Innovations

Personal floating devices compliance in Warri water ways, Delta state Nigeria

[1]Ejemeyovwi O. Success & [2]Ejemeyovwi D Ochuko (PhD) Associate Professor

[1]Department of Safety and Environment, PTI, Warri, Delta State, Nigeria

[2]Department of Geog. & Regional Planning, Delta State University, Abraka,

Abstract

Issue*: The research investigate the use of Personal Floating Devices (PFDs)by stakeholders that include boat operators, drivers and Passenger to evaluate the level and rate of compliance with PFDs to create awareness on their usage and ascertain their attitude on the usage in Warri Waterways, Delta State, Nigeria.* ***Method:*** *Data are collected from primary sources that involvesquestionnaire administration while the use of existing data such as journals, books, internet publications constitute secondary sources of data. The instrument of data collection is self-structured questionnaires for boat operators, drivers and passengers of 250 targeted respondents' sampled population in three (3) prominent jetties namely in Ogbe-Ijoh, Main-inland and Kpesu in Warri. The data presentation involves statistical simple percentages and mean data set collected that are presented with Bar and Pie graphs.****Findings:*** *Four research hypotheses were tested and analysed using Chi-square statistical technique at 0.05 level of significance and the result showed that there is a significant difference i) between the level/rate of passengers' compliance and the use of PFDs, iibetween the attitude of boat drivers/users and the use of PFDs in Warri waterways, Delta state.* ***Conclusion:*** *The study recommends that the state and local authorities should formulate legislate on the mandating wearing of PFDs coupled with effective enforcement on boat users in Warri waterways and indeed Nigeria.*

Keywords*: Passengers-Drivers, Compliance, Maritime Transport, PFDs, Legislation*

1.0 Introduction

The development of an efficient, safe and dynamic transport system is vital for sustainable growth and development of a nation. Maritime transport (water transport) is the transport of people or goods via waterways. It is cheaper compared to air and can cover several distances via sea and ocean by boats, ships, sailboat or barge through canals, streams or rivers. It is important to know that virtually all materials can be shipped or transported through water. However, water transport becomes impractical when material delivery is time-bound such as various perishable goods although Shipping may also be for commerce, recreation or military purposes. Inland water transportation is one of the most economic viable; environmentally friendly and energy efficient means of transporting all good types from one place to another place (Ojile, 2006) It also offers safe and cheaper transport action in areas with watercourses free from activities of pirates.This facilitates and promote commerce, wealth creation, poverty alleviation and job opportunities for the youths in such regions. Warri is located in the Niger Delta regularly subjected to tidal invasion with series of sandy beaches and ridges along the coast of deposited sediments (sand/silt) at the month of the Niger-Benue river system before entering the Atlantic Ocean. Niger Deltarivers include Benin, Escravos, Fishtown, Sengana, Nun, Brass, St. Nicolas, St. Barbara, St. Bertholomew, Sonbreiro, Kc, NewCalabar and Bonny (Fig. 1) with multiple dissected drainage terrain with numerous tributaries and distributive channels lying below sea level (bsl), but with only few places of 20m height above sea level (asl) (Odemero and Ejemeyovwi,

2008). It is made up of numerous distributive channels and distributaries that drain the entire landscape and empties its waters into the Atlantic Ocean. This Niger Delta is undoubtedly one of the world's largest wetlands with a total drainage area of 70.000 km^2 covering area from the Benin river estuary to the Cross River estuary along a coastline stretch of 600 km (Fig 1). Emeji and Obirino (2002) observed the entire river system to drains a total area of 1,622,400km^2

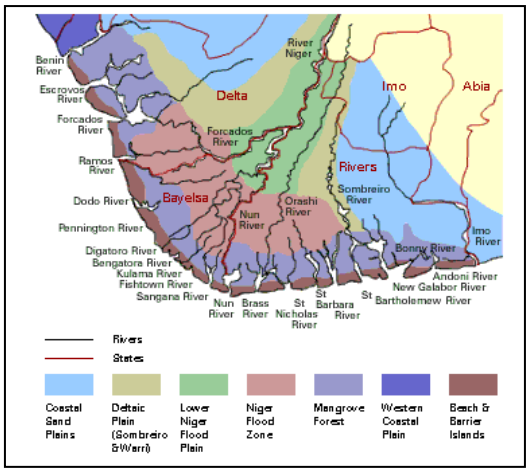


Figure 1: Map showing Niger Delta landscape with Rivers tributaries and distributive channels

Nigeria has the second longest length of waterways in Africa with a total of 8,600 km (Owena, 2003) and it centres on the longest rivers of Niger and Benue that cuts across sections of the country into south, east, west and north, conferenced at Lokoja and flows through the deltaic plain into the Atlantic Ocean. The coastal region extends from Badagry in Lagos region, through Warri to Calabar (Ezenwaji, 2010). Niceria inland waterways transverses 20 out of the 36 states with the areas adjacent to the navigable rivers represent the nation's most important agricultural, oil exploitation and mineral mining regions. Water transportation has an average share of about 1.6% of Nigeria's Gross Domestic Product (GDP) from internally generated revenue from cargoes and since water transport is slow and unsuitable for faster passenger movement, an efficient coastal and inland waterways development, quick and steady operation of the system generally can minimize the pressure on a country's air, rail and road transport infrastructures (Ndikom, (2008). The operation of Inland waterways transportation is very beneficial with respect to costs of moving heavy equipment, and machinery especially where promptness and timeliness is not put into consideration.In Nigeria, water transportation has been in existence before the advent of the imperialist that later turned colonial masters. It started with the movement of people, goods and services by means of small dug-out canoes and later, the imperialist in their quest for more trade, introduced the steam engine and with time they introduced other types of vessels for water transportation. In fact, by the 17th, British vessels were visiting Nigerian coasts and the fall of Nana of Itsekiri and the Oba of Benin palm oil trade in the Delta Region made the operations of the Royal Niger Company by Sir George Golden was possible in the 17th century by water transportation. It became clearer to the Nigerian government in her fourth National Development Plan that water transportation system needs greater attention for increased rational exploitation of the water resources. Inland water transport consists of transport River transport played a very important role prior to the development of modern means of land transport. Their importance has gradually declined on account of more reliable and cheaper transport services offered by the railways. The direct impact of inland water transportation for instance is highlighted at Niger Delta areas of Southern Nigeria by Lucas, Lincoln, Somervell and Teske, (2012) and noted that inland water transportation is vital in the development of the region and the issue of marine and waterway safety should be regarded as a key priority to planning and practice of water transport procedures on a worldwide scale. Marine safety has multidimensional content, with serious impact on numerous aspects of the maritime transport chain. Specifically, the reservation of marine and coastal environment and the protection of vessels, boats and their goods as well involve

the aversion of human losses and injuries as safety topics are addressed in the aftermath of a significant accident rather these matters should be dealt with proactively to provide an efficient, profitable and environment-friendly maritime transport network service.

