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Health Situation of Residents in the Slum Environment of Akure Core, Nigeria

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Abstract

This paper examined the health situation of residents in the slum environment of Akure core, with a view to suggesting means of improving the health standard of the residents and the environment in which they live. This research made use of 350 copies of its research questionnaire administered randomly to household heads in eight selected neighbourhoods of Akure core. The selected neighbourhoods are Owode, Imuagun, Odojoka, Araromi, Oja-Oshodi, Odokoyi, Isolo and Ijomu. A sample size of 350 households that amounted to 5% of the household population was randomly selected across the study area for questionnaire administration. The research design method through the use of questionnaire and interview was employed to gather data on health implications of slum on the residents. Findings revealed that hand dug wells mostly found in a dirty and unkempt environment was the dominant source of domestic water supply in the study area. Here too, the residents did not treat the water before use. A major health concern lies in the proximal nature of the distance between the domestic water source and the pit latrines. This was found to be less than 15 meters in most cases. Malaria was discovered to be the prevalent disease treated monthly in the study area. Statistical returns revealed that the environment affects significantly the health of the people. The study therefore proposed a safe distance of 30 meters between water source and source of pollution. Also, the provision of potable water and a constant sanitation routine check to be put in place.

Keywords

Slum, Health, Water, Environment, Malaria, Core

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1. Introduction

Slum as a social construct, describes clusters that cause particular sets of health issues [27]. This ignored slum population has turned into a significant repository for a wide range of health conditions that the formal health sector should manage; it definitely manages the serious and end-stage intricacies of these diseases at a generously more prominent expense than what it costs to oversee non-slum local area populations. Due to the casual idea of slum settlements just as the cultural, social, and conduct factors unique to the slum populations, little is known with regards to the range, weight, and determinants of ailments in these communities. These frequently lead to complications, particularly of those diseases that are chronic however preventable [27].

Overcrowded and substandard housing usually facilitate the spread of infectious diseases, such as tuberculosis, hepatitis, dengue fever, pneumonia, cholera and malaria [32] owing to congestion in inter personal space. Poor sanitation and absence of admittance to safe food and water additionally add to high pervasiveness of diarrhea inside slums. The absence of primarily strong, climate-adapted and ventilated homes further puts the health of slum dwellers in danger of climate change-related outrageous weather including heat waves, cold or tempests [32]. Also, slum regions are frequently left out of significant city networks for access to health-care services.

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Unplanned urban development intensifies non-communicable disease chances identified with outside and indoor air contamination.

It is by and large expected (and sadly satisfactory to many) that slum populations have poorer health status including morbidity, mortality, and health hazards as opposed to other urban populations [27]. Some portion of this careless acknowledgment is the conviction that slum residents are still in an ideal situation than rural residents. Furthermore, it is additionally recognized that all slums are not equal and varieties in health status among slum population groups are just about as apparent as varieties across rural communities [1].

The health of the slum population matters a lot for various reasons:

To begin with, the sheer mass of population impacted is gigantic. Almost 1 billion individuals live in slums internationally [5]. Slum health will progressively decide both urban and national health pointers. slums are presently not a midpoint on the course from provincial destitution to urban middle class. For a greater part, slum is their home.

Second, there are unjustifiable contrasts in health. All data consistently show that health in slum populations is more awful than in other urban areas [5].

Third, the perceivability of this imbalance, particularly as developing nation economies keeps on developing, has implications for political security and expanded radicalization of the young people [5].

Fourth, there is undiscovered potential for impact. Slums have high densities and young populations with little or no formal education that can enhance the effect of general health intercessions. Finally, the general health effects of health issues in slum regions are enormous. Natural and social obstructions that help the administration of outbreaks are permeable in urban slum settings, and outbreaks are more hard to control once they are in the urban space they immediately become worldwide worries; Severe Acute Respiratory Syndrome (SARs) and Ebola are examples [29].

