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Full Length Research Article

ASSESSMENT OF KNOWLEDGE, ATTITUDES AND PRACTICES ON WATER, SANITATION AND HYGIENE IN ZARIA LOCAL GOVERNMENT AREA, KADUNA STATE

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ABSTRACT
Water, Sanitation and Hygiene (WASH) Knowledge, Attitudes and Practices (KAP) are relevant concerns for sustained and effective implementation of WASH programs. This research was conducted in Zaria Local Government Area (LGA), Kaduna State to Assess the KAP on WASH to avail reliable data for informed interventions. 174 randomly selected households were interviewed. The result reveals four main sources of drinking water, viz borehole (31%), well (19%), pipe-borne (13.1%) and water packaged in sachet (24.7%). The result shows that 34.5% of households dispose solid waste through unauthorized waste collectors, 16.1 % use authorized collectors, 17.2% at public approved dumpsite, 16.1% at unapproved dump sites, 16.1% by burning, 4% bury their waste and 4% dispose waste in open water bodies/ways/drainages. The results shows that 30.5% of households have modern water closets, 42.8 % use pit latrine, and 11.5 % use public toilets. Based on the findings, it is evident that there is high accessibility of improved water to households, availability of improved toilet facility is also high, but waste management practice is poor. In conclusion, Zaria LGA is in need of WASH interventions especially as regards waste management. It is recommended that efforts should be made to intensify awareness about WASH.

Keywords: Water-Sanitation-Hygiene, Knowledge-Attitude-Practice, Households, Diseases/Infections

BACKGROUND

Water, sanitation and hygiene (WASH) services are considered a means of simultaneously promoting public relations and disease prevention (Prüss-Ustün *et al.,* 2019). It is estimated that improving good water and sanitation practices could prevent a total of 9% of the global burden of disease, which often leads to death, illness and the spread of water-borne diseases (Ibok & Daniel, 2014). Improved water supply from boreholes and wells with hand pumps is almost non-existent and mostly inadequate. Women and children travel long distances, especially for access to water, which takes energy and time, affecting children's education, women's households and economic productivity (Adeleye *et al.,* 2014). On the other hand, sanitary facilities such as excrement disposal facilities (toilets) are inadequate in local homes and public places such as schools (Hothur *et al.,* 2019) Markets (Francis *et al.,* 2016) and even in hospitals (World Health Organization, 2019), leaving people with no option but to defecate openly without the use of soaps or detergents, sometimes in and around water sources (Shrestha *et al.,* 2018). In addition, the toilets available were poorly maintained and mostly shared by large numbers of people, regardless of gender or the discretion of the women (Francis *et al.,* 2016). However, government failures prompted organizations such as the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) to help by offering a program called WASH. Her WASH team at UNICEF works on water and sanitation services in more than 100 countries around the world. WASH knowledge, attitudes and practices (KAP) are concerns related to the sustainable and effective implementation of her WASH program in the community (Du Monde, 2011). A lack of knowledge about water and sanitation leads to a lack of unsanitary practices and attitudes that contaminate water and spread disease (Yusuff *et al.,* 2014; Miner *et al.,* 2015) .This inadequate knowledge of sanitation leads to misconceptions about water quality and increases our reliance on surface water for drinking.

The declaration of a state of emergency by Kaduna State government on the WASH sector in 2020, to enable it to attain the national goal of making Nigeria Open Defecation Free (ODF) by the year 2025, as well as enable the state to build on the success of the Sanitation, Hygiene and Water in Nigeria (SHAWN) II programme is one that calls for urgent/spontaneous action (Oluwafunmilayo, 2020).

This study therefore aims to provide reliable data from the WASH KAP of Zaria Local Government Area (LGA) in Kaduna State to ensure effective implementation of WASH programs and good public health care.

