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ASSESSMENT OF KNOWLEDGE AND ATTITUDE OF HEALTH WORKERS TOWARDS EMERGENCY PREPAREDNESS AND RESPONSE IN HEALTH INSTITUTIONS IN BAYELSA STATE

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Abstract

This study assessed the knowledge and attitude of healthcare workers towards emergency preparedness and response in health institutions in Bayelsa State, Nigeria. The aims were to examine the level of knowledge and attitude of healthcare workers towards emergency preparedness response across primary, secondary, and tertiary health institutions in the state. A descriptive research design guided the study, targeting a population of 5,086 health workers, including doctors, nurses, pharmacists, community health officers, medical laboratory scientists, etc. 735 healthcare workers were sampled using a multistage sampling technique and distributed across primary, secondary, and tertiary care facilities in the study area. Data collection was carried out using a structured questionnaire, while descriptive statistics and Chi-square were used for data analysis. Results of descriptive statistics showed that healthcare workers demonstrated a high level of knowledge of emergency preparedness and a positive attitude toward participating in public health emergency response (61.1% strongly agree and 37.3% agree), making 98.4%. The weighted mean scores for knowledge (3.4) and attitude (3.6) among health care workers also showed acceptable levels. The results of the chi-square test showed that there was no statistically significant difference in the level of knowledge of the workers across different healthcare delivery ($\chi 2 = 3.21$; $p = 0.524$), but across the LGAs, the level of knowledge among health workers was significantly different ($\chi 2 = 190.38$; $p = 0.001$). Also, there was a statistically significant difference in the attitude of the workers across healthcare delivery settings ($\chi 2 = 10.45$; $p = 0.033$) and across LGAs; the attitude towards emergency preparedness among health workers was significantly different ($\chi 2 = 174.86$; $p < 0.001$). It was concluded that health workers in Bayelsa state have good knowledge and a positive attitude toward health emergency preparedness and response.

Keywords:

Knowledge, Attitude, Emergency Preparedness and Response, Health Institutions, Bayelsa State.

1.0 INTRODUCTION

Knowledge of emergency preparedness and response among health care providers is a valuable tool for enhancing effective, efficient emergency response activities. However, as different research shows, this knowledge seems to vary among professionals within the health sector and from setting to setting. It is also expected to be achieved by 2030. Naser and Saleem (2018), in a study on Emergency and disaster management training, knowledge, and attitude of Yemeni health professionals, used a descriptive cross-sectional study to find that the health professionals had insufficient knowledge of emergency preparedness and response, with only 32.0% having good knowledge, 53.5% having fair knowledge, and 14.5% showing poor knowledge. The study further showed that educational level also significantly affected knowledge: postgraduates had better knowledge than graduates, and physicians showed better knowledge than other sub-groups**.** On emergency preparedness and response training, 41.0% had received no training, and 58.9% had not participated in emergency preparedness exercises.

Similarly, an observational study on the Assessment of disaster preparedness among emergency departments in Italian hospitals revealed poor knowledge of basic concepts in hospital emergency preparedness. The results revealed that only 45% of the respondents are aware of the massive influx of the casualty emergency plan, and only 41% know who is responsible for activating it (Paganini et al., 2016). Other studies have also demonstrated insufficient knowledge of emergency preparedness and response among health care professionals and disaster preparedness among nurses. A systematic literature review showed that nurses are insufficiently prepared for emergencies and do not feel confident in responding effectively to disasters (Labrague et al., 2016).

Furthermore, a study conducted in Lagos, Nigeria, on the knowledge, attitudes, and practices of emergency health workers toward emergency preparedness and management in two hospitals, using a descriptive cross-sectional survey, showed inadequate knowledge: only 47.8% of respondents demonstrated good knowledge. In contrast, 37.1% had fair knowledge and 15.1% showed poor knowledge (Adenekan et al., 2016). Nurses have also shown a good understanding of emergency preparedness in Northern Nigeria. This was demonstrated in a study by Ayuba et al. (2015) in Northern Nigeria on nurses' roles in emergency preparedness. Using a cross-sectional descriptive survey, the researchers found that more than 60% of the participants had good knowledge of emergency preparedness and a clear understanding of the factors affecting emergency responders.

Similarly, Zeenny et al. (2020) conducted a descriptive cross-sectional study in Lebanon to assess the Knowledge, attitudes, practices, and preparedness of hospital pharmacists for COVID-19, which found that participants had good knowledge of COVID-19. Emergency care is an essential part of the health system it is the form of care administered in the first few hours after the onset of an acute medical condition, e.g., a childbirth complication, heart attack, injury, or any health problem that reaches an acute stage and poses a threat to life (Uzoechina et al., 2012). The quality of care available in an institution can be judged from how the institution’s emergency ward responds to and manages a variety of cases in all clinical areas; it is an indirect indicator of the

standard of health-care delivery provided in an institution. The ability to respond to emergencies effectively depends on having staff who know what to do and have the appropriate skills.

The patient's outcome and the speed of recovery from emergencies largely depend on the initial response of emergency health workers and the quality of care delivered at the time of presentation. This means that the knowledge and attitudes of these emergency workers toward managing emergency cases presented to their hospitals, along with their preparedness, are significant factors in determining the outcomes and recovery of such patients. In working towards a patient's survival, emergency preparedness encompasses planning, training, equipment, and exercises (Adenuga, 2012).

Emergency response training is key to epidemic control. However, in the developing world, most healthcare workers involved in case management are either poorly trained or not trained, as discovered in the studied areas. The statement aligned with an Asian study on assessing primary health centre disaster preparedness following the 2009 earthquake in Padang Pariaman, West Sumatra, Indonesia. It also noted that the lack of requisite resources and poorly trained medical personnel contributed to a poor emergency response. The use of personal protective equipment (PPE) and infection control has been documented in the management of cholera epidemics in northern Nigeria. This study suggested that simple water supply and hand hygiene practices, including point-of-use chlorination, safe water vessels, and hand washing with soap, could help reduce the risk of transmission in both the community and health centres. However, despite the use of PPE, there were reported cases of cholera infections among health care workers involved in case management during the epidemic. This could be due to breakthrough infections when health care workers were overwhelmed and did not use PPE, or to the unavailability or non-use of PPE. (Oleribe et al., 2019).