Owoeye and Omole [24] reported that only few of the residents of the core of Akure have access to good potable water which are not regularly available. Hand-dug well, which is a major source of water in the study area are often not lined and the water are not treated before use. With this overarching circumstance of water supply in the area, quality water supply cannot be ensured. It exposes the people to a greater risk of contracting serious water borne and other health related diseases. On this note, this paper investigates the health situation of residents in the slum environment of Akure with a view to suggesting means of improving the health standard of the residents and the environment they live in. Through this, the paper gives answer to the following questions: what are the sources of environmental health hazards in the slum environment, what are the prevalent diseases among residents in the slum environment and how can these diseases prevalence be mitigated?

2. Literature Review

Expanding urbanization has brought about a quicker development of slum population. Different organizations, particularly, those in developing nations are thinking that it is hard to react to the present circumstance viably. Differences among slums exist attributable to different variables. This has prompted shifting levels of health trouble on the slum children [1]. Slums are particular urban element that causes an interesting arrangement of health issues. A huge portion of weakness in slums comes from helpless access to sanitation and clean drinking water [26].

Over a decade ago, close to a large portion of the disease trouble in low-and-middle income nations is from non-transmittable diseases [17]. The high pervasiveness of hazard factors for non-transferable diseases across all age groups in urban slum local area shows the probability of a high future weight of illness. Quick activity for avoidance and control is needed to keep the circumstance from deteriorating [2]. The social-determinant approach accentuates the job of variables that work at numerous levels, be it at worldwide, public, civil and neighborhood levels in molding health. This methodology recommends that working on day to day environments in such regions as lodging, business, training, balance, nature of living environment, social help, and health administrations is vital to working on the health of urban populations [31].

The ignored diseases of individuals living in destitution make social and monetary weights to the individual, family, local area, and the country [8]. Unmistakably upgrades in health and health value need not just changes in the physical and social environment of urban communities, yet additionally a coordinated methodology that thinks about the more extensive financial and logical elements influencing health. Incorporated or staggered approaches should address the prompt, yet additionally the hidden and especially the basic causes at cultural degree of related health issues [4].

Conceptual Framework

This study adopts the concept of habitability that fosters good living environment for slum dwellers. It is simply being tenable, or reasonable for living. The word originated from the Latin habitabilis, "that is fit to live in" [30]. A portion of the provisions of planet Earth that add to its tenability incorporate the presence of water, its separation from the sun, and a

breathable atmosphere. Habitability is the conformance of a residence or home to the inferred guarantee of being suitable for living [7]. A residence that complies is supposed to be livable. It is an inferred guarantee or agreement, which means it doesn't need to be an express agreement, pledge, or arrangement of an agreement [14]. It is a generally expected law right of an occupant or legitimate teaching. To be tenable, such lodging typically:

i. must give cover, with working locks;

ii. must be warmed in the cool months;

iii. must not be pervaded with vermin, cockroaches, termites, or form;

iv. requires the property manager to prevent different inhabitants from making a lot of commotion, recycled smoke, or from selling opiates; and

v. must give consumable water [16].

There was no inferred guarantee of habitability for occupants at customary law and the lawful principle has since created in numerous locales through lodging laws and guidelines [15]. In Architecture, the term habitability is perceived to be an umbrella term for the appropriateness and worth of a fabricated natural surroundings for its occupants in a particular environment over the long haul [12].

Human Variables and habitability are significant points for working and living spaces. For space investigation, they are crucial for mission achievement. One of the basic attributes for living and working in outrageous environments is the reliance on the living space, its innovative capacity just as the socio-spatial outlining. Occupants who are presented to remote and unfriendly environments, not exclusively should beat the difficulties presented by the risks and impediments forced by the specific environment itself, yet in addition experience critical misery from being bound inside and disengaged from development and social contact [13].

Figure 1. Map of Ondo State in National Context.

Source: Ondo State Ministry of Physical Planning and Urban Development, 2019.