Objectives

- To identify various sources of potable water accessed by households in Zaria LGA
- To identify various sanitation facilities accessible to households in Zaria LGA
- To estimate the proportion of households according to sources of portable water, sanitation levels as well hygiene facilities in Zaria LGA.
- To estimate proportion of households with access to improved water sources in Zaria LGA.
- To estimate proportion of households with access to sanitation facilities in Zaria LGA
- To estimate the proportion of households having improved hygiene facilities in Zaria LGA

According to UNICEF, poor access to improved water and sanitation facilities remains the main cause of high morbidity and mortality in Nigeria, especially among the more vulnerable children (Yaya *et al.,* 2018.) Poor access to clean water and inadequate basic sanitation are responsible for nearly 90% of deaths from

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childhood diarrhea due to water-borne diseases. Facilitating access to safe waste disposal, basic hygiene practices such as hand washing with soap, and safe water supplies limit the burden of soil-borne health infections and childhood infectious diseases such as diarrhea (Khalifa and Bidaisee 2018). Considered an important strategy for by some experts, an estimated 2.4 million deaths worldwide (4.2% of all deaths) could have been avoided each year through optimal use of WASH. WHO analysis shows that about 94% of all diarrheal diseases can be prevented by promoting access to clean water and better environmental conditions (He *et al.,* 2018).

In a study conducted in the Ibadan North Municipality Region, Oyo State, Nigeria, to assess water sanitation and hygiene practices in randomly selected households, found that 56.4% were treating water (Olukanni *et al.,* 2021). Of those who treated water, 28% boiled it, 20.1% filtered it with alum, and 33.5% used chlorine. 67.3% of households had flush toilets, 16% used improved pit toilets with good ventilation, and 1.8% defecate in bushes. It was also found that 37.3% washed their hands after using the restroom and 43.5% after eating. 25.8% washed their hands with water only, while 28% washed their hands with medicated soap and water. 31.8% of those surveyed said they had become ill in the past due to drinking water (Olukanni *et al.,* 2021).

In a study by Sridhar *et al.,* (2020), evaluating knowledge, attitudes and practices regarding water, sanitation and sanitation in several selected municipalities in Kaduna State, found that the main drinking water sources were surface water (52.5%). Levels of personal and environmental hygiene was fairly good across all local governments, with 65.4% reporting using soap and water for hand washing after defecation. The incidence of water-borne diseases is generally low in this region (Sridhar *et al.,* 2020).

SAMPLING METHODOLOGY AND TECHNIQUE

Description of Study Area

The study area considered in this research was Zaria Local Government Area (LGA) located within the Zaria Township. Zaria LGA lies within the geographical coordinates of longitudes 7°36'0" W to 7°46'0" E and latitude 11°2'0" S to 11°12'0" N, consisting of 13 wards. As at the last census, Zaria LGA has an estimated population of about 406,990 (National Population Commission, 2009). Zaria has an average of 563 km^2 in area (Kaka e*t al.,* 2018).

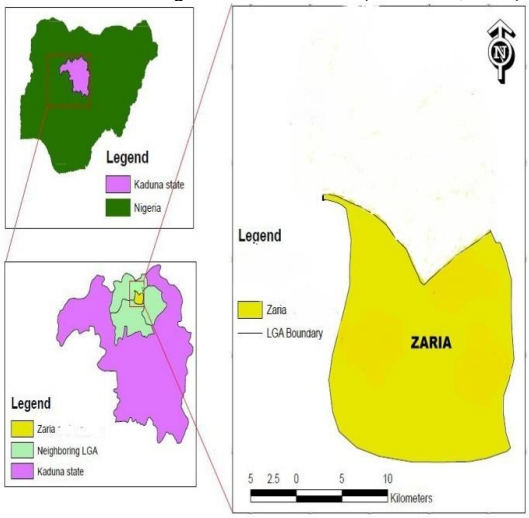

Figure 1: Map of the area of study (GADM, 2012).

