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Bioaccumulation of Aluminum in Dry Tea Leaves and Health Risks Associated with its Consumption by an Urban Populace in Port Harcourt Metropolis, Rivers State, Nigeria

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Abstract

The concentration of aluminum in two brands of dry tea leaves and health risk assessment associated with its consumption was determined using standard methods. The dry tea leaves was Purchased from livinchu supermarket along Adageorge road in the heart of Port Harcourt metropolis, Rivers State, Nigeria, and brought to the laboratory of School of Pharmaceutical Technology, Department of Pharmacy Technician. The leaves were removed from their pouches and transferred into sample bottles, followed by acid digestion and an aspiration of an aliquot of the digested solution into an Agilent 42100 MP-AES machine to determine the residual aluminum content of the various teas, which was subsequently used to estimate the health risk associated with its consumption. Results showed that all the teas studied contained aluminum at varied concentrations with green tea containing moringa and strong black tea for men having values above 1000mg/kg while the rest had values less than 1000mg/kg. The result has clearly shown that green tea with moringa and black strong tea for men are hyperaccumulators of aluminum from soils than others, which can used for phytoremediation of aluminum contaminated soil. It also suggests that consumption of dry tea leaves is a major source of dietary exposed to aluminum in humans. Health risks assessment indicators depicted that all ADIs and HQs were less than unity ($ADD < 1$ and HRI or $HQ < 1$), and implies that there is no possibility of contracting non-cancerous disease that would have caused undue health issues of public health interest via consumption.

Keywords: bioaccumulation, aluminum, dry tea leaves, health risks, consumption

Introduction

Tea is produced from dry leaves of the shrub called *Camellia Sinensis*. The tea plant is perennial and once planted can last over 100 years under good agronomic and cultural practices (Owuor et al., 2008). Its cultivation is restricted to certain areas like tropical regions and mountainous areas of the tropics, where altitudes are in the range of 1200-1800 m above sea level with temperature regimes of 10-27°C without frost. This explains why tea plants can only thrive well at very few locations in West Africa, China, Iran etc. (Asogwa, 2007).

In Nigeria, tea is only grown in Mambilla Plateau which was introduced to Nigeria from Kenya in 1972 by the Nigerian Beverage Production Company (NBPC). Ten years later, breeding started with the acquisition of 33 clones by the Cocoa Research Institute of Nigeria from NBPC. Today, tea production is a great contributor to the national economies of some African countries like Cameroon, Kenya, Malawi, Tanzania and most Asian countries like China and Iran (Omolaja & Esan, 2005).

Currently, global tea production comprises about 78% black tea, 20% green tea and 2% Oolong tea (FAO, 2008). Most of these teas are very popular alcohol-free and caffeinated beverages consumed all over the world (Cacera et al., 2001; Saud & Al-oud, 2003; Chen et al., 2007; Yao et al., 2008). However, in Nigeria, tea production has not been sufficient to meet up the demand from processing companies. Tea has both pharmaceutical and numerous health benefits when taken at the prescribed quantity because of its intrinsic properties. Despite these health benefits from tea consumption, research has shown that tea also carries some potential health risks factors which may pose a threat to the health of tea consumers, due to the accumulation of high levels of certain heavy metals and other metals like aluminum (Dogru et al., 2011; Ma et al., 2016). This idea was supported by various researchers who reported that aluminum is involved in certain diseases like Alzheimer's disease, Parkinson's disease, dialysis encephalopathy etc (Qin & Chen, 2007; Dogra et al., 2011; Kolachi et al., 2011; Deghesele et al., 2013).

Furthermore, aluminum is very toxic and has a direct effect on living organisms and there is a paucity of information regarding aluminum levels in tea leaves consumed as beverages. It is, therefore, pertinent to investigate aluminum levels in some selected tea leaves consumed in Port Harcourt metropolis since there is a paucity of information in this regard.

2.0: Materials and Methods

2.1: Collection of Materials

Two types of tea leaves namely, green and black tea which are mostly consumed and sold in Port-Harcourt metropolis were chosen and bought at livinchu supermarket along Ada George road and brought to the school of pharmaceutical technology, Rivers State College of Health Science and Management Technology, Port Harcourt Rivers State Nigeria. The tea brands consisted of three brands of green tea namely, green tea with moringa (GM), green tea with mint (G+M), green tea with lemon lime (G+Li+Le) and two brands of black tea namely, strong black tea for men and black tea Chinese respectively. Port-Harcourt is located at ..

2.2: Preparation of Dry Tea Leaves Materials

The tea leaves were prepared in two batches using single and composite samples (four pouches). To prepare the composite sample, four pouches of each brand of tea were bulked together and homogenized to form a representative sample and transferred into separate sample bottles for both green and black tea leaves. For the single batch, a single pouch of all the brands of tea leaves was torn open and the dry leave was transferred into a sample bottle for each. All the obtained samples were then stored for analytical purposes.

2.3: Acid Digestion Method

The method of Patrick-Iwuanyanwu and Chioma (2017) was used. A total of 100mL of H₂SO₄, HNO₃ and HClO₄ in the ratio of 40%:40%:20% were mixed. A portion of 1g of each sample of tea leaves was weighed and accurately digested with 2mL of the mixed acid on each sample in a Kjeldahl flask. Each sample was then digested in a fume cupboard with a hot plate until white fumes appeared. After that, the solution was then allowed to cool, filtered and transferred into a 100mL volumetric flask and made up to mark with distilled water, and an aliquot aspirated into the MP-AES Agilent 42100 machine to determine the amount of residual aluminum present in the sample at 319nm wave length.

2.4: Calculation of Health Risks Assessment

To assess the possible health risk that may be associated with the consumption of dry tea leaves, the average daily intake dose (ADI) and the health risks index or hazard quotient was determined using the appropriate formula:

$$ADD = \frac{C_{\text{metal}} \times C_{\text{factor}} \times IR}{BW} \dots \text{Equation 1 (Qaiyum et al., 2011; Peng et al., 2016).}$$

Where, C_{metal} = Al concentration in dry tea leaves (mg/kg, DW), C_{Factor} = the conversion factor, and IR = the daily intake of dry tea leaves which is 11.4g/person/day (Peng et al., 2016), and BW is the average body weight for Nigerian consumer which is 60kg for adult (Tsafé et al., 2012). The conversion factor of 0.085 was used to convert fresh tea leaves for adults.

$$HRI \text{ or } HQ = \frac{ADI}{RfD} \dots \text{Equation 2 (Charry et al., 2008; Jan et al., 2010; USEPA, 2013; Peng et al., 2016)}$$

This parameter was estimated as the ratio of the average daily intake dose (ADI) of aluminum (Al) to the daily intake oral reference dose (RfD) for aluminum (Al). The daily intake reference dose for Al was taken as 7mg/kg/day (FAO/WHO, 1989). Furthermore, the level or extent of health hazard or risk was determined as a ratio of HRI to RfD where if $\frac{HRI}{RfD} =$ or $<$

RfD: minimum risk; $\frac{HRI}{RfD} > 1$ to 5 times RfD: Low risk, $\frac{HRI}{RfD} > 5$ to 10 times RfD: Moderate risk; $\frac{HRI}{RfD} > 10$ times $>$ RfD: High risk (NYSDOH, 2007).

3.0: Results and Discussion

3.1: Results

The summary of the result of aluminum concentrations in all the dry tea leaves and their composite is displayed in Table 1 and Table 2 respectively. The result shows that the aluminum concentration in the various tea leaves differed and ranged between 22.918 mg/kg (green tea with mint) as the least and 3580.400mg/kg (Green tea with moringa) as the highest, while green tea with lemon and lime which contained ascorbic acid has an intermediate concentration of 24.903mg/kg respectively. Again, in black tea leaves, the aluminum concentration ranged between 15.394mg/kg as the least and 5231.544mg/kg as the highest in strong black tea for men.

Table 1: Summary of Aluminum Content in the Selected Tea Leaves Consumed in Port-Harcourt Metropolis

Tea Name	Code	Method	Wave Length (nm)	Aluminum Content per Pouch of Tea Leave (Mg/kg)
Green Tea with Moringa	GT+MO	EPA 3030B	319	3580.400
Green Tea With Mint	GT+MT	EPA 3030B	319	22.918
Green Tea with Lemon and Lime (Slimming Tea).	G+Le+Li	EPA 3030B	319	24.904
Strong Black Tea for Men	SBT	EPA 3030B	319	5231.544
Black Tea Chines	BT	EPA 3030B	319	15.394

Source: Researcher’s Field Work, 2023

Furthermore, a comparison of the aluminum concentration of single and composite pouches revealed that the aluminum concentration increased from 3580.400mg/kg (single pouch) to 4946.638mg/kg (composite pouches) in the dry leaves of green tea, while that of black tea increased from 5231.544mg/kg (single pouch) to 5826.851mg/kg (4 pouches). This trend was applicable to all the brands studied as depicted by Table 2, thus, suggesting that taking more than 2g (single pouch of dry tea leaves) increases the amount of Al to be ingested.

Table 2: Comparison of Aluminum Content in Single and Composite Samples of Dry Leaves of Green Tea with Moringa and Strong Black Tea for Men

Tea Name	Method	Wave Length (nm)	Aluminum Content per Pouch of Tea Leave (Mg/kg)	Aluminum Content 4 Pouches of Tea Leave (Mg/kg)
Green Tea with Moringa	EPA 3030B	319	3580.400	4946.638
Green Tea + Lemon + Lime	EPA 3030B	319	24.904	49.26
Green tea + Mint	EPA 3030B	319	22.918	46.99
Strong Black Tea for Men	EPA 3030B	319	5231.544	5826.851
Black ChineseTea	EPA 3030B	319	15.934	24.42

Source: Researcher's Field Work, 2023

3.2: Discussion

3.2.1: Bioaccumulation of Aluminum by Dry Tea Leaves

The result of this study (Table 1) is in agreement and has also confirmed the result of several independent researchers that most dry tea leaves contained aluminum in their matrix (Ruan & Wong, 2001; Moghaddan et al., 2008; Barcena – Padilla, 2010; Barcena – padilla et al., 2011). This is in agreement with literature data reported by the aforementioned researchers and implies that tea consumption is a potential source of bioavailable aluminum in the diet (Steinhausen et al., 2004; Yokel & Florence, 2008). Furthermore, the aluminum concentration in green and black tea leaves is at variance with the result obtained by Ruan and Wong (2001) who reported concentrations between 468mg/kg and 930mg/kg in their study. However, their values are not higher than that in green tea with moringa and strong black tea for men and their composites (Table 2). In another study, Moghaddan et al., (2008) have shown aluminum concentrations between 10,000mg/kg and 30,000mg/kg which are several times higher than all the results obtained in this study.

Again, the result of aluminum concentrations in green tea with moringa and strong black tea for men shows that these tea leaves are hyperaccumulators of aluminum and could be called metallophytes since they bioaccumulated Al over 1000mg/kg. This idea was

supported by Ozdemir et al. (2002), Jansen et al. (2003), Peng et al. (2018), who claimed that tea leaves are hyperaccumulators of aluminum.

The aluminum concentration in our present study could be attributed to the dry tea leaves being a metallophyte or having the potential to bioaccumulate aluminum to a great extent into their matrices. This idea was buttressed independently by Flaten (2002) and Jansen et al. (2003). However, metallophytic or hyperaccumulating potentials of tea leaves were only found in green tea with moringa and strong black tea for men. It could also be attributed to the presence of a large amount of water-soluble or bioavailable fraction of aluminum in the soil, and its mobility. In this mobile form, plants' roots can absorb or abstract it and subsequently sequester it into other parts of the plant (leave or stem). This idea was buttressed by Radulescu et al (2013). However, green tea with mint and green tea with lime and lemon does not exhibit hyper accumulating properties as their accumulation of aluminum was less than 1000mg/kg. This could be attributed to the existence of a strong affinity for root exchange sites where aluminum could precipitate as hydroxides to form plaque, thus reducing the total amount of aluminum that would have been sequestered to other parts of the plant, hence the lower concentration of aluminum in green tea with mint, green tea with lemon and lime and black Chinese tea respectively as a result of poor or reduced translocation factor (Ghosh & Singh, 2005; Bhattacharya et al., 2010). This implies that the sequestering capacity of the plant could account for the varied concentration of aluminum in the various tea leaves. Also, the presence of reduced or low polyphenols in their matrix could be implicated.

