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PREVALENCE OF IMPROPER WASTE DISPOSAL PRACTICE AND AWARENESS OF HEALTH CONSEQUENCES AMONG RESIDENTS OF YENAGOA COMMUNITIES

[1]Rowland, A.W and [2] Dotimi, D.A.

[1]National Open University, Department of Environmental Health
[2]Bayelsa Medical University, Department of Community Health Science

Corresponding author: *AKPOLO WOIN-EBIMIETEI Rowland, ebimietei1@gmail.com, atibiwilcox@gmail.com, +2348033763114*

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ABSTRACT

Background: Rapid urbanization in Yenagoa community, poses a significant environmental and community health challenge due to increased solid waste generation, necessitating proper waste disposal practices.This study aims to assess the prevalence of improper solid waste disposal methods and the awareness of health consequences among residents of Yenagoa community in Bayelsa State.

Method: A cross-sectional survey was conducted among 495 randomly selected households in Yenagoa community. Data were collected through a structured questionnaire and analyzed using descriptive and inferential statistics.

Result: The study found that majority (177, 36%)) were 30-39 years, with the "mean age" of 35 ('SD' = 10.4). Majority (276, 55.8%) were females. Majority (326, 66%) are at university level, Majority (129, 26%) are civil servants. Majority of the Participants (90%) are aware of solid waste disposal and their awareness level is high ($\bar{x} = 3.4$). Only 64% (316) of the residents are aware of the health consequences and their awareness level is fair ($\bar{x} = 2.6$). However, the prevalence of practice of improper solid waste disposal is high (94%) with 400 (81%) dumping their solid waste in open places. Major barriers to proper waste disposal included no strictly enforce laws and regulations against open dumping (250, 50%), flood prone area (100, 20%), inadequate waste collection services (60, 12%), overcrowded community (50, 10%), and Waste picking for livelihood (35, 7%). There was a statistically significant relationship between level of awareness of solid waste disposal methods, awareness of health consequences of improper solid waste disposal methods and practice of solid waste disposal method (p-value=.000).

Conclusion: Residents of Yenagoa community' awareness of health consequences of improper waste disposal methods is fair, but there's a significant gap between knowledge and practice. Enhancing public education and improving waste disposal infrastructure is recommended.

Keywords: Solid waste management, awareness, waste disposal practices, Yenagoa, community, improper, environmental health.

INTRODUCTION

Rapid urbanization and population growth in developing countries, particularly in the Yenagoa community in Nigeria, have led to increased solid waste generation, posing environmental degradation, flooding, and public health risks, including waterborne diseases[1]. Globally solid waste generation is projected to rise by 73% by 2050 to 244 million tons of waste annually impacting rural development, social, political, and economic transformation, and posing environmental challenges beyond ecological perspectives [2,3,4]. Human activities, driven by our survival struggle, have consistently overwhelmed the environment. Dump sites, often located on urban outskirts, can harbor contaminants and disease transmitters, potentially breeding diseases like cholera, malaria, fever, and typhoid, affecting human health [5].

Solid waste refers to garbage, refuse, sludge, and other discarded materials from industrial, commercial, mining, agricultural, and community activities, resulting from nearly every activity [6]. It includes a wide range of items such as household garbage, industrial waste, construction debris, discarded furniture, food scraps, and packaging materials. Solid waste can be categorized into several types based on its source and composition, such as **municipal solid waste**, which are wastes generated from households, offices, and public spaces (e.g., food waste, paper, plastics). **Industrial waste**: Waste produced by manufacturing processes (e.g., scrap metal, chemicals). **Hazardous waste**: Solid waste that risks human health or the environment (e.g., batteries, medical waste). **Agricultural waste**: Waste from farming activities (e.g., crop residues, manure). **Construction and demolition waste**: Debris from building and infrastructure projects (e.g., concrete, bricks) [6]. Proper management of solid waste is essential to prevent pollution, conserve natural resources, and protect public health.

Improper solid waste disposal is a pervasive issue in many urban areas, particularly in developing countries like Nigeria. Understanding proper disposal methods is essential for improving public health and environmental sustainability. Effective solid waste disposal methods relevant to the community context include Land filling which involves burying waste in designated areas, where it is layered with soil to minimize environmental impact. Modern landfills are designed to prevent contamination of soil and groundwater, making them a common method for disposing of non-recyclable waste[7][8]. Incineration**:** This method involves burning waste at high temperatures, significantly reducing its volume and generating energy in the process. While incineration can effectively manage waste, it requires advanced technology to control emissions and prevent air pollution[8,9]. **Composting**: Composting is an environmentally friendly method that transforms organic waste (like food scraps and yard waste) into nutrient-rich soil through natural decomposition processes. This method not only reduces the amount of waste sent to landfills but also enriches the soil, promoting sustainable agriculture[8]. **Recycling**: Recycling involves collecting and processing materials such as paper, glass, and plastics to create new products. This reduces the demand for raw materials and minimizes landfill use. Communities can enhance recycling efforts by providing accessible collection points and educating residents on recyclable materials[9]. **Biogas Generation**: Biodegradable waste can be processed in anaerobic digesters to

produce biogas, which can be used as renewable energy. This method effectively manages organic waste while generating energy and reducing methane emissions from landfills[9]. **Community Engagement and Education:** Effective solid waste management also relies on community participation and awareness programs. Educating residents about proper disposal practices and the benefits of recycling and composting can lead to more responsible waste management behaviors[7][8]. Implementing these proper solid waste disposal methods can significantly improve environmental conditions and public health in developing countries should focus on enhancing infrastructure, providing educational resources, and encouraging community involvement to foster sustainable waste management practices.

Research highlights that improper disposal methods are alarmingly common in most communities in developing countries where a significant portion of the population disposes of their waste improperly, with 6.3% burning it, 5.0% throwing it into rivers or on roads, and 2.1% keeping it in backyards[10]. The prevalence of such practices can lead to severe consequences, including pollution, disease transmission, and degradation of living conditions. The lack of organized waste collection services exacerbates this issue, leading to the accumulation of waste in public spaces and increasing health risks for the community[11]. A review indicated that almost half of the world's population still lives in rural areas and an adequate Solid Waste Management is crucial in reducing environmental and health threats [12].

