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Research Article

Disaster Preparedness of Private Primary Schools in Zaria, Nigeria

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2. Keywords

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1. Abstract

1.1. Background: Schools are considered to be safe environments. However, the recent experiences with natural and man-made disasters, in-school violence, acts of terrorism, and the possibility of wide spread communicable diseases means that there is the need for schools to be prepared for all types of crisis and disasters.

1.2. Methods: This is a cross sectional, descriptive study of private primary schools in Zaria, Nigeria. Information was obtained using a structured questionnaire, which assessed the level of education on safety measures within and outside the school compound. It also determined the presence or absence of school clinic, first aid box and safety equipment, and contingency plans in case of any disaster in the school.

1.3. Results: There were a total number of 63 private primary schools involved in the study. The age range of school existence was 1 – 49 years (mean age 14.71years). Twenty (31.7%) had proper training on safety measures within and outside the school compound, 60 (95.2%) had no clear document/policy on school disaster, and only 3(4.8%) schools had unwritten guidelines on school disaster. Sixty two (98.4%) had no planned drills/sensitization sessions. Only 1 (1.6%) had a contingency plan for another premises elsewhere.

1.4. Conclusion: Private Primary Schools in Zaria are not well prepared for major disasters. The need to protect children from harm should be a fundamental principle. All primary schools in Zaria and probably elsewhere should have disaster preparedness and plans that are uniquely designed for the school education and interface with the larger community.

3. Introduction

Schools are considered to be the most socializing institutions after the family; they are safe environments for millions of children who engage in one form of learning or the other [1]. However, the frequent occurrences of natural, man-made disasters, in-school violence, acts of terrorism, and the possibility of widespread communicable diseases call for urgent need for schools to be prepared for the possibilities of all-hazard emergencies [2,3]. No one can predict when an accident or disater will occur. To ensure the safety of students, teachers, administrators and staff, every school should be prepared to handle and subsequently recover from an accident or disaster that may occur in the school. Worldwide, 450 cities with populations over 1 million face recurring disasters. Cyclones, typhoons, and hurricanes are among the deadliest and costliest of disasters recorded in the past. It has been reported that droughts and desertification currently affect 250 million people and threaten 1.2 billion people in 110 countries [4,5]. Similarly, it has been observed that recurring floods regularly prevent millions of children from attending a full year of school [5]. The need for school safety and emergency management has become more complex and critical in the last 15 years [6,7]. Many western countries have made important advances in their ability to respond to emergency, or terrorism effectively. Despite these advances, there continues to be limited

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development of pediatric protocols that could be implemented by the local, State, and Federal agencies charged with planning and consequence management [7]. Furthermore, emergency preparedness plans have evolved over recent years [7-9]; which now include not only violence, school mass shooting, intentional (terrorist) disasters, but also unintentional public health emergencies such as natural disasters. Under the principles of double functionality, emergency response plans must now consider the technique of creating response plans that integrate intentional and unintentional disasters [9]. In Nigeria, there is paucity of similar studies considering the current rise of bomb blast in public places and institutions. The study is, therefore, intended to assess the disaster preparedness of private primary schools in Zaria.

4. Materials and Methods

4.1. Study Site

The area of the study was Zaria in Kaduna State, Nigeria. It is one of the ancient cities in the state; extremely large, heterogeneous town in the northern part of the country. It is easily accessible from different parts of the country by air via Kaduna, Kano, and Abuja; by rail as well as by road via Abuja-Kaduna-Zaria route, Jos-Zaria route, 'Kano-Zaria route and Sokoto-Zaria route. Zaria is the home of many Primary, secondary as well as tertiary institutions, including the famous Ahmadu Bello University and College of Aviation Technology. Majority of the primary schools are privately owned by renown business men and women.

4.2. Study Population

The population of private primary schools was 152. Out of this number, 63 private primary schools were randomly selected to participate in the study.