Hospitals in the disaster area are considered incapable of caring for patients, and finding an empty bed is not as easy as it may seem. It is insufficient, even though excess plant capacity is necessary to accommodate additional patients during nationwide emergencies. Sufficiency exists when the specific patient care needs are met and adequately remunerated, so neither party, including the relocated patient or the receiving hospital, will incur a significant loss. Focusing on the potential health loss, sufficiency requires attention to the patients' need for specialized care, such as cardiac care units. Even though general hospital units can care for these patients, it is preferable from a clinical standpoint to place any intensive care patient into a unit with appropriate staff and equipment (Valdmanis et al., 2010) and most African countries lack specialty emergency care and characterising the burden of disease and the state of emergency management (EM) systems is therefore necessary for evidence-based advocacy for EM development (Mould-Millman et al., 2019).

Ahayalimudin et al. (2016) conducted a cross-sectional study on the attitudes and practices of emergency nurses and community health nurses and found that both groups had positive attitudes at the practice level, with 51.6% for emergency nurses and 30.7% for community nurses, conducted in Selangor, Malaysia. This was from a similar study in central Saudi Arabia on emergency department staff's knowledge, attitudes, and practices toward disaster and emergency preparedness at a tertiary hospital. The findings revealed a neutral attitude, with only 6.3% not

interested in disaster preparedness (Nofal et al., 2018). This view was also supported by Naser and Saleem (2018), who, in a descriptive cross-sectional study on emergency and disaster management training, knowledge, and attitudes of Yemeni health professionals, reported that respondents showed a positive attitude toward emergency and disaster preparedness (84.9%).

Related studies have shown that the knowledge, experiences, and training needs of health professionals about disaster preparedness in southwest Ethiopia found that only a few people (20.6%) were trained on emergency or disaster-related topics, and the majority showed poor knowledge and have need for emergency preparedness training (92.8%) (Barhanu et al., 2016). Similarly, research in Nigeria has demonstrated poor knowledge among health care providers regarding emergency preparedness and response (Adenekan et al., 2016). Disasters that could lead to many individuals needing emergency care are not selective. It could happen to any country in the world, and fatality is dependent on the level of preparedness, especially in the health sector (Aliyu et al., 2015). Many countries' Ministries of Health have health workers with poor knowledge and attitude towards emergency preparedness and response as well as poor institutional arrangements, making it challenging to prepare for and respond to emergencies, and this is further worsened by the dearth of health sector manpower. Thus, this study sees to assess the knowledge and attitude of health workers towards emergency preparedness and response for health institutions in Bayelsa State and the key objectives are to; determine health care providers' knowledge of public health emergency preparedness and mitigation in the health institutions across Bayelsa State, and also determine the attitude of health care providers towards emergency preparedness mitigation and response in primary, secondary, and tertiary health institutions across Bayelsa State.

2.0 METHODOLOGY

2.1 Research Design

This study used a descriptive comparative survey to assess emergency preparedness in the primary, secondary, and tertiary health institutions across Bayelsa State. A descriptive comparative survey was chosen to identify the characteristics of variables in preparedness response and mitigation strategies for public health emergencies clearly. It was used to compare the preparedness level of the different health system tiers. This provides an in-depth understanding of the preparedness status of public health emergencies in Bayelsa State. The study involved collecting information from key informants and health care personnel in the health facilities using a checklist and structured interview questionnaire.

2.2 Study Area

The study area of this research is focused on the Bayelsa State Health institutions. Bayelsa State is one of the States in the Niger Delta, which is biodiverse with mangroves and rainforest that provide sequestration of carbon, supporting the variety of plants and animal life found in the region. Bayelsa is a state in the Niger Delta region in the southern part of Nigeria. It lies between Delta and Rivers State, with its capital in Yenagoa. The Ijaw language is primarily spoken with dialects such as Kolukuma, Mein, Bomu, Epie-Atisa, Nembe, and Ogbia. The official language of

Bayelsa State is English. General Sani Abacha's military government created the state out of the old Rivers State on the first of October, 1996. Its name was derived from the first few letters of the names of the major local government areas from which it was formed - Brass LGA (BALGA), Yenagoa (YELGA), and Sagbama (SALGA). Hence, BAYELSA was derived from the letters; BA + YEL + SA. Bayelsa State has one of Nigeria's largest crude oil and natural gas deposits. As a result, the state's petroleum production is extensive. However, most Bayelsans live in poverty. Bayelsa State lies in 9,415.8 square kilometres, and the Nigeria National Census of 2006 estimated the State population to be 1,704,515, accounting for 1.2% of the country's total population figure. Bayelsa State is located in a Latitude of 40 15' North to 5 o 23' South and a longitude of 05 o 22' West to 06 o 45' East. It is on longitude 6^0 degrees 05'' East and Latitude 4^o degrees 45'' North (Bayelsa State Overview, n.d.).Bayelsa State has three levels of health care as contained in the National health care system namely; Tertiary health care level with highly specialized care (Niger Delta University Teaching Hospital Okolobiri and Federal Medical Centre Yenagoa) all situated in Yenagoa Local Government Area of the State, Secondary Health care facilities spread across all the Local Government Areas and Primary Health care facilities distributed around all the wards in each of the local Government Areas with at least one functional health facility in each ward.