The health implications of improper solid waste disposal are severe. Residents living near dumpsites are particularly vulnerable to various health issues, including gastrointestinal diseases and vector-borne diseases such as malaria[13]. Studies have reported that 39.31% of respondents living close to dumpsites experienced malaria symptoms, highlighting a direct correlation between poor waste management and public health risks[13]. Additionally, the presence of hazardous materials in improperly disposed waste can contaminate water sources and air quality, further endangering community health[14]. In addition to attracting rodents and other animals, improper management of solid waste, which includes waste from both human and animal activity, releases chemicals into landfills and greenhouse gases, which pollute the environment and cause respiratory illnesses and plastic waste [13].

Awareness level of proper waste disposal methods and health consequences has been implicated for the prevalence of improper solid waste disposal in communities. A study indicated that people from rural communities often lack the proper awareness and tools to manage solid waste appropriately and turn to dangerous practices such as open burning or waste dumping [12]. Another study indicated that while approximately 95.4% of residents are aware of proper waste management practices, many still resort to improper disposal methods such as open burning and dumping waste in unauthorized location Education is one of the essential tools to create awareness among people, particularly in developing countries [13][17]. Low environmental knowledge among residents of a community can lead to a shift in attitudes towards sustainability, while those with more education are more concerned about the environment and actively participate in political decisions to protect it. However, a study conducted in Ghana indicated that while most individuals are aware of solid waste management strategies, they often lack the knowledge and commitment to implement them effectively [14][16]. However, another study indicated that despite the high level of awareness

regarding waste management practices among residents, there remains a significant gap in understanding the health consequences associated with improper disposal methods. Many residents do not recognize the potential risks posed by hazardous materials found in solid waste or the long-term effects on their health and environment[15][13]. This lack of awareness indicates a critical need for targeted educational campaigns to inform residents about the importance of proper waste management and its impact on public health.

Methods

Study Area

Yenagoa community also doubles as the capital city of Bayelsa State, Nigeria. Bayelsa state lies central and southernmost on the Nigerian Map. Yenagoa is located on latitude 4º 49N and 5º 23'N and longitude 6º 10'E and 6º 33'E with a projected population estimate of over 524,400 as at 2022. Since attaining the status of a state capital in 1996 its urbanization and population density have since accelerated appreciably. Yenagoa is a flood plain that forms part of the wetland in the Niger Delta, it is characterized by shallow aquifer and several networks of creek lets linked to a parent creek called Epie Creek. Consequently, the major river which connects all Municipal runoffs is the Epie Creek, which basically empties into the Nun River, which lies central and flanked to the west and East by Rivers Focardos (Delta State) and Orashi (Rivers State) respectively [18].

In Yenagoa community in Bayelsa State exemplifies the challenges associated with municipal solid waste management (MSWM). The study seek to investigate the prevalence of improper solid waste disposal method and the awareness of its implication among residents of Yenagoa community [13]. The successful management of solid waste depends largely on the awareness and participation of the public. Understanding the knowledge and practices of residents regarding waste disposal is crucial for developing effective waste management strategies. This study seeks to investigate the prevalence of improper solid waste disposal methods, the level of awareness of its health consequences among residents of Yenagoa and identify the barriers to proper waste disposal.

Study design

This cross-sectional study was conducted in Yenagoa, Bayelsa State. Data were collected from April to June 2025. The study targeted residents of Yenagoa, with a focus on household heads.

Study population

The study population are all those who resides in Yenagoa community. The population is estimated to b**e** 524,400 people as of 2022 projection [24].

Sample size calculation

A sample size of 500 respondents was obtained using the Taro Yamane sample size estimation formula from the projected population of 524,400 [25]. A total of 500 participants was obtained using the Taro Yemane formula as follows:.

n = N / (1 + N (e) 2
n = signifies the sample size
N= signifies the population under study
e = signifies the margin error = 0.10
n = 524,400 / (1 + 524, 400 (0.10) 2
n = 524,400 (1 + 524,400 (0.2)
n = 524,400 (1 + 104,880)
n = 524,400/ 104,881
n = 499.9
= 500

Inclusion criteria

The inclusion criteria were adults aged 18 years and above who had lived in Yenagoa

community for at least one year and gave their verbal consents to participate in the study.

Exclusion criteria

The exclusion criteria are all under the age of 18 in the Yenagoa communities, Those who have lived less than one year in the communities, those who do not live in Yenagoa communities and those who do not consent to participate in the study.

Sampling Technique

A simple random sampling technique without replacement was adopted to select the five hundred (500) respondents that constituted the sample for the study.

Study instrument

Data were collected through structured questionnaire on prevalence of improper solid waste disposal methods and its health consequences conducted by trained research assistants. The structured questionnaire was designed to gather information on: **Demographics**: Age, gender, education, and occupation. **Awareness of solid waste disposal methods/management**: Knowledge of how to manage and dispose solid waste disposal. **Awareness of health consequences of improper solid waste disposal method**: Knowledge of health consequences of improper solid waste disposal. **Practices of waste disposal methods**: Methods commonly used by households to dispose of waste. **Challenges in waste disposal**: Perceived barriers to proper waste management, such as lack of infrastructure or information.

The test-retest method was done to test reliability and The Pearson Product Moment Correlation Coefficient r was used to compare the outcomes of both experiments. For the instrument to be used, a coefficient of 0.76 was obtained and considered sufficient. Face and content validation was also done by experts in the field to ensure that the questionnaire measures what should it should measure (validity). A pilot study was also conducted and all identified shortcomings were rectified.

Data analysis

Five Hundred questionnaires (500) were distributed manually to participants who met the inclusion criteria and gave their verbal consents. However, only 495 (99%) were correctly filled and returned. The data obtained were subjected to statistical analysis such as item mean analysis with a criterion means set at 2.5 to analyse the level of awareness of solid waste disposal methods/management and awareness of health consequences. The Decision rule states that any item means or grand mean equal to or greater than the criterion mean indicates good level of awareness and any item mean or grand mean less than the criterion mean indicates poor level of awareness. Descriptive statistics of frequency and percentages were used to analyse the demographic variables and the practice of solid waste disposal. Inferential statistics of multi-linear regression was used to analyse the relationship between the level of awareness of proper solid waste disposal, level of awareness of health consequences of improper solid waste disposal methods, and the practice of solid waste disposal with a statistical significance set at $p<0.05$ using SPSS version 25. Results are presented in tables, frequency, percentages and mean.