Again, the type or variety of tea leaves could be implicated (Table 1). In our present result, the concentration of aluminum is different depending on the type or blend. For example, aluminum concentration in green tea leaves is lower than that of black tea leaves even in its composite. This view was corroborated by Fung et al (2009) who reported that the quantity of aluminum in young leaves from a Kenyan variety had a significantly higher aluminum concentration (2152mg/kg) than a Chinese variety (381mg/kg). Furthermore, Chen et al (2009) have also shown that the aluminum concentration in leaves of eight tea cultivars grown on the same plantation varied. This is in accord with Flaten (2002) and Street et al. (2007) who attributed the difference in aluminum in the different tea leaves to the presence of phenolic groups in teas. They argued that black tea leaves have more polyphenolic groups than green tea leaves and can form complexes or chelates more than green tea leaves. This is in good agreement with previous studies by Ruan & Wong (2001) and Liu et al (2003). Hence, the observed result of black tea leaves having more aluminum concentrations than green tea leaves.

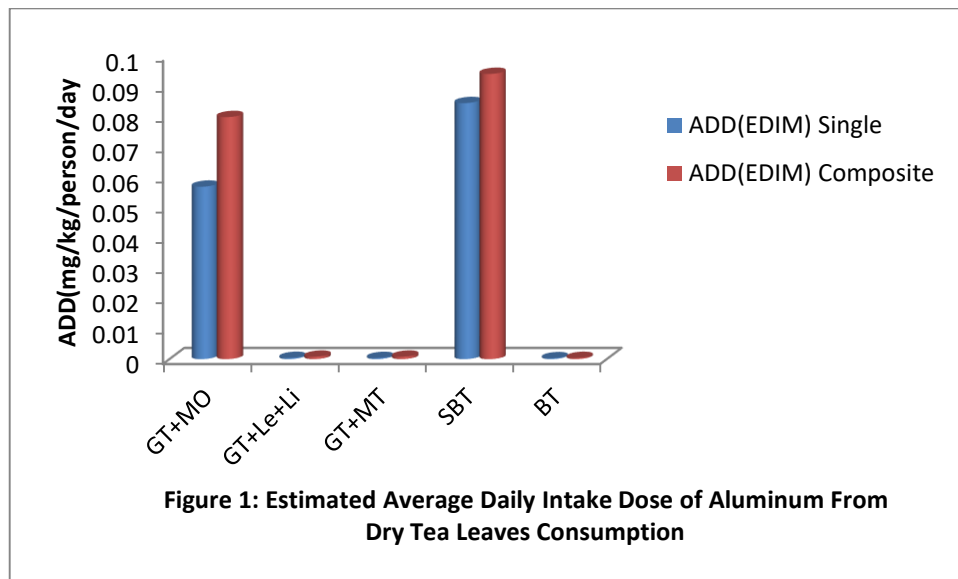
Furthermore, the location or source of the tea leaves is another factor. Several authors have independently reported that dry tea leaves obtained from different countries have different concentrations of aluminum in their dry leaves (Ansari et al., 2007; Mehra & Baker, 2007; Lech & Lachowicz, 2009). They reported that the aluminum concentration in dry tea leaves from Turkey, Czech Republic, Hong Kong and Italy showed strong variation. In addition, soil conditions such as pH, organic matter, cation exchange capacity and available phosphorous play a great role in how much aluminum can be absorbed by the tea plant and sequestered in other parts of the plant (Jin et al., 2005; Cai et al., 2010; Cai et al., 2016). This idea was supported by Peng et al (2018) who argued that aluminum concentration in dry tea leaves may be influenced by soil condition, tea variety, harvest season and leave maturity.

Another contribution to the observed aluminum concentration in the different tea leaves is the effect of the harvesting season on the bioaccumulation of aluminum. This assertion was put forward by Peng et al (2018) who reported that harvest season or seasonal variation greatly affected the levels of aluminum in dry tea leaves. Their result showed that seasonal variation gave different hyperaccumulation of aluminum with summer having the

highest, followed by autumn and springtime as the lowest. This could be attributed to higher plant metabolism or increase transpiration in autumn and summer compared to spring which would bring more aluminum into the plant. It could therefore be inferred that the blended teas were harvested in spring during which low levels of aluminum are observed, while green tea with moringa and strong black tea for men were harvested during summer and autumn respectively.

3.2.2: Health Risks Assessment of Human Exposure to Aluminum via Consumption of Dry Tea Leaves of Green and Black Teas

The estimated average daily intake (ADI) dose or average daily intake dose of Al from consuming dry tea leaves is presented in Figure 1 for both single and composite tea pouches of all the types of tea investigated. The result depicted that the ADI varied between 0.0003mg/kg/person/day and 0.0845mg/kg/person/day in the dry tea leaves from a single pouch, while in the composite pouches, it varied between 0.0004mg/kg/person/day and 0.0941mg/kg/person/day. It was also revealed that the ADI for the composite dry tea leaves was generally greater than that of the single pouch. Furthermore, strong black tea for men has the highest ADI in both single and composite pouches of dry tea leaves. However, all the ADIs were lower than unity (ADI < 1).



The HRI or HQ in dry tea leaves varies between 4.2857×10^{-5} and 1.2071×10^{-2} for a single pouch, while in the composite, it varied between 5.6340×10^{-5} and 1.3443×10^{-2} . Furthermore, the HRIs of the composites are greater than that of the single pouch. However, all the HRIs are generally less than unity (HRI < 1).

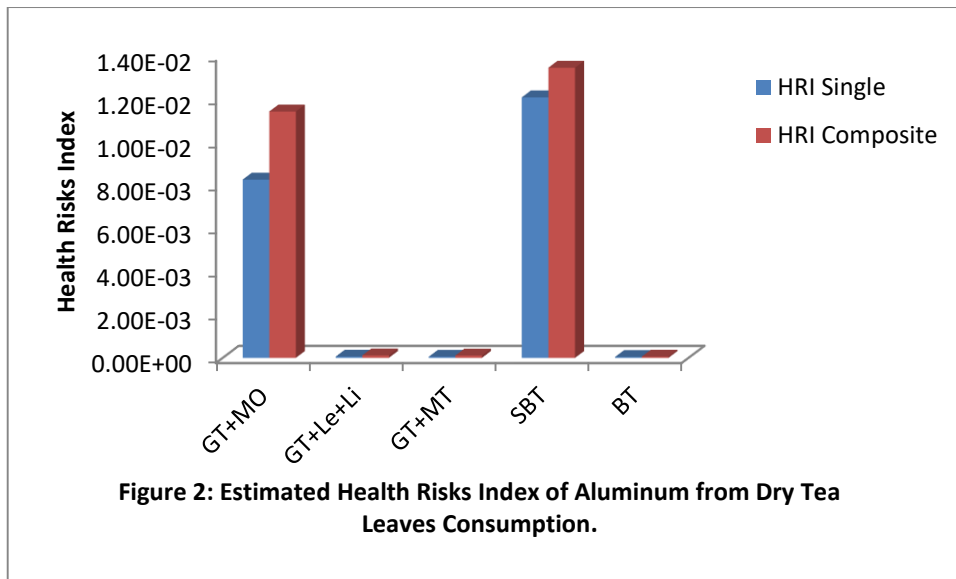


Figure 2: Estimated Health Risks Index of Aluminum from Dry Tea Leaves Consumption.

To describe the level of health risks that may be associated with dry tea leaves consumption, the ratio of HRI to RfD was calculated and compared with RfD alone and the result is presented in Figure 3. The result showed that the HRI/RfD in all the dry tea leaves were extremely less than the RfD, thus suggesting and confirming the previous health risks parameters to agree with HRI/RfD, since $HRI/RfD < RfD$. It means the minimum risk of undue health-related problems or public health concerns may arise from the consumption of dry tea leaves.

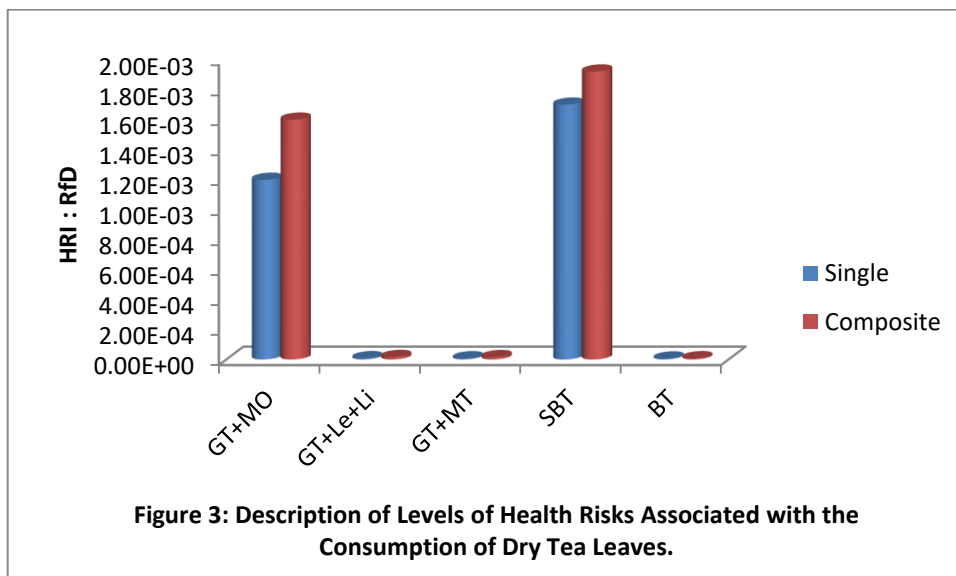


Figure 3: Description of Levels of Health Risks Associated with the Consumption of Dry Tea Leaves.

In this study, the ADI in green tea leaves and black tea leaves were observed to be low and lower than unity ($ADI < 1$). Similarly, the ADI in both the single pouch and composite

pouches were low and lower than unity. Furthermore, their values were even lower than the RfD and permissible limit of Al in water (0.2mg/L). The obtained ADI implies that consumers are not likely to have any undue health issues of public health concern.

Health risks index or hazard quotient (HRI or HQ) results have shown that all the HRIs were low and lower than unity (HRI or HQ < 1) but were higher in the composite than in the single pouch. Our present result is at variance with other researchers who did a similar study using the vegetable to assess arsenic (As) exposure via consumption. They reported independently that the HRIs obtained were greater than that unity (HRI or HQ > 1). This idea was corroborated by Ikeda et al (2000) and Zhuang et al (2007). The overall results of risk assessment depicted that currently and in the nearest future, no undue health issues of public health interest will arise or is expected.

Conclusion

The result has shown that Al concentrations in dry tea leave differ according to type and brand (green and black tea) with green tea containing moringa and strong black tea for men, having higher concentration above 1000mg/kg, while other brands in this study had concentrations far below 1000mg/kg. Thus, suggesting that both green tea with moringa and strong black tea for men are hyperaccumulator of Al. In addition, the plant could be classified as a metallophyte which could be used as a phytoremediating agent in Al polluted or contaminated soil or environment to remove Al. Furthermore, health risks assessment results showed absence of any possible undue non-cancerous diseases currently, or in the near future, since all the risks indices were lower than unity (ADI < 1; HRI or HQ < 1) in all the tea samples studied. It could therefore be inferred that the dry leaves of the various teas could be consumed since they pose no health threat to consumers.