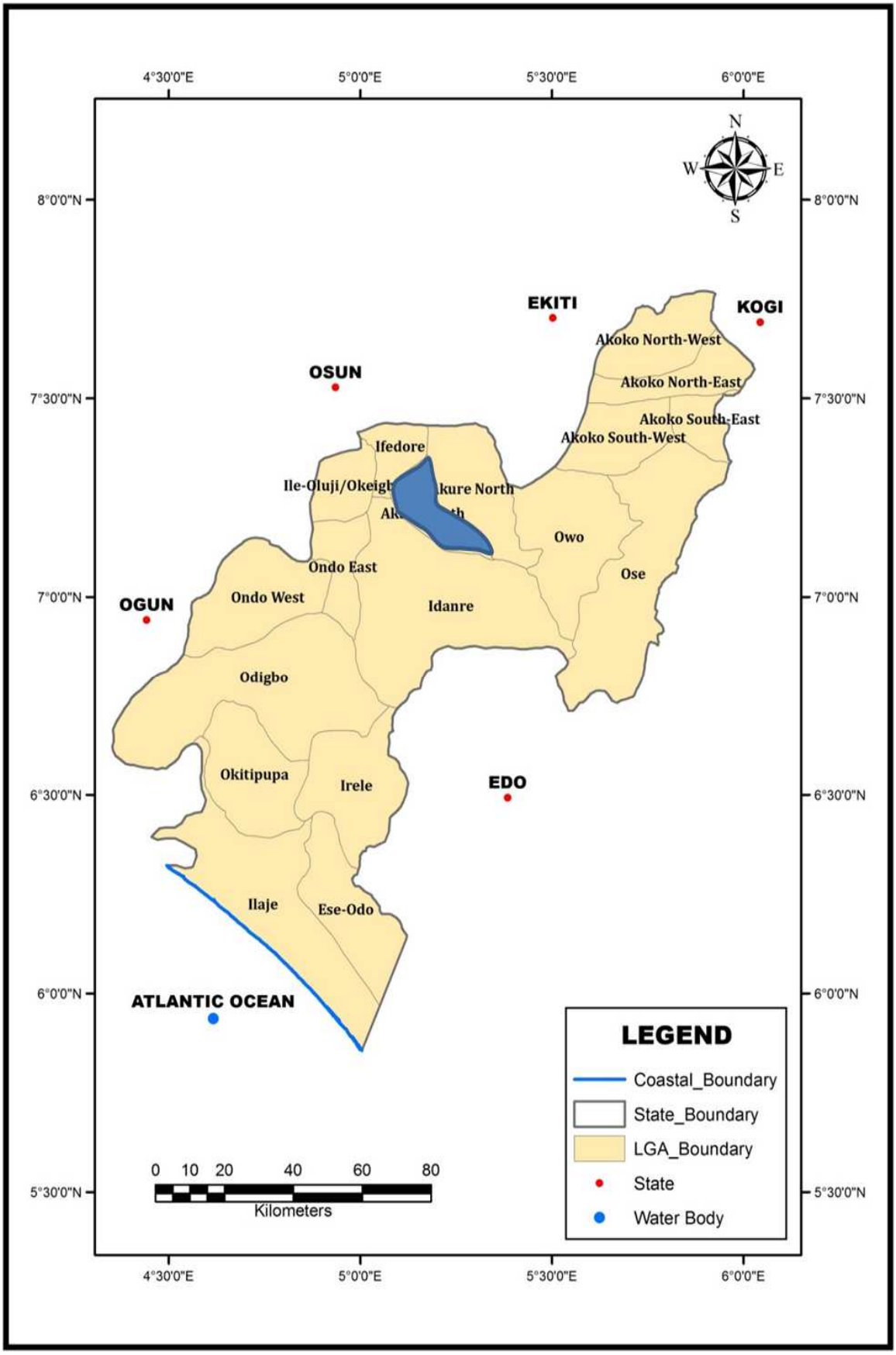

Figure 2. Map of Akure South Local Government in State Context.

Source: Ondo State Ministry of Physical Planning and Urban Development, 2019.

