0%; p < 0.001). The highest proportion of respondents who had received training in CPR had a tertiary level of education, at 28.4% (p < 0.001). Doctors and nurses were the occupational groups with the highest proportion of respondents who had received CPR training, at 48.4% (p < 0.001). These variables were significantly associated with respondents' previous training in CPR.

Table 4. Association between sociodemographic characteristics and training in CPR

Variable	Training in CPR		□2	Df	p-value
	Yes	No			
Senatorial zone					
Edo south	33 (17.0)	161 (83.0)	27.311	2	<0.001
Edo central	62 (34.6)	117 (65.4)			
Edo north	17 (12.2)	122 (87.8)			
Type of community					
Urban	26 (25.0)	78 (75.0)	34.235	2	<0.001
Semi-urban	68 (32.7)	140 (67.3)			
Rural	18 (9.0)	182 (91.0)			
Age group					
15 – 30	21 (17.1)	102 (82.9)	40.540	4	<0.001
31 – 45	36 (14.6)	210 (85.4)			
46 – 60	55 (41.0)	79 (59.0)			
61 – 75	0 (0.0)	8 (100.0)			
76 and above	0 (0.0)	1 (100.0)			
Sex					
Male	62 (30.2)	143 (69.8)	14.011	1	<0.001
Female	50 (16.3)	257 (83.7)			
Marital status					
Single	25 (18.0)	114 (82.0)	5.538	3	0.136
Married	84 (23.2)	278 (76.8)			
Separated/divorced	1 (12.5)	7 (87.5)			
Widow/widower	2 (66.7)	1 (33.3)			
Educational level					
No formal education	0 (0.0)	6 (100.0)	32.352	3	<0.001
Primary	2 (8.3)	22 (91.7)			
Secondary	6 (5.2)	110 (94.8)			
Tertiary	104 (28.4)	262 (71.6)			
Occupation					
Unemployed	1 (20.0)	4 (80.0)	71.387	10	<0.001

Civil servant	60 (39.2)	93 (60.8)			
Health worker	16 (18.8)	69 (81.2)			
Doctor/nurse	15 (48.4)	16 (51.6)			
Self-employed	3 (2.5)	115 (97.5)			
Student	13 (16.3)	67 (83.8)			
Teacher	3 (14.3)	18 (85.7)			
Engineer	0 (0.0)	5 (100.0)			
Accountant	0 (0.0)	1 (100.0)			
Electrician	0 (0.0)	1 (100.0)			
Others	1 (8.3)	11 (91.7)			

Table 5 is a contingency table illustrating the relationship between social-statistical characteristics and the ability of respondents to perform CPR. One hundred and eighty-seven respondents (35.7%) self-reported their ability to perform CPR. Proportionally more of the respondents (53.1%; p<0.001) from Edo Central could perform CPR, proportionally more of the respondents in a semi-urban community (50.5%; p<0.001) could perform CPR, proportionally more of the respondents (45.6%; p<0.001) with tertiary level of education can perform CPR, and as expected, more of the doctors/ nurses (74.2%; p<0.001) can perform CPR. These variables were significantly associated with respondents' ability to perform CPR.

Table 5. Association between sociodemographic characteristics and ability to perform CPR

Variable	**Ability to perform CPR**		**□2**	**df**	**p-value**
	Yes	**No**			
Senatorial zone					
Edo south	64 (33.0)	130 (67.0)	43.526	2	<0.001
Edo central	95 (53.1)	84 (46.9)			
Edo north	28 (18.5)	123 (81.5)			
Type of community					
Urban	41 (39.4)	63 (60.6)	47.680	2	<0.001
Semi-urban	108 (50.5)	106 (49.5)			
Rural	38 (18.4)	168 (81.6)			
Age					
15 – 30	43 (34.4)	82 (65.6)	12.901	4	0.012
31 – 45	81 (32.0)	172 (68.0)			
46 – 60	63 (46.0)	74 (54.0)			
61 – 75	0 (0.0)	8 (100.0)			
76 and above	0 (0.0)	1 (100.0)			
Sex					
Male	69 (32.5)	143 (67.5)	1.529	1	0.216
Female	118 (37.8)	194 (62.2)			
Marital status					

Single	47 (32.9)	96 (67.1)	6.607	3	0.086
Married	138 (37.3)	232 (62.7)			
Separated/divorced	0 (0.0)	8 (100.0)			
Widow/widower	2 (66.7)	1 (33.3)			
Educational level					
No formal education	0 (0.0)	6 (100.0)	55.684	3	<0.001
Primary	2 (8.0)	23 (92.0)			
Secondary	15 (12.5)	105 (87.5)			
Tertiary	170 (45.6)	203 (54.4)			
Occupation					
Unemployed	1 (20.0)	4 (80.0)	113.349	10	<0.001
Civil servant	71 (45.8)	84 (54.2)			
Health worker	51 (60.0)	34 (40.0)			
Doctor/nurse	23 (74.2)	8 (25.8)			
Self-employed	7 (5.6)	117 (94.4)			
Student	31 (37.8)	51 (62.2)			
Teacher	2 (8.7)	21 (91.3)			
Engineer	0 (0.0)	5 (100.0)			
Accountant	0 (0.0)	1 (100.0)			
Electrician	0 (0.0)	1 (100.0)			
Others	1 (8.3)	11 (91.7)			

Discussion

Like other developing nations worldwide, EMS in Nigeria are at various stages of development, with multiple institutions continually making efforts to improve their quality of service, a position affirmed by Blackwell and Kaufman [24].