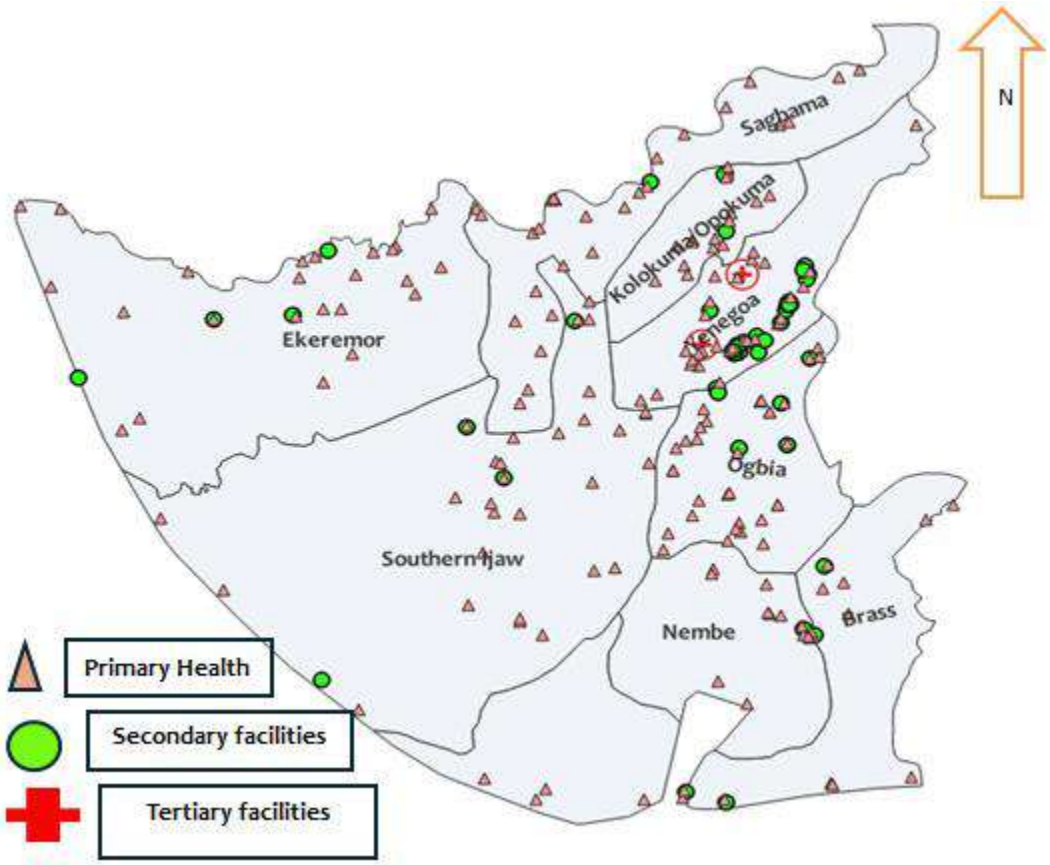

Figure 1 Map of Bayelsa State showing the distribution of health facilities.

2.3 Population for the Study

The target population of this study consists of key health personnel from the tertiary, secondary, and primary health facilities in Bayelsa State. The estimated population of the study is 5,086. An actual figure could not be obtained, hence an estimated figure from the assessment done before the Bayelsa Health summit of 2021 was used (Table 1). Health facilities listed in the study were selected from 189 viable tertiary, secondary and 105 functional primary health facilities in the eight local government areas of Bayelsa State (Table 2)

Table 1: Estimated Distribution of different healthcare professionals in Bayelsa State

S/N	Cadre of Health Care Personnel	Population
1	Doctors	730
2	Nurses/Midwives	1116
3	Pharmacists	30
4	Pharmacy Technicians	39
5	Lab. Scientists	35
6	Medical Laboratory Technicians	20
7	Lab. Assistants	42
8	CHOs	28
9	CHEWs	244
10	JCHEWs	155
11	Dental Technicians	12
12	Others	135
	Total for State Owned Facilities	2,586
13	Estimated Total for FMC Yenagoa	2,500
	Grand Total	**5,086**

Source: Corona management, Bayelsa State Ministry of Health Pre-Health Summit Situation Analysis (2021)

Table 2: Distribution of public health facilities in Bayelsa State.

S/N	LGA	Primary	Secondary	Tertiary	Total
1	Brass	11	2	0	13
2	Ekeremor	24	5	0	29
3	Yenagoa	24	6	2	32
4	Nembe	18	3	0	21
5	Ogbia	20	4	0	24
6	Sagbama	23	3	0	26
7	Kolokuma-Opokuma	8	3	0	11
8	Southern Ijaw	29	4	0	33
	Total	**157**	**30**	**2**	**189**

2.4 Sample Size Determination

The sample size for this study was calculated using the formula for estimating a simple proportion in a population, given below:

$$n = \frac{Z^2 \, X \, P \, X \, Q}{d^2} \quad (3.1)$$

where n is the minimum sample size needed in this study, Z is the standard normal deviate at 95% confidence interval, which is given as 1.96, and P is the prevalence of the disease or health event of interest in the population. For this study, a prevalence of 50% (0.5), which is expected to give a minimum sample size, is assumed while Q is the complementary prevalence given as 1 – P (1 – 0.5 = 0.5) and d is the margin of error allowable in the study (level of precision) taken as 5% (0.05). Substitution is shown below:

$$n = \frac{1.96^2 \, X \, 0.5 \, X \, 0.5}{0.05^2}$$

$$n = n = 384$$

Hence, a minimum sample size of 384 persons at the primary and secondary levels of care is needed for this study. Adjusting the sample size for non-response, using a non-response rate of 10% further increases the sample size to 422, that is, the summation of 10% of 384 (38) and the minimum sample size. However, the total population of health workers in this study, is a finite population of less than 10,000 persons, the formula for adjusting a finite population less than 10,000 was also applied as shown below:

$$n_f = \frac{n}{1 + \frac{n}{N}} \quad (3.2)$$

n_f is the new sample size for the finite population, n is the calculated sample size (422) and N is the total population size (2,586 for the primary/secondary levels and 2500 for tertiary level of care).

For the primary/secondary level

$$n_f = \frac{422}{1 + \frac{422}{2584}}$$

$$n_f = 362 \; persons$$

For the tertiary level of care

$$n_f = \frac{422}{1 + \frac{422}{2500}}$$

$$n_f = 360\ presons$$

Hence, the study involved 362 health workers at the primary/secondary level of care and 360 health workers at the tertiary level of care in the State.

2.6. Sample and Sampling Techniques

A multistage sampling technique was adopted for the selection of participants this study. The study was conducted in all the Local government areas of the State, to ensure a good representation of the State's health emergency preparedness and mitigation strategies at all levels of care delivery.

