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An Assessment of the Competency Requirements of Medical Emergency Response Procedure (MERP) Modelling for Transporters and Commuters

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Abstract

The Study examined the Competency Requirements of Medical Emergency Response Procedure (MERP) Modeling for Transporter and Commuters. The incessant cases of medical emergencies reported in the recent past and the poor level of response to handle these incidents have necessitated this study. The main objective of this study was to evaluate the skill and competencies required to manage medical emergencies in line with the Offshore Petroleum Industry Training Organisation (OPITO) criteria. The research work employed the use of primary data and methods of data collected via structured questionnaire survey, key informant interviews and focused group discussions. Data employed include respondents' demographics, response on Tiers 0 and 1 skills and competency records in the study area, findings indicated that the competency resources in the study area falls below the (OPITO) criteria for competency development and maintenance due to the absence of Tier 0 and 1 MER professionals and essential First Aid equipment including Automatic External Defibrillators (AEDs. The Study concludes that training and competency development and provision of basic first aid resources is required for medical emergencies response is key. To bridge the competency gap, the study recommends human capacity building to develop and deploy Tiers 0 and 1 competencies; secondly, government policies and framework to promote the operationalization of the medical emergency procedure, as well as funding mechanism to achieve its implementation pursuant to the sustainable development goal (SDG) 3 which focus on Health and wellbeing.

Keywords*: *MER, MER Resources, Tiers 0, 1 and 2 Competencies, MER Professionals.

1.0 Introduction

Transport has variously defined as the movement of people, cargoes and ideas from one point or location to another. Different modes of transport known have been explored from Land, water and airport transportation and none is without challenges that may bring about disruptions to the smooth execution of each trip. A number of challenges which could range from the means of transportation, nature of the routes, distance, security concerns to mention a few. These challenges have often resulted in incidence of accidents leading to situations of medical emergencies. Reed (2010) described a medical emergency as being characterized by acute injury or illness that poses an immediate risk to a person's life or long-term health effect. It could be any problem of a medical and / or surgical nature that appears abruptly - often without signs prior to its appearance in a person and that could affect the viability of any of their vital organs or has the risk of leading to a life-threatening disorder. Emergencies situations are often a product of disasters and sudden health concerns and which may require assistance from competent personnel who have received adequate training and relevant qualification.

The operationalization of Medical Emergency Response (MER) plan in Nigeria has not been well organized nor documented (Sankey et. al (2014); Ogunleye and Olusola 2019). Mac.et al (2019) in their appraisal of medical emergency response in Nigeria noted that the Federal Government established the Federal Road Safety Commission (FRSC) and the National Emergency Management Agency (NEMA) in 1988 and 1999 respectively as part of efforts to demonstrate readiness for medical emergency response. While the former was aimed as preventative in approach by checking to ensure vehicles are road worthy to minimize accidents on road that will lead to medical emergencies, the latter is saddled with the management of medical emergencies arising from disaster incidents like fire outbreaks, disease epidemics, flood disasters as well as road traffic accidents.

2.0. Literature Review

Sankey et al., (2014) studied safety awareness of emergency amongst university students in North Western Nigeria reported poor awareness amongst the study population. Indicators evaluated are first aid awareness, emergency telephone numbers to call the ambulance and fire service amongst others. Ogunleye and Olusola (2019) observed from their research on ‘Evaluating Disaster Preparedness amongst University Learners’ that disaster education response and preparedness mechanism amongst undergraduates in Ekiti State University was very poor, thus they proposed for a systematic disaster preparedness course that will include rescue drills in institutions of higher learning. Similarly, Ilo et al. (2020) further studied ‘emergency preparedness and control’ in Nigerian University libraries where they focused on Library personnel awareness of emergency response plan, their forms and roles in safety and

routine preparedness and control' in Federal and State University libraries in Southwest Nigeria. They observed from their study that the libraries studied were extremely lagging in the areas of documenting plans for routine emergency response and that response preparedness from the study population whether written or unwritten was not perceived to be effective and hence concluded that emergency response in Nigerian institution is rather too simplistic and doubtful if it exists. It is obvious from the above that level of awareness of medical emergency response plan or procedure is rather poor from the studies above whose population are also commuters and a vital components in the business of transport.

Azumi (2021) and Okpalla et al. (2022) identified the key professionals required in medical emergency response management as first responders, first aiders, medical doctors, nurses and other paramedics. The first responder is anyone/everyone at the scene of the emergency, and represent the Tier 0 person; the first aider is the Tier 1 professional who have been trained to competency to provide skilled assistance to the injured prior to the arrival of the tier 2 who are the (Nurse or nurse) as the case maybe.

The Offshore Petroleum Industry Training Organization (OPITO) criteria used as framework for this study provide a standard for the operationalization of medical emergency response procedure (MERP) also recognized the roles and functions of the first responders and designated First Aiders (DFAs) as frontline Medical Emergency Response Procedure (MERP) professionals. (OPITO MERP,2019 section 2-pg 10-15).

