Socio-Demographic and Access-Related Determinants of Untreated Hand-Dug Well Water use in Urban Slums of Abuja, Nigeria: A Cross-Sectional Study

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ABSTRACT

Access to safe and reliable drinking water remains a major public health challenge in many urban slum communities in Nigeria. In Abuja, increasing dependence on untreated hand-dug wells exposes households to significant risks of waterborne diseases. This study assessed the socio-demographic and access-related determinants of the use of untreated hand-dug well water among households in selected urban slum communities in Abuja, Nigeria. A community-based cross-sectional study was conducted among 340 households selected from four urban slum communities within the Abuja Municipal Area Council using a multistage sampling technique. Data were collected using a structured interviewer-administered questionnaire adapted from standard Water, Sanitation, and Hygiene (WASH) survey instruments. Descriptive statistics were used to summarize study variables, while Chi-square analysis and binary logistic regression were performed to assess associations and predictors of untreated well-water use. Statistical significance was set at $p < 0.05$. The prevalence of untreated hand-dug well water use was 51.8%, while 61.8% of respondents reported not treating water before consumption. Educational attainment significantly influenced water source choice, with respondents possessing a tertiary education less likely to rely on untreated wells (AOR = 0.34; 95% CI: 0.21–0.56; $p < 0.001$). Larger households demonstrated higher dependence on untreated wells, particularly households with ten or more members (AOR = 2.32; 95% CI: 1.38–3.90; $p = 0.001$). Households located more than 100 meters from water sources were less likely to use untreated wells (AOR = 0.66; 95% CI: 0.46–0.95; $p = 0.026$). The study demonstrates that reliance on untreated hand-dug well water in Abuja's urban slums is influenced by socio-demographic and access-related factors. Targeted interventions focusing on safe water infrastructure, household water treatment practices, environmental sanitation, and community-based WASH education are necessary to reduce exposure to unsafe water sources in underserved urban settlements.

Keywords: untreated well water, urban slums, WASH, water access, household determinants, Nigeria

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Highlights

• Untreated well use remains high (51.8%) in Abuja slum households

• Education reduces reliance on unsafe water sources significantly

• Larger households are more likely to depend on untreated wells

• Distance influences water choice, not always toward safer sources

• Awareness does not translate into safe water treatment practices

INTRODUCTION

Access to safe drinking water is fundamental to public health, human development, and disease prevention. Despite global progress in water supply coverage, access to safely managed drinking water services remains inadequate in many low- and middle-income countries, particularly within urban informal settlements. In Nigeria, rapid urbanization and population growth have contributed to the expansion of slum communities where public infrastructure development has not kept pace with increasing demand for water and sanitation services [1,2].

Urban slum residents frequently depend on alternative water sources such as shallow wells, boreholes, water vendors, and surface water. Among these, untreated hand-dug wells remain common because they are relatively inexpensive, easily accessible, and often available within residential compounds. However, these wells are frequently poorly protected and are highly vulnerable to contamination from nearby pit latrines, waste dumpsites, drainage channels, and animal activities [3]. Consumption of untreated water from contaminated sources contributes substantially to the burden of diarrheal diseases, cholera, typhoid fever, and other waterborne infections in developing countries [4].

Previous studies have shown that water-use behavior is shaped not only by water availability but also by several socio-demographic and environmental factors, including educational attainment, household size, economic constraints, and physical access to water sources [5,6].

Households with lower educational status and limited financial resources are often more likely to rely on unsafe water sources because safer alternatives may be unaffordable or inaccessible. Similarly, larger households may prioritize water quantity and affordability over water quality.

Although several studies have examined water access and sanitation challenges in Nigeria, there remains limited context-specific evidence regarding the determinants of untreated hand-dug well water use within urban slum communities in Abuja.

Understanding these determinants is important for designing effective WASH interventions and informing public health policies aimed at reducing exposure to unsafe water sources. This study, therefore, examined the socio-demographic and access-related determinants of the use of untreated hand-dug well water among households in selected urban slum communities in Abuja, Nigeria.

METHODS

Study Area and Study Design

A community-based cross-sectional study was conducted in four urban slum communities—Nyanya, Karu, Karmo, and Mpape—located within the Abuja Municipal Area Council (AMAC), Federal Capital Territory, Nigeria. These communities are characterized by inadequate access to formal water supply systems, poor environmental sanitation, overcrowding, and heavy dependence on informal water sources (Fig 1).