Open-water drowning public health and safety concern constitute fourth leading cause of global burden of diseases among injurie that led to death (Laosee, Gilchrist and Rudd, 2012; Lozano *et al.,* 2012). The United States Coast Guard (USCG, 2013) reported that 459 people drowned in 4,515 recreational boating incidents with only 15% victims known to have worn personal flotation device (lifejacket) and Pfds may reduce the risk of drowning by half. According to Cummings, Mueller &Quan (2011) and it is compulsorily required that all boats must carry lifejackets for all passengers (USCG, 2005). Like seat belts and bicycle helmets, the existence of a highly effective intervention alone does not necessarily lead to increased implementation of that intervention, as lifejackets present are rarely used by most adults on motorboats. The national prevalence of lifejacket usage among adults in the US on open motorboats (e.g., power boats without cabin, skiffs, and motorized rafts) was 5.3% in 2010, (USCG and JSI, 2011) a level that is consistent since 1998. Studies have shown that lifejacket use, is higher for children and adolescents (Mangione& Rangel 2004; USCG and JSI, 2011; Mangione*et al.,* 2012). The studies also showed that adult lifejacket use is highly predictive than of child lifejacket use, which suggests the importance of adults modelling in consistent with safety behavers in boating (Chung, Quan, Bennett, kernic&Ebel, 2013). Furthermore, it was also reported that most common reasons for non-use of lifejackets include bulky, uncomfortable and is needed only by children new and weak swimmers.

1.2 Research Problem

PFDs or lifejackets are the most essential safety equipment on any boat or vessel on a waterway. Every year, lives are lost i water transport and recreational boating incidents. Tragically, many people could have survived wearing a PFD, especially in smaller vessels or boats. International researches surveys indicated that many boaters, regardless of experience and knowledge, are reluctant to wear PFDs. A total of 57 percent reported that they do not wear PFDs and 26 percent wear them on some occasions. In addition, many boaters are unable to make good judgment when at risk to take pre-emptive measures to ensure their safety, 46 percent indicated bad weather as a signal to wear a PFD. However, awareness of other conditions and circumstances are low. The study illustrated that the main types of fatal incidents involved boat/vessels capsizing and person overboard are at risk. In most instances, deaths resulted from a combination of three factors namely- hazardous environmental conditions, vessel occupants suddenly and unexpectedly entering the water, without PFD use. Several attempts to address this problem through a number of initiatives include increased educational programs and campaigns aimed at increasing the level of boater awareness of safety measures, the introduction of boat operator licensing, encouraging the use of boat construction standards, and improved safety signage, signposts and handbills at boat launching ramps to provide information on local hazards. Whilst these efforts are improving the general level of boater education and safety information available, there is still a significant segment of the boating communities who do not understand or are ignorant of the risks associated with boat transport in the waterways. Therefore, the underlying reason fot this study is to ascertain the level of awareness/availability of PFDs, boat drivers and passenger's level/rate of compliance with PFDs us, attitude regardless of experience and knowledge, boat type, size and operating conditions. There is paucity of information in the area of study as studies carried out by several researchers are not located in Warri waterways with only few on road transport. The study therefore intends to bridge this gap.

1.3 Objectives of Study

The specific objectives are to createawareness for boat Drivers/Passengers, examine and determine the level/rate of passengers/ Boat Drivers compliance on the use of PFDs and to investigate attitude of boat drivers and passengers on the use of PFDs in Nigeria maritime transport.

1.4 **Hypotheses**

The following formulated null hypotheses for this research are as follow:
$H_{01:}$ There is no significant difference between the level/rate of passenger's compliance and the use of PFDs.
$H_{02:}$ There is no significance difference between the attitude of boat drivers/users and the use of PFDs.

2, 0 Literature Review

A personal flotation device (PFD is a piece of equipment designed to assist sand make a wearer to be afloat in water (Wikipedia, 2019). The wearer may be conscious or unconscious situation. They are available in various sizes to accommodate in body physique and weight of different designs, depending on wearing convenience and level of protection. They are divided into the following categories: **commercial PFDs, recreational PFDs, throwable PFDs (Ring Buoys, Cushions, etc.).** In 2003, 62% of the children of 14 years age and younger, got drowned without PFDs as they participated in recreational boating (Safe Kids Worldwide, 2004). Approximately 84% of boating-related drowning deaths, could be avioded through proper use of PFDs. To ensure that a PFD is safe for use, it must carry the seal of approval from the United States Coast Guard (USCG, 2006). A PFD should be in good condition of appropriate size, type and buoyancy for the user with terminal date.It is expected that an operator of every boat must supply the required number and types of approved Personal PFDs. An approved PFD is one that meets the safety standards established by the US Coast Guard, ie with a Coast Guard approval stamped or sewn on it, in serviceable condition (ripped, damaged or unserviceable PFD's are not legal). All PFD's must be readily accessible, wearable and must be of proper size for the intended wearer. It is unlawful to operate any boat (including inflatables and inner tubes) unless at least PFD's of the proper size are available for each person on board. Texas Handbook of Boating Laws and Responsibilities classified the types from I –V. Types I, II, and III refer to wearable PFDs (lifejackets) in decreasing order of performance; Type IV refers to throwable PFDs; and Type V refers to any PFD that is conditionally approved as equivalent in performance to Type I, II, III, or IV Coast Guard regulations specify which Coast Guard-approved PFDs are acceptable for particular applications (Groff and Ghadiali, 2003) and explainedas follow:Type I = Wearable type PFD, Type II = Wearable type PFD, Type III = Wearable type PFD, Type IVPFD =-Buoyant cushion and type V = Wearable type refers to any PFD that is conditionally approved as equivalent in performance, Type1 PFDs are "offshore life jackets" that can be used in remote or rough waters where rescues could take a long time. Type I PFDs are the "excellent for flotation and will turn most unconscious persons face up in the water." Type II PFDs are referred to as "near-shore vests, good for calm waters and fast rescues." Unlike the type I vests, type II PFDs might not be able to turn unconscious wearers face up in the water. Type III PFDs are "flotation aids" designed for calm waters and fast rescues, and they will not be able to turn an unconscious person face up. Unlike types I to III, type IV PFDs are not worn, but thrown. These "throwable devices" are intended to be thrown to someone having trouble in the water and are not designed for extended periods of time, for non-swimmers, or for people that are unconscious. Type V (not shown) PFDs are "special use devices" that are designed for specific water activities, such as kayaking, windsurfing, or water-skiing; they should be used only for the purpose described on their label (Yuma, Carroll& Morgan, 2006). Some general guidelines can be used to help parents decide which PFD is best for their child. Type I PFDs are the best for flotation and also are the best protection for no swimmers (USCG, 2002). Unfortunately, type I PFDs are only available in two sizes (adult and child) and often do not fit infants and toddlers. Type II PFDs are available in a broad range of sizes and are more comfortable to wear, but they may lack the capacity to turn unconscious wearers face up and should not be used in rough water. In most situations, however, type II PFDs are a good compromise between buoyancy and fit for general boating activities. Type III PFDs also come in a wide range of sizes, but the wearer must be able to hold his or her head up while in the water. Children without strong swimming skills would be best in a type I or II PFD. For a child's PFD to be appropriate, their weight must fall within the "user weight" criteria on the PFDs' label (USCG, 2006). PFDs must be legally worn when boat is sailing or underway. In addition, each boat of 16 feet or longer (except canoes and kayaks) must have at least one throwable Type IVPFD =-Buoyant cushion or ring buoy on board