4.3. Inclusion & Exclusion Criteria

4.3.1. Inclusion: The private primary schools that had registered with the Education Departments of the two Local Governments (Sabo & Zaria) that covered the geographic study area, those with a minimum number of 100 pupils were included in the study.

4.3.2. Exclusion: Those schools that were not registered nor had a minimum number of 100 pupils including schools that refused to give consent were excluded in the study.

5. Study Design

It was a cross sectional, descriptive study (September-November, 2017), of private primary schools in Zaria, Nigeria.

5.1. Sampling technique and sample size

Four geographic clusters of importance in Zaria metropolis were identified and selected by purposive sampling technique. These areas included the following

Zaria City: The entire area that is enclosed within the old Zaria City "Ganuwa"

Zaria Waje: This area is composed of Tudun Wada, Kongo, Magume, TukurTukur, Wusasa, Gwargwaje and Danmagaji

Sabon Gari: It is made up of SabonGari, PZ area, MTD area, Kwangilla

Samaru: This area is composed of Falladan and Samaru.

Of the 4 areas identified, all private primary schools that have been registered with the Local Government were listed in each area and the result obtained was as follows:

Zaria City, 11 schools; Zaria Waje, 19 schools; Sabon Gari 16 and Samaru 17 schools given a total of 63 schools

The private primary schools with a minimum number of 100 students that consented and participated in the study were 63 schools

5.2. Identifications of Respondents

The head of school responded to the general questions regarding each school. In the absence of the head of school, the deputy head of school responded to the questionnaire after receiving approval from the head.

5.3. Data collection tools

A questionnaire written in English language was used to collect the data. The questionnaire was pre-tested and validated using a population (private primary schools in Kaduna town) similar to the study population.

6. Data Collection

The questionnaire determined the number of years each school has been in existence, It also determined the presence and the number of emergency gate(s), as well as safety measures within and outside the school compound. The locations of shut-off devices for gases, electricity, and water in the school were documented. The questionnaire also sought to determine the presence of written document/policy on school disaster management; well planned orientations/drills/sensitizations exercises. The presence or otherwise, of a list of contacts information such as home address, office address, phone numbers, email addresses of parents and guardians (P &Gs) was determined. The availability or absence of the list of contacts information for emergency supporting agencies such as fire service centre(s), ambulance service, police station, Radio station, Television station, Hospital(s) was also determined. The questionnaire also determined the presence or absence of fire extinguisher, school clinic, and the capacity

of its equipment; the number and qualification of the staff in the clinic; first aid box and the presence or absence of alternative campus in case of any disaster in the school. The questionnaires were administered by one of the authors (JGM). A total of 63 questionnaires were given out to private primary schools that consented to participate in the study, and all were adequately completed and returned.

7. Statistical Analysis

All data were imported into an SPSS Windows Version 17 for the purpose of generating frequency tables for variables. The significant level was set at 0.05.

8. Ethical Consideration

Permission to conduct the study in the private primary schools was obtained from the departments of education of the two local Governments (SabonGari and Zaria). Verbal consent to participate in the study was obtained from the proprietor before the questionnaires were administered.

9. Results

Data from a total of 63 private primary schools were analyzed. The mean duration of existence of the schools that participated in the study was 14.71 (range 1– 49 years). Only 12(19%) had emergency exits, while 51 (81%) had none. Twenty (31.7%) had carried out proper training on safety precautions within and outside the school compound **(Figure 1)**.

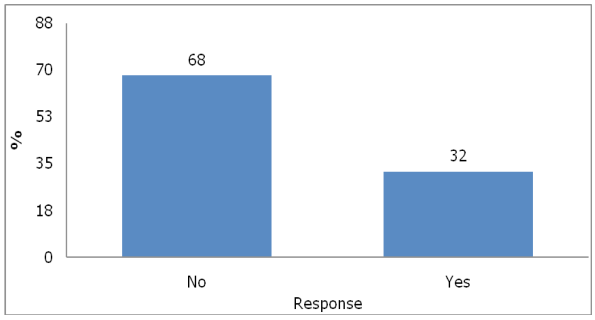

Figure 1: Teaching on safety measures in the school.