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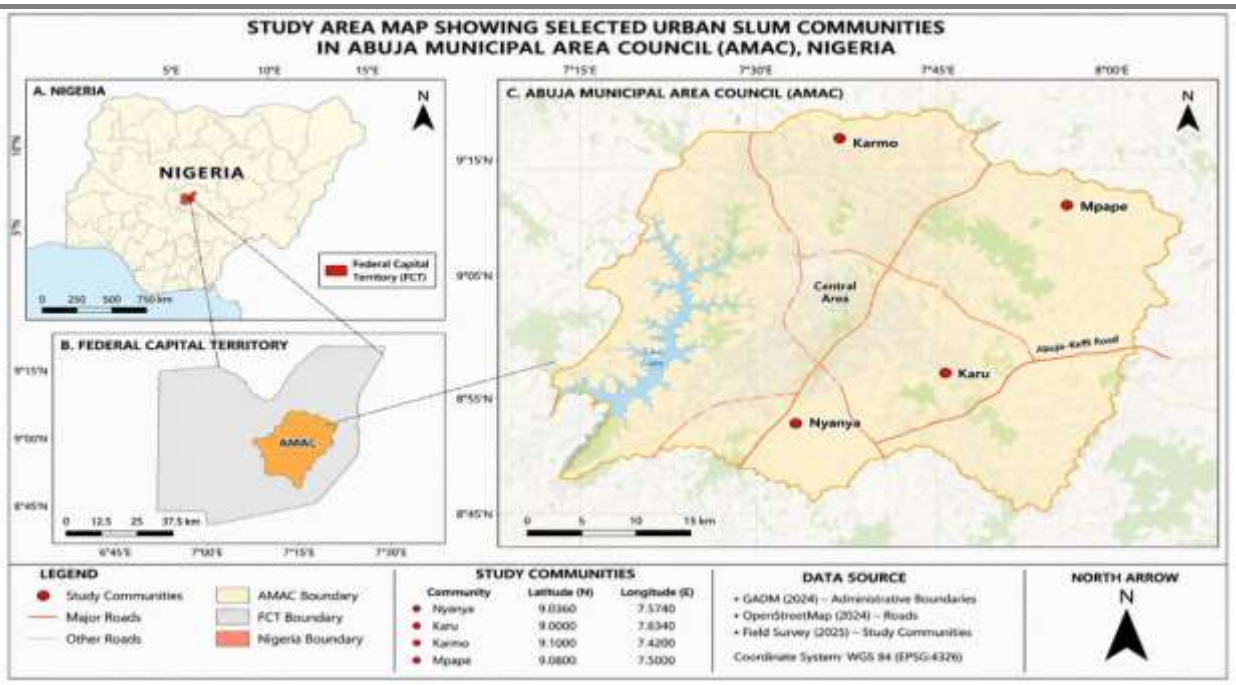

Fig 1. Map indicating the study area

Study Population and Sampling Technique

The study population comprised households residing within the selected urban slum communities. A multistage sampling technique was employed. First, the four communities were purposively selected based on their high population density and documented reliance on informal water sources. Cluster sampling was subsequently used to identify residential areas within each community, after which systematic random sampling was applied to select households. A total of 380 households were approached for participation, of which 340 completed the questionnaire, yielding a response rate of 89.5%.

Inclusion Criteria

The following households were eligible for inclusion:

- Households are located within the selected urban slum communities.
- Households present during the period of data collection.
- Respondents aged 18 years and above who had resided in the community for at least six months.

Households were included irrespective of their primary water source to enable comparison between users and non-users of untreated hand-dug well water.

Data Collection Instrument

Data was collected using a structured interviewer-administered questionnaire adapted from standard Water, Sanitation and Hygiene (WASH) survey tools, including WHO/UNICEF Joint Monitoring Programme instruments and related literature [2,7]. The questionnaire captured information on:

- Socio-demographic characteristics.
- Household water sources and usage patterns.
- Water handling and treatment practices.
- Environmental and sanitation conditions.
- Knowledge and perceptions regarding water safety.

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The questionnaire was pretested among 30 households in a similar community outside the study area to assess clarity and suitability. Necessary modifications were made following the pilot study.