(http://whitewaterlake.org/documents/Personal FloatationDevices.pdf). Measuring PFDs buoyancy is in Newton (N) and 10 Newton equals 1 kilogramme (Kg) of flotation. There are 4 European standards for personal floatation devices, which must all carry the CE mark (http://www.iws.ie/boating/personal-flotation-devices.327.html). The 50 Newton personal flotation device the 100 newton lifejacket, the 150 newton lifejacket, the 275 newton lifejacket.Personal Flotation Devices Labeling and Standards Under 46 U.S.C. 3306, 4102, and 4302, the Secretary of the Department in which the Coast Guard is operating is charged with prescribing safety requirements for lifesaving equipment on inspected vessels, uninspected vessels, and recreational vessels. Type approval and carriage requirements for personal flotation devices (PFDs) fall under this category. In Department of Homeland Security Delegation No. 0170.1(II)(92)(b), the Secretary delegated this 46 U.S.C., Subtitle II, authority to the Commandant. As required under 46 U.S.C. 4302(c)(4), the Coast Guard has consulted with the National Boating Safety Advisory Council (NBSAC) regarding the issue addressed by this final rule. See NBSAC Resolution 2012-90-05 (available in the docket).The purpose of on the carriage and labelling of Coast Guard-approved PFDs, is to facilitate future adoption of new industry consensus standards for PFD labelling that more effectively convey safety information, and to help Start Printed Page 56492 harmonize our regulations with PFD requirements in Canada and in other countries.

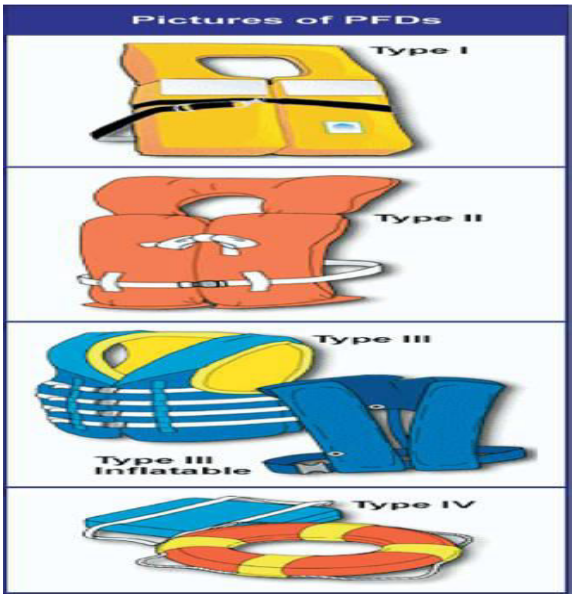


Figure 2: Types of Personal flotation devices (PFDs)

Source: Texas Parks and Wildlife Department. (2004). *The Texas handbook of boating laws and responsibilities*. Retrieved August 22, 2019 from www.boat-ed.com

2.2 Accidents in Water Transport

There are more marine accidents occurring in August in Nigeria than any other months of the year because of strong water waves outflow from Chad, Cameroon and other countries thatuproots trees by the river banks and submerged wrecks into the navigable ways.It was discovered that 102 wrecks located at 62 wreck sites within the Lagos ports area and another seven wrecks at the Lagos cost about US$40 million to remove (Egbuh, 2006). Obviously, such large number of wrecks constitutes enormous danger for navigation by ocean-going ships visiting Lagos area. On the other hand, Bob-Manuel (2002) observes that human error was a predominant factor in capsizing of vessels. He asserts that vessels may capsize when they hit high and steep breaking waves from the side which will subject them to severe rolling or pitching, gale and loss of stability. He contends that some of these factors can be controlled by the provision of internal buoyancy compartments in order to secure the stability of the boat

when fully laden. Egbuh (2006) also states that capsize hazards can also be minimized by reducing the period of exposure i.e. the number of trips of the boat per day, by the acquisition of wave data, detailed study of the wave pattern and developing ways to encounter dangerous waves. He concludes that avoidance of overloading to maintain enough freeboard and prudent observance of the national maritime rules and regulations are very critical in averting boat accidents. The Nigerian Association of Master Mariners (NAMM) in 2009 identified poor pilotage services, lack of adequate lighting system at the ports, absence of a system to administer, monitor and investigate these mishaps, failure to sound signals, inappropriate speed of the ship, light or shapes off and inappropriate directions or supervision on work and collision among other causes of marine accidents. They identified causes of collision to improper lookout classified into three types: i) No lookout; ii) Failure to recognize the other vessel until just before collision despite standing lookout; and iii) Insufficient observation of the movement of the other vessel after recognizing it. Other causes of accidents include: inappropriate reporting or taking-over, inappropriate manoeuvrings, poor selection and maintenance of course, insufficient attention to weather or sea-surface conditions, inappropriate anchoring or mooring, insufficient maintenance, inspection or handling of lubricating oil, /fuel oil as well as insufficient study of the waterways, Reviewed works of commercial fishermen and other recreational water users have similar reasons for lifejacket non-usage include belief of lifejackets may be protective and may be irrelevant due to cold water conditions (Nguyen *et al.,* 2002; Baker, Giles, Strachan, and Stadig, 2009).

