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Investigation of Factors Influencing Effective Utilization of Home Appliances among Households in Sokoto Metropolis

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ABSTRACT

The study investigates the factors influencing effective utilization of home appliances among households in Sokoto Metropolis. The study was conducted in Sokoto Metropolis, the capital city of Sokoto State. A multi-stage sampling technique was used to select Ten (10) wards purposively and 10 respondents were randomly selected from each of the ten (10) wards making a total of 100 respondents. The data collected were analyzed using descriptive and Likert scale and score and any items below 3.0 was not accepted as factors responsible for household knowledge, level of utilization, constraints of utilization, and any items that is 3.0and above was accepted as a factor influencing effective utilization of household appliances. The results of the study showed that majority of the respondents (70%) in the study area are females while 30% are males. Most of the respondents in the study fall between the age range of 20-29yrs and 30-39 years while the lowest are within 40-49 years and above respectively. Majority of the respondents are married (61%) while 22% are single. Educational level of respondents showed 54% had secondary education, 28% had tertiary education, and 12% had postgraduate education while 6% had primary education. This study further revealed that 42% of the respondents are self-employed, 27% are civil servant, and 14% are unemployed, while 5% are students. The annual income of the respondents is above one million naira and only few had between five hundred thousand naira annual incomes. Majority of the respondents (52%) had 10 household size, 38% had 15 and above while 10 had 5 household size. Most of the respondents (61%) are dominant of sub urban area while 25% are in the rural areas. Majority (54%) of the households in the study area depends on NEPA, 38% generator while 8% had solar generating power. There is high level of acceptance on effective utilization of some household appliances in the current study. The respondents accepted all the benefits highlighted in the current study. The study recommend that people should regularly clean and maintain, read the manual of operation, use the right parts when replacing faulty parts so that their home appliances will perform maximally, efficiency and stay longer.

Keywords: Appliances; Constrains; Energy; Efficiency; Home Appliances; Household; Knowledge; Metropolis; Utilization; Sokoto.

1.0. Introduction

Adenle *et al.* (2021) and Adamu *et al.* (2020) reported that home appliances are an integral part of modern life, transforming the way we live, work, and interact with our living spaces. Home appliances have revolutionized the way we perform daily tasks, from cooking and cleaning to entertainment and comfort, saving us time, effort, and energy. Adusei and Opoku, (2021) started that however, with the rapid advancement of technology, home appliances have become increasingly sophisticated, efficient, and connected. Accordingly to Anilkumar and Joseph (2019b) and Shareef *et al.* (2018) today's appliances not only provide essential functions but also offer advanced features, such as smart controls, energy efficiency, and seamless integration with other smart devices.

Arku *et al.* (2020) and Anilkumar and Jelsey (2019) reported that the utilization of home appliances offers a range of benefits, including time savings, improved convenience, and enhanced efficiency. According to Akinyemi and Ogunleye (2021) and Akanle and Nwaobiala, (2020) these advantages contribute to a better quality of life by making daily tasks easier, reducing costs, and supporting environmental sustainability. Akintan *et al.* (2018) and Baldini *et al.* (2018) reported that additionally, modern appliances often offer energy efficiency and aesthetic value, while also providing educational and entertaining opportunities. By incorporating these appliances into daily routines, individuals can enjoy a more comfortable, organized, and efficient home environment. Annamalai *et al.,* (2020) reported that home appliances play a crucial role in modern households, offering a range of benefits

that contribute to convenience, efficiency, and overall quality of life. Home appliances are integral to modern living, offering significant advantages in terms of convenience, efficiency, and quality of life. Sathya and Vijayasanthi, (2016) and Dadashi *et al.* (2022) opined that home appliances serve a wide array of functions, each designed to simplify, streamline, and enhance various aspects of daily life (Chukwu and Bala, (2023), Vijavalakshmi and Mahalakshmi, 2013). Therefore, it is crucial to understand how to operate, maintain, and optimize the use of home appliances effectively became the major reason for this study.

2.0. Methodology

2.1. Study Area

The study was conducted in Sokoto Metropolis, the capital city of Sokoto State in north western Nigeria. The metropolis includes major urban districts such as Sokoto North, Sokoto South, Sokoto west and Sokoto East, The name Sokoto (which is the modern/anglicised version of the local name, *Sakkwato*) is of Arabic origin, representing *sooq*, 'market' in English. It is also known as *Sakkwato, Birnin Shaihu da Bello* or "Sokoto, Capital of Shaihu and Bello". **Sokoto** is a major city located in extreme north-western Nigeria, near the confluence of the Sokoto River and the Rima River. Sokoto is the modern-day capital of Sokoto State and was previously the capital of the north-western states. According to the provisional figures of the 2006 National Population Census, Sokoto State has population of 3,696,99 people made up of principally of two major groups namely; Hausa and Fulani. There are of course the Zabarmawa and Tuareg minority in the border Local Government Areas.