Validity and Reliability

Content validity was assessed by experts in public health and environmental health. Reliability analysis was conducted using Cronbach's alpha coefficient. The overall Cronbach's alpha value was 0.78, indicating acceptable internal consistency of the questionnaire items.

Data Collection Procedure

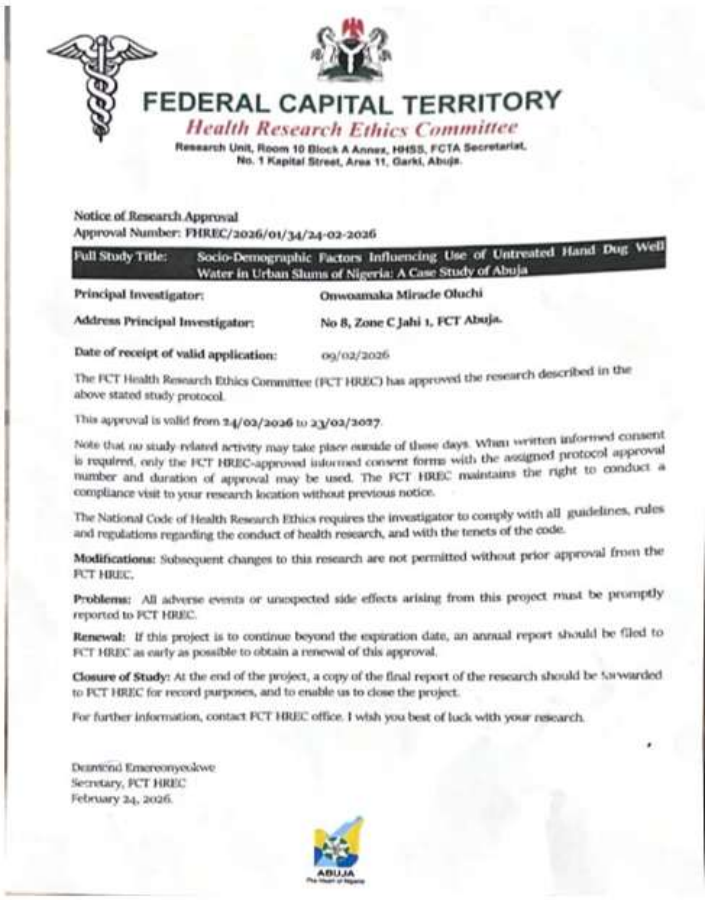
The questionnaire was administered through face-to-face interviews by trained research assistants to accommodate respondents with varying literacy levels. Enumerators received training on study objectives, ethical considerations, and standardized interviewing procedures.

Data Analysis

Data were analyzed using SPSS version 26. Descriptive statistics, including frequencies and percentages, were used to summarize variables. Chi-square tests were used to assess associations between socio-demographic variables and untreated water use. Binary logistic regression analysis was performed to identify independent predictors of untreated hand-dug well water use. Statistical significance was established at $p < 0.05$. Model fitness was assessed using the Hosmer–Lemeshow goodness-of-fit test.

Ethical Considerations

Ethical approval was obtained from the Federal Capital Territory Health Research Ethics Committee (Approval Number: FHREC/2026/01/34/24-02-2026). Written informed consent was obtained from all participants before data collection. Confidentiality and anonymity of respondents were maintained throughout the study (Fig 2).



FEDERAL CAPITAL TERRITORY
Health Research Ethics Committee
Research Unit, Room 10 Block A Annex, HHSS, FCTA Secretariat,
No. 1 Kapital Street, Area 11, Garki, Abuja.

Notice of Research Approval
Approval Number: FHREC/2026/01/34/24-02-2026

Full Study Title:	Socio-Demographic Factors Influencing Use of Untreated Hand Dug Well Water in Urban Slums of Nigeria: A Case Study of Abuja
Principal Investigator:	Onwoamaka Miracle Oluchi
Address Principal Investigator:	No 8, Zone C Jahi 1, FCT Abuja.
Date of receipt of valid application:	09/02/2026

The FCT Health Research Ethics Committee (FCT HREC) has approved the research described in the above stated study protocol.

This approval is valid from 24/02/2026 to 23/02/2027.

Note that no study related activity may take place outside of these days. When written informed consent is required, only the FCT HREC-approved informed consent forms with the assigned protocol approval number and duration of approval may be used. The FCT HREC maintains the right to conduct a compliance visit to your research location without previous notice.