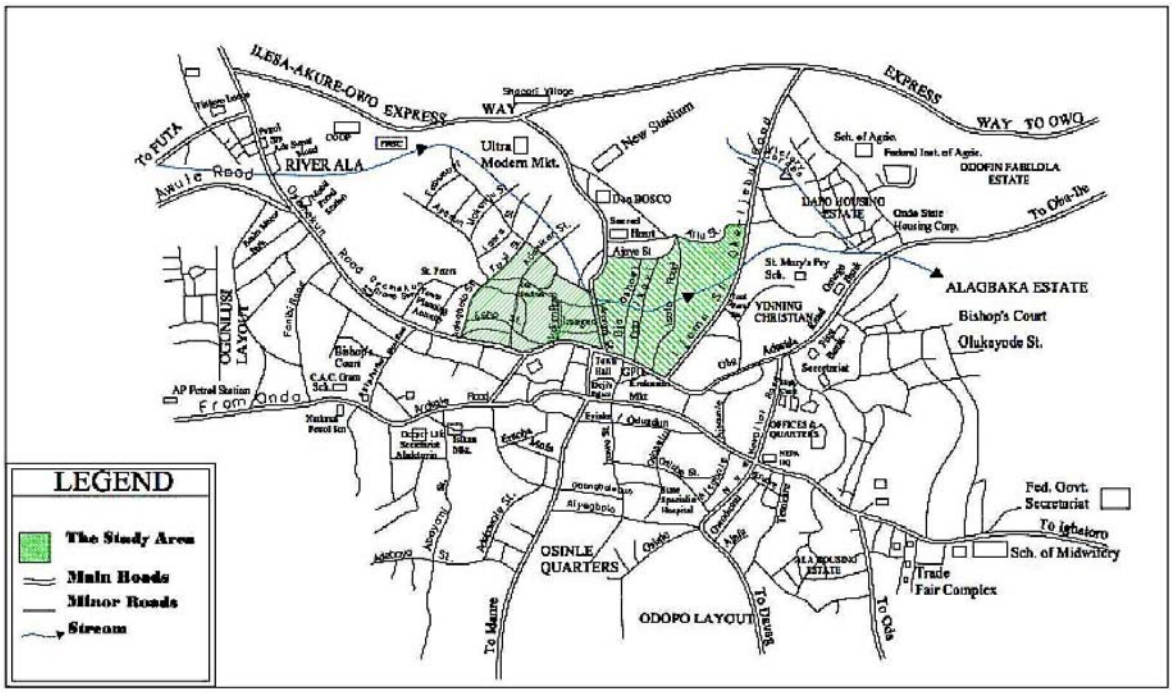

Figure 3. Map of Akure showing the Study Area.

Source: Adapted from Owoeye and Omole, 2012; P. 161 [Modified by the Author].

Figure 4. The Study Area.

Source: Google Earth Imagery, 2021 [Modified by the Author].

Slum dwellers must embrace the concept of habitability to ensure a safe, clean and livable environment. Habitable maintains that houses in slum environment are guaranteed of desired airspace between two buildings, toilets and kitchen must be within the building, rooms must be well spaced to standard, also the maximum standard of 2 persons per room according to the United Nations Habitat must be maintained. Akure core, the focus of this study which possess the characteristics of slum, such as those that can be detrimental to the health, need to adopt this concept to restore livability and healthy status of the residents.