3.0 Material and Methods.

3.1 Sources and Method of Data for Research.

3.1.1 Primary Data Sources

Well as structured questionnaire was used to explore staff and student perception on the research theme. The purposeful random sampling was adopted in the distribution of the questionnaires amongst the student population and staff. This is to enhance a broader spread of respondents in the study population. Ogunleye and Olushola (2020) maintained that purposeful sampling is a technique widely used in qualitative research for the identification and collection of information-rich cases for the most effective use of limited resources.

Questionnaire survey was done in the hostels, lecture theatres, laboratories and offices. The instrument of data collection for the research shall be structured questionnaire designed to elicit data on medical emergency resources and competencies amongst staff and students. Additionally, primary data was

collected through focus group discussion and Key Informant Interview (KII) from students and staff within the University.

Other Primary Data Source

Other data sources for the research were explored by engaging health centre personnel as key informants and undertake an inventory of MER resource like basic first aid facilities in the study area. In addition, field record generated during the fieldwork like googleearthimagemap used to visualize the resource outcome, GPS mapping of the Tier 1 stations or ERs, and record of time recorded during the drills.

3.1.2 Secondary Data Sources

The secondary data used for the research include the existing literature, scholarly articles and text related to the theme of the research subject as well as international documentation and standards related to the subject matter. (OPITO MERP standard, ISO 9001:2015; and OSHA 45001). Also, other secondary data sourced are spatial data and topographic map covering the study area.

3.1.3. Method of Data collection

The instruments used for data collection in this research work were the structured questionnaire, interviews, Global Positioning System (GPS), Stop watch to record time and a Toyota Siena used as ambulance to simulate the drill exercise.

A total of 450 questionnaires were produced for the fieldwork. Questionnaire was distributed to academic staff in Physics department and Environmental Management and Toxicology departments (EMT) in the College of Science, while Non-academic staff surveyed are specifically staff at the Health Centre, Porter at student's hostel, drivers and members of the University corporative during their Annual General meeting- (AGM) in August 2023.

3.1.4. Method of Data Analysis

Both the primary and secondary data collected were meticulously organized for analysis. The map and the Satellite Image map collected was referenced and overlay operation carried out to align both spatial data. The GPS coordinate captured for the Emergency Rooms was then plotted in the GIS environment using (ArcGIS) application to present a visual representation of ERs for Tier 1 MER professionals.

The information elicited from the structured questionnaire was statistically analyzed and presented in tables and further explained using descriptive statistics, data elicited during the KII and FGD which formed the qualitative approach/method explored for the research was systematically presented to cover the inventory and comparatively discussed using the OPITO guideline or criteria as the standard.

3.1.5. Method of Data Presentation

Tables, figures and maps was used to present and visualize the data generated from the fieldwork and explained using descriptive statistics.

4.0. Results and Discussion

4.1 Demographic Characteristics of Respondents

4.1.1 Respondent's category

The Table 3.1 shows the categories of the respondents that participated in the questionnaire survey. Of the 419-questionnaire analyzed, 260 representing 62.1% were students, 39 representing 9.3% were academic staff, while 120 respondents were non-academic staff, represents 28.6%.

Table 4.1: Categories of Respondents

	Frequency	Percentage	Cumulative Percent
Students	206	2.1	62.1
Academic	39	9.3	74.1
Non- Academic	120	28.6	100.
Total	419	100	

4.1.2 Genders of Respondents

With respect to the sex of the respondents, only 65 respondents which represent 15.5% of the sample population were male, while 354 of the respondents representing 84.5% are female as shown in Table 4.2 which indicates that more female participated in the questionnaire survey.

Table 4.2: Genders of Respondents

Respondent's Gender	Frequency	Percentage	Cumulative Frequency
Male	65	15.5	15.5
Female	354	84.5	100
Total	419		

4.1.3 Ages of Respondents

The age distribution of the respondents as shown in Table 4.3 indicates that majority of the respondents are between age cohort of 15- 25years and which represent the student categories. 206 respondents representing 49.2% are within the age cohort of 15-25years; 54 respondents which represent 12.9% are

with the cohort of 26-35years and 70 and 89 respondents representing 16.7% and 21.2% respectively belong to the age cohorts of 36-45years and 45years and above.

Table 4.3: Ages of Respondents

Age Cohorts	Frequency	Percent	Cumulative Frequency
15-25 years	206	49.2	49.2
26-35 years	54	12.9	62.1
36-45 years	70	16.7	78.8
45-above	89	21.2	100
Total	419		

4.1.4: Respondent's Student Level

Table 4:4 indicate the distribution of respondents that are students as shown below; the Table 4.10 indicate that more 100 levels students participated in the survey, 113 students representing 43.5% belong to this category, 85 respondents (32.7%) were 200levels, 300 and 400levels respondents recorded 23 and 14 (8.8% and 5.4%) respectively while 500level students recorded 25 respondents representing 9.6%.