The National Code of Health Research Ethics requires the investigator to comply with all guidelines, rules and regulations regarding the conduct of health research, and with the tenets of the code.

Modifications: Subsequent changes to this research are not permitted without prior approval from the FCT HREC.

Problems: All adverse events or unexpected side effects arising from this project must be promptly reported to FCT HREC.

Renewal: If this project is to continue beyond the expiration date, an annual report should be filed to FCT HREC as early as possible to obtain a renewal of this approval.

Closure of Study: At the end of the project, a copy of the final report of the research should be forwarded to FCT HREC for record purposes, and to enable us to close the project.

For further information, contact FCT HREC office. I wish you best of luck with your research.

Desmond Emereonyeolowe
Secretary, FCT HREC
February 24, 2026.

ABUJA

Fig 2: The Ethical Consideration

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RESULTS

Socio-Demographic Characteristics of Respondents

A total of 340 respondents participated in the study. Most respondents were aged between 18 and 35 years (70.5%), while females accounted for 53.5% of the study population. More than half of the respondents (52.9%) had attained tertiary education, whereas only 4.1% reported having no formal education. Household sizes were generally moderate to large, with 45.3% comprising 4–6 persons (Table 1).

Table 1. Socio-Demographic Characteristics of Respondents (n = 340)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18–25	112	32.9
	26–35	128	37.6
	36–45	68	20.0
	≥46	32	9.5
Gender	Male	158	46.5
	Female	182	53.5
Marital Status	Single	176	51.8
	Married	142	41.8
	Widowed	12	3.5
	Divorced	10	2.9
Educational Level	No formal education	14	4.1
	Primary	38	11.2
	Secondary	108	31.8
	Tertiary	180	52.9
Household Size	1–3 persons	96	28.2
	4–6 persons	154	45.3
	7–9 persons	66	19.4
	≥10 persons	24	7.1

Prevalence and Patterns of Untreated Well Water use

Untreated hand-dug wells were the most frequently reported source of drinking water, accounting for 51.8% of households. Boreholes constituted 28.8% of water sources, while municipal water supply accounted for 12.4%. More than half of respondents (54.1%) relied on shared or community-managed water sources, and 57.6% reported paying for water. Water shortages were commonly experienced during the dry season, as reported by 64.1% of respondents (Table 2, Fig 3).

Table 2. Water Sources and Access Characteristics Among Respondents (n = 340)

Variable	Category	Frequency (n)	Percentage (%)
Primary Drinking Water Source	Hand-dug well	176	51.8
	Borehole	98	28.8
	Municipal supply	42	12.4
	Other sources	24	7.0
Distance to Water Source	<50 m	144	42.4
	50–100 m	118	34.7
	>100 m	78	22.9
Average Daily Water Consumption	<20 L	74	21.8
	20–50 L	188	55.3
	>50 L	78	22.9
Ownership of Water Source	Private	102	30.0

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	Community/shared	184	54.1
	Vendor	54	15.9
Payment for Water	Yes	196	57.6
	No	144	42.4
Seasonal Water Shortage	Dry season	218	64.1
	Rainy season	46	13.5
	No shortage	76	22.4

Water Handling and Treatment Practices

Plastic drums (42.9%) and jerry cans (32.4%) were the most common water storage containers. Although 46.5% of respondents consistently covered storage containers, 17.0% reported never covering stored water. A substantial proportion of households (61.8%) did not treat water before consumption. Among households practicing water treatment, boiling was the most frequently reported method (18.2%), followed by filtration (10.0%) and chlorination (6.5%) (Table 3).