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Assessment of Capacity Needs of Health Personnel in Management of Survivors of Sexual and Gender-Based Violence in Rivers State: A Case for Health Promotion in the Era of COVID-19

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Abstract

Sexual and Gender-based violence (SGBV) is a common and serious public health problem affecting millions of Nigerians which COVID-19 has escalated. The capacity of health personnel in managing SGBV survivors should be determined in order to ensure effective health promotion. This paper therefore investigated the capacity needs of health personnel in Rivers State in managing SGBV survivors. The study adopted descriptive survey research design which was carried out during a workshop organized for randomly selected health personnel in the employ of the Rivers State government in August, 2021. The questionnaire was used as the instrument for data collection, administered on 40 respondents which included doctors, nurses, community health extension workers (CHEWs) and medical records officers. Two research questions and two hypotheses guided the study, and data were analysed using mean, percentage and chi-square. The result showed that majority of the respondents (67.5%) needed training on skills of managing SGBV survivors. The hypothesis showed significant difference on the knowledge level of SGBV among nurses and doctors in Rivers State. The study recommended that government and non-governmental organisations should provide health workers in Rivers State with comprehensive capacity training on management of SGBV survivors to achieve health promotion.

Keywords: assessment, capacity needs, health personnel, management, sexual and gender-based violence

Introduction

The term, health promotion is sometimes used interchangeably with health education, or used as Siamese twins. Both terms focus on how to achieve wellness through lifestyle and preventive measures. However, health promotion particularly has been defined as the science and art of encouraging individuals modify their lifestyle towards a state of best possible health (Kumar & Preetha, 2012). The principle behind the idea of health promotion is the fact that lifestyle is a major contributor to disease burden and mortality which can be prevented by eliminating their risk factors. It is against this background that the United Nations' sustainable development goals incorporate health promotion strategies. Consequently, this paper sees health promotion as a key intervention in the elimination of sexual and gender-based violence (SGBV). This thrust can only be achieved if the health worker has the capacity to function effectively.

Recently, the prevalence of sexual and gender-based violence has taken a new dimension in the wake of COVID-19, making humans across tribes and religions an endangered species and has attracted global concerns. To give it the desired attention, the United Nations in 2015 commenced the commemoration of the Elimination of Sexual

Violence and the theme for 2021 commemoration was **“Building Back Better: Supporting Survivors of conflict-related Sexual Violence in the context of a Pandemic Recovery”**. Sexual and gender-based violence is a common and serious public health problem affecting millions of people each year throughout the world and it is driven by many factors such as stigmatization, inequality, poverty, illiteracy, weak judicial system, negative cultural practices, among others.

Complex social problems such as COVID-19, increasing rate of unemployment, banditry, armed robbery, communal conflicts, political instability, violent protests, and moral decadence, among others have increased the prevalence of sexual and gender-based violence in the world. COVID-19 in particular did not only bring socio-economic burden, it also increased the health and mortality burden of nations. Rape and violence cases increased as a result of lockdown and restrictions in the wake of COVID-19. These acts of violence have implications on the physical health, psychological health and social wellbeing of the survivors. According to United Nations Population Fund (UNFPA, 2020), the victim’s dignity, security and autonomy are undermined. Essentially, the health consequences of sexual violence include forced and unwanted pregnancies, unsafe abortions, traumatic fistula, sexually transmitted infections, including HIV, and even death (UNFPA, 2020).

Sexual and Gender Based Violence (SGBV) is any act of aggressive behaviour that results in, or likely to result in, physical, sexual, or psychological harm or suffering to an individual including threats of such acts, coercion, or arbitrary deprivation of liberty, whether occurring in public or in private life as a result of one’s gender (Arango et al. 2014). Here, we adopt the explanation of gender by Scott and Marshall (2005) as the biological and sociocultural dimensions into which individuals are grouped. The biological dimension separates individuals as male and female with distinct natural characteristics such as in procreation. On the other hand, the sociocultural dimension brings to the fore culturally induced unparallel roles, stereotypes and economic/political positions which society places on males and females, resulting in the concepts of masculinity and femininity. The term SGBV, according to World Health Organisation (WHO, 2021), comprises both rape and attempted rape, sexual abuse, sexual exploitation, forced early marriage, domestic violence, marital rape, trafficking and female genital mutilation. These acts have no sex or age barrier; any person can be a victim. However, violations against women and girls are the most prevalent globally. Hence, it is estimated that one in three women will experience physical or sexual abuse in her lifetime (United Nations Population Fund, UNFPA, 2020).

SGBV hinders national productivity as it occurs amongst people in the productive age group who have to deal with the negative physical and psychological consequences of the act. Therefore, appropriate investments in the services of SGBV have the potential to transform national economies, facilitate the achievement of demographic dividends and engender development. SGBV is an offence punishable under section 218 of the criminal code, cap 37, vol 11, law of Rivers State of Nigeria.

Beyond providing health care services to victims, collaborative effort should be made to exterminate the culture of silence which has encouraged the prevalence of SGBV; culture of silence to avoid stigmatization, culture of silence to avoid litigation because of financial burden and exposure to security risk. Most importantly, the worker who is saddled with the responsibility of managing the victims of SGBV should be spotlighted to determine their capacity needs.

Capacity needs assessment helps to identify gaps and weaknesses that hinder achievement of targets in an area of human endeavour, possibly an institution. Capacity needs assessment is aimed at strengthening services for better outputs. Food and Agriculture Organisation of the United Nations (2021) states that the purpose of a capacity needs

assessment is to provide a clear picture of an institution's competence with regard to their strengths, weaknesses and available assets, focusing on the personnel, the institution and its environment. Capacity needs assessment also exposes actual existing gaps with relation to opportunities, threat and other elements within an institution for the achievement of planned objectives (World Agroforestry Organisation, 2021).

Oxford University Clinical Research Unit (2017) opined that health workers, most of the time, do their work in challenging and stressful environments because of their difficulty in dealing with patients and their families in terms of communication. Consequently, the unit organises capacity building for workers. It is necessary to deal with the challenges which health workers face by assessing their capacity needs in order to address them by relevant authorities.

Allen et al. (2016) assert that, in dealing with patients, health workers need appropriate training, support, supervision, funds and infrastructure for effective health care delivery. Capacity building (also known as capacity strengthening) is a process through which individuals and groups increase their skills to perform fundamental functions, tackle emerging issues and needs in a sustainable manner (Horton et al, 2003). Therefore, assessment needs for capacity building of health personnel in dealing with sexual and gender-based violence survivors could be impactful on health care system of Rivers State.

According to Yousafzai et al. (2014), effective health promotion interventions depend on the capacity of the health care system. They aver that capacity building also includes mobilizing support for the frontline health personnel in order to promote a result-oriented health care system. The import of this paper is underscored by the 2021 theme for the commemoration of elimination of sexual violence which focuses on support for survivors. It is believed that this paper would make a contribution on the way forward on SGBV with particular attention on the health worker.

Available literatures show that few authors have worked on capacity needs assessment of health workers generally. For example, Dussault et al. (2008) assessed the capacity to produce health workers in Rwanda. The results reviewed that physical structures in terms of classrooms were generally good except at the Faculty of Medicine and insufficient budgets were reported by all the investigated institutions. The results also showed that managerial competence was lacking.

Allen et al. (2016) studied capacity building and training of needs for community health workers. The results showed that 80% of the workers agreed that they were well trained to discharge their responsibilities but they spotted communication, advocacy, assurance of service and culturally competent services as their priority areas. The present study on the capacity needs assessment of health worker dealing with SGBV survivors contributes to fill the gap created by paucity of empirical studies on health personnel and SGBV survivors. Consequently, this paper would provide some insight on their professional development needs.

Methodology

The study adopted *descriptive survey* research design which was carried out during a workshop organized for randomly selected health personnel in the employ of the Rivers State government in August, 2021. The questionnaire was used as the instrument for data collection, administered on 40 respondents which included doctors, nurses, community health extension workers and medical records officers. Two research questions and two hypotheses guided the study, and data were analysed using mean, percentage and chi-square.

RESULTS

Research question 1: What is the level of knowledge of sexual and gender-based violence among health personnel in Rivers State?

N= 40

S/N	Statements	SA	A	D	SD	\bar{X}	S	Decision
1	Gender-based violence is any act of violent behaviour that results in, or likely to result in, physical harm.	31	9	0	0	3.8	0.18	Accepted
2	Gender-based violence is any act of violent behaviour that results in, or likely to result in, sexual harm.	30	10	0	0	3.8	0.16	Accepted
3	Gender-based violence is any act of violent behaviour that results in, or likely to result in, psychological harm.	14	24	2	0	3.3	0.31	Accepted
4	Gender-based violence includes threats of coercion because one's weakness.	13	24	3	0	3.3	0.31	Accepted
5	Gender-based violence includes arbitrary deprivation of liberty.	16	22	2	0	3.4	0.30	Accepted
6	Gender-based violence occurs in public or in private life as a result of one's gender.	7	17	10	6	2.6	0.89	Accepted
7	Forced early marriage is a type of SGBV.	14	16	10	0	3.1	0.35	Accepted
8	Cultural harmful practices are forms of SGBV	15	18	5	2	3.2	0.30	Accepted
9	Withdrawal of financial support is a type of SGBV.	5	7	20	8	2.2	0.83	Rejected
10	Threats, false accusation, intimidation and public ridicule are forms of SGBV.	7	9	17	7	2.4	0.87	Rejected
Grand mean						3.11	0.45	Accepted

Research questions 2: What are the capacity needs of health personnel in combating SGBV in Rivers State?

S/N	Statement	Percentage Responses	
		Yes (%)	No (%)
1	Strategies to be applied to ensure safety of the survivor.	35 (87.5%)	5 (12.5%)
2	Strategies to be applied to ensure confidentiality.	20 (50%)	20 (50%)
3	Strategies to be applied to ensure respect of the survivor.	26 (65%)	14 (35%)
4	Strategies to be applied to ensure non-discrimination of the survivor.	24 (60%)	16 (40%)
5	Strategies to be applied to ensure non-judgemental attitude towards the survivor.	28 (70%)	12 (30%)
6	Knowledge of implementation of multi-sectorial response to SGBV (including health, psychosocial support, security, and legal responses).	29 (72.5%)	11 (27.5%)
7	Knowledge of the principles of case management.	29 (72.5%)	11 (27.5%)
8	Knowledge of critical analysis of context, trends and vulnerabilities related to SGBV	31 (77.5%)	9 (22.5%)
9	Knowledge of advocacy/outreach activities to sensitize communities on SGBV.	25 (62.5%)	15 (37.5%)
10	Knowledge of communication skills with SGBV survivors.	26 (65%)	14 (35%)
Mean		27 (67.5%)	13 (32.5%)

Hypotheses 1: There is no significant difference between the knowledge level of SGBV among nurses and doctors in Rivers State.

Statement	SA	A	D	SD	Total	$\sum \frac{(O - E)^2}{E}$	X_c^2	P	df	α	Decision
1	20 (10.7)	8 (10.7)	0 (4.6)	0 (2)	28	8.76					S
2	18 (10.7)	10 (10.7)	0 (4.6)	0 (2)	28	5.03					
3	14 (10.7)	12 (10.7)	2 (4.6)	0 (2)	28	2.65		0.0000			
4	10 (10.7)	15 (10.7)	3 (4.6)	0 (2)	28	2.34		1			
5	10 (10.7)	16 (10.7)	2 (4.6)	0 (2)	28	2.31			2	0.0	
6	6 (10.7)	10 (10.7)	7 (4.6)	5 (2)	28	7.86	78.0		7	5	
7	10 (10.7)	12 (10.7)	6 (4.6)	0 (2)	28	0.64	0				
8	10 (10.7)	11 (10.7)	5 (4.6)	2 (2)	28	0.09					
9	4 (10.7)	6 (10.7)	10 (4.6)	8 (2)	28	30.60					
10	5 (10.7)	7 (10.7)	11 (4.6)	5 (2)	28	17.72					
Total	107	107	46	20	280						

(S = Significant, P = P-Value)

The P-Value is < .00001. The result is significant at $P < .05$. Based on the chi-square calculated $X_c^2 = 78.00$ with $df = 27$ gives P-value = .00001 which is less than $\alpha (0.05)$ showed significant difference on the knowledge level of SGBV among nurses and doctors in Rivers State.