Ethical consideration

Participants were fully informed about the study's purpose, procedures, potential risks, and their right to withdraw without any repercussions. Confidentiality was strictly maintained to protect participants' personal information, especially when

discussing behaviors or health-related issues. Additionally, the study was conducted with cultural sensitivity, ensuring that questions are respectful and non-judgmental. The results will be used to benefit the community, such as through public health interventions or education, rather than for any exploitative purposes.

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Demographic Characteristics

Table 1. below indicated that 118(24%) are between 18-29years, 177 (36%) are between 30-39 years, 140 (28%) are between 40-49years, 50(10%) are between 50-59 years and 10(2%) are between 60years and above. The "mean age" of the respondents was 35 ('SD' = 10.4). that 219 (44.2%) are males and 276 (55.8%) are females. 1(0.2%) are at Primary level, 116 (23.4%) are at secondary level, 52 (11%) are at vocational training level, 326 (66%) are at university level. that 129 (26%) of the respondents are civil servants, 12 (2%) are oil and gas industry workers, 49 (10%) are Traders, 96 (19.4%) are self-employed, 60 (12%) are public servants, 39 (8%) are students and 25 (5%) are unemployed, and 85 (17%) are in other occupations.

Table 1: Demographic Characteristics

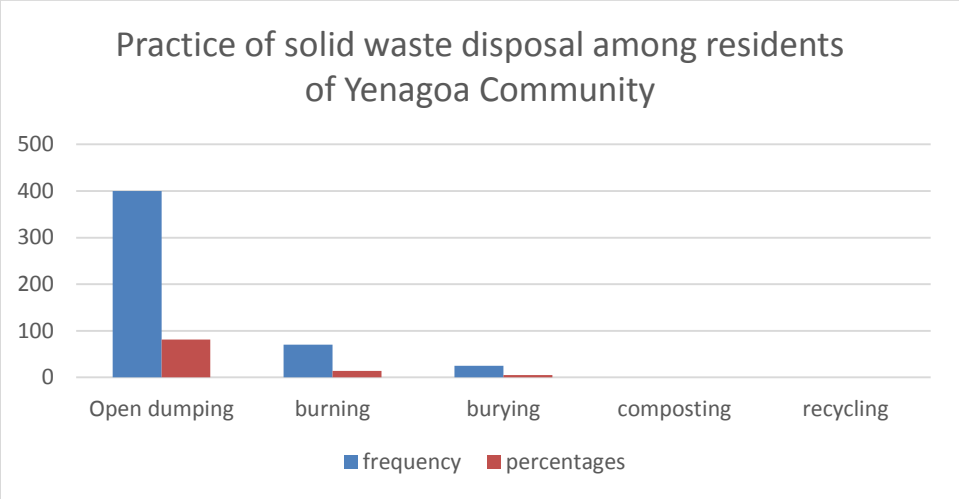
S/N	**VARIABLES**	**FREQUENCY**	**PERCENTAGES**
1	**SEX**		
	Male	219	44.2
	Female	276	55.8
	Total	495	100.0
2	**AGE**	**FREQUENCY**	**PERCENTAGES**
	18-29	118	23.8
	30-39	177	35.8
	40-49	140	28.3
	50-60	50	10.1
	61 and above	10	2.0
	Total	495	100.0
	Mean age	35('SD'= 10.4).	
3	**HIGHIEST EDUCATIONAL QUALIFICATION**	**FREQUENCY**	**PERCENTAGES**
	Primary	01	0.2
	Secondary	116	23.4
	Vocational Training	52	10.5
	University	326	65.9
	Total	495	100.0
4	**OCCUPATION**	**FREQUENCY**	**PERCENTAGES**
	Civil Servant	129	26.1
	Oil and gas industry worker	12	2.4
	Trader	49	9.9
	Self employed	96	19.4
	Public servant	60	12.1
	Ttudent	39	7.9
	Unemployed	25	5.0

	Other	85	17.2
	Total	495	100.0

PRACTICE OF SOLID WASTE DISPOSAL AMONG RESIDENTS OF YENAGOA COMMUNITY

Figure 1 below indicates that 400 (81%) participants dump their solid waste in an open place, 70 (14%) burn their solid waste, 25(5%) bury their solid waste, and none practice composting or recycling. Therefore, the prevalence of improper waste disposal is 94%.

Fig 1: Practice of solid waste disposal among residence of Yenagoa Community



Prevalence of improper waste disposal methods

Number of people involved in improper waste disposal at a point

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Total population sampled at that time

= 470/495= 0.94= 94%.

LEVEL OF AWARENESS OF PROPER SOLID WASTE DISPOSAL AMONG RESIDENTS OF YENAGOA METROPOLIS

Table 2 below indicates that majority 445(90%) of the residents are aware of solid waste disposal/management. The grand mean is ($\bar{x} = 3.4$). Using the criterion mean of 2.50, one may conclude that the residents of Yenagoa Metropolis have good awareness level on solid waste disposal/management because the Item mean and Grand mean of their awareness level is greater than the criterion mean (2.50).

Table 2: Level of Awarenesss of proper solid waste disposal among residents of Yenagoa Metropolis

S/N	Item	Strongly agree	Agree	Disagree	Neutral	TWS	Mean	Decision
1	Solid waste management involves a multi sectoral participation (Individual, community, private and Government sectors)	309 (1236)	169 (507)	14 (24)	3 (3)	1770	3.6	Good level of awareness
2	Solid waste management is the complete process of collection, transportation, treatment and disposal of solid waste.	273 (1092)	195 (585)	22 (44)	5 (5)	1726	3.5	Good level of awareness
3	Solid waste management starts from the point of generation	244 (976)	199 (597)	42 (84)	10 (10)	1667	3.4	Good level of awareness
4	Source segregation is the activity of separating your solid waste produced at home, office etc. according to the composition?	221 (884)	204 (612)	64 (128)	6 (6)	1630	3.3	Good level of awareness
5	Source segregation reduces the need for secondary segregation, and aids in promoting recycling	202 (808)	226 (678)	52 (104)	15 (15)	1605	3.2	Good level of awareness
6	Every household must have a waste bin with tight fitted cover to prevent insect infestation and emission of offensive Odor	337 (1348)	140 (420)	14 (28)	4 (4)	1800	3.6	Good level of awareness
7	Recycling is the process of converting waste materials into new materials and objects	337 (1348)	140 (420)	14 (28)	4 (4)	1800	3.6	Good level of awareness
8	Refuse, Reduce, Reuse	222	222	45	6	1650	3.3	Good level