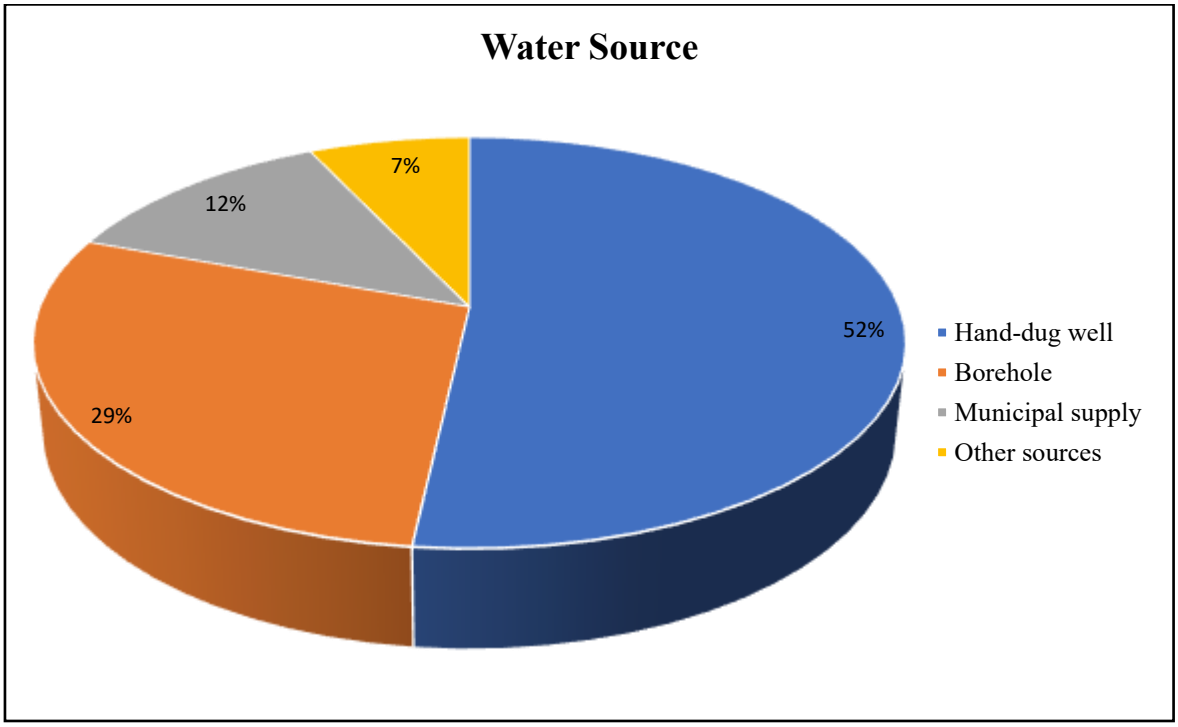

Fig 3: Distribution of Primary Sources of Drinking Water among Respondents.

Table 3. Water Handling and Treatment Practices Among Respondents (n = 340)

Variable	Category	Frequency (n)	Percentage (%)
Storage Container Type	Plastic drum	146	42.9
	Clay pot	58	17.1
	Jerry can	110	32.4
	Other	26	7.6
Cover Storage Containers	Always	158	46.5
	Sometimes	124	36.5
	Never	58	17.0
Cleaning Frequency	Daily	84	24.7
	Weekly	132	38.8
	Monthly	76	22.4
	Rarely	48	14.1
Treat Water Before Drinking	Yes	130	38.2

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	No	210	61.8
Treatment Method	Boiling	62	18.2
	Filtration	34	10.0
	Chlorination	22	6.5
	Other	12	3.5
	Not applicable	210	61.8
Source of Water Treatment Knowledge	Health worker	96	28.2
	Media	78	22.9
	School	64	18.8
	Other sources	102	30.1

Perceptions of Water Safety and Environmental Conditions

Although awareness of waterborne diseases was relatively high (72.9%), unsafe water practices remained common. Approximately 43.5% of respondents considered their drinking water unsafe, while 40.6% reported previous experiences of water-related illnesses, particularly diarrhea and typhoid fever. The environmental conditions surrounding water sources indicated considerable contamination risks. Nearly one-quarter (24.7%) of water sources were located within 10 meters of sanitation facilities, while 41.8% were situated close to waste dumpsites. In addition, 62.4% of water sources lacked protective fencing (Table 4).

Table 4. Perceptions of Water Safety and Water-Related Illnesses Among Respondents (n = 340)

Variable	Category	Frequency (n)	Percentage (%)
Safety Rating of Drinking Water	Safe	126	37.1
	Unsafe	148	43.5
	Don’t know	66	19.4
Perception of Untreated Well Water Safety	Yes	102	30.0
	No	174	51.2
	Not sure	64	18.8
Notice Changes in Water Quality	Yes	156	45.9
	No	184	54.1
Experienced Water-Related Illness	Yes	138	40.6
	No	202	59.4
Type of Illness	Diarrhea	74	21.8
	Typhoid	42	12.4
	Cholera	10	2.9
	Other illnesses	12	3.5
	Not applicable	202	59.4
Awareness of Waterborne Diseases	Yes	248	72.9
	No	92	27.1

Association Between Socio-Demographic Factors and Untreated Well Water Use

Chi-square analysis showed no statistically significant association between age and untreated hand-dug well water use ($\chi^2 = 4.62$, $p = 0.201$). However, educational attainment and household size demonstrated statistically significant associations with untreated well water use ($p < 0.001$). Reliance on untreated wells decreased progressively with increasing educational attainment.