Nigeria has witnessed boat mishap that led to several deaths reported by Naku (2007) as follow: A boat sank while crossing the River Niger carrying 100 passengers overloaded with goods and 80 people lost their lives in 2003. In 2006, a census official was drowned in a boat mishap in Kano while 80 people died in 2007 along Dole-Kaina River following collision between a cargo ship and a ferry overloaded with market women returning home. He also reported the death of 50 children in a wooden passenger and cargo boat that was over overloaded with people developed mechanical fault on the Nun River of Bayelsa State, Nigeria. In 2008, there was another boat mishap involving Naval patrol boat and a passenger speedboat that claimed nine lives on the Nun River in the night (Sapa-dpa, 2008). Addeh (2009) also reported that about 55 people died when a boat attempted to rescue another boat that had first layer leakage, developed engine fault at the middle of River Nano carrying primary school children at the Nigeria-Benin border. Furthermore, a passenger ship of 200 people capacity carrying 500 passengers, had accident along Nembe River in Port Harcourt in 2000 resulting into the death of dozens, while three people lost their lives in Bangi, Niger State following another boat mishap in 2008.In 2017, 18 people drowned in a boat accidents, meanwhile it was reported that the barely a week earlier, more than 50 persons had died when an overloaded craft capsized. In another development, 12 persons lost their lives when their boat capsized due to heavy rainfall in River Kaduna, Shiroro district. It was also reported that six farmers died and four was rescued when a local canoe broke into two parts after hitting a stump in Gassol local government. In kebbi also, it was reported that 33 people drowned after a boat carrying traders from Dosso region of the republic of Nioger capsized on the Niger River while 84 persons were rescued. Reported too is that 12 persons were killed when a passenger boat capsized in the commercial hub of Lagos.Adeyeye (2018) report the case of a boat mishap which occurred in Kwara state claiming the lives of 19 passengers due to drowning. He reported that the boat conveyed 22 persons across the River Niger for a wedding ceremony capsized with only three persons rescued. Thousands of people are injured and hundreds die in boating-related accidents each year. In 2009, the Center for Disease Control (CDC) performed a study to identify the leading causes of boating-related incidents. The following selected statistics from the study demonstrate some of the most significant findings.

In 2009, there were 3,358 injuries and 736 fatalities from boating accidents.

- 70% of the accidents were as result of operator error.
- Of the people that died, 73% drowned.
- Of those who drowned, 90% were not wearing personal floatation devices.
- Alcohol usage was the leading contributing factor in fatal boating incidents.

USCG conducted further study on boating fatalities and the effectiveness of wearing life preservers and the most significant aspects of their study include 9 out of 10 drowning occur in inland waters and not in the ocean as most people erroneously thought.Boat-related drowning mainly involved boats less than 20 ft. long or less.Almost every drowning victim had available life jacket and refused not to wear it.The aforementioned reasons therefore informed this research study which timely in all respects.

3.0 Research Method

The questionnaire instrument and oral interview as primary data sources and the use of existing data such as journals, books, internet publication amongst others are secondary sources of data collected. The methods and procedures used are research design, population of the study, sample size, sampling technique, instrument of data collection, reliability of the instrument, validity of the instrument, administration of the research instrument, and method of data analyses.

i. **Research Design**

Descriptive survey design is adopted for the study. Descriptive survey involves collection of data in order to test hypothesis or to answer questions concerning the current status of the subject of study (Ader, Van Marwik, Deltaan&Beekman, 2008). The design is chosen because it is appropriate for educational fact-finding as it yields accurate and great deal of information.. It enables gathering of data at a particular point in time to describe the nature of the existing conditions (Cohen, Manion&Morizon, 2000).

ii. Population of the Study

The population represents passengers and boat drivers using Kpesu jetty, Main Inland Jetty, and Ogbe-Ijoh jetty in Warri, Delta State. For the purpose of this study, adults aged 18 and above (male and female) using the above three mentioned jetties will form the participants**.**

i. **Sample of the Study**

The 300 samples is adopted for this study which comprise boat drivers and passengers in the three jetties. A sample is a subset of the target population being studied. These jetties (Kpesu, Main-Inland, and Ogbe-Ijoh) are chosen based on higher level of passenger traffic in boarding of boats. This sample is necessary due to the large number of passengers and boat drivers, the large size of the geographical location and economic implication. However, the sample is a true representative of the population considering their similar characteristics and experiences.

a. **Sampling Technique**

The study made use of purposive and convenient sampling techniques. These techniques allowed focussing on only subjects applicable to the study. Thus, those who did not meet up with the criteria of selection are not included in the study. Only adults (males and females) of boat drivers' and passengers were considered.

b. **Instrument for Data Collection**

Data for this research work is obtained through questionnaire instrument and personal observation. The study used an adjusted four-point Likert-scale format. The respondents were required to indicate whether they strongly Agree (SA=4), Agree (A=3), Disagree (D=2), and Strongly Disagree (SD=1).The questionnaire is divided into five (5) sections: A, B, C, D and E. Section "A" focused on respondents' demographic details with 6 items while sections B,

C, D and E with several items focused on the specific objectives of the study. The instrument is designed for respondents to tick the appropriate response to the items provided.

c. **Validity of the Instrument**

To ascertain the validity of the instrument for this study, the face and content validity method was adopted. The questionnaire was given to the researcher's colleagues (three other lecturers in the Department of Industrial Safety and Environmental technology, petroleum Training Institute, Effurun, Delta State) adopted in measurement and evaluation. The critical review of the instrument by these experts helped to validate the questionnaire administered to the respondents.

d. **Reliability of Instrument**

The test-retest method was employed to determine the reliability (degree of consistency in the research instrument as applied at different occasions) of the study's research instrument. The questionnaire designed for the study were re-administered to forty (40) passengers and boat drivers' in IziscoObos and Python Jetty point are not among sample points chosen for the study. The two sets of questionnaires were scored separately and the correlation co-efficient is computed using the Pearson's Product–Moment Correlation Coefficient (r). A positive correlation coefficient of 0.85 was obtained establishing instrument consistency. Reliability coefficient of 0.70 is acceptable, more than 0.80 is good and more than 0.90 is considered excellent (George and Mallery, 2003).

e. **Method of Administration of Instrument of Data Collection**

The study's data were obtained from a primary source: questionnaire. The researcher administered the questionnaires to the sampled boat drivers and passengers at the jetties. However, three specially trained Field Research Assistants who are conversant with the terrain were employed in order to facilitate the process of data administration and collection. Visual inspection/personal observation was carried out in the three (3) different jetties in Warri to know the level of compliance amongst passengers and drivers.

f. **Method of Data Analyses**

The study employed both descriptive and inferential statistics for the purpose of data presentation, analyses and test of hypotheses respectively. The data collected from the respondents were presented in frequency tables and charts, and statistically analyzed using percentage (%), and arithmetic mean ($\overline{\chi}$). A mean cut-off point of 2.50 was adopted as decision criteria. The Chi-square (χ^2) statistical tool is used to test the hypotheses formulated at 0.05 level of significance with a view to determining the relationship between the variables under investigation.

4.0 Results and Data Analyses

The section began with analyses of the questionnaire instrument return rate, then the demographic data of the respondents, analysis of responses and discussion of research findings. The total 300 research questionnaire administered to the respondents, 246 were successfully retrieved representing 82 percent of the total questionnaire administered while 54 (18%) were eligible and suitable for use as they are not well completed in line with the instruction given and therefore 246 are analysed for the completion of this study. The breakdown of the instrument return rate is presented in Table 1 below.