Table 4.4: Respondent's Student Level

Level	Frequency	Percent	Cumulative Frequency
100	113	43.5	43.5
200	85	32.7	76.2
300	23	8.8	85.0
400	14	5.4	90.4
500	25	9.6	100
Total	260		

4.3 Evaluation of MER Competency Resource

In other to assess the competency level of the various tiers of responders, the Table 4.5 adapted from the OPITO MER was used as criteria;

From the key informant interview (KII) and focus group discussion (FGD) sessions carried out, the Tiers 0 and 1 structure does not exist in the study area, and consequently their inventories is 0. The competency need and training requirement to maintain competency for each tier of medical emergency professional or responder was therefore used to evaluate and determine adequacy of the resource in the study area.

For instance a Tier 1 MER professional (DFA) is required to have completed Basic First Aid Course of at least 40hours which is the standard for INTERNATIONAL RED CROSS certification and a designated first aider (DFA) refresher training twice yearly lasting for at least two hours to be deem competent. The following facilities are of great importance for the deployment of Tier 1 skills and which is observed to be absent or non- existent in the study area. Furthermore, their response time to arrival the accident/ incident is given at 4 minutes.

Table 4.5: MER Competency Evaluation Criteria.

Tier	By	At	Time (after incident)	Equipment/ Transport requirements	Training requirements	Skills maintenance requirements
Tier 0 (Initiation)	Bystander	Site	Immediate	•None	• Call for help • Make area safe • Do's &don'ts (1 hour on induction for everyone onsite)	•Every 1-2 years
Tier 1 **(**First aid & defibrillation)	Designated First Aider (DFA)	Designated room	<4 minutes	• First aid bag • Automated external defibrillator (AED) • Oxygen for high risk activities	•Designated First Aider (DFA) Training (usually 40 hours)	•DFA skills refresher (twice per year, for 2 hours)
Tier 2 **(**Medical stabilisation)	Health Professional (Paramedic, Nurse or Doctor)	Designated medical room	<1 hour (or 20 mins depending on risk assessment)	• Trauma bag • Ambulance, equipment & supplies • Advanced life support equipment, medication & supplies • Oxygen	• Professional medical training • Advanced Life Support (ALS/ACLS) certification • International Trauma Life Support	• ALS/ACLS training every 3 years • ITLS/PHTLS/ATLS every 4 years • Experientia l refresher

					(ITLS/PHTLS/ATLS) certification	training every year
Tier 3 (Hospital admission and care)	Emergency Physician	Hospital	<4 hours (or 1 hour depending on risk assessment)	•Ensure access to ground, sea or air transportation	•N/A	•N/A

4.3.1 Determination of Competency Level in FUPRE

Using the Table 4.5 to evaluate the competency level of the various Tiers the results is shown in the Table 4.6 below.

There is no record to evidence that such formal competency development training has been done and records being maintained as observed from the key informant interview with doctors at the FUPRE Health Centre (FHC) during the fieldwork. Similarly, there is also no record to confirm that Tier 1 MER competency is available and being maintained as per the requirement in the criteria in Table 4.5. However, the doctors confirmed that in addition to their formal training at medical school and their respective institutions and registration with their respective Medical Councils (including the Nursing council in Nigeria, Medical Laboratory council on Nigeria especially) some of the staff have had training and certifications in Basic Life Support (BLS); Advance cardiovascular Life Support (ACLS) and international Trauma Life Support (ITLS) certifications. Consequently, the competency level of MER resource in FUPRE falls below the Offshore Petroleum Industry Training Organization (OPITO) criteria for competency development and maintenance due to the absence of the Tiers 0 and 1 competencies as indicated in Table 4.6.

Table 4.6. Determination of Competency Level in FUPRE Health Centre

Tier	Frequency	Percentage
Tier 0	0	0
Tier 1	0	0
Tier 2	15	100

4.3.2: Competency Requirement for Various Tiers of MER Professionals

From table 4.5, the competency requirement for the various Tiers of MER professional is given as minimum criteria for the maintenance of competency as a medical emergency response professional in the industry. As shown in the Table 4.7, Tier 0 MER professional is deemed competent after completing the Tier 0 or First Responder's training/ course upon completing recruitment in the organization, or on arrival at a new location or facility, the training is part of the induction programme designed for newly employed persons; and evidence of training completion is documented and maintained. A yearly refresher programme is also a common practice. For Tier1 MER professional, the persons must complete a 5days (40 hours contact time) training and a twice per year DFA refresher 2 hours training as a skilled maintenance requirement to be deemed competent as a Tier MER professional as indicated in Table 4.5.