Stage I: Selection of Wards/health facilities at the Local Government Area (LGA) level; Five wards were selected from each LGA by simple random sampling (balloting), making a total of 40 wards to be included in the study out of the 105 administrative wards in the State. This amounts to 38% of the total primary health facilities in the State which is considered representative enough. The functional public health facilities in each of the selected wards in the local government area of the State would be drafted into the study. Two secondary health facilities each would be selected from the 8 LGAs of the state by simple random sampling. The two tertiary public health facilities in the state will also be drafted into the study.

Stage II: **Selection of participants from the health facilities for the study;** There are 362 participants recruited from 40 primary health care centres and 16 secondary health centres. A proportionate allocation of participants was adopted to recruit participants at the primary and secondary levels of care. The total includes 56 primary and secondary health facilities. number to be recruited from the primary level by proportionate allocation is as shown below:

$$Subgroup\ sample\ size = \frac{Number\ in\ subgroup}{Total\ numebr\ of\ group}\ X\ sample\ size \quad (3.3)$$

For the primary level of care

$$Subgroup\ sample\ size = \frac{40}{56}\ X362$$

$$Subgroup\ sample\ size = 258.6$$

Approximately 259 health workers were recruited from the 40 public primary health facilities that would be recruited for the study.

For the secondary level of care

$$Subgroup\ sample\ size = \frac{16}{56}\ X362$$

$$Subgroup\ sample\ size = 103.4$$

Approximately 103 health workers were recruited from the 16 secondary public health facilities for the study. Stratified random sampling was adopted in the health facilities to ensure that all cadres of health care providers, including doctors, nurses, pharmacists, medical laboratory scientists, health attendants, and other relevant health care workers, were involved in the study.

For the tertiary centres, participants from the Federal Medical Centre (FMC) and the Niger Delta University Teaching Hospital (NDUTH) were recruited proportionately to the population of health workers in each centre. The selection of participants from the centres was done using the stratified sampling technique to ensure that all cadres of health care providers were recruited in the study.

2.7. Methods and Instrument of data collection

Eight research assistants were recruited for the data collection, each representing the focal person in the eight LGAs of Bayelsa state during the Study. They were trained on the study's objectives, purpose and benefits to participants and the entire health system in Bayelsa state. The training includes obtaining informed consent and ensuring that other medical research ethics principles are upheld. The selection technique was reviewed, and the number of participants recruited from each LGA and at the three levels of health care delivery would be communicated. The research assistants also review the questionnaire during the training to understand the responses to each question in the study tools. Role-plays were conducted between the research assistants to ensure that the procedures for administering the questionnaire were well understood. The role-play also allowed the research assistants to be corrected in any area where there might be errors in data collection.

At the commencement of data collection in each facility, the most recent staff nominal roll serve as the sampling frame. The professional cadres are the strata from which a simple random sampling technique on each research day selected participants. After the selection, each eligible participant was briefed on the study objectives, benefits, and procedure to obtain informed consent. 794 copies of the study instruments (398 for primary/secondary healthcare facilities, and 396 for tertiary healthcare facilities) were distributed. Each trained research assistant distributed copies of research instrument (65-100 copies) according to number of health facility his/her apportion LGA. Eligible participants were allowed to ask questions and seek clarifications, after which written informed consent was obtained from those willing to participate, thus recruiting them for the study. Thereafter, the study questionnaire was administered to the recruited health workers. In all, a total of 794 copies of the study instruments that were distributed, a total of 761 were successfully retrieved, of which only 735 (primary facility=243; secondary facility=127, tertiary facility=365) were correctly filled, hence, valid for computation of the study results.

The instruments for data collection in this study were a structured questionnaire. The study questionnaire comprises three sections: Section A contains respondents' profiles; Section B contains items on health workers' knowledge of emergency preparedness and response; and Section C contains items on health workers' attitudes towards emergency preparedness and

response. The responses to items on the questionnaire are a 5-point Likert scale response, namely strongly agree–5; Agree–4; disagree–2, strongly disagree–1, and undecided–3.

2.6 Validation and Reliability testing of the study Instrument

Validation and reliability testing were done through expert and peer reviews and pretesting of the adapted study questionnaire. Pretesting was done in 2 primary health facilities in Ahoada West LGA of Rivers state, a suburban LGA close to Bayelsa state. Responses were evaluated from the pretesting and expert/peer review, and based on suggestions and observations, the questionnaire was further modified to improve their validity and reliability in data collection. Reliability of the instrument was ensured by accurate and careful phrasing of each question to avoid ambiguity and leading respondents to an answer. Test and retest were deployed to determine the instrument's reliability, using twenty-five subjects in primary and secondary health facilities in Ahoada West LGA. The instrument was administered twice within an interval of two weeks. Both sets of responses would be scored and analysed. Pearson's Product-Moment Correlation (PPMC) analysis was done, and a reliability coefficient of 0.86 would be considered acceptable. Cronbach's Alpha, a measure of internal consistency, was carried out; a Cronbach's alpha of 0.7 would be considered acceptable. The study tool was subjected to expert/peer review to ensure the content and face validity. The questionnaire was given to peers and supervisors for content validity. Content validity ensures that it is sufficiently comprehensive in seeking the proper range of responses, it is appropriate in terms of space and length, flow of questions, and whether the questions are consistent with the study's objectives

3.9 Data Analysis

Data collected by the eight research assistants was uploaded to the ODK cloud and aggregated. The ODK form used for the data collection allows real-time data collection monitoring, and submitted forms were easily viewed, and corrections were easilymade in the field where necessary. After ensuring complete and accurate data collection, aggregated data were downloaded from the server into the principal researcher's personal computer for data cleaning and analysis. Data cleaning was done on Microsoft EXCEL software, and a clean dataset was exported into the Statistical Package Social Sciences (SPSS) software version 25 for data analysis. Univariate analysis was carried out by summarising categorical variables using frequencies and percentages and continuous variables using mean and standard deviation or median and interquartile range as appropriate. The knowledge and attitude of health care providers concerning emergency preparedness and mitigation strategies were assessed by the 15 questions in Sections 2 and 3, and 8 questions in Section 4, respectively. The responses from participants were scored and graded. For the Knowledge domains, the maximum achievable score is 75 points (15 X 5points), while attitude has a maximum achievable score of 40 points (8 X 5 points). The grading for knowledge and attitude is shown in Table 3. The difference in level of knowledge and attitude across the three levels of health care delivery was assessed using the Chi-square test of proportion. The level of significance is set at p-value < 0.05. A criterion mean of 3 was calculated from the five-point Likert scale used in the questionnaire which was used to compute the weighted mean of each question in the questionnaire and the entire items in each set of questionnaires.