	and Recycling are the essential principles in solid waste management	(888)	(666)	(90)	(6)			of awareness
9	Food remnants and other organic waste can be recycled	182 (728)	172 (516)	73 (146)	68 (68)	1458	2.9	Good level of awareness
10	Recyclable materials include glass, paper, cardboard, food waste, single use nylon bags, sachet water package, metal, plastic, tires, textiles, batteries, hair extensions, electronics.	237 (948)	220 (660)	22 (44)	16 (16)	1668	3.4	Good level of awareness
		2564/10 =256. 256/495 x100= =52%	1887/ 10=1 89. 189/4 95x1 00= 38%	362/1 0=36. 36/49 5x100 = 7%	137/1 0=14. 14/49 5x100 =3%	Grand mean =33.8/10 = 3.4		
		Good Knowledge = 445 (90%)		Poor Knowledge = 50(10%)		Grand mean =3.4		Good Knowledg e

Criterion Mean: 2.5

AWARENESS OF THE HEALTH CONSEQUENCES OF IMPROPER SOLID WASTE DISPOSAL AMONG RESIDENTS OF YENAGOA METROPOLIS

Table 3: below indicates that only 64% (316) of the residents are aware of the health consequences of improper solid waste disposal. The grand mean is ($\bar{x} = 2.6$). Using the criterion mean of 2.50, one may conclude that the residents of Yenagoa Metropolis have fair knowledge of the health consequences of improper solid waste disposal because the mean of six (6) out of 13 Item mean were less than the criterion mean and Grand mean of their knowledge level is slightly above the criterion mean (2.50).

Table 3: Level of awareness of health consequences of improper solid waste disposal among residents of Yenagoa metropolis

S/N	Item	Strongly agree	Agree	Disagree	Neutral	TWS	Mean	Decision
1	Burning waste releases harmful pollutants, including dioxins, furans, and particulate matter, which can cause respiratory diseases such as asthma, bronchitis, and chronic obstructive pulmonary disease (COPD).	50 (200)	65 (195)	80 (160)	300 (300)	855	1.7	Poor awareness level
2	Inhalation of toxic fumes from burning plastics and other hazardous materials can lead to acute and chronic respiratory conditions.	100 (400)	15 (45)	30 (60)	350 (350)	855	1.7	Poor awareness level
3	Improper waste disposal sites attract pests like rodents, flies, and mosquitoes, which can transmit diseases such as malaria, dengue fever, cholera, and leptospirosis.	450 (1800)	20 (60)	25 (50)	0 (0)	1910	3.9	Good awareness level
4	Contact with contaminated waste can lead to infections, including skin infections, gastrointestinal infections, and more serious diseases like hepatitis and dysentery.	370 (1480)	0 (0)	0 (0)	125 (125)	1605	3.2	Good awareness level
5	Hazardous chemicals	50	65	0	380	775	1.6	Poor

	from industrial waste, pesticides, and pharmaceuticals can contaminate water and soil, leading to poisoning and long-term health issues like cancer, reproductive disorders, and endocrine disruption.	(200)	(195)	(0)	(380)			awareness level
6	Sharp objects, broken glass, and other dangerous materials in open dumps can cause injuries such as cuts, puncture wounds, and infections.	400 (800)	95 (285)	0 (0)	0 (0)	1085	2.1	Poor awareness level
7	Spontaneous fires in open dumpsites can lead to burns and other fire-related injuries.	200 (800)	185 (555)	0 (0)	110 (110)	1465	2.9	Good awareness level
8	Liquid that drains from waste can contaminate groundwater and surface water sources with pathogens, chemicals, and heavy metals, leading to waterborne diseases and poisoning.	300 (1200)	180 (540)	0 (0)	15 (15)	1755	3.5	Good awareness level
9	Excess nutrients from organic waste can cause algal blooms in water bodies, leading to the production of toxins harmful to human health.	80 (320)	55 (165)	12 (24)	348 (348)	857	1.7	Poor awareness level
10	Crops grown in contaminated soil can absorb hazardous substances, which can then enter the food chain and pose health risks to consumers.	360 (1440)	43 (129)	30 (60)	62 (62)	1691	3.4	Good awareness level

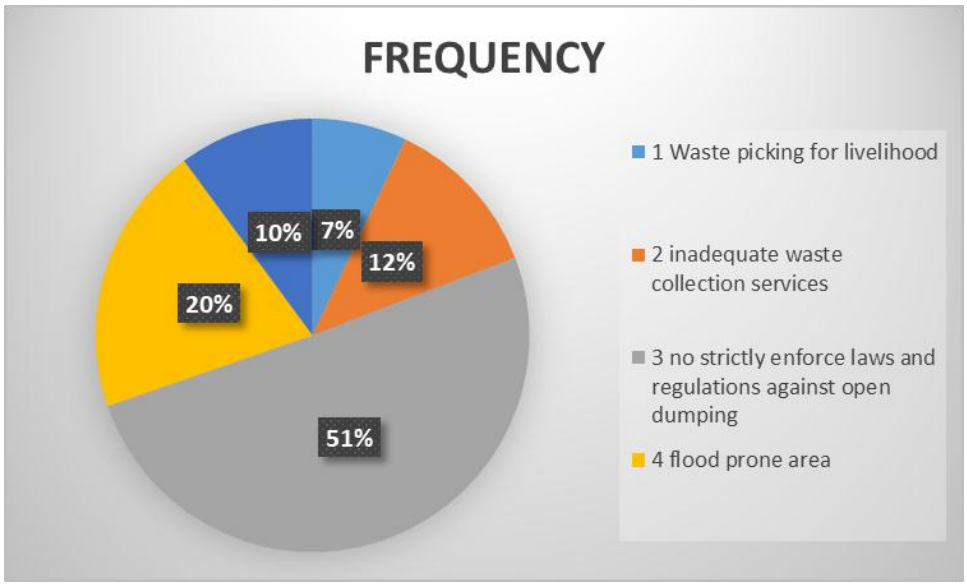
11	Chronic Conditions: Long-term exposure to air pollutants from waste burning can exacerbate chronic health conditions, reduce lung function, and increase the risk of cardiovascular diseases.	32 (128)	65 (195)	8 (16)	390 (390)	729	1.5	Poor awareness level
12	Living near improperly managed waste sites can lead to stress, anxiety, and a sense of helplessness due to concerns about health and safety	390 (1560)	100 (300)	5 (10)	0 (0)	1870	3.8	Good awareness level.
13	Communities near waste dumpsites may experience social stigma and reduced quality of life, contributing to mental health issues.	280 (1120)	150 (450)	10 (20)	55 (55)	1645	3.3	Good awareness level.
		3,062/13=236	1038/13=80	200/13= 15	2135/13=164			
		236/495x100= 48%	80/495x100=16%	15/495x100=3%	164/495x100= 33%		Grand Mean=34.3/13	
		Good Knowledge =316 (64%)		Poor Knowledge =179 (36%)			Grand Mean= 2.6	