Respondents with a tertiary education were considerably less likely to use untreated wells compared with respondents without formal education. Similarly, larger households showed significantly higher dependence on untreated wells compared with smaller households (Table 5).

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Table 5. Association Between Socio-Demographic Variables and Untreated Well Water Use

Age Group (years)	Used Untreated Well n (%)	Did Not Use Untreated Well n (%)	Total	χ^2	p-value
18–25	48 (60.0)	32 (40.0)	80		
26–35	72 (65.5)	38 (34.5)	110		
36–45	52 (65.0)	28 (35.0)	80	4.62	0.201
≥46	46 (65.7)	24 (34.3)	70		
Total	**218**	**122**	**340**		

Predictors of Untreated Well Water use

Binary logistic regression analysis identified educational attainment, household size, and distance to water source as significant predictors of untreated hand-dug well water use. Respondents with tertiary education were significantly less likely to rely on untreated wells (AOR = 0.34; 95% CI: 0.21–0.56; $p < 0.001$). Conversely, households with ten or more members were more than twice as likely to depend on untreated wells (AOR = 2.32; 95% CI: 1.38–3.90; $p = 0.001$). Households located more than 100 meters from their water source were significantly less likely to use untreated wells (AOR = 0.66; 95% CI: 0.46–0.95; $p = 0.026$) (Table 6).

Table 6. Binary Logistic Regression Analysis Predicting Untreated Hand-Dug Well Water Use (n = 340)

Predictor Variable	B	SE	AOR	95% CI	p-value
Age (26–35 vs 18–25)	0.24	0.19	1.27	0.88–1.83	0.184
Secondary education	-0.61	0.21	0.54	0.36–0.81	0.003*
Tertiary education	-1.08	0.24	0.34	0.21–0.56	<0.001*
Household size (7–9 persons)	0.68	0.22	1.98	1.28–3.08	0.002*
Household size (≥10 persons)	0.84	0.26	2.32	1.38–3.90	0.001*
Distance >100 m from source	-0.42	0.18	0.66	0.46–0.95	0.026*

*Reference categories: Age (18–25 years), Education (No formal education), Household size (1–3 persons), Distance (<50 m). AOR = Adjusted Odds Ratio; CI = Confidence Interval. Statistically significant at $p < 0.05$.

DISCUSSION

This study assessed the socio-demographic and access-related determinants of the use of untreated hand-dug well water in selected urban slum communities in Abuja, Nigeria. The findings revealed a high prevalence of untreated water use among households despite relatively high awareness of waterborne diseases. The high dependence on untreated hand-dug well observed in this study reflects persistent inequalities in access to safely managed water services within informal urban settlements. Similar findings have been reported in other Nigerian and sub-Saharan African urban slum communities where unreliable municipal supply and economic constraints compel households to depend on informal water sources [5,8]. The persistence of unsafe water use in urban settlements highlights the need for inclusive urban planning and equitable water infrastructure development.

Educational attainment emerged as a significant protective factor against reliance on untreated wells. Respondents with higher educational status were less likely to use untreated water sources, likely due to improved health literacy, awareness of waterborne disease risks, and greater access to alternative water options. This finding is consistent with studies conducted in Ghana, Kenya, and Nigeria, which reported that higher educational attainment improves adoption of safer water practices [6,9]. Household size also significantly influenced water source choice. Larger households demonstrated increased reliance on untreated wells, possibly because of higher household water demand and economic pressure associated with purchasing safer water sources. Although household income was not directly measured in this study, household size, education, and payment for water may indirectly reflect socioeconomic status. Future studies should incorporate direct measures of household income or wealth indices to strengthen the understanding of economic influences on water-use behavior.