Table 3. Grading for facilities knowledge and attitude among health care providers.

Study tool/Domain	Number of items	Range of scores		
		Poor	Fair	Good
Questionnaire				
Level of Knowledge	15	15 – 44 points	45 – 59 points	≥ 60 points
Level of Attitude	8	8 – 23 points	24 – 31 points	≥ 32 points

3.0 RESULTS AND DISCUSSIONS

3.1: Knowledge of emergency preparedness and response among health workers in public health institutions in Bayelsa state.

Table 4 shows the Knowledge of health care providers on emergency preparedness and mitigation strategies in the health institutions across Bayelsa State. The majority of health workers (92.6%) in the study either 'agree' (52.5%) or 'strongly agree' (40.1%) with the definition of emergency preparedness and response that refers to the ability of health care systems, communities, and individuals to prevent, protect against, quickly respond to, and recover from health emergencies. Despite, this knowledge of the definition, only 40.0% of respondents in the study know where to access the emergency preparedness and response plan at the health facility where they work; 46.8% of respondents understand the steps to follow in the hospital in cases of emergency; while only 33.4% of respondents have participated in training dealing with emergency preparedness and mitigation strategies over the past two years. In addition, a good percentage of respondents reported knowing that a hospital emergency preparedness plan consists of structural, non-structural, functional, and human resource components, with 262 (35.6%) strongly agreeing and 378 (5.4%) agreeing. On the other hand, only 21 (2.9%), 2 (0.3%), and 72 (9.8%) disagree, strongly disagree, and are undecided, respectively, that a hospital emergency preparedness plan consists of structural, non-structural, functional, and human resource components.

Further assessment on if the participants have knowledge of Emergency Operations Centre (EOC) as a predetermined location chosen for the Emergency Operations 109 (14.8%) strongly agreed with 411 (55.9%) agreed and 36 (4.9%) of the respondents disagreeing, with 34 (4.6%) strongly disagreeing with 145 (19.7) stating not being sure to the question. Test item on knowledge of steps to follow in the hospital when there is an emergency that causes a sudden influx of large number of patients are well documented in the emergency plan in this health facility, only 70 (9.5%) strongly agree with 272 (37%) agree while, 157 (21.6%), disagree, 101 (13.7%) strongly disagree and 133 (18.1%) were undecided. The mean knowledge score for emergency preparedness and response among health care workers was 50.9% ± 20.0% with an acceptable weighted mean of 3.

Figure 2 presents the level of knowledge among health care workers regarding emergency preparedness and mitigation strategies. The results showed that 136 of the 745 health workers who participated in the study (18.5%) had 'good' knowledge of public health emergency preparedness. About 2 in every five participants had 'fair' level (40.4%) and 'poor' level (41.1%) of knowledge (Figure 4.4). 3.4 calculated weighted mean on the knowledge of health care

workers on emergency preparedness for public health emergencies was an acceptable signifying a good knowledge level of health care workers on emergency preparedness.

Table 6, which shows the distribution of knowledge levels of public health emergency preparedness and mitigation strategies across the different levels of health care delivery, was similar in the State ($\chi 2 = 3.21$; $p = 0.524$). The proportions of respondents with a 'good' level of knowledge at the primary, secondary, and tertiary levels of care were 18.1%, 18.9%, and 18.6%, respectively (Table 4.5). Additionally, 'poor' level 39.2% at the tertiary level, 40.7%% at the primary level, and 47.2% at the secondary level of care. However, across the LGAs, the level of knowledge among health workers was significantly different ($\chi^2 = 190.38$; $p - 0.001$). The LGAs with the leading proportions of health care workers with 'good' level of knowledge were Brass (59.4%), Ogbia (32.7%), and Yenagoa (25.9%). In Nembe, 93.2% of health workers, 53.4% in Yenagoa, and 40.8% in Ogbia were rated as having a 'fair 'level of knowledge (Table 4.5). The highest proportion of 'poor' knowledge was found among health care workers in Kolokuma/Opokuma (89.8%), Southern Ijaw (83.3%), and Ekeremor (66.1%).

The study revealed that health care workers in Bayelsa State have good knowledge of public health emergency preparedness to public health emergencies. A good proportion of health workers demonstrate knowledge of emergency preparedness. (92.6%) In the study, either 'agree' (52.5%) or 'strongly agree' (40.1%) with the definition of emergency preparedness. Furthermore, a good number of participants have knowledge of the Emergency Operations Centre (EOC) as a predetermined location chosen for the Emergency Operations 109 (14.8%) strongly agreed with 411 (55.9%) agreed with a The mean knowledge score for emergency preparedness and response among health care workers was 50.9% ± 20.0% with an acceptable weighted mean of 3.

These findings align with previous research conducted by Zeenny et al. (2020) in Lebanon on the knowledge, attitude, practice, and preparedness of hospital pharmacists for COVID-19, which showed participants had good knowledge of emergency preparedness. Similarly, Ayuba et al. (2015), in their study on the role of nurses in emergency preparedness, indicated that the participants had good knowledge of emergency preparedness. A good number of health care workers demonstrating good knowledge of public health emergency preparedness indicates progress in governmental and institutional efforts to enhance preparedness capabilities in the Bayelsa State health sector.

In contrast to the findings from this study, some other researchers identified inadequate knowledge of health care workers on emergency preparedness and mitigation strategies for public health emergencies. Naser and Salem (2018), in a study on Emergency and disaster management training, knowledge, and attitude of Yemeni health professionals, shared similar findings with an observational study on the Assessment of disaster preparedness among emergency departments in Italian hospitals, which revealed poor knowledge of basic concepts in hospital emergency preparedness.