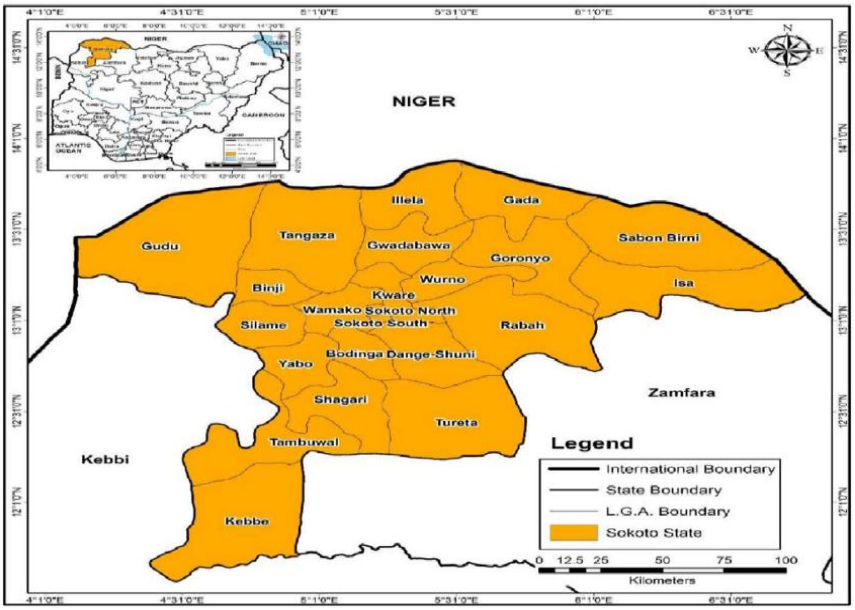

Figure 1. Map of Sokoto state

2.2. Sample technique and Sampling Size

A multi-stage sampling technique was used to select the required respondents for this study. First stage 1: Twenty (20) wards were purposively samples out of population of 734,000 households in Sokoto State. Secondly stage 2: Ten (10) wards were purposively sample out of twenty (20) wards, thirdly, stage 3: 100 respondents were randomly selected from the ten (10) wards.

2.3. Reliability of the Instrument

Meanwhile, to estimate the reliability of the questionnaire, ten (10) validated copies of the instrument were administered to ten (10) households within, but who are not part of the samples for the research.

2.4. Data Collection Instrument

Structured questionnaire were administered to the respondents with the help of a research assistant and collected back after the respondents had finished answering the questions there-in. Data collected from respondents were based on knowledge of home appliances, level of utilization of home appliances, and constraints of home appliances.

2.5. Data Analysis

The data collected were analyzed using descriptive and Likert scale and score and any items below 3.0 was not accepted as factors responsible for household knowledge, level of utilization, constraints of utilization, and any items that is 3.0 and above was accepted as a factor influencing effective utilization of household appliances.

3.0. Results and Discussion

3.1. Demographic Information of the Respondents

The results in Table 3.1, shows the demographic information of the respondents in the study. Majority of the respondents (70%) in the study area were females while 30% were males, this implies that women dominate in the utilization of household appliances. Women are widely assumed to dominate in household appliance use due to their traditional roles in cooking and laundering which are energy-intensive activities (Adusei and Opoku, 2021). Most of the respondents in the study fall between the age range of 20-29yrs followed by those between 30-39 years while the lowest are within 40-49 years and above respectively. This observation in the age of respondents in utilization of household appliances showed that majority of the respondents are in their economic or productive age rather they are refers to as youths (Akanle and Nwaobiala, 2020). This study revealed that majority of the respondents is married (61%) while 22% are single. This is because married people use appliances more often in cooking, cleaning, and food preservation and management of resources than single people. In term of educational level of respondents toward household appliances and utilization, 54% had secondary education, 28% had tertiary education, 12% had postgraduate education while 6% had primary education. Educational level of people can influence the income and access to information which indirectly impacts appliances acquisition and usage patterns especially for modern, energy-efficient technologies. This study showed that 42% of the respondents are self-employed, 27% are civil servant, 14% are unemployed, while 5% are students. The results of this study indicated that occupation can play a significant role in household appliances utilization in many ways including household purchasing power for appliances, and affecting the need for time-saving appliances due to work schedule (Akintan *et al.*, 2018). The income of people can influence appliances usage pattern by enabling different lifestyle and potentially increasing the demand for comfortability based on the income of the respondents recorded in the study. Most of the respondents (61%) are dominant of sub urban area while 25% are in the rural areas.