For efficient and effective emergency preparedness and response, there must be a multifaceted and concerted effort in addressing the identified issues, which, among others, include delayed Response, poor funding, poor communication/ information sharing, insecurity, bad roads, inadequate infrastructure like ambulances, dilapidated primary health care centres, and lack of training.

EMR team/call number: Over three-quarters of the participants stated that they were neither aware of any emergency medical response team in their locality nor knew a number to call in the event of a medical emergency. The research shows that fewer than 1% of respondents call the emergency number. It was also noted that less than ten per cent of the respondents call for help during medical emergencies, which is fundamental to saving lives. Raising public awareness about the emergency call numbers 112 and 739 is crucial for having a functional emergency preparedness and response system.

EMS response time: Over three-quarters of the time, the response time was over 10 minutes. It was only 5.5% of the time that EMS responses were less than 10 minutes. This was far below the average response time in advanced nations, which was about 7 minutes in urban settings and 14 minutes in rural settings in previous studies [11, 12].

Ambulance services: Over eighty per cent of the respondents reported the non-availability of ambulance services in their community. Among those that reported available ambulances, private GSM numbers were utilized to call for help. It was also noted that over half of the respondents used motorbikes or private vehicles to reach a health facility during a medical emergency. It is also noteworthy that the ambulances lack a mobile intensive care unit, a communication system, and other essential equipment. Most of the 'keke napep' ambulances supplied by the Government are currently moribund and non-functional, and are often dumped in the various council secretariats. These are issues that require urgent attention for a smooth and efficient emergency response.

Training: Slightly over half of the respondents had prior first-aid training, and about one-fifth had received CPR training in the last 2 years. Most of these recertification training sessions on emergency Medicare should be routinely carried out every two or three years to ensure an effective and efficient emergency medical response system.

Associations: It was observed that among the respondents, the most significant proportion of those with CPR training resided in the Edo Central Senatorial District, were from semi-urban communities, and had tertiary education, with the majority being doctors or nurses. The location of Irrua Specialist Teaching Hospital (ISTH) in the Edo Central senatorial region could have influenced the outcome, though no previous data substantiated it. Most communities around ISTH are mainly semi-urban. This underscores the importance of regular training for health workers on BLS, CPR, and ACLS, as it will significantly enhance prompt, efficient, and effective EMS services and preparedness within the Edo state health system.

Sustainability: There needs to be a strong advocacy for the government to provide regular training and retraining of EMS first responders. There should also be routine facility assessment and upgrades, along with improved budgetary allocation.

Conclusion/ Recommendation

1. Over three-quarters of the respondents stated there was no Emergency Medical Response team or an emergency number to call. To this end, the Government should set up an urgent Emergency Medical Response centre in every local Government of the state and carry out mass awareness campaigns regarding their functionality.
2. Over four-fifths of the respondents stated that neither medical ambulance services nor AEDs were available in their communities. Therefore, the Government should provide adequate ambulances and AEDs across the state and equally ensure they are decentralized and strategically positioned to respond promptly to medical emergencies.
3. The factors stipulated by the respondents/participants that caused delays in EMR included women waiting for approval from their spouses before seeking medical attention, poor road conditions, the non-availability of medical ambulances, the dilapidated state of most PHC centres, inadequate budgetary allocation to health, and insufficient funding. Others include poor resource management, untrained medical personnel, and a negative attitude among staff toward clients. Therefore, the Government should ensure that there are motorable roads, that PHC centres are rehabilitated and equipped with state-of-the-art facilities, and that adequate funding is available for medical emergencies.
4. More than three-quarters of the participants stated the EMS response time was over 10 minutes. There is an urgent need for government and healthcare institutions to reduce EMS response times and waiting times in emergency rooms. This can be achieved through continuous training of first responders and by establishing triage stations in large healthcare institutions.

5. Slightly more than one-third of the respondents could perform CPR. Among these numbers, about three-quarters had prior CPR training. Therefore, the Government needs to empower the Primary Health Care Development Agency to conduct routine training and retraining of all healthcare workers in first aid, CPR, BLS, and ACLS.

6. There was a strong association between the ability to give CPR and previous training among the respondents. About nine out of every ten with previous CPR training could render CPR during an emergency.

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Conflicts of Interest

I, Dr Charles Okpere, hereby state that there were no conflicts of interest while conducting this research.

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