Forty five (71.4%) had an identified shut-off devices for gases, water and electricity in their schools while 18 (28.6%) of the schools had none. Only 3(4.8%) schools had unwritten guidelines in the event of disaster in that school while 60(95.2%) had no documented policy in the event of disaster in the school. Sixty-two (98.4%) had no organized plans for drills/ sensitization sessions at all, while 1 school (1.6%) had a single session of sensitization exercise over the previous two years. Majority **(Figure 2)** had partial list of contacts including home address, office address, mobile phone number, home telephone number, email address of parents and guardians (P &Gs), with majority not having email addresses in place.

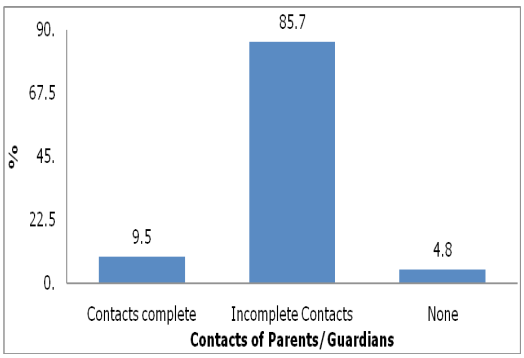

Figure 2: Status of contact information (Home address, office address, phone number (home & Mobile), email address) of parents and guardians.

Majority **(Figure 3)** had no complete contacts of emergency supporting agencies such as fire service centre, Ambulance service, Police station, Radio station, Television station and hospital that need to be contacted in case of an emergency in the schools.

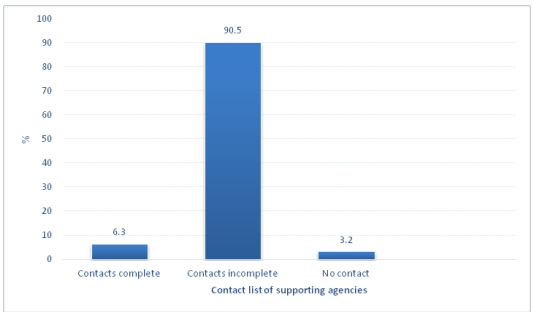

Figure 3: Status of contact information (office address, phone number, email address) each of supporting organizations (Ambulance service, fire service center, police station, mass media center, hospital) of emergency response.

Forty-eight (76.2%) had fire extinguishers **(Figure 4)**.

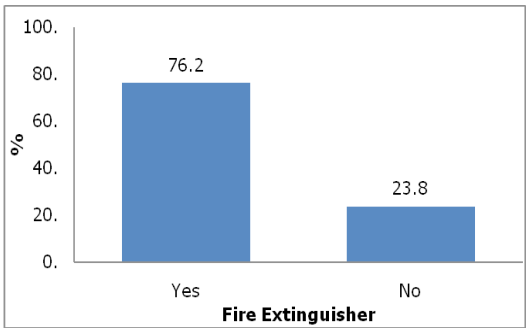

Figure 4: Presence of fire extinguisher in the school.

Of this number, sixty-eight percent (43 of 48) of the fire extinguishers were expired at the time of study **(Figure 5)**.

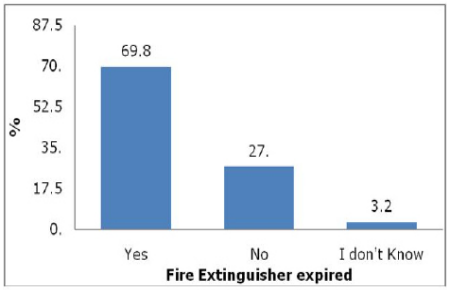

Figure 5: Expiration of fire extinguisher in the school.

Sixty-two schools (98.4%) had no school clinic while only 1(1.6%) school had a school clinic.