Table 1: Tale showing Questionnaire Return Rate

Description	Frequency	Percentage %
Total Questionnaire Administered	300	100
Number not returned/wrongly ticked	54	18
Number accepted	246	82

Source: Field Survey 2019

1. Gender of Respondents

Table 2: Distribution of respondents by sex

Category	Frequency	Percentage (%)
Male	79	32
Female	167	68
Total	**246**	**100**

Source: Field Survey, 2019

The above analysis showed that 167 (68%) of the respondents were females while the remaining 79 (32%) respondents were males. Thus table analysis depicted that females are higher than male respondents who responded to the instrument. Data is plotted in the pie graph shown in *Fig 1* below.

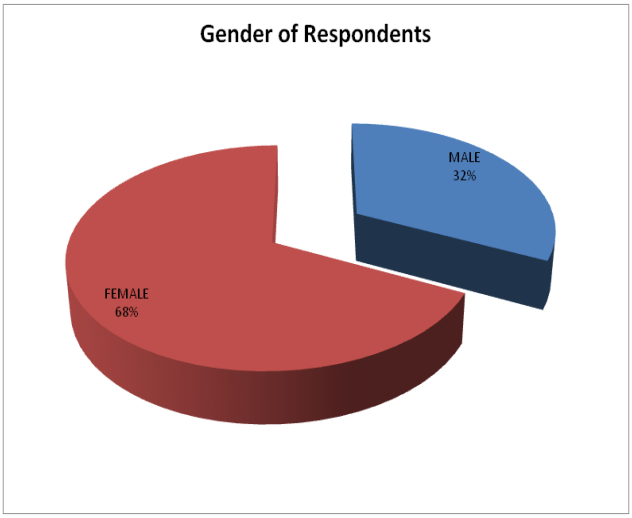


Fig 1: Pie Graph Showing proportion of Respondents by Gender

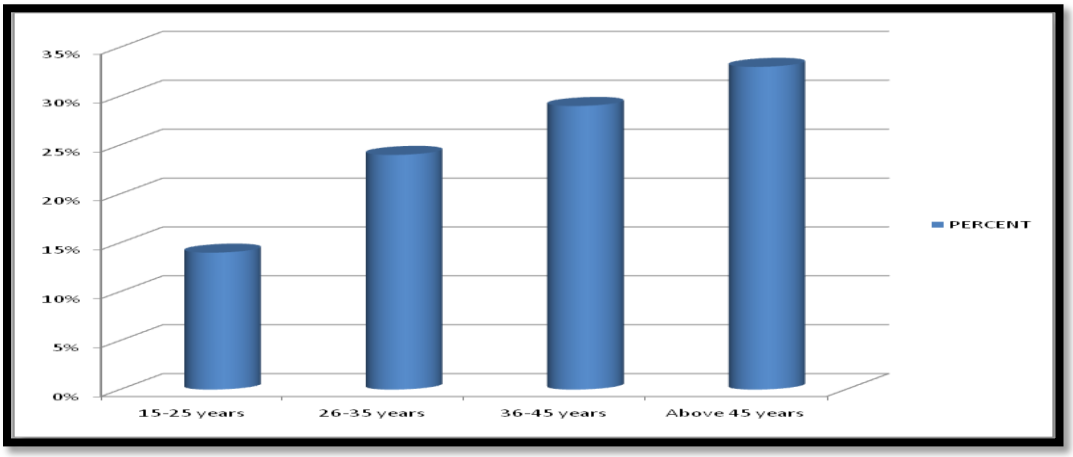
2. Age of Respondents

Table:3 Distribution of Respondents by Age

Frequency	Percentage (%)
36	14
59	24
70	29
81	33
246	**100**

Source: Field Survey, 2019

Table 2 indicated that 36(14%) of the respondents belong to the 15-25yrs age bracket. Respondents in the 26-33yrs age bracket are 59 which represent 24 percent. A total of 70 (29%) of the respondents are in the 36-45 years old categories. Furthermore, a total of 81(33%) respondents endorsed they are above 45 years old. Respondents' age brackets in percentages (%) is plotted in the Bar Graph shownin figure 2 below.



Age of Respondents

Fig .2: Showing Respondents by Age.

3. Educational Qualification of Respondent

Table 3: Distribution of respondents by educational qualification

Description	Frequency	Percentage (%)
No formal Education	39	16
Primary school	52	21
Secondary school	82	33

TCII/OND/NCE	36	15
HND/Degree	37	15
Master Degree and above	0	0
Total	**246**	**100**

Source: Field Survey, 2019

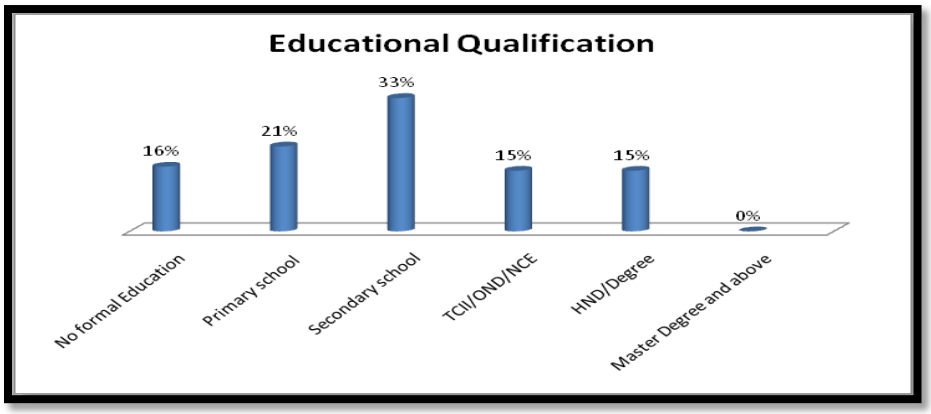


Fig 3: Showing Respondents by Educational Qualification

Table 4 revealed that a total of 82 (33%) respondents are holders of O-level from secondary school, 36 (15%) respondents are holders of TCII/OND/NCE etc. The analysis further indicate 37 (15%) of respondents are Degree/HND holders. No Master Degree holder, while respondents with no formal education and primary school are 39 (16%) and 52 (21%) respondents respectively. Respondents' educational qualification in percentages (%) is plotted in the Bar graph shown in figure 3.

4. Category/status of PFDs User

Table 5: Distribution of Respondents by category of user

Description	**Frequency**	**Percentage (%)**
Drivers	57	23
Passengers	189	77
Total	**246**	**100**

Source: Field Survey, 2019

The above table indicated that 189 (77%) of the respondents are passengers while 57(23%) are boat drivers as presented with pie graph in figure 4 .