BARRIERS TO PROPER SOLID WASTE DISPOSAL METHODS AMONG RESIDENTS OF YENAGOA COMMUNITY

Figure 2 below indicated that barriers to proper waste disposal included no strictly enforce laws and regulations against open dumping (250, 51%), flood prone area (100, 20%),

inadequate waste collection services (60, 12%), overcrowded community (50, 10%), and Waste picking for livelihood (35, 7%).

Fig 2: Barriers to proper waste disposal



Discussion

Numerous research revealed that understanding the household's demographics—which include sex, age, education level, and occupation is crucial [19].The findings of this study indicate that majority of the respondents are between the ages of 30-39 years and 55% were females. This confirms the findings of a similar study conducted in Ethiopian where respondents are between 31–45 years old and over 60% of them were women [19].

The study also revealed that the prevalence of improper solid waste disposal among the residents of Yenagoa Community is 94%. This is higher than the findings of a study conducted in Akure where 37.5% illegal dumping and open burning [20]. This means that illegal dumping of solid waste is a prevalent issue in Nigeria, affecting all states [15].

The findings of the study indicated that 90% of the residents of Yenagoa Community have good awareness level of solid waste disposal method. Unlike the findings of a study conducted in Dhaka indicated that the awareness solid waste disposal method of the community people were at a moderate level [21]. The study also revealed that 64% of the residents of Yenagoa Community are aware of the health consequences of improper wastes disposal method. This is contrary to the findings conducted in Ghana which indicated that in spite of the fact that the households reported diseases connected to environmental factors related to waste management, 87% of all the households surveyed did not believe that any member of their household had become ill due to an illness related to garbage [23].

The study revealed that while awareness of health consequences of improper solid waste disposal methods is relatively high among Yenagoa residents, this awareness does not translate into proper waste disposal practices. The predominant practice remains open dumping, which poses significant environmental and public

health risks. The gap between awareness and practice can be attributed to several factors, including no strictly enforce laws and regulations against open dumping, flood prone area, inadequate waste collection services, overcrowded community, and Waste picking for livelihood..

This study highlights the need for a multifaceted approach to improve solid waste management in Yenagoa. Public education campaigns should emphasize the importance of waste segregation and recycling, while local authorities should enforce laws and regulations against open dumping, invest in improving waste collection services and providing waste disposal facilities, such as bins and recycling centers.

Conclusion

This study has shown that there is a considerable gap between awareness and practice of solid waste disposal methods in Yenagoa. While residents are generally aware of the consequences of improper solid waste disposal methods, many continue to engage in improper practices due to no enforcement of laws and other barriers. Strengthening waste management systems, coupled with targeted public education, will be critical for addressing these issues.

Strength of the study

A strength of the cross-sectional study is its ability to provide a quick and cost-effective assessment of both the prevalence of improper waste disposal practices and the level of health awareness among a large population at one point in time. This can help identify high-risk behaviors and gaps in knowledge, providing essential data to guide immediate public health interventions. Additionally, it allows for the collection of data from diverse subgroups within the community, offering insights into the distribution of these practices and awareness across different demographic segments.

Limitations of the study

The study only provides a snapshot of the situation at a single point in time. As such, it cannot establish causal relationships between improper waste disposal practices and health outcomes or determine changes in behavior or awareness over time. Additionally, recall bias may affect the accuracy of self-reported data on waste disposal habits and health awareness, as participants may not accurately remember or may under report undesirable behaviors. Finally, the study may not account for seasonal variations in waste disposal practices or health risks.

Recommendations

1. **Public Health Campaigns**: Implement targeted campaigns to raise awareness about the environmental and health impacts of improper waste disposal.
2. **Waste Management Infrastructure**: Improve waste collection services and provide more waste bins and recycling centers.
3. **Government and Private Sector Collaboration**: Encourage partnerships to invest in sustainable waste management initiatives.

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Conflict of Interest

There is no conflict of interest

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PREVALENCE AND PATTERN OF DRUGS ABUSE AMONG YOUTHS IN JOS NORTH LOCAL GOVERNMENT AREA, PLATEAU STATE, NIGERIA: A 2025 CROSS-SECTIONAL STUDY.

[1] Azi, E. J; [2] Jatau, S. S; [3] Kakwi, J. D; [4] Adangs, L. E; [5] Raim. M. O

[1]Public Health Department, Faculty of Health Sciences, Plateau State University, Bokkos, Plateau State, Nigeria
[2] Public Health Department, Faculty of Health Sciences, Plateau State University, Bokkos, Plateau State, Nigeria.
[3] Public Health Department, Faculty of Health Sciences, Plateau State University, Bokkos, Plateau State, Nigeria
[4] Public Health Department, Faculty of Health Sciences, Plateau State University, Bokkos, Plateau State, Nigeria.
[5] Department of Environmental Management and Toxicology, Faculty of Sciences, Federal University Otuoke, Bayelsa State, Nigeria.

Corresponding author: *AZI, EMMANUEL JOHN, aziemmanuel@plasu.edu.ng, aziejohnazi@gmail.com, +2347037705945*

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ABSTRACT

Background: Drug abuse among youths in Nigeria has become a significant public health concern, particularly in urban areas like Jos North LGA, Plateau State. The study aims to investigate the prevalence and patterns of drug abuse among youths aged 11-45 years in Jos North LGA, Plateau State, Nigeria.