3. Materials and Methods

3.1. Study Area

This research was conducted in the residential core of Akure, the administrative and business capital of Ondo State, Nigeria. In particular, the research was conducted in randomly selected eight [8] residential neighbourhoods in the core of Akure. As illustrated in Figure 4, these neighbourhoods are Owode [1], Imuagun [2], Odojoka [3], Araromi [4], Oja-Oshodi [5], Odokoyi [6], Isolo [7] and Ijomu [8]. Akure has all out areal degree of 340 km² [19], and locates between Latitude 7°15' and 7°17'' North of the Equator and Longitude 5°14' and 5°15'' East of the Greenwich Meridian [18]. The climate is hot and muggy, impacted by downpour bearing southwest rainstorm twists from the sea and dry northwest breezes from the Sahara Desert [28]. It has ferruginous tropical soils with two rainy seasons. While, the normal yearly temperature is 26.7°C, the normal yearly precipitation is 2378 mm [6]. Akure has mean yearly relative dampness of around 77.1% [9]. It has rainforest vegetation, which is evergreen. The vegetation comprises of damp swamp timberland [22]. [28] noted that Akure has three residential zones, which are the core, transition and the periphery. The core of a city is a place of earliest settlers, having the highest concentration of human population characterized by old dilapidated buildings, with the worst environment due to poor sanitation [25]. The population of the selected neighbourhoods which make up the study area was estimated to be 34,800 persons. The estimated figure was gotten from the digitized imagery which puts the total number of buildings in the eight housing quarters at 1,392 [Figure 4]. This figure was arrived at, using the Ondo State Bureau of Statistics [21] postulation of five households per building and five persons per household. The geographic location of the study area is presented in Figures 1, 2, 3 and 4.

3.2. Methodology

This study started with a reconnaissance survey to each of the eight [8] neighbourhoods of Akure core, this was done to be familiar with the housing and living condition of residents in the study area. The selected neighbourhoods are Owode, Imuagun, Odojoka, Araromi, Oja-Oshodi, Odokoyi, Isolo and Ijomu. The choice of these neigbourhoods was justified by [10] who identified these areas as the core with high prevalence of slum. This survey, ascertained that the environmental condition of this residential core calls for great attention, hence; a thorough investigation need be conducted to be sure of its effect on the health of the residents. This paper made use of the research design method which focused on data collection about health implications of slum on the residents through the use of questionnaire and interview.

Data were obtained from household heads selected randomly across the eight housing quarters in the study area. This study used household population for the administration of questionnaires. Building demography survey was conducted to infer the number of buildings in the study area. Google earth 2020 imagery of the study area was utilized and confirmed by digitizing on ArcMap 10.6, the building population was arrived at 1,392 buildings. Taking into consideration Ondo State Bureau of Statistics [21], estimated household size of five people for each family and five families for every building, the estimated family population of the study was arrived at 6,960 households [1,392 buildings x 5 households per building = 6,960 households].

A sample size of 350 households that amounted to 5% of the household population was randomly chosen across the study area for questionnaire administration. The sample size is conceivable considering the homogeneity of slum dwellers health worries of the housing quarters. Likewise, [23] utilized more modest size of 210 households in a related study to acquire great outcomes on the study area. The systematic random sampling technique was utilized to select respondents at every 20th residential building in the study area. Data codification and analyses were finished utilizing the IBM Statistical Packages for Social Scientists (SPSS) version 23 and Microsoft Excel 2016. Data were presented in Tables.

4. Results and Discussions of Findings

This paper examined the health situation of slum of slum dwellers in the 8 selected quarters of Akure core. This study looked at the sources of environmental health hazard and the prevalent diseases among residents of the slum environment.

4.1. Means of Water Supply as Source of Environmental Health Hazard

From the statistics in Table 1, well was discovered to be the major means of water supply in the environment with 90.9%. This implies that the residents of the study area use the hand dug well as a major means of extracting water which they use for domestic purposes. These wells were mostly at the premises of their buildings, and were found in a dirty environment. The condition of these wells were mostly in a poor state as some of them were not covered. From the survey conducted, it was found that majority of the wells were not lined and this could pose a serious health threat to residents who are the consumers due to some microorganisms that chose such water environment as their habitat. It was also discovered that water from the dominant water source in this dismaying environmental condition is not being treated before use. This is the same water they drink and use for other domestic purposes. This study aligned with [24] who also noted the main source of water to be well and found in an unkempt environment. In an environment as this, quality water cannot be guaranteed as the residents are exposed to contracting water borne diseases and other similar ailments. Figure 5 shows the condition of a well in the study area.