Location can influence household appliances availability and reliability of energy infrastructure. Consistent power supply was the major reason that encourage majority of the appliances utilized by the respondents.

Table 3.1. Demographic Information

Items	Frequency	%
Gender		
Male	30	30
Female	70	70
Total	100	100
Age		
20-29	40	40
30-39	38	38
40-49 and above	22	22
Total	100	100
Marital Status		
Widowed	8	8
Divorced	9	9
Married	61	61
Single	22	22
Total	100	100
Educational Level		
Postgraduate	12	12
Tertiary	28	28
Secondary	54	54
Primary	6	6
No formal education	0	0
Total	100	100
Occupation		
Retired	12	12
Unemployed	14	14
Self-Employed	42	42
Civil Servant	27	27
Student	5	5
Total	100	100
Household income per annum		
500,000.00	36	36
one million above	64	64
Total	100	100
Household size		
5	10	10
10	52	52
15 above	38	38
Total	100	100
Location		
Urban	14	14
sub-urban	61	61
rural area	25	25
Total	100	100
Primary source of power supply		
NEPA	54	54
Solar	8	8
Generator	38	38
Total	100	100

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3.2. Level of effective utilization of Home Appliances

The study revealed from Table 3.2, that utilization of household appliances varies significantly among household owners. The results of the study showed a wide spread differences in their utilization. High level of acceptance on ownership and effective utilization of some household appliances mentioned in the current study are attributed to air conditioners, electric kettle, electric fan, refrigerator, washing machine, television, generator, and blender while the some of the respondents reject their effective utilization of household appliances in electric cooker, microwaves, dish washer, yam pounding machine, air fryer, juices extractor and vacuum cleaner (Adenle *et al.*, 2020). A majority of these disparity in appliances utilization in the study could be due to accessibility to social amenities which electrical could be the major factor because most of the appliances mentioned in the study are electrical energy demanded. Aside that, specific usage levels of household appliances could depends on so many factors such as socioeconomic characteristics of the people, geographical location, climate, and appliances efficiency. Inability to use household appliances is typically due to electrical issues like overloading circuits or faulty wiring, appliance-specific malfunctions from the main electrical system (Adamu *et al.*, 2020).

Table 3.2. Level of effective utilization of Home Appliances

Items	Very regular (5)	Regular (4)	Occasionally (3)	Very Rarely (2)	Never (1)	Total	Decision Mean	Mean	Remark
Air Conditioner	37	20	14	3	26	339	**3**	3.39	Accepted
Electric kettle	54	20	14	5	7	409	**3**	4.09	Accepted
Electric Fan	52	19	17	12	0	411	**3**	4.11	Accepted
Washing-Machine	17	12	45	12	14	306	**3**	3.06	Accepted
Refrigerator	69	15	6	3	7	436	**3**	4.36	Accepted
Television	35	28	14	16	7	326	**3**	3.68	Accepted
Generator	30	18	13	14	25	314	**3**	3.14	Accepted
Electric Cooker	7	30	25	14	24	282	**3**	2.82	Reject
Microwave	24	8	11	23	34	265	**3**	2.65	Reject
Dish washer	14	23	13	14	36	265	**3**	2.65	Reject
Yam pounding machine	0	2	3	43	52	155	**3**	1.55	Reject
Blender	28	23	13	13	23	320	**3**	3.2	Accepted
Air fryer	13	8	12	31	36	231	**3**	2.31	Reject
Juice extractor	17	13	17	24	29	265	**3**	2.65	Reject
Vacuum cleaner	3	8	23	26	40	208	**3**	2.08	Reject

3.3. Maintain or Service your Home Appliances

The results presented in Table 3.3 showed the maintenance or services of appliances in the study area. The results of the study showed that all the appliances maintenance or service strategies listed in the study had mean above 3.0 indicating their acceptance on the maintenance behavior. This observation of acceptance showed that the respondents have full knowledge of appliances used in their home. Regular cleaning of household appliances improves their efficiency, extends their lifespan, ensures food safety, promotes better hygiene, reduces energy consumption, and contributes to a fresher, cleaning-smelling home (Akinyemi and Ogunleye, 2021). The respondent's behaviour towards screwing back all loose nuts in the appliances maintain structural integrity, ensure

safe operation, reduce vibration and noise, and prevent components failure. The respondent's knowledge of household appliances when it breakdown and become inefficient will help in troubleshooting such as checking for foreign objects or loose components and when to contact a professional for repairs (Arku *et al.*, 2020). This knowledge will ensures safety, optimal performance and energy efficiency, preventing damage to the appliances electrical system (Baldini *et al.*, 2018).