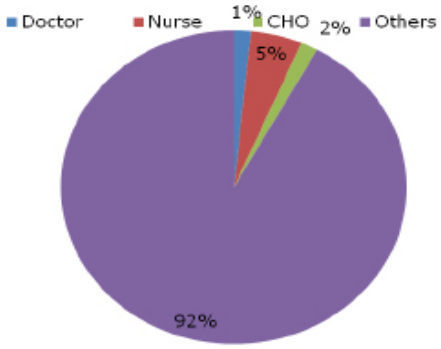

Figure 6: Category of health workers in the school clinic.

The only doctor in one of the schools pays a visit to the school once every two weeks. However, 7 schools (11%) that had no clinic had some form of collaboration with a General public or private hospital/clinic. Majority 41(65.1%) (Figure 7) of the schools had first aid boxes. However, of the 41 schools that had first aid boxes, ninety-three percent (38 of 41) of them had no qualified/trained staff supervising the use of first aid box.. Only 1 school (1.6%) had a contingency plan for an alternative school premises in case of an unforeseen catastrophe in the place where they are presently situated.

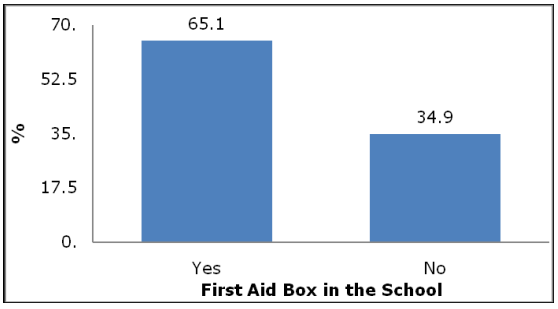

Figure 7: Presence of first aid box in the school.

10. Discussion

We attempted to determine the disaster preparedness of private primary schools in the city of Zaria, Nigeria, in light of the recent increase in disasters in Nigeria. Our data demonstrated that although school authorities were aware of the recent increase in the frequency of disasters in the country, there is a lot to be done in so many areas to ensure adequate preparation for school disasters. Some of the employees including management staff in the private primary schools in the study area did not believe their schools are at risk of developing a disaster. This underscored the overall believe that no area or place is immune to disaster [1,10,11]. This further underscored the need for adequate disaster preparedness in school environments. There is need for a deliberate and well-orchestrated action to disabuse this attitude, so as to prevent any catastrophes. In our study, we found out that many of the private primary schools had no documented policy on disaster management. This has a serious implication, should a disaster occur, the casualties and consequences may be enormous. Many reports including the one by Bruria et al. [12] have indicated that adequate planning and preparation prior to occurrence of a disaster in a community has helped to significantly reduce the morbidity and mortality. Similarly, it has been established by previous reports [13-18] that, efficient and effective disaster preparedness would improve the assessment, triage, and management of the injured and ill children at schools, by having well trained and confident school staff members who could facilitate the transfer of these children to an acute care facility [13,19,20].

The population in any school environment usually contain many students, the teachers, non teaching and administrative staff. Therefore, it is expected that apart from the main entrance to the school, there should be an emergency exit that can be used as an escape route for any emergency situation such as fire outbreaks or any disaster event. However, we found that not many schools had emergency exits. Therefore, there is the need for the local Government Education Department to provide or come up with a policy guideline on this matter as soon as possible. Interestingly, quite a number of schools had a single location where the switch off devices for gases, water and electricity were installed. Furthermore, the points where these devices were located, were well known by both students and staff of the schools. This is very important as these devices could be shut off easily in the event of an accident.