The study findings further revealed that there was no significant difference in the knowledge of public health emergency preparedness among health care workers at different levels of health facilities across Bayelsa State ($\chi 2 = 3.21$; $p = 0.524$). However, the significant differences in

emergency preparedness and response knowledge among health workers across different local government areas (LGAs) of Bayelsa State suggest that local context, resource availability, and individual experiences shape these capacity levels. According to Barhanu et al. (2016), healthcare providers in resource-constrained areas often perceive themselves as less prepared due to inadequate training and limited emergency resources. In Bayelsa, some LGAs may have better access to training and resources than others, leading to varying confidence levels ($\chi^2 = 190.38$; p – 0.001) in preparedness and response capabilities. This disparity could impact the effectiveness of emergency responses, as confidence and perceived readiness influence decision-making during crises. Nonetheless, varying capabilities can influence the effectiveness of emergency responses, underscoring the need for targeted training and resource allocation to bridge perceptual gaps and enhance overall healthcare system resilience in Bayelsa State. Ensuring equitable resource distribution and continuous capacity-building across all LGAs is essential to foster uniform confidence in emergency preparedness among health workers.

Table 4*:* Response of respondents on knowledge of emergency preparedness and response among health workers in public health institutions in Bayelsa state

Statement	Response Pattern – Frequency N = 735 (%)						
	SA	A	U	D	SD	WM	Remark
Emergency preparedness and response refer to the ability of health care systems, communities, and individuals, to prevent, protect against, quickly respond to, and recover from health emergencies.	295 (40.1%)	386 (52.5%)	40 (5.4%)	7 (1.0%)	7 (1.0%)	4.3	Accepted
Hospital emergency preparedness plan consists of structural, non-structural, functional, and human resource components.	262 (35.6%)	378 (51.4%)	72 (9.8%)	21 (2.9%)	2 (0.3%)	4.2	Accepted
There is an emergency preparedness and response plan at the hospital, and I know where to access it.	64 (8.7%)	230 (31.3%)	112 (15.2%)	192 (26.1%)	137 (18.6%)	2.9	Disagree
Over the past two years, I have participated in training dealing with emergency preparedness and response.	52 (7.1%)	193 (26.3%)	39 (5.3%)	276 (37.6%)	175 (23.8%	2.6	Disagree
Emergency Operations Centre (EOC) is a predetermined location chosen for the Emergency Operations.	109 (14.8%)	411 (55.9%)	145 (19.7%)	36 (4.9%)	34 (4.6%)	3.7	Accepted

The steps to follow in the hospital when there is an emergency that causes a sudden influx of large number of patients are well documented in the emergency plan in this health facility.	70 (9.5%)	272 (37.0%)	133 (18.1%)	159 (21.6%)	101 (13.7%)	3.1	Accepted
The steps to follow in the hospital when there is an emergency that causes a sudden influx of large number of patients are well understood by staff at in this facility.	63 (8.6%)	281 (38.2%)	136 (18.5%)	192 (26.1%)	63 (8.6%)	3.1	Accepted
I have the competence to carry out accepted triage principles used in an emergency.	101 (13.7%)	286 (38.9%)	63 (8.6%)	181 (24.6%)	104 (14.1%)	3.1	Accepted
Weighted Mean						**3.4**	Accepted

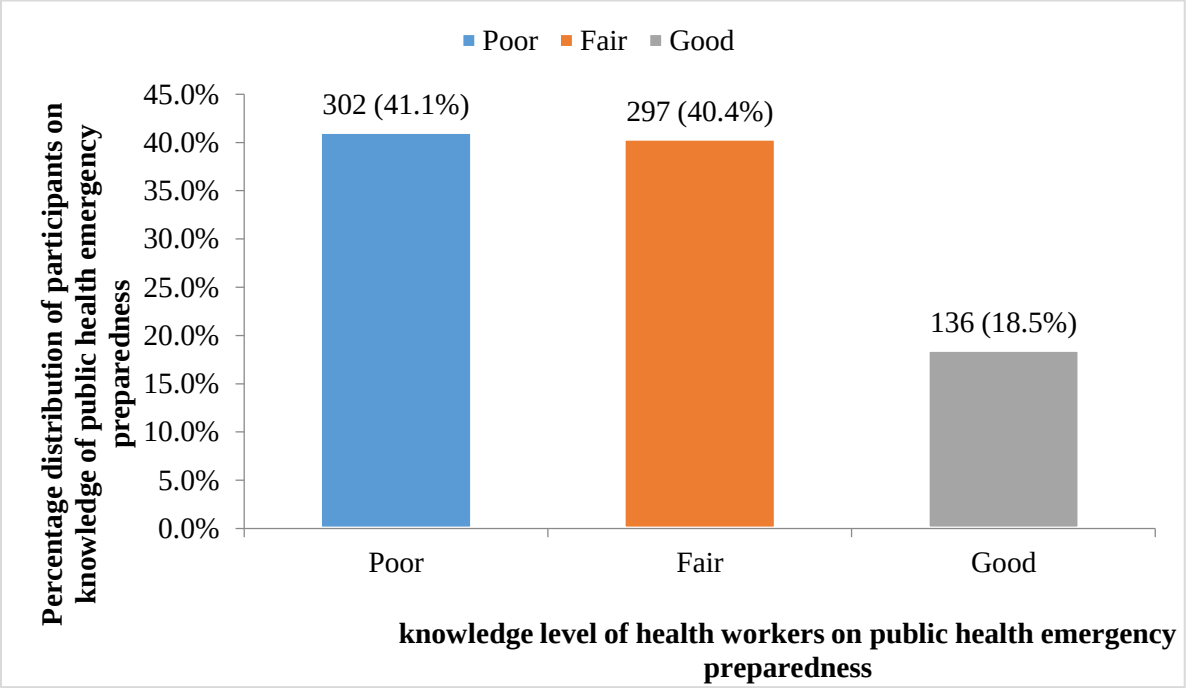

Figure 2: Level of knowledge of public health emergency preparedness and mitigation among health workers in public health facilities in Bayelsa State

Table 5: Levels of knowledge of emergency preparedness among health workers in public health facilities at the different levels of care and LGAs in Bayelsa State.