Hypotheses 2: There is no significant difference between the knowledge level of SGBV among nurses and community health extension workers in Rivers State.

Statement	SA	A	D	SD	Total	$\sum \frac{(O - E)^2}{E}$	X_c^2	P	Df	α	Decision
1	17(9.2)	7(10.6)	0	0	24	7.83					
2	16(9.2)	8(10.6)	0	0	24	5.67					
3	12(9.2)	10(10.6)	2(2.4)	0	24	0.95					
4	13(9.2)	11(10.6)	0	0	24	1.59					
5	4(9.2)	14(10.6)	4(2.4)	2(1.8)	24	5.23	48.88	.006113	27	.05	Significant
6	3(9.2)	13(10.6)	4(2.4)	4(1.8)	24	8.48	8	3			
7	4(9.2)	12(10.6)	5(2.4)	3(1.8)	24	6.74					
8	5(9.2)	11(10.6)	5(2.4)	3(1.8)	24	5.56					
9	8(9.2)	12(10.6)	0	4(1.8)	24	3.03					
10	10(9.2)	8(10.6)	4(2.4)	2(1.8)	24	1.80					
Total	92	106	24	18	240						

(S = Significant, P = P-Value)

The P-Value is $< .00001$. The result is significant at $P < .05$. There is significant difference between the knowledge level of SGBV among nurses and community health extension workers (CHEW) in Rivers State. Based on the chi-square calculated $X_c^2 = 48.88$ with $df = 27$ gives P-value = .006113 which is less than $\alpha (.05)$ showed significant difference on the knowledge level of SGBV among nurses and CHEW in Rivers State.

Discussion of Findings

The findings showed that the respondents’ knowledge level of what constitute SGBV was high (mean = 3.11). However, item analysis of the variables showed that the respondents had poor knowledge about economic and psychological/emotional variants of SGBV having had mean scores of 2.2 and 2.4 respectively. The findings also showed that health personnel in Rivers State needed further training on skills of managing SGBV survivors. The hypothesis showed significant difference on the knowledge level of SGBV among nurses and doctors in Rivers State on one hand, and on another hand, among nurses and Community Health Extension Workers.

The findings on the respondents’ level of knowledge of sexual and gender-based violence are similar to the position of Allen et al. (2016), where health personnel showed good knowledge of their responsibilities. The fact that health workers in Rivers State showed good knowledge of forms of SGBV is an indication that collaboration between NGOs working on SGBV and the SGBV Unit in the Ministry of Health is yielding positive results. The findings, however, disagree with the study carried out by Dussault et al. (2008) which assessed the capacity of health workers in Rwanda. The results showed that managerial competence was lacking.

The findings that majority of the health workers needed capacity building in terms of appropriate skills in different areas of eliminating SGBV or managing the survivors were not surprising because Rivers State had not domesticated the national action plan on the

elimination of SGBV. This gap is what the findings of this paper have exposed. Recalling Yousafzai et al. (2014), effective health promotion interventions depend on the capacity of the health workers. Consequently, capacity building which includes mobilizing support for the frontline health personnel is important for promotion of a result-oriented health care system.

Conclusion

Capacity building of health workers in Rivers State towards the management of SGBV survivors is critical. It is also a key intervention strategy in health promotion that would lead citizens and communities into wellness through reduction of risk factors associated with not only SGBV, but also general lifestyles that constitute disease and economic burden in society in the era of pandemics.

Recommendations

1. Health workers in Rivers State should be given further training on silent variants of SGBV such as economic and psychological variants by NGOs and Ministry of Health.
2. They should also be given comprehensive capacity training on management of SGBV survivors to achieve health promotion.
3. Communities should be given health promotion and education by NGOs and government agencies on the dangers of SGBV and the encouragement to reduce its associated factors in order to promote wellness.

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Language as a Tool for Unification and Socio-Economic Development in Nigeria

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Abstract

Language is of great essence to man. It is the means through which humans express their thoughts, exchange phatic communion, develop themselves and conquer their environments. Nigeria is one multilingual country in which the role of language as a unifying factor cannot be denied. Every citizen of Nigeria belongs to a particular ethno-linguistic family by means of which social relationships and affinities are shared among people of the same sociocultural and sociolinguistic lineage. The current spate of violent extremism in parts of the country has led to debates on the unity and socio-economic development of the country which cannot thrive in the face of uncertainties and violent upheavals. Thus, this paper discussed the role of language in the unification and socio-economic development in Nigeria. Ideas and opinions were obtained from secondary sources and analysed qualitatively. As a way forward, the paper recommended the adoption of the Hausa language for the purposes of unification and socio-economic development in Nigeria.

Keywords: language, unification, socio-economic development, culture

1. Introduction

Many proposals have been made on the issue of an indigenous national language in Nigeria to accelerate national unity and socio-economic development. With over 400 tribes and languages in Nigeria (Nwala & Obisike, 2014; Ndukwe, 2015), it is evidently impossible to satisfy all the demands of every ethno-linguistic group in the quest for an indigenous national language (Mann, 1990). The proposals failed because of difficulty in their implementation due to inherent setbacks and handicaps. For example, it was suggested that the three major languages should be learnt simultaneously, and that was the principle behind WAZOBIA (a combination of the major languages in Nigeria: Yoruba, Hausa and Igbo) which failed because ethnic sentiments beclouded its conception. It has now become very clear that adopting the three major languages simultaneously in whichever disguise may be cumbersome in execution. Again, WAZOBIA gives the impression of reconfiguration of the country into three regions as represented by the three languages, thereby defeating the purpose of unification of Nigeria. Others include Swahili, Esperanto and Guosa, Anglo-Nigerian Pidgin (Mann, 1990). Arguments for an indigenous national language have continued to attract attention among academics because of its effect on socio-economic development.

Socio-economic development, as a term, focuses on the improvement of the overall life of individuals in terms of their access to basic things of life such as food, house, clothing, education, good health and security. Socio-economic development also translates into reduction of inequalities and illiteracies (including political and moral illiteracies). It is the process of transformation in gross domestic product, life expectancy, literacy and levels of employment (Kapur, 2018). As noted by Olaide and Abdulkareem (2021), socio-economic development is a broad term which encompasses all essential areas of life that need development. The level of socio-economic development in Nigeria has been captured by

National Bureau of Statistics (NBS, 2020). According to NBS, over 82.9 million Nigerians were considered poor based on the Nigeria Living Standards Survey (NLSS) of 2018 -19. The NLSS is predicated on the consumption aggregate of a household on food and non-food goods and services. The report of “2019 poverty and inequality in Nigeria” indicates that 40% of the total population, that is, 83 million people live below the country’s poverty line of 137,430 Naira (\$381.75) per year, a substantiation of the claim that Nigeria is the world capital of poverty. The NLSS underscores the need for socio-economic development in Nigeria.

Many factors contribute to the socio-economic development of a country, depending on the political, social, environmental, religious, cultural, educational and linguistic backgrounds of the country. Again, most of the factors elapse into each other; hence a political factor has both social and cultural undertones. This paper focuses on language as an important tool for unification and socio-economic development in Nigeria. It derives its concern from the dwindling state of nationhood orchestrated by violent extremism in parts of the country and agitations for secession. The paper is also mindful of the fact that development cannot take place where divisive tendencies appear overwhelming hence an attempt is made here to establish the link between language and unity, which is the bedrock for development. Based on this understanding, this paper lends itself to the position of Jhingan (2011):

For development, it is essential that races should not be kept aloof from each other. Rather, they should be intermixed so that there is a union of cultural values and racial qualities. But such measures require a lot of patience. The society’s structure is transformed by such racial changes (p. 63).

Jhingan’s exposition serves as a launching pad for the discourse here. This objective shall be accomplished through the following subheadings:

- Concept of Language
- Language as a tool for Unification
- Language as a tool for Cultural Exchange
- Language as a tool for Internal Business transactions
- Language as a tool for Security of a Nation

2. Concept of Language

Language, loosely and generally known as a means of communication, is of great essence to man. It is the means through which humans express their thoughts, exchange phatic communion, develop themselves and conquer their environments. Language may be expressed verbally or nonverbally as in the case of the deaf and dumb who depend on sign language for communication. That ants and animals gather, disperse and run away when they sense a danger is an indication that their existence is dependent on a language which enables them to communicate. It is obvious that humans cannot exist and co-exist without a form of communication. This explains why it is difficult for any human to exist without both auditory and visual organs.

The foregoing explanation of language drives impetus from the following definitions of language as:

1. any particular system of human communication which consists of the structured arrangement of sounds (or their written representation) into larger units, e.g. morphemes, words, sentences, utterances (Richards & Schmidt, 2010, p.311).
2. any verbal or non-verbal communication engaged in by humans, animals, or even machines (Scott & Gordon, 2005, p. 353).

3. a system of communication by vocal sounds within a group of people who use it to convey meaning (Tamunobelega, 2015, p. 417).

Specifically, the exploration and fullest use of language as a means of communication puts humans apart; hence in the words of Emenanjo (2015, p. 277): “language is one of the things that distinguish man from other animals. ... It shares all the dynamic characteristics of all living things, including death”. The implication of this discourse is that language is human specific. According to Nwala and Obisike (2014), humans use language to transmit their cultures and exchange all forms of phatic communion. This means that language can be harnessed for socio-economic development of a country especially in a multilingual nation like Nigeria. It is in this regard that one sees the imperativeness of the adoption of English Language as the official language of Nigeria. No one can dispute the fact that using English as a medium of communication and pedagogy over the years has facilitated its spread in Nigeria, unifying the various language groups (Nwala & Obisike, 2014). Logically, if English, a hitherto foreign language, can unite Nigerians, the adoption of an indigenous language, without ethnic bias, will further unite the country.

3. Language as a Tool for Unification

Language is the nucleus of every society as it unites and also destroys an organization. The unifying power of language is explicitly stated in the Bible (Genesis 11:6): “Now then, these are all one people and they speak one language; this is just the beginning of what they are going to do. Soon they will be able to do anything they want”. The importance of language has been enunciated by the Federal Republic of Nigeria (2004) in her *National Policy on Education*:

Government appreciates the importance of language as a means of promoting social interaction and national cohesion; and preserving cultures. Thus every child shall learn the language of the immediate environment. Furthermore, in the interest of national unity it is expedient that every child shall be required to learn one of the three Nigerian languages: Hausa, Igbo and Yoruba (p. 10).

The above position of government has given credence to the thrust of this discourse. Collaboratively, Ndukwe (2015) agrees that language promotes loyalty and internal cohesion, connecting a rallying point for the process of national development. Consequently, it has become necessary for Nigeria to adopt one indigenous language as the second official language in Nigeria, replacing the position of French. This arrangement will unite the part of Nigeria that owns the language and other parts of the country, leading to what Nair (2018) calls national unity. According to Nair, a national language helps to foster national unity.

4. Language as a Tool for Cultural Exchange

The culture of a people is transmitted through the use of language. Every language carries with it the behaviour and artifacts of its owners. It means that language and culture are inseparable (Kuo & Lai, 2006); as one is learning a language, one is also learning the culture of its owners. In the case of Nigeria, it has been noticed that code-switching to an indigenous language is a mark of solidarity and love for the owners of the language, bridging cultural gaps in society.