Familiarizing an environment, in which one lives, is one of the fundamental principles of emergency or disaster. It is important for staff and students in a school to be aware of what to do in the event of a disaster, the escape routes, and possible muster point(s) should be well described and appropriately labelled [21-24]. Therefore, pupils should be taught exactly what to do. In our study, we found that only 31.7% of schools have had some training/awareness exercises while majority have not. This has serious consequences to the lives of not only the pupils but also to the staff. More importantly, since new students are admitted to the school at the beginning of every session, there will be need to organize simulation exercise many times, so as to create rooms for new students to get familiar with the rudiments of safety measures in the schools. In addition, organized drills or simulation exercises are also means of keeping stake holders in disaster management abreast of practical approaches, as well as to give updates in disaster management. The results of our study revealed that not many private primary schools had organized such a drill. This in effect meant that if disaster should strike in any of these schools, the morbidity and mortality will likely be high. Disaster management often requires proper coordination of activities and a unified direction of command. Efforts should be

made to increase the knowledge of administrative staff, teachers, and students, so as to know what to do in the event of a disaster. Barrett et al. [25] has illustrated the value of school nurses educating school teachers about emergencies in children. Sapien et al. [26] demonstrated that school teachers' confidence level in recognizing distress in emergency improved after attending an education session consisting of video footage and didactic teaching. Therefore regular drills/practicing of the emergency response plan are absolutely necessary for an effective and efficient response during disaster [27-29]. Also, it is important to note that, none of the schools had any consideration for children with special care needs.

We also found a poor school system of communication to supporting services like hospitals, fire-fighting service centers, police stations, mass media centers as well as parents and guardians. Having a complete list of contacts of supporting agencies in emergency has been shown to be very helpful during disaster management. Supporting agencies such as fire service center could help tremendously in the event of fire incident. The police station is another place that could easily be reached to provide security, traffic control, ensure orderly evacuation, as well as to serve as rescue teams in any scene of disaster. Mass media centers such as Radio and Television centers could be used to properly inform the populace, parents of pupils to come to school and vacate their wards early as well as during a disaster. Also, these media could be used to give progress as well as updates to the populace during management of the disaster. In the guidelines for disaster planning in schools, provided by the American Academics for paediatrics [21], it was advised that, Police, public health officials, firefighters, and other members of the local disaster-response infrastructure should be in the Incident Command System, a design to effectively and efficiently manage incidents by integrating such agencies, personnel, procedures, equipment, and communications under a common organizational structure is necessary. There is need to establish a school-wide communication system linking all areas of the campus directly with these supporting agencies through various means of communication such as cellular phones, walkie-talkies, alarms, intercom systems.

On the availability of some facilities such as first aids boxes, fire extinguishers, and school clinics with well trained professional personnel, the results of our study revealed a very poor availability of these facilities. Although most schools had first aids boxes, no trained health personnel were in-charge of these first aids boxes and some were not regularly stocked. Only sixty percent of schools had fire extinguishers, and majority of these fire extinguishers had expired. Only 1.6% of schools had school clinics, which were managed by nurses. The only clinic that was being supervised by a trained doctor, only received him fortnightly; in between these periods, students could only be referred to a General hospital. Although, we noted that, majority of the schools that had no school clinic, had some form of collaboration with one general or a private health facility, which can attend to their students in the event of a disaster. If the school cannot afford to have one clinic on their own, a group of schools clustered in one area could contribute and manage a single school clinic. The school authority is therefore, expected to take a leadership role in the preparation of schools for any disaster or life-threatening emergencies, by developing a strong partnership with local health facilities, or with local primary care physicians [22]. There is need for schools in Zaria to take an active role in local community response planning, assist in the development of pre-hospital protocols, and, in the event of a disaster, participate in the community or hospital disaster plan.

Also of interest was the fact that, only few (1.6%) had a contingency plan in the event the school is ravaged by a disaster. Developing a contingency plan [30] by providing an alternative school premises in the event of disaster has been shown to be vital because this will ensure continuity in learning and teaching.

11. Conclusion

There are wide spread fundamental gaps in the disaster preparedness of private primary schools within Zaria metropolis. We recommend that proprietors of private primary schools in conjunction with Local Government authority including communities where they are located should put in efforts to improve the deficiencies as highlighted in the findings of this study.

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