Characteristics		Level of knowledge			Chi-square test (pValue)
	Total N = 735	Poor N = 30(%)	Fair N= 297(%)	Good N= 136(%)	
Level of Care					
Primary level	243	99 (40.7%)	100 (41.2%)	44 (18.1%)	3.21 (0.524)
Secondary level	127	60 (47.2%)	43 (33.9%)	24 (18.9%)	
Tertiary Level	365	143 (39.2%)	154 (42.2%)	68 (18.6%)	
Local Government Area	**N = 370**	N=159(%)	N=143(%)	N=68(%)	
Brass	32	3 (9.4%)	10 (31.3%)	19 (59.4%)	190.38
Ekeremor	56	37 (66.1%)	14 (25.0%)	5 (8.9%)	(0.001)
Kolokuma/Opokuma	49	44 (89.8%)	4 (8.2%)	1 (2.0%)	
Nembe	44	1 (2.3%)	41 (93.2%)	2 (4.5%)	
Ogbia	49	13 (26.5%)	20 (40.8%)	16 (32.7%)	
Sagbama	52	24 (46.2%)	19 (36.5%)	9 (17.3%)	
Southern Ijaw	30	25 (83.3%)	4 (13.3%)	1 (3.3%)	
Yenagoa	58	12 (20.7%)	31 (53.4%)	15 (25.9%)	

4.3 Attitude of health workers to emergency preparedness and mitigation strategies in public health institutions in Bayelsa State.

Table 6 presents the response patterns of health care providers to questions about their Attitude towards emergency preparedness and response. Almost all participants (98.4%) either 'strongly agree' (61.1%) or 'agree' (37.3%) that 'Potential hazards likely to cause disaster should be identified and dealt with immediately they are identified' while 1.1% were undecided, 2.7% disagree, with 0.8% strongly disagree that they need to know emergency preparedness plans. (Table 4.6). About half of the respondents 'strongly agree' that 'Emergency preparedness planning is for everybody in the hospital' (53.3%), and 40.7% 'agree', 2.1% were undecided with 3.7% disagreeing and 0.1 strongly agreeing that emergency preparedness planning is for everybody. 274 (37.8%) strongly agree and 342 (46. %) that they are willing to participate in emergency response including infectious disease outbreak however, only 431 (58.6%) were willing to participate without incentives (Table 4.6). The weighted mean score of attitudes of health care worker to emergency prepared and response in Bayelsa State was at an acceptable level of 3.6 which indicates that the health care workers in Bayelsa State have a positive attitude towards public health emergency preparedness and mitigation of public health emergencies.

Figure 3 shows that almost half of the health care workers who participated in the survey (48.3%) had a 'good' attitude towards emergency preparedness and response in the State. Less than a tenth of respondents (7.6%) had a 'poor' attitude, while 324 respondents (44.1%) had a 'fair' attitude (Figure 4.5). Table 7 shows that a 'good' attitude was seen in the highest proportion among respondents at the secondary level of care (56.7%). At the primary level of care, 49.0% were categorized as having a 'good' attitude, while 44.9% of respondents at the tertiary level were

rated as having a 'good' attitude. 'Poor' attitude ranged between 4.5% of respondents at the primary care level and 9.9% at the tertiary care level. The distribution of 'good', 'fair', and 'poor' attitudes among health care workers in the primary, secondary, and tertiary levels of care was significantly different ($\chi 2 = 10.45$; $p = 0.033$). Concerning LGAs, a statistically significant difference was also observed in the level of attitude in the 8 LGAs of the State ($\chi^2 = 174.86$; p – 0.001). In Brass and Sagbama LGAs, 87.5% and 84.6% of health workers, respectively, had 'good' attitudes towards emergency preparedness and response, while as low as only 2.3% of respondents had 'good' attitudes in Nembe LGAs. Still in Nembe LGAs, 97.7% of health workers had a 'fair' attitude while none (0.0%) had a poor attitude. About a third of health workers in Kolokuma/Opokuma LGA (30.6%) had a 'poor' attitude towards emergency preparedness and response.

The finding that healthcare workers in Bayelsa State exhibit a generally positive attitude toward emergency preparedness and response suggests a growing awareness and commitment to managing public health emergencies. This attitude is critical for effectively implementing emergency protocols and ensuring rapid responses during crises. According to the Theory of Planned Behavior (TPB), a positive attitude significantly influences individuals' intentions and behaviors toward preparedness actions (Ajzen, 1991). Research by Ayuba et al. (2015) supports this, indicating that healthcare providers who understand the importance of preparedness tend to engage more proactively in emergency response efforts. This 'good' attitude is likely driven by the increasing frequency of public health emergencies, which has heightened the perceived importance of readiness among health workers.

However, some studies reveal discrepancies in healthcare workers' attitudes, particularly in resource-limited settings. Adenekan et al. (2016) reported that many healthcare providers in Nigeria showed limited enthusiasm for emergency preparedness due to inadequate training and limited resources. Similarly, Barhanu et al. (2016) found that, despite a theoretical understanding of emergency preparedness, a lack of practical experience often dampened healthcare workers' willingness to fully engage in preparedness activities. These findings suggest that, while the general attitude may be positive, actual engagement can vary depending on resource availability and the frequency of training.