Yu (2020) also avers that language and culture are so symbiotically related that one’s attitude towards the target culture can affect the understanding of the second language. This means that if one has a positive attitude towards a given tribe’s culture, one’s love for the tribe’s language will be expressive. So, positive cross-cultural psychology can be developed

among Nigerians with the view to creating better world views and dispositions towards one another. It is therefore pertinent here to re-emphasise the need for a national language in Nigeria because of its potentials to create national cohesion and tolerance.

5. Language as a Tool for Internal Business transactions

In Nigeria, English has gained ground as the language used in markets, in day-to-day business transactions given the heterogeneous nature of the nation (Nwala & Obisike, 2014). One cannot also deny the fact many Nigerians who are illiterate in English struggle to communicate effectively during exchange of goods and services with non-speakers of their local language. The local traders who dominate “bush markets” in Nigeria readily come to mind here. Adoption of an indigenous national language will solve the problem of language of business for that part of the country that owns the national language. This will create large markets for goods and services in Nigeria.

6. Language as a Tool for Security of the Nation

Ethno-linguistic pluralism is one of the factors responsible for increase in banditry and insecurity. The simple reason that, psychologically, an individual would be suspicious and conscious of the presence of another person, if possible, prepare for attack so long as they have difficulty in communication. This psychology permeates all areas of life, including places of work, marriages and most importantly, security formations. This explains why Liddicoat (2008) avers that for armed forces to succeed in their operations, they need a common language; in this case, an indigenous language that can foster unity and brotherhood. To achieve this objective, an indigenous national language should be adopted and taught in military and police colleges. By acquiring the language, they would perform optimally in the zone where the language has its native speakers.

7. Conclusion

Nigeria is one multilingual country in which the role of language as a unifying factor cannot be denied. Every citizen of Nigeria belongs to a particular ethno-linguistic family by means of which social relationships and affinities are shared among people of the same sociocultural and sociolinguistic lineage. For example, a Hausa trader residing in the southern part of Nigeria will show brotherly bargaining with any customer (from any southern tribe) who speaks Hausa. There are instances where many Nigerians gained one favour or the other because of their ability to speak a particular language in certain situations. Ultimately, language has the power of bridging the gap of ethnic divides in a multi-tribal nation, leading to peaceful co-existence. It is also capable of stimulating socio-economic growth by first creating a peaceful environment as no meaningful development can thrive in disunity.

8. The Way Forward

To achieve the same feat which the English language has recorded in Nigeria as her language of unification, one indigenous language should be adopted, taught in schools nationwide for quick spread. This arrangement will unite the part of the country that owns the language with the rest parts. The fear that the adoption will make other languages extinct has no basis. After all, the indigenous languages have, over the years, been functioning alongside the use of English as the official language in Nigeria without going into extinction. This paper suggests the adoption of the Hausa language for this purpose. The reasons for the choice of Hausa are:

1. The southern part of Nigeria is more receptive to education; hence it will be easier to have Hausa taught in the schools in the South.

2. The Hausa language has the capacity of bridging the gap between the north and the south because of its commercial value; many of the food items used in Nigeria come from the north.
3. It will give security agencies the confidence to fight insurgency in the north as they speak and interact in Hausa.
4. There are more untapped economic potentials in the north waiting to be harnessed. Many southerners are reluctant to move to the north because of insecurity arising from language differences.

In addition, Mann (1990, p.98) wrote: "...Hausa is generally regarded as an easy language to learn. Of all the major languages of Nigeria, Hausa is the only one to enjoy this reputation."

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Attitude and Ethical Behaviors of Healthcare Providers as Antidotes of Health Service Consumer Satisfaction in Mgbuoshimini Primary Health Centre, Port Harcourt, Nigeria

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Abstract

Health service consumers' satisfaction with the services they receive has been a challenge over the past decade, and this has been attributed to many factors that diverse scholars have investigated using different variables. In this study, the attitude and ethical behaviours of healthcare providers as antidotes to health service consumers' satisfaction in the Primary Health Centre at Mgbuoshimini, Port Harcourt, Nigeria, were investigated. A cross-sectional descriptive research design was used to select participants from pregnant women, nursing mothers, couples for family planning, and sick patients. The data were analysed using descriptive statistical tools. The results of the grand total response values were 400 (100%) and strongly agree had 190 (47.5%), agree had 160 (40%), 390 (100%) and strongly agree had 260 (66.7%), agree had 100 (25.6%), and strongly disagree had 13 (3.3%). The overall results were strongly agreed (66.7%) and agreed (25.6%); these connote that the attitudes and ethical behaviours of the healthcare providers towards healthcare service consumers in the primary healthcare facility were poor and that healthcare providers do not execute good ethical behaviour towards health service consumers in the facility, leading to low levels of health resource consumption, low patronage image promotion, and consumers' loss of confidence in the service provider. Therefore, the government should put mechanisms in place to ensure a positive attitude and favourable ethical behaviour among healthcare providers, and individual healthcare providers should also acquire soft skills to improve their attitude and ethical behaviour.

Keywords: attitude, ethical behaviour, health service consumer, healthcare provider

INTRODUCTION

According to the Holy Bible, human beings were created by the Almighty God at the beginning of time to experience everything on earth to the fullest, including perfect health (Genesis 1:26-31). Because of man's refusal to follow God's instruction, which goes beyond his ongoing struggle to maintain a high standard of healthcare, everything broke apart and mankind was unable to regain the level of health that God had established for humans (Genesis 3:1–24). Therefore, as a result of the drive to deliver coordinated services of high value to people, healthcare professionals are incredibly reliant on one another, making healthcare organisations distinct from any other types of service providers. Consequently, the

diversity, nature, and quality of healthcare service delivery have also presented a particular challenge for healthcare workers and allied health professionals that are tasked with delivering high-quality and adequate medical care to a wide range of patients regardless of their particular medical requirements, preferences, and scheduling. Furthermore, a variety of academic works have shown that what might be regarded as high-quality healthcare services vary amongst providers, patients, or clients, locations, times, and day-to-day needs. Equally, in providing quality of healthcare services to health service consumers, different experts, including doctors, health information managers, nurses, and pharmacists, among others, always followed a variety of requirements and policies of the government and health regulatory bodies.

A lot of literature, including Abdulsalam and Khan (2020) and Isaruk et al. (2021), has indicated that the term quality healthcare services is somewhat difficult to describe and establish, and healthcare professionals provide services differently as a result of varying factors such as experience, individual abilities, availability of tools or equipment, relevant resources, and personalities. Consequently, providing high-quality healthcare services that satisfy patients' needs requires an enabling work environment that encourages and addresses staff members' attitudes and ethical behaviours. Bohner and Dickel (2011) claim that attitude is an assessment of thought objects and is a powerful tool for taking positive action. Harrell (2005) posits that to change an attitude, one must take ownership of their internal conversation and change their heart. It has cognitive, affective, and behavioural components. Equally, Mahan (2019) posits ethical behaviours as the application of moral concepts, standards of conduct, and ideals surrounding good behaviours in the workplace, and the ethical principles that direct a person's behaviours or the conduct of a profession are referred to as ethics.

In providing healthcare, given the diversity of consumer groups, healthcare providers must take into account their histories and experiences (Vuong, et al., 2018), including building a rapport with patients to ease their anxiety and stress. These procedures will help compassionate healthcare providers deliver effective treatment at the right time and manner. According to McColl-Kennedy, et al. (2017), healthcare providers' attitude and ethical behaviours are important in luring patients to adhere to medical or therapeutic advice, and consumers of healthcare services are choosing the type of facility they want to attend based on how they perceive safety procedures. Healthcare providers must commit to advancing diversity and representation in healthcare through a proactive mindset and constant adherence to ethical conduct. Healthcare ethics is a set of rules that serve as a guide for providers when providing patients with healthcare services, and Kirilmaz, et al. (2015) posit that healthcare ethics consists of four components: autonomy, beneficence, non-maleficence, and justice. Ethical behaviours in the healthcare workforce involves respecting a patient's right to make decisions, beneficence, non-maleficence, justice, and confidence in colleagues (Varkey, 2021).

A case study design research by Charles and Viswanadham (2022) found that diverse factors pose challenges in delivering healthcare services, while factors that pull healthcare service delivery include social media, infrastructure, and NHIF services. Similarly, Njong and Tchouapi (2020) assessed user satisfaction with healthcare services in Cameroon, and results showed that 85% of users were satisfied, but age, educational status, and waiting time were prominent covariates. Equally, Garge, et al. (2018) study on consumer health care: current trends in consumer health monitoring revealed that the term healthcare has a very wide scope that ranges from lifestyle and wellness right up to care for patients with acute conditions, and that with the availability of digital accessories for monitoring basic biological functions, the potential for obtaining detailed data on the lifestyle, habits, and behaviours of

an individual exists. Tomas, et al. (2019) study on factors associated with nurses' negative behaviours at a public health facility in Namibia found that caring behaviour is essential for healthcare organisations and their employees. In the same way Nyarko and Kahwa (2020) examined the attitude of health workers (nurses) concerning patients and the perception patients have about them in Ghana using a mixed methods approach found that hospitals can improve customer satisfaction and loyalty through efficient public relations, frequent in-service training. Farkhani, et al. (2017) determined the challenges of premarital education programmes in Iran using qualitative research and in-depth, semi-structured interviews and found that ethical behaviour is a fundamental feature of professional nursing and is essential for nurse job responsibility.

More so, governments at different levels in the world, and particularly in Nigeria, have invested in the health sector so that health service consumers can get satisfaction from seamless, quality healthcare services, including a reduction in mortality rates and frequent medical tourism. On the other hand, regardless of all the efforts that are being made by the government at all levels of care to ensure quality and standard healthcare service delivery to meet health service consumers' satisfaction, health service consumers are still continuously experiencing great challenges in receiving satisfactory quality healthcare services from many nations healthcare settings across the world (Isaruk et al., 2021; Charles & Viswanadham, 2022). Although numerous researchers, such as Garge, et al. (2018), Tomas, et al. (2019), and Nyarko and Kahwa (2020), have used a variety of indicators at various times and places to examine the factors preventing patients from receiving acceptable quality healthcare, no study that specifically looks at the attitude and ethical behaviours of health service consumers, particularly in a primary health centre (Mgbuoshimini), is known among the researchers. For that reason, using the Mgbuoshimini Healthcare Centre in Obio/Akpor Local Government Area, Rivers State, Nigeria, is necessary in order to assess the degree or level to which health service customers are satisfied with the services they have received and to add to the body of knowledge in terms of concepts, empirical evidence, and theories derived from the study. In a nutshell, this study explored the attitudes and ethical behaviours of health care providers as antidotes to healthcare service consumers' satisfaction in Primary Health Centre Mgbuoshimini, Rumueme, in Obio/Akpor Local Government Area, Rivers State, Nigeria.

The objectives of the study are to:

1. Explore the attitudes of healthcare providers towards health service consumers in the Primary Health Center Mgbuoshimini in Rumueme, Port Harcourt.
2. Assess the ethical behaviors of healthcare providers towards health service consumers in the Primary Health Center Mgbuoshimini in Rumueme, Port Harcourt,
3. Assess the combine impacts of the attitude and ethical behaviors of healthcare providers on health service consumers in the Primary Health Center Mgbuoshimini in Rumueme, Port Harcourt.

Research Questions

Three research questions were formulated to guide this study, and they are:

1. What types of attitudes do healthcare providers always show towards health service consumers in the Primary Health Centre Mgbuoshimini in Rumueme, Port Harcourt?
2. What ethical behaviours do healthcare providers always exhibit towards health service consumers in the Primary Health Centre Mgbuoshimini in Rumueme, Port Harcourt?
3. What are the combined impacts of the attitude and ethical behaviours of healthcare providers on health service consumers in the Primary Health Centre Mgbuoshimini in Rumueme, Port Harcourt?