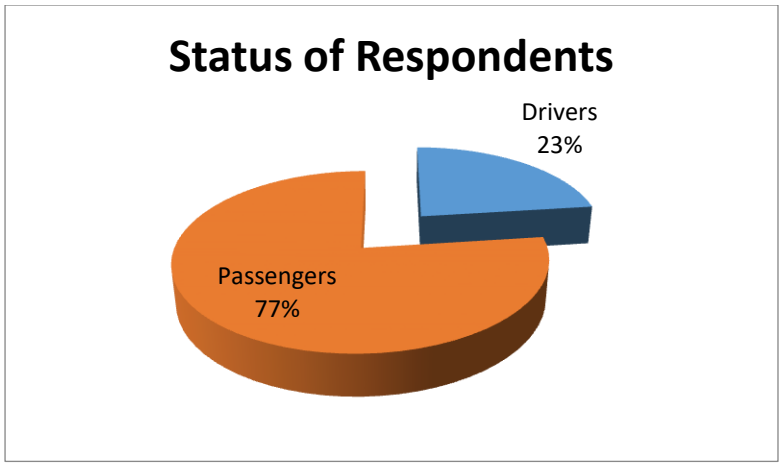


Fig. 4: Showing proportion of Respondents by Status.

Table 6: Distribution of Respondents by Jetty location

Description	**Frequency**	**Percentage (%)**
Ogbe-Ijoh	82	33
Kpesu waterside	93	38
Warri Main Inland	71	29
Total	**246**	**100**

Source: Field Survey, 2019

The table 5 indicated that 82 (33%) of the respondents use Ogbe-Ijoh jetty. Majority of the respondents, 93 (38%) use Kpesu jetty while 71 (29%) of the remaining respondents use the Main Inland jetty. The Bar Graph in figure 5 shows proportion (percentage) of respondents by jetties.

Percentage of Respondents by Jetties Locations

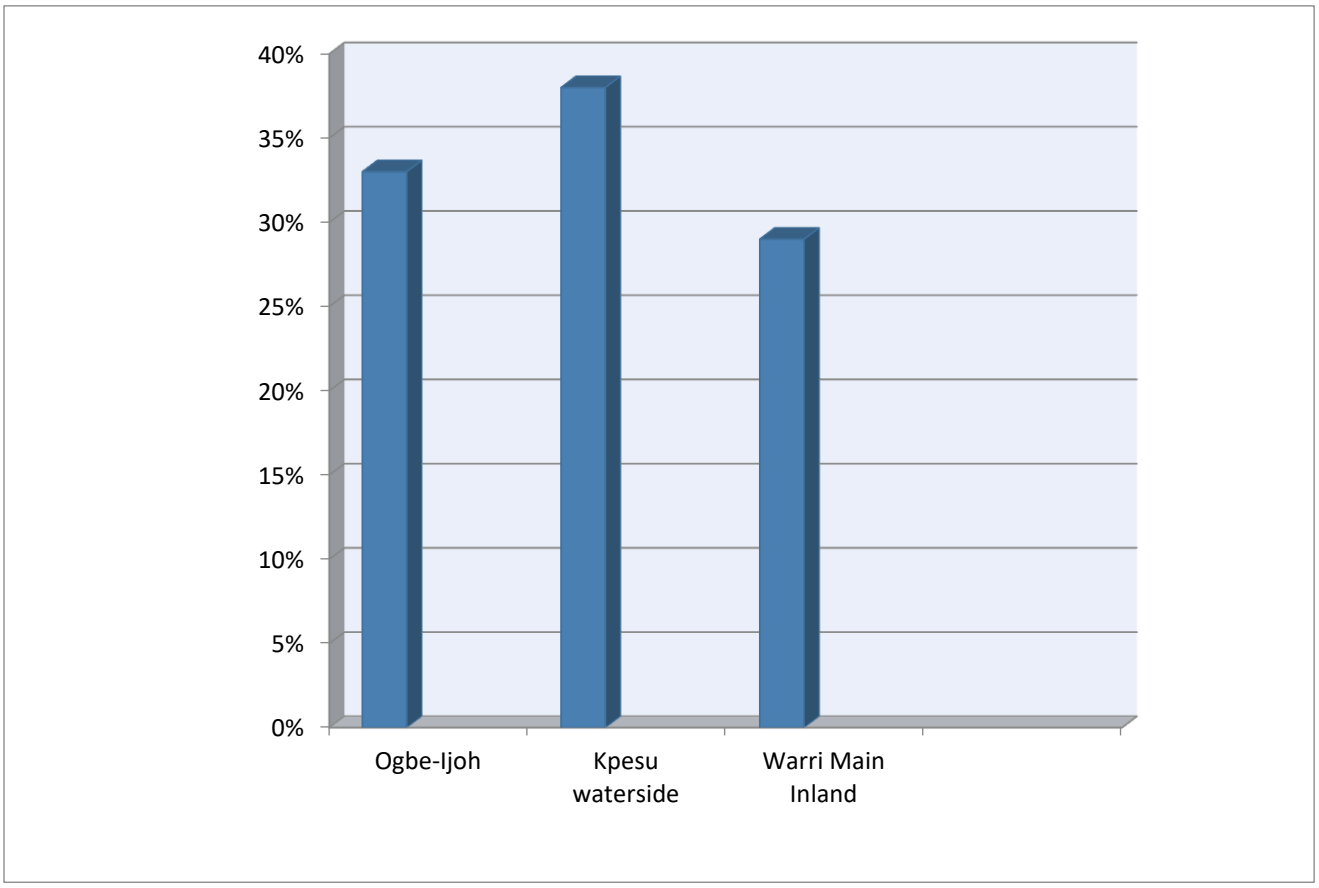


Fig.5: Showing Respondents by jetty location

6. Length of Time Respondents have been using inland waterways

Table 7: Distribution of Respondents by length of usage of jetties

Description	**Frequency**	**Percentage (%)**
1-4 years	60	24
5-10 yrs	86	35
11-16 yrs	73	30
17 yrs and above	27	11
Total	**246**	**100**

Source: Field Survey, 2019

Table 7 revealed 60 (24%) of the respondents have used waterways transport for a period of 1-4 years. A total of 86 (35%) and 73 (30%) respondents endorsed they have used the waterways transport for a period of between 5-10 years and 11-16 years respectively. The Bar Graph in figure 6 is used to present this data