Table 3.3. Maintain or Service your Home Appliances

Items	Very regular	Regular	Occasionally	Rarely	Never	Total	Decision Mean	Mean	Remark
Cleaning the appliances	38	24	15	14	9.0	368	**3.0**	3.68	Accepted
Screw all loose nuts	17	25	37	14	7.0	331	**3.0**	3.31	Accepted
Reading the user manual	32	26	30	12	0.0	378	**3.0**	3.78	Accepted
When it breaks down	42	25	13	14	6.0	383	**3.0**	3.83	Accepted
When it becomes inefficient	37	28	24	8.0	3.0	388	**3.0**	3.88	Accepted
When a newer model is available	30	26	34	5.0	5.0	371	**3.0**	3.71	Accepted
Use the appliances with adequate power supply	46	30	14	8.0	2.0	410	**3.0**	4.10	Accepted
Unplugging unused devices	56	38	6.0	0.0	0.0	450	**3.0**	4.50	Accepted
Turn off appliances when not in use	50	35	15	0.0	0.0	435	**3.0**	4.35	Accepted
Avoid overloading appliances	68	23	6.0	3.0	0.0	456	**3.0**	4.56	Accepted
Attending a short course on how to use some home appliances	24	28	13	28.0	7.0	334	**3.0**	3.34	Accepted

3.4. Benefit of Effective usage of Home Appliances

The benefit of effective usage of home appliances is presented in Table 3.4. The results showed that respondents agreed to the benefit of using home appliances. These benefits could be achieved by maintaining appliances to improve their performance, and contribute to their durability, extending their overall lifespan (Chukwu and Bala, 2023). The benefit of home appliances in time saving speed up daily task like cooking, cleaning, and food storage, allowing people to accomplish more with less effort and time. In terms of improving hygiene or cleanliness, some home appliances have high temperatures and automation to kill germs, removes dirt, and sanitize dishes and clothes effectively, reducing the presences of microbes and ensuring a cleaner, healthier home environment

(Dadashi et al., 2020). Appliances like washing machines will increase hygiene through targeted cleaning and disinfection processes. In creating comfort at home to improve family conveniences, home appliances regulate the indoor environment, provide entertainment, and leisure and enhance overall conveniences and well-being through energy efficiency. This study also showed that home appliances save consumers money on utility bills, offer long term value through durability and reduce consumption.

Table 3.4. Benefits of Effective usage of Home Appliances

Items	Strong agree (5)	Agree (4)	Undecided (3)	Disagree (2)	Strongly disagree (1)	Mean	Remark
Time saving	55	26	13	6	0	3.00	Accepted
Improved hygiene or cleanliness	25	47	22	4	2	4.39	Accepted
Energy saving	78	18	4	0	0	3.06	Accepted
Better food storage and safety	36	38	14	8	4	3.78	Accepted
Greater comfort at home to improve family conveniences	65	28	7	0	0	3.68	Accepted
Task completion	47	37	13	3	0	3.46	Accepted
Consistent results	38	32	15	7	8	3.57	Accepted
Long-term savings	56	24	16	4	0	3.96	Accepted
Reduce risks of accident	43	28	18	7	4	3.41	Accepted
Economy friendly	47	31	14	8	0	3.35	Accepted

4.0. Conclusion

The results of the study showed a wide spread differences in the utilization of home appliances. High level of acceptance on ownership and effective utilization of some household appliances mentioned in the current study are attributed to air conditioners, electric kettle, electric fan, refrigerator, washing machine, television, generator, and blender.

The study showed that the respondents have full knowledge of appliances used in their home. Cleaning household appliances improves their efficiency, extends their lifespan, ensures food safety, promotes better hygiene, reduces energy consumption, and contributes to a fresher, cleaning-smelling home. All the benefit highlighted in the study when using appliances at home include time saving, improved hygiene or cleanliness, energy saving, better food storage and safety, greater comfort at home, task completion, consistent results, long-term savings, and reduce risk of accidents.

5.0. Recommendations

1) The study recommend that people should regularly clean and maintain their home appliances to maximize efficiency and longevity.

2) For safety, avoid overloading circuits and keep the appliances unplugged whenever they are not using them to prevent hazard and save energy.

3) Carefully reading the user manual to follow manufacturer's instructions for proper use.

Declarations

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Competing Interests Statement

The authors declare that they have no competing interests related to this work.

Consent for publication

The authors declare that they consented to the publication of this study.

Authors' contributions

Both the authors took part in literature review, analysis, and manuscript writing equally.

Availability of data and materials

Not applicable for this study.

Ethical Approval

Not applicable for this study.

Informed Consent

All participants in this study voluntarily gave their informed consent prior to their involvement in the research.

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