RESEARCH METHODOLOGY

A cross-sectional descriptive study was used to examine the attitude and ethical behaviours of healthcare providers towards healthcare service consumers in a primary health centre in Mgbuoshimini, Rumueme, Obio/Akpor Local Government Area, Rivers State, Nigeria. The population of the study comprised one hundred (100) participants, ranging from pregnant women, nursing mothers, couples for family planning, and sick patients who have been using the facility from March 1 to April 19, 2023. The detailed population includes 50 pregnant women, 30 nursing mothers, five couples from the family planning unit, and 15 sick patients. A sample size of 80 was determined using Taro Yamane's formula [i.e., $n = N/(1 + N(e)^2)$], and a simple random sampling technique was also adopted to select the respondents for the study. The primary instrument for data collection was a self-structured questionnaire that was divided into sections A and B. Section A consisted of personal data, and Section B consisted of questions related to the research study. The questionnaire used was carefully framed and examined to fit into the context of the work, and after drafting, it was given to other scholars in related fields for scrutiny and vetting. After observing its worth in both validity and reliability through the test-retest method, 20 copies of the constructed questionnaire were administered to concerned patients within the clinic. In addition, the process was repeated after a few hours, and the results showed consistency, meaning that the instrument was reliable. Researcher personally administered and retrieved the instrument from the respondents over the course of four working days, and the collected data were presented and analysed using descriptive statistical methods such as frequency distribution tables and percentages for easy understanding and interpretation. More so, ethical principles were strictly adhered to, and there was no conflict of interest.

RESULT PRESENTATION

Eighty (80) copies of questionnaires were distributed to health service consumers (patients) in the Primary Health Centre, Mgbuoshimini, Rumueme in Obio/Akpor Local Government Area, Rivers State, and eighty (80) copies were retrieved, making a 100% return rate. The analysis was done, and they are presented in the form of frequency distribution tables to give better explanations.

Data Presentation

Table 1: Sex Distribution of the Respondents

Sex	Frequency	Percentage (%)
Male	30	46
Female	50	54
Total	80	100

Source: Field Survey, 2023

Table 1 shows the sex of the respondents. Thirty (30, 46%) of the respondents were males, while 50 (54%) were females. This finding gives the impression that the majority of the health service consumers (respondents) receiving care in the health facility are females, and they stand a better chance to air out their satisfaction level from the attitude and ethical behaviours of healthcare providers that would or have been stilling assurance and confidence in their retention or visit to other facilities for healthcare needs.

Table 2: Age Distribution of the Respondents

Age	Frequency	Percentage
18-28	8	10
29-39	20	25
40-50	40	50
51 and above	12	15
Total	80	100

Source: Field Survey, 2023

Table 2 shows the age distribution of the respondents. Eight(8, 10%) of the respondents fell within the age range of 18–28; 20 (25% of the respondents) were within the age bracket of 29–39; 40 (50%) of the respondents fell within the age range of 40–50; and 12 (15%) of the respondents were in the age bracket of 51 and above. This result implies that the majority of the respondents fell within the age range of 40–50 years, and within this age range were mature mothers who had experiences over the years both in childbirth, immunisation, family planning programmes, and other healthcare needs and are more likely to be the proper people that can really determine their satisfaction level of care received over the years to compare with the one received in the primary healthcare of the study.

Table 3: Educational Qualification of Respondents

Educational Qualification	Frequency	Percentage (%)
WAEC/GCE/NECO	-	-
ND/Technician	20	25
HND/B.sc/B.edu/B.Tech	52	65
PGD/Masters	8	10
Total	80	100

Source: Field Survey, 2023

Table 3 shows the educational levels of the respondents. Twenty (20, 25%) respondents have ND or technical qualifications; 52 (65%) respondents are HND, B.Sc., B.edu., or B.Tech. holders; and 8 (10%) of them are PGD or master's degree holders. This finding gives the impression that the majority of the respondents are HND/B.Sc/B.Edu/B.Tech holders and would be capable of airing out how satisfied they are with the quality of healthcare service provision in the healthcare facility.

Research Question 1: What are the attitudes of health care providers towards health service consumers in Mgbuoshimini Primary Health Centre, Rumueme, Port Harcourt, Rivers State?
Table 4: Showing respondents' responses to the attitudes of healthcare providers towards health service consumers with options of the Likert 4 rating scale of strongly agree (SA), agree (A), disagree (D), and strongly disagree (SD), respectively.

S/N	Items	Response Mode			
		SA	A	SD	D
1	There is gender discrimination among healthcare providers	45(56%)	15(19%)	8(10%)	12(15%)
2	Healthcare providers lack a right based approach when dealing with patients	40(50%)	20(25%)	12(15%)	8(10%)
3	Healthcare providers exhibit a nonchalant attitude when dealing with healthcare consumer	50(62%)	20(25%)	4(5%)	6(8%)
4	Greater attention is given to Social class citizens	55(68%)	15(19%)	7(9%)	3(4%)

Source: Field Survey, 2023

Table 4 shows the attitudes of healthcare providers towards health service consumers. Forty five(45, 56%) of the respondents strongly agreed that there is gender discrimination among healthcare providers; 15 (19%) of the respondents also agreed, while 8 (10%) and 12 (15%) of the respondents strongly disagreed and disagreed, respectively; 40 (50%) of the respondents strongly agreed that healthcare providers lack a right-based approach when dealing with patients; 20 (25% of the respondents also agreed), while 12 (15%) and 8 (10%) of the respondents strongly disagreed and disagreed, respectively; Furthermore, 50 (62%) of the respondents strongly agreed that healthcare providers exhibit a nonchalant attitude when dealing with health service consumers; 20 (25% of the respondents) also agreed, whereas 4 (5%) and 6 (8%) strongly disagreed and disagreed with the statement, respectively. The grand total response value was 100% at 320, and strongly agreed was 190 (59.375%), agreed was 70 (21.875%), disagreed was 31 (9.6875%), and strongly disagreed was 29 (9.0625%). The outcome of the strong agreement response of 190 (59.4%) revealed that the healthcare providers had a negative attitude towards healthcare service consumers at the primary healthcare centre. This outcome implies that there is poor quality and dissatisfaction with the healthcare services delivered in the facility.

Research Question 2: What are the ethical behaviors of healthcare providers towards healthcare service consumers in Mgbuoshimini Primary Health Centre, Rumueme, Port Harcourt, and Rivers State?

Table 5: Showing respondents' responses on the ethical behaviors of healthcare providers towards health service consumers with 4 options on the Likert rating scale of strongly agree (SA), agree (A), disagree (D), and strongly disagree (SD), respectively

S/N	Items	Response Mode			
		SA	A	SD	D
1	Health service consumers' health information are not strictly handled	25(31%)	30(38%)	15(18%)	10(13%)
2	Harassment of a patient do occur	45(56%)	35(44%)	-	-
3	Indulging in fraudulent act by collecting money when immunization is free	50(63%)	30(37%)	-	-
4	Abandonment and neglect of a patient that needs urgent attention	45(56%)	35(44%)	-	-
5	Preferential treatment by service providers	25(31%)	30(38%)	15(18%)	10(13%)

Source: Field Survey, 2023

Table 5 shows the ethical behaviours of healthcare providers towards health service consumers. Twenty-five (25, 31%) strongly agreed that health service consumers' health information was being exposed; 30 (38%) agreed to the statement; 15 (18%) strongly disagreed, and 10 (13%) disagreed; 45 (56%) strongly agreed that harassment of a patient was unethical; 35 (44%) agreed, and none of the respondents strongly disagreed or disagreed with the statement. 50 (63%) of the respondents strongly agreed that indulging in fraudulent acts by collecting money when immunisation is free is unethical; 30 (37% agreed), and none of the respondents strongly disagreed or disagreed with the statement. 45 (56%) strongly agreed that abandonment and neglect of a patient that needs urgent attention is unethical; 35 (44%) agreed, while none of the respondents strongly disagreed or disagreed, respectively. The grand total response value was 400 (100%), strongly agreed 190 (47.5%), agreed 160 (40%), disagreed 30 (7.5%), and strongly disagreed 20 (5%). This finding indicates that strongly agreed 190 (47.5%) and agreed 160 (40%) response values signify that healthcare providers do not execute good ethical behaviours towards health service consumers in the facility. This act could be a factor in the poor quality and lack of satisfaction with healthcare service provision in the facility.

Research Question 3: What are the combined impacts of the attitude and ethical behaviorsof health care providers on health service consumers in primary health centers in Mgbuoshimini, Rumueme, Port Harcourt, and Rivers State?

Table 6: Showing respondents responses on the combined impacts of the attitude and ethical behaviorsof health care providers on health service consumers in the Primary Health Centre Mgbuoshimini, with 4 options on the Likert rating scale of strongly agree (SA), agree (A), disagree (D), and strongly disagree (SD), respectively.

S/N	Item Options	Response Mode			
		SA	A	SD	D
1	There will low level of health resource consumption	40(50%)	30(38%)	5(6%)	5(6%)
2	It can lead to low patronage image promotion	50(63%)	20(25%)	5(6%)	5(6%)
3	It can lead to patients' loss of confidence in the service provider	50(63%)	30(37%)	-	-
4	There will be no referral of any kind by the health service consumers	60(75%)	10(13%)	7(8%)	3(4%)
5	Staff strength will be reduced as a result of low patronage	60(75%)	10(13%)	-	-

Source: Field Survey, 2023

Table 6 depicts the combined impact of the attitude and ethical behaviours of health care providers on health service consumers. Forty(40, 50%) of the respondents strongly agreed that there will be a low level of health resource consumption; 30 (38% agreed), while 5 (6%) and 5 (6%) of the respondents strongly disagreed and disagreed, respectively; 50 (63%) of the respondents strongly agreed that it can lead to low patronage image promotion; 5 (6%) and 5 (6%) of the respondents strongly disagreed and disagreed, respectively; 50 (63%) strongly agreed that it can lead to patients' loss of confidence in the service provider; 30 (37% agreed, while none of the respondents strongly disagreed and disagreed, respectively; 60 (75%) strongly agreed that there will be no referral of any kind by the health service consumers; 10 (13% agreed); and 7 (8%) and 3 (4%) of the respondents strongly disagreed and disagreed with the statement, respectively. The grand total response value of 390 (100%) indicated strongly agreed 260 (66.7%), agreed 100 (25.6%), disagreed 17 (4.4%), and strongly disagreed 13 (3.3%). This overall result of 66.7% strongly agreed and 25.6% agreed connotes that the attitudes and ethical behaviours of healthcare providers towards health service consumers in the primary healthcare facility were poor. Hence, a low level of health service consumers' satisfaction was associated with the institution.

DISCUSSION OF FINDINGS

Findings on demographic data regarding gender, age, and educational levels of the respondents showed that 30 (46%) of the respondents were males and 50 (54%) were females; the highest percentage of respondents fell within the age range of 40–50 years; and 52 (65%) of respondents had HNDs, B.Sc., B.Ed., or B.Tech., respectively. These results give the impression that the majority of the health service consumers (respondents) receiving care

in the health facility are female, are within childbearing ages, and have degrees from different higher educational institutions. In addition, findings also showed that the majority of respondents are mostly mothers, who are always in need of healthcare for themselves, their children, and their families to ensure the healthiness and economic growth of the family, and who also have experience and knowledge of what quality healthcare is from their individual perspectives of satisfaction level. This study finding supports Kirilmaz, et al. (2015) study results, which showed a positive correlation between sub-dimensions of the Ethical Sensitivity Questionnaire and no significant difference in ethical behaviour according to sex, marital status, or education.

The study findings revealed that greater attention is given to social class citizens (55%), healthcare providers nonchalant attitude when attending health service consumers (50%), gender discrimination among healthcare providers (45%), and the lack of a good approach to healthcare consumers' satisfaction levels (56%). The grand total response values were 320 (100%), strongly agreed 190 (59.375%), agreed 70 (21.875%), disagreed 31 (9.6875%), and strongly disagreed 29 (9.0625%), respectively. The study outcome implies that there is poor quality and dissatisfaction with the healthcare services delivered in the facility. Conversely, Tomas, et al. (2019) showed a strong association between nurses' negative behaviour and management's reluctance, patients' behaviour, and cultural practises, and that caring behaviour is essential for health care organisations and their employees.