Sampling Methodology

The survey is designed to be a cross-sectional survey using a multi-stage sampling design. The sampling plan for the survey aimed at generating point estimates of core indicators at state level. Although Slovin's sample size calculation was used (Tejada and Punzalan 2012), based on population which generated a sample size of 384 with margin of error of 0.05. However, considering the scarce funding, the research is reduced to a minimum of 144.

$$n = \frac{N}{(1 + Ne^2)}$$

The first stage involved the random selection of 12 Enumeration Areas (EAs) in Zaria LGA, from the Enumeration Area Demarcation (EAD) frame domiciled with Kaduna State Bureau of Statistics (KDBS).

The second sampling stage involved the random selection of 16 households from the records of earlier listed household across the 12 EAs, to participate in the study. Interviewers asked to speak to the head of the household or (if not available) asked for an adult who can answer questions about the subject of the research.

The study variables included socio-demographic characteristics, sources of water, and KAP regarding forms of household water treatment, water collection and storage systems, faecal disposal, and household as well as environmental hygiene (Sridhar *et al.,* 2020). Consent from households was obtained before the household questionnaire was administered.

The survey utilized Electronic-questionnaire Data Collection (EDC) methodology, using the kobo-toolbox and data collected was analyzed using the International Business Machines Corporation's Statistical Package for the Social Sciences version 25 (IBM SPSS 25) software.

FINDINGS

Coverage Analysis

The study sampled 196 households from 12EAs, however 175 were visited successfully covered, with consented interviews conducted in 174 household showing a response rate of 88.8%.

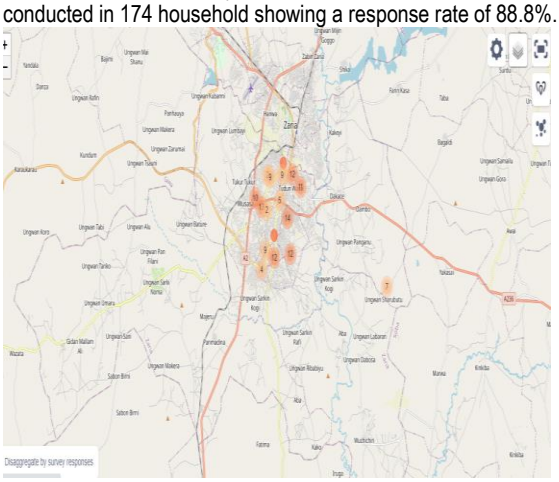

Figure 2: Heat map showing survey coverage
Source: Field Survey, (2023).

KAP on Water Supply and Management.

Water is a vital resource necessary for all forms of life. Access to safe and clean water is crucial for drinking, cooking, sanitation,

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agriculture, and industrial activities.

Table I: Main source of water used by household for general domestic purposes.

	Frequency	Percent
Bore-hole.	55	31.6
Bore-hole (hand pump).	18	10.3
Pipe Borne (Water) inside the Compound.	17	9.8
Pipe Borne (Water) outside Dwelling/Compound.	11	6.3
Pipe Borne inside Dwelling.	3	1.7
Protected Spring.	1	0.6
Protected Well.	44	25.3
Rivers/Stream.	1	0.6
Spring.	1	0.6
Unprotected Well.	15	8.6
Water Vendor (human pushed or Animal drawn Cart /Tricycle (Mairuwa) .	4	2.3
Water Vendor (tanker).	1	0.6
Others.	3	1.7
Total.	174	100.0

Source: Field Survey, (2023).

Table I above shows the distribution of households in Zaria LGA on their source of water for general domestic activities like cooking, bathing etc. the result reveals that most households amounting to over 40% source their water from bore holes, most of which are mechanized.
Some source water from wells, mostly protected while quite a few still get water from the government run water board system, either piped directly into their dwelling, compound or nearby facilities.