The Tier 2 MER professional must have acquired academic or professional training as a nurse as a minimum or medical doctor as the case may be and must be registered by the regulatory council, and must be in possession of professional certifications in Basic (BLS), Advance Life Support or Advanced Cardio-vascular Life Support and International Trauma Life Support (ALS/ACLS and ITLS). In addition to these requirements, refresher trainings for ALS/ ACLS is required every 3 years and ITLS is dues every 4year in addition to experiential refreshing training yearly to be deemed competent. From this qualitative evaluation of MER competencies, it is only the Tier 2 MER competency that is available in the study area when compared with the standard. The absence of the Tier 0 and Tier 1 competencies resource is a significant gap for an adequate management of emergencies and which can result in lagging indicators such as lost time injuries (LTIs) and fatality. (OPITO, 2019).

Table 4.7. Competency Requirement for Various Tiers of MER Professionals

Tier	Knowledge and Skill Requirement	Response Time	Skill Maintenance requirement
Tier 0	Call for Help; Make area safe; give clear description of area and of patient's condition.	immediate	Annually or once every 2years
Tier 1	40 hours Designated First Aider (DFA) Training:	Less than 4minutes	DFA Skill Refresher course (twice per year)
Tier 2	*Professional Medical Training; (Nigeria Medical and Dental Council Registration, Nursing Council of Nigeria, Medical Laboratory Council of	plus or minus 1hour, but not exceeding 20mins	*ALS/ACLS training every 3years; *ITLS training every 4years

	Nigeria. *ALS/ACLS certification (Advanced Life Support/ Advanced Cardio-vascular Life Support); *ITLS certification. (International Trauma Life Support)		*Experiential refresher training every ear

4.4. Discussion

The results from the study on evaluation of medical emergency response indicated a very poor awareness level amongst the study population, complete lack of knowledge of emergency procedure detailing what to do in an emergency situation, lack of emergency call numbers to notify and call the ambulance, and the absence of their tier-based structure for the management of medical emergencies. The skill and competencies proposed in the study as detailed in the OPITO MERP guideline conform with Azumi (2021) and Okpalla et al. (2022) in their work which recognized and identified the key competencies and professional skills required in medical emergency response management as first responders, first aiders, medical doctors, nurses and other paramedics.

Consequently, the results from the foregoing discussion above clearly justify the development of tier 0 and tier 1 competency resource if medical emergencies are to be efficiently managed. Therefore, transporters and commuters alike as stakeholder in the transport parlance are to be involved in this development. While the transport owners and operators can facilitate the operationalization of the process, electronic and print media can be explored to create awareness on emergency education on the general public who make up the commuting population.

The demonstration of readiness or response to medical emergencies can be achieved via the instrumentality of policy by operator of the sector to ensure provision of first aid box with minimum content is available in transport vehicles, and mobile ambulance position at intervals of at least one hour travel apart as per the OPITO requirement for tier 2 resource and facilities. Thus, by developing Tiers 0 and 1 competencies amongst drivers and mates, and by facilitating access to Tier 2 facilities along major routes and motor parks, the operators of the transport sector, namely; National Association of Transport owners (NATO); National Union of Road transport Workers (NUTRW); and Petroleum Tanker Drivers (PTD) propagating this policy and make available this basic first aid equipment to handle medical emergencies in transit will achieve the desired goal.

In addition, in line with Sankey et al., (2014); their study on safety awareness of emergency amongst university students in North Western Nigeria identified emergency call numbers as an indicator to be

evaluated as well as first aid awareness. Consequently, emergency call numbers for ambulance or Tier 2 facilities should be made available to complement the Tiers 0 and 1 competencies for an adequate management of emergency situations. This vital information can be cascade through posters and sticker to be posted on vehicles and bus terminals to make operators and commuters aware and know what to do in emergency situations. Furthermore, funding mechanism for this innovation can be achieved through a number of ways like the introduction of passenger's insurance scheme, the unions or international donor agencies.

5.0. Conclusion

The finding from the research has clearly identified the competency requirement gaps for medical emergency response in the study area, noting that the non-existence of the tier-based response structure which highlights the roles and competencies for tiers 0 and 1 respectively, identification of basic first or emergency equipment and supplies. The availability of these pre-hospital competencies plays very important and complementary in handling medical emergency situations and which shall in no small way enhance the delivery of medical emergency services. Consequently, the need to develop this competency and skill through training and emergency awareness education is underscored. Also, the fact that medical emergencies are not location specific, further underscores the development of these competencies within the transport sector to promote emergency awareness and education amongst transport operators and commuters respectively.

5.1. Recommendations

The key stakeholders in the transport sector, the commuting public, humanitarian organizations and professional institutions join hands to demonstrate this readiness with a view to save lives and promote wellbeing.

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