Percentage of respondents by Length of Usage of Jet

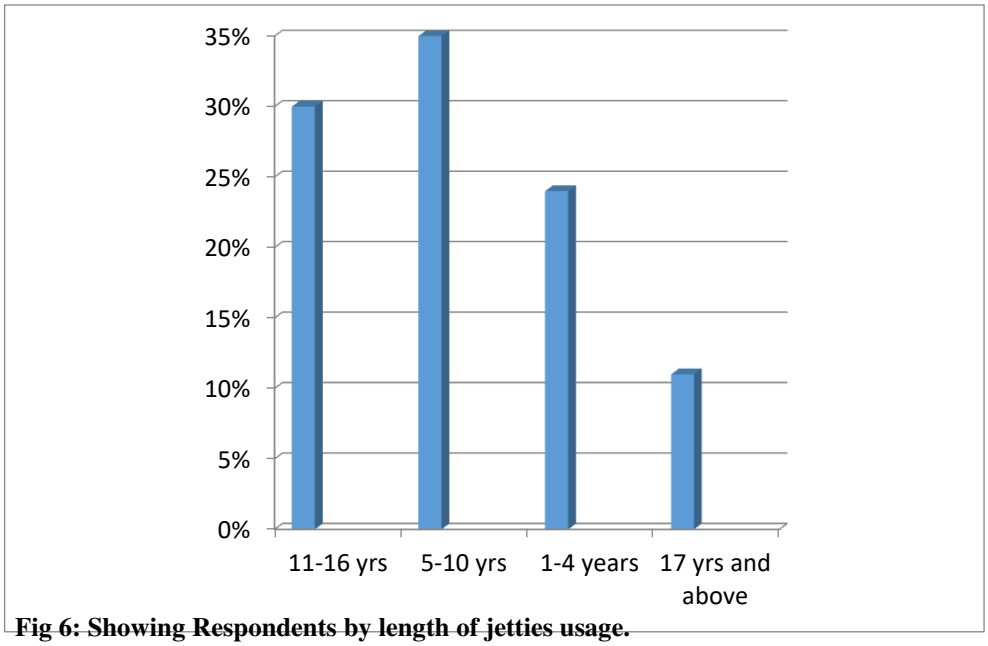


Fig 6: Showing Respondents by length of jetties usage.

Section B: Awareness/availability of Personal Floating Devices (PFDs) in Warri waterways.

Table 8: Results obtained for awareness/availability of Personal Floating Devices (PFDs) in Warri waterways, Delta State

S/No 7	Variables/Items audited	Agree		Disagree			
		SA 4	A 3	D 2	SD 1	Mean	Decision
I	I am aware of the availability of Personal Floating Devices (PFDs) in use at waterways	169 (69)	77 (31)	0 (0)	0 (0)	3.7	Accept
Ii	Wearing Personal Floating Devices (PFDs) has a lot of benefits such as safety of user in the event of boat mishap	86 (35)	133 (54)	11 (4)	16 (7)	3.3	Accept
Iii	Most Personal Floating Devices (PFDs) available in commercial are not comfortable for use.	79 (32)	122 (50)	27 (11)	18 (7)	3.1	Accept

Iv	The number of Personal Floating Devices (PFDs) available in most boat is not enough for its passengers onboard	113 (46)	133 (54)	0 (0)	0 (0)	3.5	Accept
V	It is better to manage the bad ones they have than to sail without Personal Floating Devices (PFDs) in the open marine environment.	113 (46)	110 (45)	23 (9)	0 (0)	3.4	Accept
Vi	It is very difficult to get the size of a Personal Floating Devices of some passengers	121 (49)	112 (46)	13 (5)	0 (0)	3.4	Accept
Vii	Personal Floating Devices (PFDs) are safe enough to reduce drowning in the event of boat mishap	108 (44)	120 (49)	18 (7)	0 (0)	3.4	Accept

Source: Field Survey, 2019 Percentages (in parentheses) and mean values estimated to the nearest whole number

Table 8 indicates that all the items scored a mean ($\overline{\chi}$) above 2.50 showing that they were accepted as agree that the respondents are aware and endorsed availability of Personal Floating Devices (PFDs) in Warri waterways, Delta State

Section C: General attitude of drivers' and passengers towards the use of Personal Floating Devices (PFDs)

Table 9: Results obtained for attitude of drivers' and passengers towards the use of Personal Floating Devices (PFDs) in Warri Waterways, Delta State

S/No 10	**Variables/Items audited**	**Agree**		**Disagree**			
		SA 4	**A 3**	**D 2**	**SD 1**	**Mean**	**Decision**
I	Most passengers feel that they already knew how to swim so there is no need for Personal Floating Devices (PFDs)	72 (29)	69 (28)	71 (29)	34 (14)	2.7	Accept
Ii	Most passengers will hold Personal Floating Devices (PFDs) in their hands even while onboard.	89 (36)	96 (39)	42 (17)	19 (8)	3.0	Accept
Iii	Some passengers say it gives them heat or stain their clothes.	107 (43)	122 (50)	17 (7)	0 (0)	3.4	Accept

Iv	Some passengers refuse to put them on, because a lot of persons might have used them.	91 (37)	135 (55)	8 (3)	12 (5)	3.2	Accept
V	Some passengers feels that most of the Personal Floating Devices (PFDs) are uninflatable and there is no need to wear what will not float in case there is an accident.	68 (28)	99 (40)	49 (20)	30 (12)	2.8	Accept
Vi	I occasionally wear under any situation any type of Personal Floating Devices (Ps) because they are familiar with the terrain and job	97 (39)	120 (49)	11 (5)	18 (7)	3.2	Accept

Source: Field Survey, 2019

Table 9 indicates that all the items scored a mean ($\overline{\chi}$) above 2.50 showing that they were accepted as agree. This signifies there is a positive attitude of passengers and boat drivers towards the use of Personal Floating Devices (PFDs) in Warri waterways, Delta State.

5.0 Test of Hypotheses

The following hypotheses formulated for this study are tested below at 0.5 level of significance.

Hypothesis 1: the use of PFDs in Warri waterways, Delta state.

Question 8 frequencies observed were employed to test hypothesis 2.

Table10 : Frequency Observed for Hypothesis 1

Ques1ions 8	**SA**	**A**	**D**	**SD**
I	89	132	10	15
Ii	86	69	68	23
Iii	147	99	0	0
Iv	88	62	65	31
V	73	98	35	40
Vi	106	124		0
Vii	84	130	13	19
Total	**673**	**714**	**207**	**128**
Mean ($\bar{X}$)	**673/7=96**	**714/7=102**	**207/7=30**	**128/7=18**

Table 11: Chi-square Statistical Analysis to Test Hypothesis 1

Responses	**FO**	**FE**	**FO-FE**	**(FO-FE)^2**	$\frac{(FO-FE)^2}{FE}$
SA	960	61.5	34.5	1190.25	19.4
A	1020	61.5	40.5	1640.25	26.7
D	30	61.5	-31.5	992.25	16.1
SA	18	61.5	43.5	1892.25	30.8
TOTAL	**246**	**246**		$\sum \frac{(FO-FE)^2}{FE}$ **=93.0**	

Frequency Expected (FE) = $\sum$ FO/n 246/4 = 61.5

DF at 0.05 level of significance= (Rows-1) (Columns-1)

= (4-1) (2-1) =3X1 = 3

Thus, χ^2 value= 7.815.