Table II: Main source of drinking water for household

	Frequency	Percent
Bore-hole.	35	20.1
Bore-hole (hand pump).	19	10.9
Bottled Water (Including from water dispenser).	9	5.2
Pipe Borne (Water) inside the Compound.	14	8.0
Pipe Borne (Water) outside Dwelling/Compound.	7	4.0
Pipe Borne inside Dwelling.	2	1.1
Protected Spring.	1	0.6
Protected Well.	20	11.5
Rivers/Stream.	1	0.6
Sachet Water (Pure water).	43	24.7
Unprotected Well.	13	7.5
Water Vendor (human pushed or Animal drawn Cart /Tricycle (Mairuwa).	6	3.4
Water Vendor(tanker).	1	0.6
Others.	3	1.7
Total.	174	100.0

Source: Field Survey, (2023).
Table II above reveals four main sources of water for drinking viz bore hole (31%), well (19%), pipe borne(13.1%) and water packaged in sachet (popular known as "pure water"). The result specifically reveals that 24.7% rely on sachet water, 20.9 % on mechanized borehole 10.1 % on hand pumps, 11.5% on protected wells, And 12% on pipe borne water outside dwelling and only 1.1% pipe borne supply directly inside dwelling.

Table III: Treatment to improve the quality of the drinking water

	Frequency	Percent
no	92	52.9
yes	82	47.1
Total	174	100.0

Source: Field Survey, (2023).

Table III above reveals that most households (52.9%) make good attempt to treat unpackaged water. Suggesting in table IV below that the most popular treatment methods are use of alum, boiling and chlorine.

Table IV: Type of treatment to improve the quality of the drinking water

	Frequency	Percent
Alum	35	42.7
Boiling	29	35.4
Chlorination	9	11.0
Cloth filtration.	2	2.4
Simple sand filtration	3	3.7
Others	4	4.9
Total	82	100.0

Source: Field Survey, (2023).

Table V: Reason for not treating water

	Frequency	Percent
High cost of water treatment chemicals	4	4.3
I don't know how to treat water	4	4.3
The water is clean	83	90.2
Treating water takes much time	1	1.1
Total	92	100.0

Source: Field Survey, (2023).

Also revealed in table V above was that the main reason why most don't treat water is because they believe the water is safe enough for drinking, while some either don't have knowledge on how to treat water or claim that the cost of treatment is high.

Table VI: Time taken to get to nearest water point

	Frequency	Percent
1 -2 hours	1	0.6
30 minutes to1 hour	23	13.2
Less than30 minutes	149	85.6
Don't know	1	0.6

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Total	174	100.0

Source: Field Survey, (2023).

The result also reveals in table VI above, was that 85.6% access water within just 30 minutes and table VII below suggest that males are mostly responsible for fetching water.

Table VII: Persons mostly responsible for fetching water in household

	Frequency	Percent
Adult females	8	4.6
Adult males	28	16.1
All members of the household	84	48.3
Boys	25	14.4
Girls	4	2.3
others	25	14.4
Total	174	100.0

Source: Field Survey, (2023).

Table VIII: Type of containers used for storage

	Frequency	Percent
bucket/drum with covers	104	59.8
jerry cans	23	13.2
open bowls/buckets (no cover)	41	23.6
Others	6	3.4
Total	174	100.0

Source: Field Survey, (2023).

Table VIII above shows that 59.8% of households use covered containers for water storage, 13% use jerrycans and 23.6% use open containers.

KAP on Sanitation and Hygiene.

This next section looks at attitude and practice of households towards general sanitation and hygiene. Precisely trying to get insight on how households collect their waste, various means of waste disposal, types of toilet facilities available to households and hand washing habits of households. Waste management plays a crucial role in maintaining a clean and healthy environment. The consequence of poor waste management can cause serious problems to human health and the environment. Effective waste management prevents the spread of diseases and protects public health. Proper disposal of hazardous waste, medical waste, and sewage reduces the risk of contamination and prevents the transmission of pathogens to humans and other organisms.

Also, promoting proper toilet sanitation and hygiene practices, including regular cleaning, hand washing, and maintenance, is crucial for minimizing these health risks and maintaining a safe and hygienic environment.