Table 7*:* Response of respondents on attitude towards emergency preparedness and response among health workers in public health institutions in Bayelsa state

Statement	Response Pattern – Frequency N = 735 (%)						
	S/A	A	U	D	S/A	WM	Remark
I need to know about emergency preparedness plans.	330 (44.9%)	371 (50.5%)	8 (1.1%)	20 (2.7%)	6 (0.8%)	4.7	Accepted
Emergency preparedness planning is for everybody in the hospital.	392 (53.3%)	299 (40.7%)	16 (2.1%)	27 (3.7%)	1 (0.1%)	4.4	Accepted
Potential hazards likely to cause disaster should be	449 (61.1%)	274 (37.3%)	6 (0.8%)	5 (0.7%)	1 (0.1%)	4.6	Accepted

identified and dealt with immediately they are identified.							
Lives and properties are lost during emergencies due to the poor attitude of health care workers to emergencies	195 (26.5%)	230 (31.3%)	70 (9.5%)	154 (21.0%)	86 (11.7%)	3.4	Accepted
Emergency preparedness and response is for doctors and nurses only.	17 (2.3%)	44 (6.0%)	17 (2.3%)	261 (35.5%)	395 (53.7%)	1.7	Disagree
I will willingly participate in emergency response including infectious disease outbreaks whenever the need arises.	278 (37.8%)	342 (46.5%)	33 (4.5%)	46 (6.3%)	36 (4.9%)	4.1	Accepted
I will willingly participate in emergency response including infectious disease outbreaks without nincentive.	122 (16.6%)	309 (42.0%)	56 (7.6%)	155 (21.1%)	93 (12.7%)	2.5	Disagree
Health personnel have a very good attitude to emergency preparedness and mitigation of public health emergencies.	109 (14.8%)	386 (52.5%)	94 (12.8%)	0 (0.0%)	146 (19.9%)	3.4	Accepted
Weighted Mean						**3.6**	Accepted

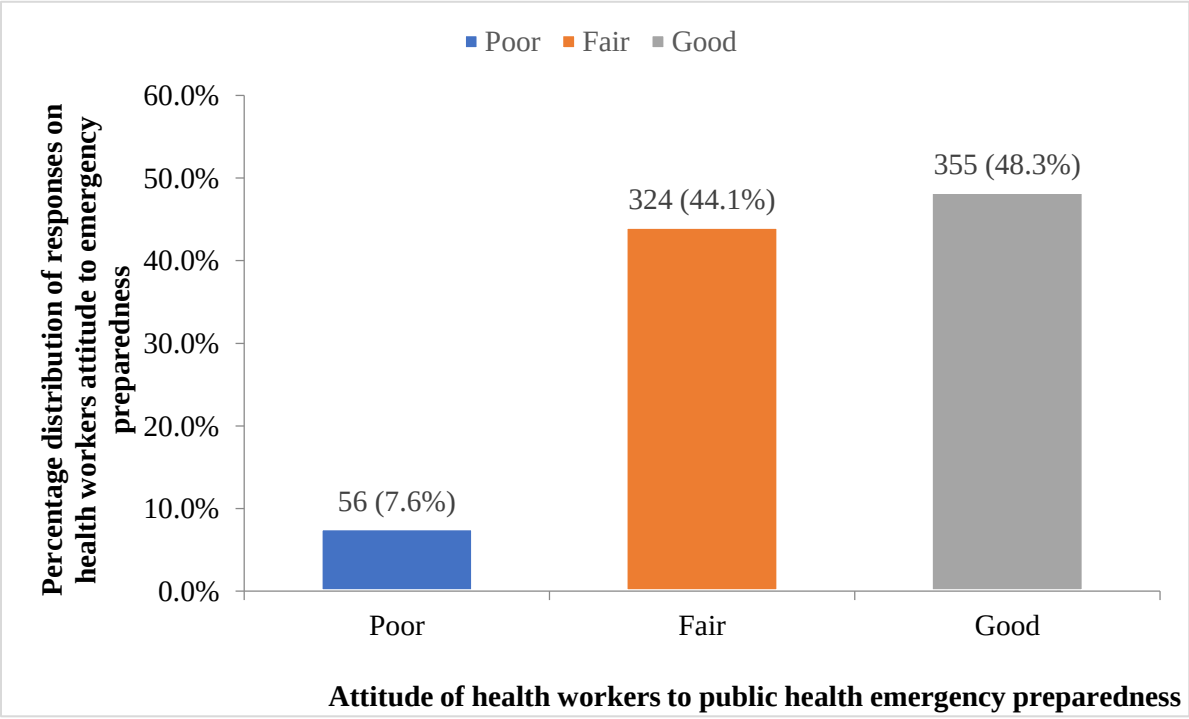

Figure 3 Level of attitude among health workers in public health facilities in Bayelsa state

Table 7: Levels of attitude of health workers towards emergency preparedness and response in public health facilities at the different levels of care and LGAs in Bayelsa state.

Characteristics		Level of Attitude			Chi-square test (pValue)
	Total N= 735	Poor N = 56 (%)	Fair N = 324 (%)	Good N =355 (%)	
Level of Care					
Primary level	243	11 (4.5%)	113 (46.5%)	119 (49.0%)	10.45
Secondary level	127	9 (7.1%)	46 (36.2%)	72 (56.7%)	(0.033)
Tertiary Level	365	36 (9.9%)	165 (45.2%)	164 (44.9%)	
Local Government Area	**N= 370**	**N = 20 (%)**	N = 159(%)	N= 191(%)	
Brass	32	0 (0.0%)	4 (12.5%)	28 (87.5%)	174.86
Ekeremor	56	1 (1.8%)	25 (44.6%)	30 (53.6%)	(0.001)
Kolokuma/Opokuma	49	15 (30.6%)	26 (53.1%)	8 (16.3%)	
Nembe	44	0 (0.0%)	43 (97.7%)	1 (2.3%)	
Ogbia	49	1 (2.0%)	18 (36.7%)	30 (61.2%)	
Sagbama	52	1 (1.9%)	7 (13.5%)	44 (84.6%)	
Southern Ijaw	30	1 (3.3%)	17 (56.7%)	12 (40.0%)	
Yenagoa	58	1 (1.7%)	19 (32.8%)	38 (65.5%)	

4.0 CONCLUSION

Based on the findings of this study it was concluded that Health workers demonstrated a strong knowledge and understanding of emergency preparedness, ensuring competency in their responsibilities, with a generally positive attitude toward emergency preparedness and response. HIV-specific post-exposure prophylaxis is accessible, and personal protective equipment is used consistently during emergencies. Health workers also adhere to proper handwashing protocols. At the same time, standard operating procedures for workplace hazard prevention are clearly displayed, and engineering controls are in place to mitigate risks from radiation and extreme temperatures. It was also concluded that healthcare workers, on average, exhibited a positive attitude towards emergency preparedness and response.

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