Decision

The null hypothesis (H_0) there is no significant difference the level/rate of passengers compliance and the use of PFDS in Warri Water Ways was rejected while the alternative hypothesis designated (H_1) is accepted since χ_c^2 =93.0 is higher than χ_t^2 =7.815 hence we conclude that there is a significant difference between the level/rate of passengers compliance and the use of PFDs in Warri waterways, Delta state.

Hypothesis 2: There is no significance difference between the attitude of boat drivers/users and the use of PFDs in Warri waterways, Delta state.

Question 10 frequencies observed were employed to test hypothesis 2.

Table 12Frequency Observed for Hypothesis 4

Questions 10	**SA**	**A**	**D**	**SD**
I	72	69	71	34
Ii	89	96	42	19
Iii	107	122	17	0
Iv	91	135	8	12

V	68	99	49	30
Vi	97	120	11	18
Total	**524**	**641**	**198**	**113**
Mean ($\bar{X}$)	**524/6=87**	**641/6=107**	**198/6=33**	**113/6=19**

Table 13: Chi-square Statistical Analysis to Test Hypothesis 2

Responses	**FO**	**FE**	**FO-FE**	**(FO-FE)^2**	$\frac{(FO-FE)^2}{FE}$
SA	87	61.5	61.5	650.25	10.6
A	107	61.5	45.5	2070.25	33.7
D	33	61.5	-28.5	812.25	13.2
SD	19	61.5	-42.5	1806.25	29.4
TOTAL	**246**	**246**		$\sum \frac{(FO-FE)^2}{FE}$ **=86.9**	

Frequency Expected (FE) = $\sum$ FO/n 246/4 = 61.5DF at 0.05 level of significance= (Rows-1) (Columns-1)

= (4-1) (2-1) =3X1 = 3 Thus, χ^2 value= 7.815.

Decision

The null hypothesis (H_0) there is no significant difference between the attitude of boat drivers/ the users and the use of PFDS in Warri Waterwayswas rejected while the alternative hypothesis designated (H_1) is accepted since χ_c^2 =86.9 is higher than χ_t^2 =7.815 hence we conclude that there is a significant difference between the attitude of boat drivers/users and the use of PFDs in Warri waterways, Delta state.

4.1 Discussion

The results from this study are hereby discussed below as follows.

Hypothesis 1 (H_0) was rejected while the alternative hypothesis designated (H_1) is accepted since χ_c^2 =93.0 is higher than χ_t^2 =7.815 hence we conclude that there is a significant difference between the level/rate of passengers compliance and the use of PFDs in Warri waterways, Delta state. This finding is in alignment with a national observational study undertaken by the Canadian Coast Guard Auxilliary (Central & Arctic) (2000) found that only 21% of boaters in Canada wear a lifejacket or PFD. This percentage is not uniform in the population, as

there is a clear gradient of lifejacket/PFD wear by age. Nearly 85% of children aged five or less regularly wear their lifejackets/PFDs. This rate drops below 70% for children aged six to nine, and by the teen years has dropped to 37%. Adults are the least likely to wear a lifejacket/PFD, with 19-35 year olds only using one 16.5% of the time, and those between 36 and 60 only 13% of the time. Thus the people in the age group with the highest incidence rate of drowning, are also those who are not wearing any buoyant gear. As might be expected, in the vast majority of cases for which data on PFD use are available, those that drowned were not wearing a PFD. Finally, there is a significant difference between the attitude of boat drivers/users and the use of PFDs in Warri waterways as evident in the hypothesis 2 (H_0) that was rejected, while the alternative designate (H_1) is accepted since χ_c^2 =86.9 is higher than χ_t^2 =7.815. This finding is in agreement with Groff and Ghadiali (2003) study which observed that despite the fact that there seems to be little evidence that swimming ability is a strong predictor of the outcome in many of these recreational boating related drownings, people seem to feel that lifejackets or PFDs are only for those who have not yet learnt to swim. In a survey of young men in the demographic group most at-risk, the vast majority felt they did not need a PFD because they can swim well.

5.0 Conclusion

The following are quantitative deductions from the current study: There is a significant difference between i.) the level/rate of passengers' compliance and the use of PFDs;and ii.)betweenthe attitude of boat drivers/users and the use of PFDs in Warri waterways, Delta state.

Drowning has been identified as a risk associated with aquatic activity and is estimated to claim the lives of 372,000 people every year, accounting for 7% of the global burden of injury-related death. Not wearing a lifejacket or PFDs may increase drowning risk; studies found generally low levels of lifejacket/PFDs wear among passengers, boat drivers and other users. In this study are several risk factors associated with boating-related drowning areidentified such as age and gender, swimming ability, lack of boating safety training and inexperience, water temperature, weather and boating conditions, speed, collisions, alcohol and other drugs, reckless behaviour, and refusal to wear a lifejacket or personal flotation device calls forimmediate legislation to save lives. Education, social marketing and incentives, changes to PFDs designs and standards, legislation and changes to insurance requirements were the various methods of encouraging boaters to wear PFDs identified.

6.0 Recommendations

Sequel to the findings emanating from this study, the following recommendations are made that: The state and local authorities should formulate legislation on penalties apply to occupant not wearing lifejackets when they are required to do so and mandatory wearing of PFDs, coupled with effective enforcement on boat users in Warri waterways of Delta State and penalties apportioned to the owners and masters of vessels found not carrying PFDs/lifejackets, or if there are not enough lifejackets for everyone on board. There is need to disseminate corrective information and awareness of on the need for compulsory usage and for new and more comfortable PFD designs critical to increasedattractiion and voluntary wear by adults.

4. Boater education and effective educational campaigns will be more effective in reducing boating-related fatalities than a mandatory wear law.

5. Adequate enforcement of the existing laws should be carried out more effectively by regulatory bodies

6. Make sure that the lifejackets are well fitting and suitable for the boating situation.

7. Placement of notice such as no life jacket on, no entry.

8. Placement of notice at the entry of Jetties with posture of person wearing life jacket marked good (√) as a safe entry measure and posture of person not wearing life jacket marked bad (x) as an unsafe entry mode.

5.4 Suggestions for further Studies

The following suggestions have been handed down by the researcher for further studies.

1. The study should be replicated in other jetties across the country (Nigeria) not covered in this study.
2. The study should be replicated using a larger sample size and methodology including test of research hypotheses.
3. A study should be undertaken to ascertain trends and factors associated with non-wearing of personal flotation devices among boat users in jetties in Delta State.
4. A study should be carried out to assess compliance with PFDs/lifejacket regulations in boating in Nigeria.

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