Table IX: Type of waste container mainly used by household

	Frequency	Percent
Covered container	30	17.2
Covered standard waste bin	18	10.3
Covered/uncovered basket	7	4.0
Polythene bag alone	2	1.1
Sack	39	22.4
Uncovered container	65	37.4
Uncovered standard waste bin	9	5.2
Others	4	2.3
Total	174	100.0

Source: Field Survey, (2023).

Table IX highlights the type of waste containers used by households to collect solid waste. The result shows that 10% use standard waste bins, 17.2 % manage with improvised covered containers 42.6% use uncovered bin while 22.4% use sacks for solid waste collection.

Table X: Main means of solid waste disposal used by households

	Frequency	Percent
Household Dispose into Drainage/ River/Sea/Creek/Pond.	7	4.0
Solid Waste Buried by Household.	7	4.0
Solid Waste Burnt by Households.	28	16.1
Solid Waste Collected by Authorized Collectors.	13	7.5
Solid Waste Collected by Unauthorized Collectors.	60	34.5
Solid Waste Disposed in an Unapproved Dump Site.	28	16.1
Solid Waste Disposed in Public Approved Dumpsite.	30	17.2
Others.	1	0.6
Total.	174	100.0

Source: Field Survey, (2023).

Table X above highlights how households dispose of solid wastes. The results reveals that majority of households (34.5%) engage the services of unauthorized waste collectors to dispose of solid waste, while 16.1 % enjoy the service of authorized collectors. 17.2% dispose of their waste at public approved dumpsite, and 16.1% dispose at unapproved dump sites. 16.1% of households burn their waste, 4% bury their waste and 4% dispose their waste in open water bodies/ways/drainages.

Table XI: How household dispose of waste water from bathroom, kitchen, laundry e.t.c.

	Frequency	Percent
Flows or thrown into drains/gutter.	115	66.1
Through drainage into a pit (soak away).	36	20.7
Through the sewage system.	2	1.1
Thrown onto the ground/street/outside.	20	11.5
Others.	1	0.6
Total.	174	100.0

Source: Field Survey, (2023).

Table XI above shows the means of water waste disposal by households. Waste considered here are waste generated from domestic activities like bathing, laundry, dishwashing etc. the result reveals that 66.1% of households dispose of water waste into nearby gutters/drainage. 20.7% make use of the personal improved pit drainage system, while 11.5% just thrown their waste in open fields.

Table XII: Type of toilet facility usually used by members of

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household

	Frequency	Percent
Pit Latrine without covering (Without Slab).	17	9.8
Pit latrine without ventilation with covering, exclusively used by households.	32	18.4
Pit latrine without ventilation with covering, shared by households.	25	14.4
Public Toilet.	20	11.5
Ventilated improved Pit Latrine exclusively used by households.	5	2.9
Ventilated improved Pit Latrine shared by households.	17	9.8
Water Closet shared by households outside the housing unit (outside the building).	4	2.3
Water Closet within the housing unit.	53	30.5
Others.	1	0.6
Total.	174	100.0

Source: Field Survey, (2023).

The toilet is a very important facility used to answer the call of nature. It has also been observed to be a medium for fast disease transmission. Table XII above shows the result of type of toilet facility available to households. The results suggest that 30.5% of households in Zaria LGA have modern water closets installed right inside their respective dwelling, while 18.4% of households use the pit latrine with covering but exclusively for their households. 14. 4 % use share pit latrines and 11.5 % use public toilets and 9.8%.use pit latrine without covering. As for infant feacal waste, table XIII below shows that most households dispose of such in the toilet/latrine.

Table XIII: Disposal of child feacal waste

	Frequency	Percent
In the bush	1	0.6
In the toilet/latrine	169	97.1
Others	4	2.3
Total	174	100.0

Source: Field Survey, (2023).

Hand wash practice, Knowledge and Prevalence of WASH Related Diseases.