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An important finding of this study was the inverse relationship between distance to water source and untreated well water use. Households located farther from water sources were less likely to rely on untreated wells. This may indicate that households living farther from shallow wells are more likely to seek alternative sources, such as boreholes or vendor-supplied water perceived to be safer. The finding further suggests that convenience and accessibility strongly influence household water choices. Despite a relatively high awareness of waterborne diseases, many households did not practice household water treatment. This demonstrates a knowledge-practice gap commonly observed in WASH-related studies, where awareness alone does not necessarily translate into safe practices due to economic, behavioral, and structural barriers [10]. Public health interventions should therefore move beyond awareness campaigns and include practical support measures such as low-cost household treatment technologies, subsidized water services, and community-level behavior change programs.

The environmental conditions observed around many water sources, including proximity to sanitation facilities, waste dumpsites, and drainage channels, indicate significant contamination risks. These conditions are consistent with previous reports linking shallow well contamination to poor sanitation and environmental management in densely populated urban communities [11]. Strengthening environmental sanitation and protecting existing water sources should therefore form part of integrated WASH interventions. The findings of this study have important policy implications for urban slum communities in Nigeria. Government agencies and development partners should prioritize the expansion of safe and affordable water infrastructure within underserved settlements. Community-based interventions promoting household water treatment, environmental sanitation, and regular monitoring of water quality should also be strengthened. In addition, local authorities should enforce environmental regulations relating to waste disposal and safe sanitation facilities near water sources.

From a One Health perspective, unsafe water use in densely populated urban settlements has implications for human, environmental, and community health. Improving access to safe water and sanitation is therefore essential for reducing the burden of waterborne diseases and improving overall public health outcomes.

Study Limitations

This study has several limitations. First, the cross-sectional design limits causal interpretation of the observed associations. Second, the use of self-reported data may have introduced recall and social desirability bias. Third, microbiological analysis of water samples was not conducted; therefore, actual contamination levels of water sources could not be confirmed. Future studies should incorporate laboratory-based microbiological assessment of water quality to complement household survey findings and strengthen scientific rigor. Finally, direct household income and wealth indicators were not quantitatively measured.

CONCLUSION

Reliance on untreated hand-dug well water remains high among households in urban slum communities in Abuja, Nigeria. Educational attainment, household size, and distance to water sources significantly influence water-use behavior. Despite awareness of waterborne disease risks, unsafe water handling and treatment practices remain common.Improving access to safe drinking water in urban slums requires integrated interventions that address infrastructure deficits, environmental sanitation, socioeconomic inequalities, and household behavior. Targeted WASH interventions focusing on vulnerable households, community engagement, and environmental protection are essential for reducing dependence on unsafe water sources and improving public health outcomes in underserved urban communities.

Funding

This research received no specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data Availability Statement

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

Credit Authorship Contribution Statement

Chinwe E. Okoli and Onwoamaka Miracle Oluchi conceptualized and designed the study, collected data, performed statistical analysis, and prepared the original manuscript draft. Enid Godwin and Abdulrahman Musa Adeiza contributed to manuscript review, editing, and interpretation of findings.

Conflict Of Interest

The authors declare no conflict of interest.

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Appendix I: Consent Form

University of Abuja Faculty of Veterinary Medicine

Department of Veterinary Public Health and Preventive Medicine

Dear Respondent,

My name is Onwoamaka Miracle Oluchi, a postgraduate student of the University of Abuja with ID number 23/31VVHW/034. I am conducting a research study titled:

"**Socio-Demographic Factors Influencing Use Of Untreated Hand-Dug Well Water In Urban Slums Of Nigeria (A Case Study Of Abuja)".**

This study aims to examine how socio-demographic characteristics such as income, education, household size, and length of residence influence the continued use of untreated hand-dug well water in selected urban slum communities. The findings will provide evidence for targeted interventions that can help improve water safety, reduce the risk of waterborne diseases, and enhance public health outcomes in these areas.

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I am inviting you to participate in this study. Your participation is voluntary, and you may choose to withdraw at any time without penalty. All information you provide will be kept strictly confidential and will be used solely for academic purposes.

Benefits of Participating in the Study

While there may be no direct personal benefit to you, your participation will help generate valuable data that could inform community-based water safety programmes, public health policies, and awareness campaigns aimed at reducing reliance on unsafe water sources.

I have fully explained the nature and purpose of this research to: .....