Figure 5. Improperly Covered well in the area.

Source: Author's Field Survey, 2021.

Table 1. Source of Water Supply.

Source of Water Supply	Frequency	Percentage
Pipe Borne Water	7	2.0
Public Water Supply	14	4.0
Borehole	11	3.1
Well	318	90.9
Total	350	100

Source: Author's Field Survey, 2021.

4.2. Water Quality Assessment

In recent times, [20] conducted chemical and microbiological analysis test on the quality of water in the study area. The chemical analysis results revealed that the hardness value in the study area was below the WHO permissible limit [500 mg/l]. This suggests a tolerably soft water body. Water total hardness is mainly conferred by calcium and magnesium particles, aside from sulfate, chloride and nitrates are found in mix with carbonates. The parameter esteems fall inside WHO passable cutoff points.

Using water samples drawn from two wells in two selected neighbourhoods of the study area; [20] affirmed that water Ph in these selected neighbourhoods (Ijomu and Isolo) were 7.59 and 7.92 respectively (Table 2). This is considered satisfactory for natural water which is as per WHO passable limit of 6.5-8.5. The nitrate content of water from the wells at Ijomu and Isolo were 4.7mg/l and 3.2mg/l respectively [Table 2]; these values were significantly underneath the WHO limit of 50 mg/l. The level of alkalinity at Ijomu and Isolo were 368.4mg/l and 505.1mg/l respectively (Table 2) these values were above the WHO permissible limit of 200mg/l. The chemical analysis showed a moderately soft water and a Ph considered acceptable for natural water. However, with the level of alkalinity which is above WHO permissible limit [200mg/l], taste can become unpleasant, which upon consumption could have an adverse consequence on the health of the consumer. The level of alkalinity revealed that the water is unfit for consumption and could be a source of water borne borne diseases like typhoid, cholera and diarrhea which can bring down the state of health of the consumer. A good potable water must be tasteless, colourless and odourless.

Table 2. Water Physio-Chemical Analysis Result.

Parameter Quarters	Acidity [mg/l]	Alkalinity [mg/l	PH	Total Hardness [mg/l]	Ca^2 [mg/l]	Cl [Mg/l]	NO_3 [mg/l]
Ijomu	61.2	368.4	7.59	1.55	0.4	67.71	4.7
Isolo	81.6	505.1	7.92	2.60	0.67	110	3.2

Source: Olajuyigbe, Olamiju and Ola-Omole, 2016; P. 6.

Microbiological analysis of hand-dug well was conducted at two selected neighbourhoods of the study area (Odojoka and Oja-Oshodi) and reported in Table 3. E-coli and coliform counts were detected from the well water sample drawn from these housing quarters [20]. The presence of e-coli and coliform counts revealed that water from these wells were undependable for human consumption; drinking water should be totally liberated from e-coli and coliform. Most of the wastes generated in these neighbourhoods end up in Ala river. These can pollute the wells through lateral seepage to underground water. Standard

minimum safe distance from source of water (well) to soure of pollution such as soak away pits and latrines was largely compromised in these neighbourhoods; these are unerving sources of water pollution. The microbiological analysis revealed that well water in these neighbourhoods are unsafe for consumption, as the intake without proper treatrment could result into various water borne diseases like typhoid, cholera and diarrhea, which can be detrimental to the health of the consumer.

Table 3. Microbiological Analysis Report on Hand Dug Wells.

Housing Quarter	Total Bacteria Load	E-Coli Count	Total Coliform Count
Odojoka	106 x 10 cfu	2 x 10 cfu	3 x 10 cfu
Oja-Oshodi	126	ND	2 x 10 cfu

Source: Olajuyigbe, Olamiju and Ola-Omole, 2016; P. 6.

Based on the structure of this study, it is necessary to conduct a water test, hence, the adoption of the water quality assessment test conducted by [20] in the same study area. The outcome of this test can be said to remain the same and valid, as there has not been many changes in the water distribution pattern of the study area from the time of carrying out the test and the time of conducting this research.