Findings revealed that indulging in fraudulent acts by collecting money when immunisation is free (50/63%), abandonment and neglect of a patient that needs urgent attention (45/56%), lack of use of polite words on patients (45/56%), non-strict handling of healthcare service consumers' medical information (38%), and preferential treatment by healthcare service providers (inequity) (30/38%) strongly agree and agree concurrently. The grand total response value was 400 (100%), strongly agreed 190 (47.5%), agreed 160 (40%), disagreed 30 (7.5%), and strongly disagreed 20 (5%). The study established evidence of poor quality healthcare delivery that causes health service consumers to always derive non-satisfaction. The study findings are somewhat in line with Farkhani, et al. (2017) and Kirilmaz, et al. (2015) studies, which revealed that ethical behaviour is characterised by honesty, fairness, and equity in interpersonal, professional, and academic relationships, as well as in research and scholarly activities.

RECOMMENDATIONS

This study found that healthcare providers have a negative attitude and lack good ethical behaviours towards health service consumers at Primary Health Centre Mgbuoshimini and Rumueme in Obio/Akpor Local Government Area, Rivers State. As a result, we conclude that the positive attitude and ethical behaviours of the healthcare workforce are antidotes for quality healthcare service delivery that can meet the needs of health service consumers all the time, and that unethical behaviours towards them can always lead to conflicts, low levels of health resource consumption, low patronage image promotion, patients' loss of confidence in the service provider, no referrals of any kind, and reduced staff strength. Therefore, the study recommends that a good or positive attitude and favourable ethical behaviours of employers towards health service customers should be maintained at all times, and the government should put measures in place such as re-training, motivation, and an enabling work environment. In addition, each healthcare professional needs to develop soft skills that will help them become more ethical and positive in their interactions with patients, staff, and facilities, as well as provide better quality care in general. Lastly, all stakeholders must work collaboratively to ensure necessary measures for smooth healthcare service delivery at every level of healthcare systems worldwide.

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Emerging Ethical Issues in University Administration in Nigeria Educational Institutions

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Abstract

Educational institutions are knowledge factories where individuals are enriched with skills, knowledge and capacity to nurture and develop their potentials. University consists of teachers who are widely read with knowledge and skills with the onus of producing students worthy in character and learning. The study explores the emerging issues in university administration in Nigeria in educational institutions. Emerging issues in university administration are behavioral patterns that undermine the integrity of the educational system. Some of these ethical issues are examination malpractices, indecent dressing, cult-related activities, sexual harassment, extortion from students through the sale of textbooks and blatant disregard for schools ethos and code of conduct. As a way forward, the study suggests that educational institutions should, as a priority, establish dress codes for students and teachers and sensitize students on the core values of Nigerian culture and the likely consequence of unethical issues on the psychic of individuals and the university community.

Keywords: educational institutions, university administration, indecent dressing, sexual harassment

Introduction

Education is adjudged as a fulcrum for societal development, and economic empowerment of individuals and helps them acquire certain critical and innovative skills that help them to navigate the challenges of life. Individuals struggle to acquire the basic skills that will develop their potentials and make them not only live a worthy life, but contribute to the development of society. Education helps to provide the manpower need of society by training and inculcating skills and knowledge that will help drive society. This is actualized through the activities of lecturers who are widely read and knowledgeable in the skills of teaching and learning with the onus of producing students who are worthy in character and sound judgment. Tertiary education is education accrued after post-basic education in institutions like universities, polytechnics, monotechnics, colleges of education and other inter-universities centers and specialized institutions (Federal Republic of Nigeria, 2014).

The essence of tertiary education as defined in the National Policy of Education is not only instilling the learners with skills and knowledge to be self-reliant but also providing the manpower needs that are relevant to the labour market. These tasks are the responsibility of the lecturers who are trained in the pedagogy and certificated as having expertise and knowledge on the art and science of teaching and learning. Lecturers are creams of intellectuals with different educational backgrounds and different world views, cultures, religions, ethnic, ages and gender diversities. Tertiary education has been defined as the community of scholars who are assembled for implementing educational goals. Thus, a community consists of various calibers of people in society whose values and ideals must be congruent with the rules and regulations governing the university.

University is recognized as consisting of different intellectuals and skills from different backgrounds and to ensure that the goals of educational institutions are achieved there are rules and regulations that all concerned must adhere to. These rules can be classified

as codes of conduct or ethics that enable the managers of the university to ensure the seamless achievement of educational goals. So, to achieve these, students must be professionally trained in behaviour and character in line with the teaching profession. Like every organized organization are guided by organizational ethics so also educational organizations are guided by educational ethics that enable the university community to be in harmony and work towards actualizing educational goals.

Ethics are guidelines, rules of conduct or a set of principles that connote what is good or bad, what is morally wrong or right and what is acceptable or unacceptable within given settings. (Ofojebe 2018: Kanu & Ursula, 2012). Ethics in an organization are those set of standards that refrain members from undesirable acts like rape, stealing, murder, assault, and slander among others. They serve as the consciences of society. (Velasquez et al, 2012). They also stated that ethical standards include honesty, compassion, loyalty and other positive values that are cherished by society. Educational ethics are behavioural conducts that every individual in the university community is expected to adhere to. It is the guiding principles that bind the lecturers and students in the process of teaching and learning. It is a set of standards that the lecturers and students must always uphold in educational settings. It is those set of standards that inhibit students, lecturers and the entire university community from doing wrong and adhering to the norms of educational institutions. Ethics in education are very important for the effective administration of the system since the concept is based on the doctrine of what is morally right and wrong. Ethics in education not only helps in the protection of the interest of teachers and students but helps individuals to make the right decisions.

Despite the importance of ethics in the attainment of educational goals, there are various ethical issues as a result of the divergence of views and opinions of members of the academic environment that the administrators are to contend with. Some of these ethical issues relate to indiscipline, dishonesty, intimidation, sexual harassment and other infringement that dent the integrity of the university community. (Velasquez et al, 2012). Indiscipline has been the bane for the failure of the attainment of educational goals. Indiscipline connotes the violation of schools' moral values that are capable of obstructing the smooth and orderly functioning of the school system (Jekayinfa, 2013). Indiscipline breeds other negative values that are also inimical to the development of society. Some of these negative values are indecent dressing, sexual harassment, intimidation and molestation related to abuse of office. It is against this background the paper tends to explore the emerging ethical issues in university administration in Nigerian educational institutions with an emphasis on indecent dressing and sexual harassment in university education in Nigeria.

Educational Institutions

Educational institutions are knowledge factories where individuals come to enrich their minds and acquire skills and experiences for the betterment and development of individuals and society. According to UNESCO, the main purpose of educational institutions is to provide education such as schools, colleges, universities or training centers. Educational institutions are crucial to the development of individuals because it is the fountain of knowledge that helps people to access education and promote equal opportunities among citizens. It also provides for the needs of society through teaching, research and innovations. Educational institutions act as agents of socialization through which the norms, traditions and culture are transmitted from one generation to another. Educational institutions can be classified into three cohorts basic-education, post-basic education and tertiary education. Tertiary education is education given after post-basic education and it consists of universities, inter-universities, colleges of education, and schools of health among others (FRN, 2014).

University is the zenith of academic pursuit and where professionals are identified, nurtured and developed for the good of individuals and society.

University Administration

University education is the highest echelon in academic pursuit and where individuals' talents are developed and nurtured. University education does not only provide liberal education to the recipients but also provides leadership to society by instilling positive values, skills and knowledge that make individuals responsible and responsive citizens (Wordu, 2021). University education through teaching and research generates knowledge and technological innovations that enable it to solve not only educational problems but societal problems.

In the same vein, Ogunraku (2016), stated that universities are educational institutions of higher learning that run academic programmes for undergraduate and postgraduate courses for the development of individuals and society. The benefits of university education are enormous and it is achieved through knowledge generation, dissemination and application. For university education to achieve these laudable goals there is the need for the provision of the legal framework through which human and non-human resources are harnessed for the attainment of the educational goals. The legal framework is the administrative architecture through which the managers of educational institutions enforce and implement educational policies and programmes.

The coordination of these resources in such a manner that enhance the seamless attainment of educational goals is referred to as administration. According to Gulick and Urwick (1937), administration has to do with getting things done with the accomplishment of the defined objectives. Educational administrators are saddled with the responsibilities of implementing educational policies and programmes and in the process administrators engage in planning, organizing, coordinating, controlling, or leading and evaluating (Peretomode, 2013). It is enlightening to note that administrators are also responsible for the implementation of educational policies as soon as they are formulated.

It is also pertinent to note that the universities are the creation of law and more interesting is the fact that the law that establishes a university is also the law that establishes a committee system of administration. Nwafor (1998: 143), averred that committee are usually "prescribed by the legislature that establishes the university so, they are a *sine quo non* of university administration". The enabling law defines the administrative structures of the university, their responsibilities, and the hierarchy of authority and their limitations. According to section 2, sub-section 1 of Decree No 84, of 28th September 1979 which established the University of Port Harcourt, the university shall consist of; Chancellor, a Pro-Chancellor, a Vice Chancellor a body called Congregation, Convocation, and the campus and colleges of university, the faculties, schools, institutions of teaching and research units of the universities (Okai & Wordu, 2019).

The university governance revolves around two major pillars namely the Governing Council and the Senate. The council is the highest policy-making body in the university and it is saddled with the responsibility of general management, supervision, funding, policy and public relations of the university (Okai & Wordu, 2019). The visitor of the university- the governor of a state university and the president of a federal university appoint the chancellor who is the chairman of the Governing Council. The Senate is chaired by the vice-chancellor while the registrar acts as the secretary. Senate is the highest academic authority in the university. It is saddled with the responsibility of regulating the activities of the university in line with the National Universities Commission, (NUC). It is within the purview of the senate to implement academic programmes, moderate examinations and direct teaching and learning in the university. Other members of the senate are the Deputy Vice-Chancellors, the Dean of

Faculties and Provost, the Heads of Department, the Director of Institutes and centres, the Librarian, the Bursar as the financial adviser and all professors and nominated members from the congregation.

Committees system of administration becomes a vital ingredient for effective administrative techniques used to facilitate management activities at the university and provide opportunities for academics to deal with complex educational issues as a group (Nwafor, 1998; Obayan, 2002). It is imperative to emphasize that all committees emanate from the council or the senate. Council committees are committees with a representative from the council. Examples of such committees are the Finance and General Purpose Committee, Appointment and Promotion Committee (Academies), Appointment and Promotion Committee for Senior Professionals, Administrative and Technical Staff, among others. The Senate committee is usually a core committee on academics and it emanates from the senate. Consequently, they are responsible to the senate. Such committees are the Curriculum and Instruction Committee, Assessment and Graduate Senate Business Committee, Committee of Deans, Admission and Committee among others. The committee system of administration becomes an indispensable tool in university governance. The committee becomes a platform where different experts meet to provide information and knowledge to solve a given problem and in the process promote coordination and planning among the various segments of the university (Nwachukwu, 1998; Okai, 2021; Wordu, 2021).

The importance of committee is enormous in university administration and many have observed that university governance connote a committee system of administration. It is in recognition of the benefits of committees that the University of Ibadan, UI enshrined the Committee of Ethics as the university policy statement. Using the University of Ibadan as a reference case, the university established a committee on ethics in the University Ethics Policy. The committee is further divided into six different ethics committees namely the Social Sciences and Humanities Research Ethics Committee, (SSHREC) Animal Care and Use Research Ethics Committee, (ACUREC) Plant Use and Conversation Research Ethics Committee, (PUCREC) Science and Technology Ethics Research Committee, (STREC) Ethics in Teaching and learning, (ETL) and Ethics for Professional Conduct (EPC) (UI Ethics Policy). Despite the various ethics policies in universities, there are various infractions or unethical behaviours among the students and teachers in educational institutions. Consequently, it becomes necessary to enumerate some of these unwholesome practices that managers of educational institutions must curb if universities must remain relevant as the intellectual power house where individuals come and are fed with wisdom and knowledge.