Participant's Signature: _____ Date: _____

Researcher's Name and Signature: _____ Date: _____

Supervisor's Name and Signature: _____ Date: _____

Appendix II: Questionnaire

Socio-Demographic Factors Influencing Use Of Untreated Hand-Dug Well Water In Urban Slums Of Nigeria (A Case Study Of Abuja)

This questionnaire is designed to collect data on water sources, handling practices, and perceptions of water safety among residents of selected urban slum communities in Abuja (FCT), Nigeria. Your responses will be kept strictly confidential and used solely for academic research purposes.

Section A: Socio-Demographic Information

N/S	QUESTION	RESPONSE OPTIONS
1	Age	18–25 ( ), 26–35 ( ), 36–45 ( ), 46+ ( )
2	Gender	Male ( ), Female ( )
3	Marital Status	Single ( ), Married ( ), Widowed ( ), Divorced ( )
4	Level of Education	No formal education ( ), Primary ( ), Secondary ( ), Tertiary ( )
5	Occupation	Specify: _____
6	Household size	1–3 ( ), 4–6 ( ), 7–9 ( ), 10+ ( )

Section B: Water Source And Access

N/S	Question	Response Options
7	Primary source of drinking water	Hand-dug well ( ), Borehole ( ), Municipal supply ( ), Other: _____
8	Distance from your house to the water source	Less than 50m ( ), 50–100m ( ), Over 100m ( )
9	Average daily water consumption	Less than 20L ( ), 20–50L ( ), Over 50L ( )

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10	Ownership of the water source	Private ( ), Community/shared ( ), Vendor ( )
11	Months when water shortages occur	Specify: _____
12	Do you pay for water?	Yes ( ), No ( )

Section C: Water Handling And Storage Practices

N/S	Question	Response Options
13	Type of water storage container	Plastic drum ( ), Clay pot ( ), Jerry can ( ), Other: _____
14	Do you cover water storage containers?	Always ( ), Sometimes ( ), Never ( )
15	How often do you clean your water storage?	Daily ( ), Weekly ( ), Monthly ( ), Rarely ( )
16	Do you treat your water before drinking?	Yes ( ), No ( )
17	If yes, the method of treatment	Boiling ( ), Filtration ( ), Chlorination ( ), Other: _____
18	Source of knowledge on water treatment	Health worker ( ), Media ( ), School ( ), Other: _____

Section D: Perception Of Water Safety

N/S	Question	Response Options
19	How would you rate the safety of your drinking water?	Safe ( ), Unsafe ( ), Don't know ( )
20	Do you believe untreated well water is safe to drink?	Yes ( ), No ( ), Not sure ( )
21	Do you notice changes in the water's taste, color, or smell?	Yes ( ), No ( )
22	Have you ever experienced illness linked to water?	Yes ( ), No ( )
23	If yes, what kind of illness?	Diarrhea ( ), Typhoid ( ), Cholera ( ), Other: _____
24	Are you aware of diseases spread through unsafe water?	Yes ( ), No ( )

Section E: Environmental And Sanitation Factors

N/S	Question	Response Options
25	Distance between the water source and the nearest toilet/latrine	Less than 10m ( ), 10–30m ( ), Over 30m ( )
26	Is the water source fenced or protected?	Yes ( ), No ( )
27	Presence of a waste dumpsite near a water source	Yes ( ), No ( )
28	Do animals have access to your water source?	Yes ( ), No ( )
29	Are there drainage channels near your water source?	Yes ( ), No ( )

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30	Have you reported unsafe water conditions to authorities?	Yes ( ), No ( )

Section F: Knowledge And Awareness

N/S	Question	Response Options
31	Have you attended any community meetings on water safety?	Yes ( ), No ( )
32	Do you know how to treat water at home?	Yes ( ), No ( )
33	Can you identify signs of water contamination?	Yes ( ), No ( )
34	Do you know the health effects of drinking unsafe water?	Yes ( ), No ( )
35	Do you think the government is responsible for providing safe water?	Yes ( ), No ( )
36	Do you know of NGOs working on water safety in your area?	Yes ( ), No ( )

Section G: Recommendations

N/S	Question	Response Options
37	Would you be willing to pay for safer water?	Yes ( ), No ( )
38	Preferred method for improving water quality	Treatment ( ), Protection ( ), Relocation ( )
39	Would you participate in community water projects?	Yes ( ), No ( )
40	Any suggestions for improving water safety?	_____

Scoring Key

Each correct or safe practice response will be scored as 1 point, while incorrect or unsafe practice responses will be scored as 0 points. Higher scores indicate better knowledge and practices regarding safe water handling and usage.