Table XIV below shows the result of practice of households with respect to hand washing.

Table XIV: Hand wash practice

	Frequency	Percent
Water and soap	131	75.3
Water only	37	21.3
Water with ash	1	0.6
Nothing	1	0.6
Others	4	2.3
Total	174	100.0

Source: Field Survey, (2023).

The result reveals that 75.3% of households actually use water and soap in washing hands. Others mostly use just water.

DISCUSSION

By the standards, an improved water source is one which is available when needed or within 30min of household and free of faecal and other external contamination (World Health Organization, 2017). This research discovered that a good number of households (about 78%) in Zaria LGA have access to improved water source both for dinking and general domestic use, which a welcome development unlike as observed in similar studies in some other parts of Kaduna state, where there were almost no improved water sources (Sridhar *et al.,* 2020); therefore, communities widely use wells and water sources that are polluted due to lack of adequate drinking water sources (Ibrahim *et al.,* 2016) for drinking which can spread infection (Lukman *et al.,* 2016). A closer look at the data suggests that dwellings in the rural areas do not enjoy such luxury, which is a cause for concern. It was discovered that only 1.1% of households enjoy direct service of the State's water board corporation, which is only an indication that the Water Board Corporation is highly inefficient in meeting the needs of water for the people of Zaria LGA. The research also discovered that most households do not give importance to treating water before consumption; hence further research might need to investigate the quality of such water to ascertain if it's actually safe for drinking.

It was also noted that most households (over 50%) collect their solid wastes with uncovered containers unlike as observed in some parts (western/eastern) of Nigeria, where mostly protected containers are used (Olukanni *et al.,* 2021). This is considered not best practice as exposed garbage makes easy harborage for disease vectors and eventually become heavily contaminated and depositing germs at the slightest contact (Nnaji, 2015), leading to disease like diarrhea (Yaya *et al.,* 2018). Most households (over 70%) also dispose of solid waste through unsafe mediums viz burning, unauthorized collectors who most like dispose same in unauthorized locations, and even nearby drainages, thereby exposing themselves to several health and environment risk. The attitude towards disposing water waste is also lamentable, as doing so only could increase the chance of surface or even ground water contamination.

The connection between source of water and prevalence of WASH related diseases indicates the importance for emphasis on need for proper water management. It is not enough to be disposed to improved water; attention must also be given to other components of the WASH framework.

The research further revealed that about 78% of households have access to improved toilet facility, with most having the modern water closet systems inside their dwelling. However, a good proportion still use unimproved pit latrines this is in contrast to findings in similar study in other part of Kaduna state were lack of improved toilet facilities resulted in the indulging of open defecation by members of the community (Sridhar *et al.,* 2020) a development also noted in other developing countries (Reddy *et al.,* 2017). Also revealed was that a good number of households practice good hand washing practice.

Conclusion

With a goal to gain insight on the attitude and practice of households in Zaria LGA towards WASH, the research got Reponses from 174 samples across 12 EAs. Based on the findings from this research, it might be tempting to assume that given there is high accessibility of improved water to households in Zaria (although mostly are from boreholes that are managed by private owners), and that availability of improved toilet facility is also high in Zaria LGA, but the fact that waste management practice and knowledge is note so good may still present dire implications. Because even if availability of improved water and improved toilet facility is at 100%, the lack of proper waste management still exposes inhabitant to same health risk associated with poor WASH practices.

Hence in conclusion, Zaria LGA is in need of WASH interventions especially as regards waste management and the government's effort towards providing basic water and sanitation services cannot be relied upon.

Recommendations

Based on the findings from this research, the following recommendations are suggested;

a. Efforts should be made to make more awareness on importance of proper hygiene practice.
b. Efforts should be made to increase installation of improved water facilities especially around rural settings.
c. Efforts should be made to educate household on proper water management practice; from the point of treatment to storage.
d. More private waste collectors should be encouraged and structured in a way that it effectively takes care of waste collection problems in the society.

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