4.3. Distance of Toilet Facility from Water Source as Source of Environmental Health Hazard

Result in Table 4 revealed the distance between the dominant water source (hand-dug wells) and the toilet facility [soak away/pit latrine]. About 10-15 meters appear to be the most common distance between the two facilities. The mean distance was estimated to 12.5 meters; this clearly showed a close proximity between the source of pollution and the dominant water source which could be very harmful to the health of the residents in this environment. Water contaminated by faecal waste is no longer considered fit for consumption. With this present proximity, there is a clear indication that the water could be contaminated which could lead to ailments such as cholera, typhoid, diarrhea among others. This practice is unsafe and can greatly affect the health status of the residents. [3] posited that distances under 10 meters and 10-20 meters of water to soak-away pits are delegated hazardous and somewhat safe respectively. Thus, a large number of wells in this study area are classified as unsafe for consumption.

Table 4. Distance of Toilet Facility to Water Source.

Distance	Frequency	Percentage
Less than 5 meters	54	15.4
5-10 meters	91	26
10-15 meters	110	31.4
15-20 meters	74	21.1
Above 20 meters	21	6
Total	350	100

Source: Author's Field Survey, 2021.

4.4. Type of Environmental Hazard Experienced

Table 5 revealed the type of environmental hazard experienced by residents of the slum environment. Mosquito attack was discovered to be prevalent in the environment with 61.1%; followed by noise pollution with 15.4%. Other environmental hazards such as poor water condition, poor ventilation and unpleasant odour was also discovered with 9.4%, 8% and 6% respectively. Mosquito attack being the dominant hazard experienced could be traced to the poor state of the environment. It is well known that mosquitoes thrive in dirty environment, they live and breed in an environment that is water logged. The core of Akure exhibit the same characteristics. Anopheles mosquitoes are the causative organisms of the Plasmodium parasites which predispose slum dwellers to ill health. Noise pollution which was also recorded as one of the hazards experienced tends to affect the mental health of the people. This noise is as a result of the study area nearness to market, its closeness to stadium, noise from moving vehicles, and noise from the neighbourhood associated with the daily hustling and bustling activities of the residents was observed to have negative impact on the health of the residents as this could distort sleep bringing an imbalance in the mental health of the people. According to [11] environmental noise incites quantifiable organic changes as a pressure reaction, and plainly influences sleep design, just as abstract sleep quality. Other environmental hazard experienced such as poor water condition, poor ventilation and unpleasant odour had a significant effect on the physical and mental health of the people.

Table 5. Type of Environmental Hazard Experienced.

Environmental Hazard	Frequency	Percentage
Poor Water Condition	33	9.4
Mosquito Attack	214	61.1
Poor Ventilation	28	8.0
Noise Pollution	54	15.4
Unpleasant Odour	21	6.0
Total	350	100

Source: Author's Field Survey, 2021.

4.5. Prevalent Disease Experienced

As presented in Table 6, from the field survey malaria was discovered as the dominant disease experienced by the residents [85.1%], followed by typhoid [7.4%], STDs [4%] and Diarrhea [3.4%]. These ailments have been known over time to crumble the health status of individuals infected. The

environmental condition of this study area, can be said to encourage this prevalent disease, of which at the long run can be detrimental to the body. Majority of the respondents experienced and treat these ailments on a monthly basis. This further proved that the condition of this environment continues to negatively affect the health of the residents. The environmental demerits such as mosquito bites, unclean water and dirty environment had been identified to be the major causative organ of the constant occurrence of these ailments.

Table 6. Prevalent Disease Experienced.

Disease	Frequency	Percentage
Malaria	298	85.1
Typhoid	26	7.4
Diarrhea	12	3.4
STDs	14	4.0
Total	350	100

Source: Author's Field Survey, 2021.

4.6. Analysis of Hypothesis Testing

Ho: There is no significant association between the environmental condition and the health of the people in the core of Akure.