Method: A cross-sectional descriptive survey design was employed, involving a random sample of 274 youths from six selected communities within Jos North LGA, chosen through a multi-stage sampling technique. Data were collected using structured questionnaires and subsequently analyzed using SPSS. Bivariate analysis was conducted to examine the relationship between socio-demographic characteristics and drug abuse.

Results: The study found a moderate prevalence rate of drug abuse at 39.1%. Interestingly, a slightly higher proportion of females (39.1%) engaged in moderate drug or substance abuse compared to males, although this difference was not statistically significant (P-value = .995).

Conclusions: The study concludes that the prevalence of drug abuse among youths in Jos North LGA is moderate, with a slightly higher rate among females. Additionally, awareness of the health risks associated with drug use and parental drug use significantly influence the likelihood of drug abuse in this population. It is recommended that targeted public health interventions be developed to increase awareness of the dangers of drug abuse, particularly among young females

Keywords: Drug abuse, Youth, Prevalence, Patterns, Public health, Jos North LGA, Plateau State, Nigeria.

INTRODUCTION

Drug abuse is a significant public health concern with far-reaching consequences, affecting individuals and communities across the globe. The United Nations Office on Drugs and Crime (UNODC) [1] reports that drug abuse not only undermines health but also disrupts social and economic structures, making it a pressing issue worldwide. In Nigeria, the abuse of drugs among youths has escalated into one of the most troubling health-related phenomena, contributing to a range of mental health issues, social dysfunctions, and educational setbacks [2-4]. This alarming trend underscores the importance of understanding the specific factors driving drug abuse among Nigerian youths, particularly in regions like Jos North Local Government Area (LGA) of Plateau State. Empirical studies highlight the severity of drug abuse among youths and its long-term consequences. For instance, research indicates that many adolescents who engage in drug abuse are at a heightened risk of developing substance dependence in adulthood, leading to significant morbidity and mortality [5-8]. This transition from occasional use to chronic dependence is a critical period that warrants focused study, particularly in areas where drug abuse is prevalent. In Nigeria, the situation is exacerbated by socio-economic challenges, which often leave youths more vulnerable to the lure of drug use as a coping mechanism [9-12]. Understanding these dynamics is crucial for developing effective interventions that can mitigate the impact of drug abuse in this population. The prevalence of drug abuse among youths in Jos North LGA is particularly concerning. Existing data, though limited, suggest that drug abuse in this region is not only widespread but also growing, contributing to a host of social and health problems

Despite the wealth of data on drug abuse at the national and global levels, there are significant gaps in our understanding of how these trends manifest in specific localities like Jos North LGA. Most studies have focused on broader national trends, leaving a void in localized research that can offer insights into the unique socio-cultural and economic factors influencing drug abuse in this area. Filling this gap is essential for developing interventions that are not only effective but also culturally and contextually relevant. This study aims to bridge that gap by providing a detailed analysis of the prevalence and patterns of drug abuse among youths in Jos North LGA. The economic and social burden of drug abuse is profound, not just globally but also at the community level. According to the UNODC, the global costs associated with treating drug abuse are staggering, amounting to hundreds of billions of dollars annually. In Nigeria, the financial impact of drug abuse is similarly severe, straining already limited healthcare resources and exacerbating poverty and social inequality. The costs are not just financial; the human cost is equally devastating, with drug abuse leading to increased rates of mental illness, violence, and premature death [1, 13 -16]. These challenges are particularly acute in regions like Jos North LGA, where socio-economic disparities make the population more vulnerable to the adverse effects of drug abuse. The rationale for this study is rooted in the need to address these pressing issues at a localized level. By focusing on the youths of Jos North LGA, this research seeks to uncover the specific factors that contribute to drug abuse in this region

Study Area

The study was conducted in Jos North Local Government Area (LGA), Plateau State, Nigeria. Jos North is one of the 17 LGAs in Plateau State, characterized by a diverse population and a mix of urban and semi-urban settlements. The area is known for its multi-ethnic and multi-religious communities, which contribute to the socio-cultural complexity of the region. The LGA is subdivided into 20 political wards, each comprising several settlements, with varying levels of access to education, healthcare, and other social amenities.

Study Design

A cross-sectional survey design was employed for this study. allowing for the analysis of multiple variables at once, such as demographic factors, types of drugs abused, and the socio-economic status of the respondents.

Study Population

Jos North LGA according to National Population Commission (population Census, 2006) is 439,217. Out of this population, the total population of male 220,856 and 216,361 females) The study population comprised youths aged 11-45 years residing in Jos North LGA. This age range was selected because it encompasses the critical periods of adolescence and early adulthood, during which individuals are most susceptible to engaging in drug use and abuse.

Inclusion and Exclusion Criteria

Inclusion criteria for the study required participants to be within the age range of 11-45 years and to have resided in Jos North LGA for at least six months prior to the study. Exclusion criteria included individuals outside the specified age range, those who were non-residents of Jos North LGA, and individuals with cognitive impairments that could interfere with their ability to understand and respond to the questionnaire.

Sample Size Calculation

The sample size for the study was calculated using the Taro Yamane formula [28] for sample size determination. A sample size of 400 was estimated as presented below:

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

Where N = Population size = 1001,155; e = level of significance = 0.05

$$n = \frac{1001155}{1 + 1001155(0.05)^2}$$

$$n = \frac{1001,155}{1 + 1001155(0.0025)}$$

$$n = \frac{1001155}{1 + 2502}$$

$$n = \frac{1001155}{2503}$$

$n = 399.982$

Hence, the sample size was approximated to 400.

Four hundred was settled for, as the sample size for the study. The sample size was considered adequate for the study.

Sampling Techniques

A multistage sampling technique was utilized to select the study participants. In the first stage, six political wards were randomly selected from the 20 existing wards in Jos North LGA using a simple random sampling technique (balloting method). The selected wards were Tafawa Balewa, Angwan Rogo/Rimi, Gangare, Kabong, Tudun Wada, and Naraguta "B."

In the second stage, one settlement was randomly chosen from each of the selected wards, ensuring that the sample was representative of the different socio-economic and cultural backgrounds within the LGA. Finally, in the third stage, 67 youths were randomly selected from each of the six settlements, resulting in a total of 402 respondents.

Study Instrument

The primary instrument for data collection was the Prevalence and Pattern of Drug Abuse Questionnaire (PREPATDAS). The questionnaire included sections on demographic information, types of drugs used, frequency and duration of use, and perceptions of drug-related risks. It was pre-tested in a pilot study conducted in a neighboring LGA to ensure its reliability and validity.

Data Analysis

The collected data were entered into Microsoft Excel and subsequently exported to the Statistical Package for Social Sciences (SPSS) software for analysis. Descriptive statistics, including arithmetic means and percentages, were used to summarize the findings, while frequency distributions and charts were employed to present the data visually. A chi-square test was conducted to determine associations between categorical variables, such as socio-demographic characteristics and drug abuse patterns, with significance set at the 5% level. This analytical approach allowed for a comprehensive understanding of the factors associated with drug abuse among youths in Jos North LGA and provided the statistical rigor necessary to support the study's conclusions.

Ethical Approval

Ethical approval for the study was obtained from the Ethics Committee of the Plateau State Ministry of Health. This approval ensured that the study adhered to ethical standards, including respect for participants' rights, confidentiality, and informed consent. Written informed consent was obtained from each participant prior to their inclusion in the study. For participants under the age of 18, consent was also obtained from a parent or guardian.

Results

The response rate was above 60%, however, out of the 402 copies of the questionnaire administered, 274 copies representing 68.2% were retrieved and found useable. All results of data analyzed were based on the retrieved questionnaire. Hence, table 1 below shows the socio-demographic characteristics of the study participants, which provide a detailed understanding of the population under investigation, which comprised 274 respondents. The distribution of age groups revealed that the majority of the participants (42.0%) were aged between 18-24 years, followed by those aged 25-34 years, who constituted 35.8% of the sample. A smaller proportion of participants were under 18 years old (11.7%), while those aged 35 and above made up 10.6% of the sample. the sample was predominantly male, with 68.2% of the respondents being male and 31.8% female. Educational background varied among the participants, with the majority (55.1%) having attained secondary education. Those with tertiary education and primary education each accounted for 16.4% of the sample, while 12.0% had no formal education. Regarding employment status, the largest group of respondents were unemployed (40.5%), followed by self-employed individuals (32.5%). Public sector employees made up 17.2% of the sample, while private sector employees constituted 9.9%.

The location of the respondents showed a higher representation from urban areas (70.8%) compared to rural areas (29.2%). Family setting and living arrangements also provided insightful data. A majority of the respondents (55.8%) came from polygamous families, while 44.2% were from monogamous families. Additionally, 66.8% of the participants were living with their families, compared to 33.2% who were not. Parental education levels varied, with 36.5% of fathers having tertiary education, and 28.5% of mothers having secondary education, reflecting a relatively educated parental demographic. However, 25.2% of the respondents reported that either or both parents used drugs

Table 1: Socio-Demographic Characteristics of Respondents

Socio-Demographic Characteristics	Frequency (n=274)	Percentages (%=100)
Age group		
<18 years	32	11.7
18-24years	115	42.0
25-34years	98	35.8
35 and above years	29	10.6
Sex		
Male	187	68.2
Female	87	31.8
Educational background		
No Education	33	12.0
primary	45	16.4
Secondary	151	55.1
Tertiary	45	16.4
Employment status		
Self-employee	89	32.5
Public sector employee	47	17.2
Unemployed	111	40.5
Private sector employee	27	9.9
Location		
Rural	80	29.2
Urban	194	70.8
Family setting		
Monogamy	121	44.2
Polygamy	153	55.8
Staying with family		
Yes	183	66.8
No	91	33.2
Father's Level of Education		
No education	40	14.6
Primary	59	21.5
Secondary	75	27.4
Tertiary	100	36.5
Mother's Level of Education		
No formal Education	57	20.8
Primary	68	24.8
Secondary	78	28.5

Tertiary	71	25.9
Either or both parents taking drugs		
Yes		
No	69	25.2
	205	74.8

Table 2 shows the data from the study. Of the 274 respondents, 58.4% reported being aware of the health implications associated with taking drugs, while 41.6% indicated a lack of awareness. When asked about their current drug or substance use, 39.1% of respondents admitted to taking drugs, whereas 60.9% stated that they were not involved in drug use. Although a majority do not engage in drug abuse, the significant proportion that does (nearly 40%) highlights the prevalence of this issue among the youth. Among those who use drugs, a significant majority (74.8%) reported using multiple drugs, while 25.2% were involved in mono or single drug abuse. Regarding the influence behind drug use, 71.0% of respondents who take drugs cited friends as the primary influence, while 11.2% mentioned parents, and 17.8% indicated that no one influenced them.

Interestingly, when asked whether they enjoyed taking drugs, 67.3% of the drug users responded affirmatively, while 32.7% did not enjoy the experience.

Table 2: The prevalence rate of youths' drug abuse

Characteristics	Frequency(n=274)	Percentages (%)
Awareness of health implication of taking drugs		
Yes	160	58.4
NO	114	41.6
Are you taking any drug or substances?		
Yes	107	39.1
NO	167	60.9
Number of drugs being use		
Mono/single drug abuse	27	25.2
Multiple drugs of abuse	80	74.8
Who influence you into taking drug/substance		
Friend	76	71.0
Parents	12	11.2
No body	19	17.8
Do you enjoy taking drug?		
Yes	72	67.3
No	35	32.7

Table 3 below displayed the results of bivariate association between characteristics of respondents and their abuse of drug or substance. From the Table, it was found that there is no significant association between nine of the respondents characteristics (age, gender, educational level, location, employment status, family setting, staying with family, mothers level of education and fathers level of education) and their abuse of drugs and substances (p-values >0.05) among youths in the study area. While there is significant association between

two of the respondents characteristics (either or both parents using drugs and awareness of health implication of taking drug or substance) and abuse of drugs or substance among youth in the study area (p-values<0.05).