H1: There is a significant association between the environmental condition and the health of the people in the core of Akure.

Chi Square was used to test the association between the condition of the environment and the health of the people in the core of Akure. Variables used to determine the condition of the environment was the general cleanliness of the environment which was discovered to be in a poor condition. From the reconnaissance survey conducted at the initial stage of the research, it was discovered that the environment was in an appalling state; the physical look of the buildings was poor. Debris were found in open spaces, some of the drainages was discovered to be blocked and some waterlogged, this breed mosquitoes which is the causative organism for malaria. Waste water from bathroom and kitchen, so also urine was discovered to be improperly channelled to drainages which created an ugly outlook of the environment. These variables were considered and used to test the association between them and the health of the people. Tables 7 and 8 revealed the association between the condition of the environment and the health of the people. The interpretation is that there is statistically significant association between the condition of the environment and the health of the people with a strong effect X^2 (6) = 449.167, p <.01, Cramer's v =.801. The implication is that; the environment affects significantly the health of the people. The diseases experienced and the frequency of the treatment had a relationship with the condition of the environment. The general pollution of the environment through indiscriminate disposal of waste water into drainages and the disposal of solid wastes in open spaces breed various insects, rodents and flies which when they come in contact with the human body, crumble the health and reduces the state of wellness. This goes to prove that the state of health of residents in a clean and serene environment will definitely improve as opposed to a dirty and unkempt environment.

Table 7. Chi-Square Tests.

	Value	Df	Asymptotic Significance [2-sided]
Pearson Chi-Square	449.167[a]	6	.000
Likelihood Ratio	255.557	6	.000
Linear-by-Linear Association	138.446	1	.000
N of Valid Cases	350		

a. 6 cells [50.0%] have expected count less than 5. The minimum expected count is .38. Source: Author's Field Survey, 2021.

Table 8. Symmetric Measures.

		Value	Approximate Significance
Nominal by Nominal	Phi	1.133	.000
	Cramer's V	.801	.000
N of Valid Cases		350	

Source: Author's Field Survey, 2021.

5. Conclusion and Recommendations

This paper has assessed the health situation of residents in the slum environment of Akure core. Results obtained revealed well as the major means of water supply in the area, these wells were not lined, the residents do not treat the water before use. This could pose serious health challenges to the residents due to some microorganisms that use such environment as their habitat. A mean distance of 12.5 meters was discovered to be between the residents' source of water and their toilet facility. This showed a close proximity between the two which can be very harmful to the health of the residents in this environment. The water when consumed could be a major

source of various water borne diseases. Mosquito attack was discovered to be prevalent in the environment, this could be traced to the poor state of the environment. Mosquitoes live and thrive in a dirty/water logged environment. Akure core exhibit these same characteristics. Malaria was recorded as the dominant disease experienced and treated on a monthly basis by the residents. The environmental condition of this study area, can be said to encourage this prevalent disease and at the long run can be detrimental to the body. Statistics also revealed that the condition of the environment had a significant association with the health of the people, which implied that, the environment affects significantly the health of the people.

Based on the empirical analysis results, this study proposed that hand dug wells should be situated far away from pit latrines and soakaway which can be a source of water contamination. A safe distance of 30 meters according to [3] should be kept up with; and all existing wells within 30 meters to source of pollution such as pit latrine and soakaway should be closed down. This study also propose that provision of potable water should be made available at strategic places which shall be within walkable distance to individual homes. This can be achieved through Public-Private-Partnership [PPP] and should be stricly monitored to avoid being abandoned at the long run. There is a need to put in place a constant sanitaion routine check which shall be conducted by the ministry of environment in this locale; this will help checkmate the sanitation practices of residents in the area.

Authenticity of Data

Data provided in this manuscript are authentic and reliable.

Declaration of Conflicting Interests

The authors have pronounced no expected irreconcilable situations as for the exploration, creation, as well as distribution of this article.

Aknowledgements of Sources of Data

All the sources used in gathering data for the development of this manuscript were acknowledged and referenced duly.

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