Table 3: Association Between Socio-Demographic Characteristics and Drug Use

Characteristic	Taking any drug or substances?	X^2	Df	P-value	Remark
	Yes (%)	No (%)			
Age group					
<18 years	14 (43.8%)	18 (56.3%)	1.049	3	.789
18-24 years	41 (35.7%)	74 (64.3%)			
25-34 years	40 (40.8%)	58 (59.2%)			
35 years and above	12 (41.4%)	17 (58.6%)			
Gender					
Male	73 (39.0%)	114 (61.0%)	.000	1	.995
Female	34 (39.1%)	53 (60.9%)			
Educational background					
No education	14 (42.4%)	19 (57.6%)	1.263	3	.738
Primary	16 (35.6%)	29 (64.4%)			
Secondary	62 (41.1%)	89 (58.9%)			
Tertiary	15 (33.3%)	30 (66.7%)			
Location					
Rural	38 (47.5%)	42 (52.5%)	3.389	1	.066
Urban	69 (35.6%)	125 (64.4%)			
Employment status					
Self-employed	34 (38.2%)	55 (61.8%)	2.524	3	.471
Public sector employee	19 (40.4%)	28 (59.6%)			
Unemployed	47 (42.3%)	64 (57.7%)			
Private sector employee	7 (25.9%)	20 (74.1%)			
Family setting					
Monogamy	50 (41.3%)	71 (58.7%)	.470	1	.493
Polygamy	57 (37.3%)	96 (62.7%)			
Staying with family					
Yes	65 (35.5%)	118 (64.5%)	2.888	1	.089
No	42 (46.2%)	49 (53.8%)			
Mother's level of education					
No education	27 (47.4%)	30 (52.6%)	4.436	3	.218
Primary	30 (44.1%)	38 (55.9%)			
Secondary	25 (32.1%)	53 (67.9%)			
Tertiary	25 (35.2%)	46 (64.8%)			

Characteristic	Taking any drug or substances?	X^2	Df	P-value	Remark
Father's level of education					
No education	14 (35.0%)	26 (65.0%)	2.011	3	.570
Primary	25 (42.4%)	34 (57.6%)			
Secondary	33 (44.0%)	42 (56.0%)			
Tertiary	35 (35.0%)	65 (65.0%)			
Either or both parents using drugs					
Yes	48 (69.6%)	21 (30.4%)	36.078	1	.000
No	59 (28.8%)	146 (71.2%)			
Awareness of health implications					
Yes	77 (48.1%)	83 (51.9%)	13.303	1	.000
No	30 (26.3%)	84 (73.7%)			

Discussion of Findings

Prevalence of drug or substance abuse

The finding of moderate (39.1%) prevalence rate of drug abuse was discovered. The finding is in contrast with that of Odejide, A. O. (16) who found that drug abuse was high. The implication of this finding is that the low proportion of prevalence rate may be due to chance. Moreover, office of National Drug Control strategy [1]. found that mostly abused drugs are for free, usually from friends and relatives made this finding not surprising because drugs that were abused may be easily gotten without much labour and difficulty. This finding agree with the findings of NDLEA [18] that despite the efforts of various tiers of government and NDLEA to stem drug abuse tide in the country, there has been a consistent rapid rise in the number of cases especially among the young adolescents (10-24 years).

Demographic variations of drug and substance abuse

In this study, lager percentage of female respondents (39.1%) engage in substance abuse compared to male respondents (39.0%) which is steeper for those in their early age compared to other age group this is contrast with the studies of [19] who also reported that majority of drug users are male respondents in a study on systematic review on prevalence and description of tobacco control and substance abuse strategies in Sub-Saharan African countries [20]. This gender difference may be attributed to societal perception as most African communities see drug abuse as a sign of masculinity or even specific to manhood and vigor [21]and also in contrast with these submissions of [9] who reported a higher proportion of respondents were male students and this suggests that the compulsive use of drugs is associated majorly with male gender. The gender differences in drug abuse are said to have their foundation in the very first stage of drug involvement and the opportunity to use the drugs. While social values discourage such act among women. However, gender differences with regard to substance use vary widely across the literature. Age, though, shows consistent

patterns, with older adolescents participating in substance use more often than their younger counterparts, with risk increasing each year from ages 10 to 17 [12]). One review of thirty-five studies indicated that most findings consistently show that childhood maltreatment is a risk factor for earlier onset of substance use [24] This may be because victims of maltreatment use drugs and alcohol as coping mechanisms rather than purely for social reasons. Thus, their onset is less dependent on the time other adolescents begin to use substances.

Conclusion

There was moderate prevalence rate of youth' drug abuse while female abuse drug or substance than male in addition and awareness of health implication of using drug or substance is significantly associated factor to drug or substance abuse.

Strength and

One of the strength of this study is that it focusses on a novel environment which is cosmopolitan area, providing valuable insights into the prevalence and patterns of drug abuse among youths in Jos North LGA, Plateau State,

Limitation

Some limitations that should be acknowledged include firstly, the cross-sectional design of the study limits the ability to infer causality. The data were collected at a single point in time, which means that while associations between variables were identified, it is not possible to determine the direction of these relationships or establish a cause-and-effect link. This limitation could affect the interpretation of findings, particularly concerning the relationships between socio-demographic factors and drug abuse.

Recommendations

Based on the findings of this study, as well as the discussions and conclusions drawn, the following recommendations are proposed to address the issue of drug abuse among youths in Jos North LGA:

Enhancing Educational Interventions: Ensuring uninterrupted school sessions is vital, as consistent educational engagement plays a key role in educating and enlightening youths about the dangers of drug abuse. Educational institutions should integrate comprehensive drug education into their curricula, focusing on the health risks, legal consequences, and long-term impact of drug use.

Establishing Specialized Government Agencies: it is recommended that specialized agencies be established at both the state and local government levels, in addition to the existing National Drug Law Enforcement Agency (NDLEA).

Targeting Gender-Specific Interventions: The study's findings indicate that females in Jos North LGA are slightly more likely to engage in drug abuse than males, challenging traditional perceptions of drug abuse as predominantly a male issue. Therefore, it is essential to adopt a multifaceted approach to drug education, with a particular focus on young females.

Supporting Families Affected by Drug Abuse: The study revealed a significant association between parental drug use and the likelihood of drug abuse among youths, underscoring the critical role of family dynamics in the perpetuation of drug abuse behaviors. It is recommended that support programs be developed to assist families where drug use is prevalent.

Policy Development and Implementation: Policymakers in Plateau State and beyond should consider the

findings of this study when formulating drug prevention and control policies. These policies should be inclusive of gender considerations, recognizing the vulnerability of both young males and females to drug abuse. Furthermore, policies that promote collaboration between schools, healthcare providers, community organizations, and law enforcement agencies could enhance the effectiveness of drug abuse prevention efforts.

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