Ethics in University Education

The upturn of digital technology and globalization has caused the diffusion of cultures and belief systems among the citadel of learners. This has created a high level of awareness, knowledge and exposure among students and lecturers thus influencing their behaviour within the school system.

The 21st-century rapid development epoch with a seemingly borderless world with an upturn of the digital revolution desires an educational system with a well-defined behavioural pattern that will enhance the attainment of educational goals. University education as the fountain of knowledge consists of different individuals with various capacities and intellectual skills that work towards the attainment of educational goals. In so doing, lecturers and students have adopted certain decisions that enable individuals or educational institutions to make certain decisions that enable them to gain at the expense of the larger society (Ofejebe, 2018). These behavioural patterns that help individuals to gain an undesired advantage are unethical and therefore need to be curtailed if not eradicated for the

development of individuals and society. Conversely, ethics in university education is achieved when employees in the university community carry out their responsibilities in consonance with university ideals, visions and missions. Ethical behaviour is when an individual acts noble, just, unbiased and respect others and when actions are guided by the norms of society.

This brings to the fore the importance of ethics in educational institutions. It is acknowledged that ethics in education is a discipline of dealing with what is educationally accepted, wrong or right, good or bad with commitment and moral duty. (Ecole Globale). Ethics becomes a yardstick in determining behaviours and actions that are accepted within educational institutions. Consequently, ethics not only helps individuals to make the right choice, develop an accepted standard for teaching and learning, protect the interest of teachers and students, but also helps in the effective management of educational institutions. Filani (2003) averred that ethics is pivotal for the sustenance of a university. This is true because ethics as a regulating device helps to encourage positive values that will boost academic excellence, and regulate professional conduct among the teachers and students. It is also within the realm of ethics to provide social norms and ensure accountability in educational institutions.

Ethical Issues in Nigerian Educational Institutions

Generally, when tertiary institutions graduate students they affirm that the students have been found worthy in character and learning. Unfortunately, educational institutions are challenged with numerous ethical issues that the managers of educational institutions must address to remain relevant in a global economy. Ethical issues in university education are centered on indiscipline. Indiscipline in educational institutions connotes the inability of the students and teachers to adhere to a legal framework that guides the attainment of educational goals. It is a life not in conformity with educational rules that hamper the smooth and orderly functioning of educational institutions (Jekayinfa, 2013). The author affirmed that indiscipline breeds corruption and other related social vices. Should this be the case of an institution that produce students who have been found worthy in character and learning?

According to Ngonso (2022), averred that ethical issues in Nigerian higher education are indiscriminate absence from class and non-availability of project supervisors, late commencement of lectures and non-completion of course outlines, the setting of difficult tests and examinations, campus prostitution, cultism, drug/substance abuse, monetization of intellectual propriety/lecturers' involvement in the writing of students' projects, examination malpractices, falsifying research data and plagiarism. Others are sexual harassment and molestation related to abuse of office, corruption and embezzlement (Ogunleye, 2000). The list of ethical issues as it relates to university education is inexhaustible but suffice it to say that the study is interested in indecent dressing and sexual harassment.

Indecent Dressing

Indecent dressing is one of the ethical issues that has ravaged educational institutions and most scholars are agitated that if no appropriate action is taken will likely destroy the serenity and ambience of university education. The public university education in Nigeria is faced with this nauseating problem that is gradually becoming a norm rather than an exception. The highest citadel of learning is becoming brothels where females wear seductive dresses or nudity in the name of fashion. Immoral and seductive dressing in university education is morally offensive and sexually provocative that onlookers hardly differentiate between male and female students and street thugs and prostitutes respectively (Ekwukoma & Osamiro 2021). Indecent dressing is dressing that shocks or offends others; appears sensuous,

provocative or stimulating and unveils the sensitive parts of the body to attract the attention of the opposite sex (Ekwukoma & Osamiro, 2021; Omede, 2011). It is enlightening to note that the University of Ibadan on Ethics Policy opined that one of the responsibilities of students to an educational institution is that the students must “dress appropriately or following the school dressing code in such a way that protects the respect for persons within a learning environment”.

Indecent dressing at times called immodest dressing comes in various forms and shapes. They are sleeveless tops, body hugs, short knickers, transparent clothing, bogus fashion, spaghetti tops, off shoulders, wicket straps, low neck blouses, mono straps, hot pants, low slug snacks, backless, miniskirts, dresses, attires printed with offensive or obscene words, and skirts with slits above the knees (Omede, 2011; Okafor & Uwalaka, 2020; Sola, 2018).

The cause of indecent dressing in educational institutions is a manifestation of what is happening in society. It gradually encroached into tertiary education as a result of environmental influence as a result of modernization and globalization. It is pertinent to note that the first point of emphasis related to indecent dressing is the parent who by all standards should be a role model and the first agent of socialization. Poor parenting plays a significant role in the upbringing of the children. It is argued that the first nine years of a child is very vital in the modelling of the child. It is either won or lost within this age bracket. The parent’s decisions in the life of a child either makes the child or mars the child; children live or die depending on the decision of their parents (Egbule, 2013).

Another significant factor that influences students in educational institutions to be indulged in this unpalatable attitude is peer group influence. The fear of being isolated and the desire to belong and be like their mates have caused them to join the bandwagon of immodest dressing. This is more aggravating if the child lacks good parenting. The influence of modernization and globalization are contributing factors to why students in educational institutions copied other ways of life. The up turn of digital technology has contributed to the dissemination of content that is vulgar, repulsive and alien to Nigerian culture. Through digital technology, students exchange obscure pictures that promote indecent and immoral practices that are inimical to the development of educational institutions. The effect of Western civilization have eroded the cherished core values of Nigerian tradition and children desired to be associated with Western values like smoking, drug abuse, immodest dressing and prostitution among other vices.

It is important to mention that there are consequences associated with indecent dressing in educational institutions. Some of the consequences are sexual harassment, unwanted pregnancy, ritual killing, stealing and poor academic performance. Indecent dressing is a prelude to sexual harassment, sexual harassment will necessitate disturbance which will lead to poor academic performance. Oli (2018) averred that it will lead to students’ frustration and they may become deviants in society. There is the likelihood that ladies who dress indecently or provocatively could be prone to sexual harassment or rape (Okafor & Uwalaka, 2020).

The Way Forward

There is no denying the fact that indecent dressing has permeated educational institutions and the menace is becoming fashionable among youths and are been cheered by adults whose cravings are to take advantage of them.

1. The first strategy in curbing this monster starts with the family. The family must ensure that children are nurtured to cherish African core values and jettison internet-induced negative values that are not in consonant with Nigerian culture and traditions.

2. Parents should also be role models in every facet of human endeavour because children learn faster from what they see than what they learn from schools.
3. Educational institutions' the managers must as a priority establish a comprehensive dress code that will be reviewed from time to time and ensure adequate compliance by students and lecturers.
4. The school security must be well equipped with necessary resources that aid effective monitoring and ensure that students comply. The managers of educational institutions must integrate dress codes as part of the pedagogical content and student orientation for both the new and returning students at least once a year.
5. Sensitization and enlightenment by school authorities through conferences, seminars and workshops highlighting the dignity of womanhood and the consequences of indecent dressing to society.
6. Religious and non-governmental organizations should sensitize the public to the need for modest dressing and the preservation of Nigeria's core values.
7. The government at all levels must legislate on dressing culture especially, among teenagers.
8. Finally, educational institutions should establish robust counselling units with all the necessary devices that will aid effective counselling.

Conclusion

The university is an intellectual powerhouse where men and women are groomed to enjoy a richer and more meaningful life. Where individuals' potentials are identified, developed and nurtured to stardom. University consists of individuals who are widely read with various skills and capabilities to transmit, transform and extend knowledge with the onus of producing students who are worthy in character and sound judgment. Unfortunately, modernization and globalization have caused the inflow and diffusion of cultures and eroded the core values and ethics of Nigerian society. The effect of globalization has led Nigerian youths to jettison the value system and copied the unwholesome practices of immodest behaviour and lifestyle. It is unarguable that students in tertiary education dressing are very provocative and offensive that some of the female students barely cover sensitive areas in the name of fashion.

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Safety Standards Compliance in the Successful Operation of Biomedical Equipment: A Study of Port Harcourt Metropolis

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Abstract

This study was carried out to investigate the Safety Standards (sine-qua-non) in the Successful Operation of Biomedical Equipment in Selected Health care facilities in Port Harcourt Metropolis of Rivers State. The study employed a descriptive research design and the instrument for data collection was structured questionnaire which were distributed to the five (5) selected Health care facilities Port Harcourt Metropolis of Rivers State. A total number of 100 respondents were used for the study. The respondent's views/data were collated presented and analyzed using simple percentage statistical method. Findings of the study showed that majority of the respondents (70%) said they do not have safety environment that could guarantee successful operation of some biomedical devices, (75%) said there is no safety standards for operation of some biomedical equipment in their Health care facilities and 90% agreed that there were consequences of poor safety appliance to biomedical equipment. Following the result of the study as indicated above, it could be deduced that safety standards were not observed which resulted in unusable equipment, untreated patients, wrong diagnosis, wrong treatment, electric shock, and infection from contaminated equipment, frustrated medical staff and overloaded repair shops. Hence this study recommended that operation of equipment should be carried under the conditions for which it is appropriate, only staff that are knowledgeable in the operation of the biomedical equipment should be allowed and also ensure that there are routine inspection and maintenance of the biomedical equipment as at when due to avoid the above unpleasant conditions.

Keywords: safety, biomedical equipment, hospitals

INTRODUCTION

The use of biomedical devices in healthcare delivery in Nigeria is faced with many challenges which may lead to shutdown of equipment. It exposes patients, medical staff and visitors to electric hazards. Electric safety is the containment or limitation of hazardous electrical shock, explosion, fire or damage to equipment and buildings. These devices must be properly installed in an environment in which they can give accurate and uninterrupted services such as proper operation, regular care and maintenance of these devices. The consequences of breakdown of biomedical equipment results to unusable equipment, untreated patients, wrong diagnosis, wrong treatment, frustrated medical staff and overload repair shops. The interwoven issues of safety, quality control and maintenance of existing biomedical devices are very important (Oluwadare, 2022; Bamigboye & Bello, 2019).

Safety is the absolute protection from danger or accident. It is also a state of being free and protected from dangers, hazards or accidents arising from the environment or

workplace (laboratory, workshop, house, road, school etc). It is generally concerned with the prevention of accidents, promotion of occupational health, and prevention of environmental pollution and security of entire workforce or equipment. Safety also deals with freedom from hazards or conditions that possess the potentials for causing injury, disease, economic loss or damage to properties and the environment. Thus matter dealing with safety often tends to broaden the concept to include issues of Health, Safety and Security (HSES). Medical instruments are device intended to diagnose, treat or monitor the patient under medical supervision. Regular care, repair and preventive maintenance of these devices are essential (Charles 2009, Health Safety and Environment [HSE], 2023).

MATERIALS AND METHODS

This study adopted descriptive survey design method. The population of this study was centralized on 10 hospitals/health centers in the selected healthcare facilities in the Port Harcourt metropolis. To verify that each unit in the sample was chosen at random, the researcher used probability approaches that involved simple random selection process. Each respondent was given a chance to choose one piece of paper that had been shuffled and written "Yes" or "No." Those who choose the "yes" paper had to respond to the survey. The sample size was 100 staff in 10 healthcare facilities in the study area. Well-structured questionnaire was employed to collect data. While the secondary data were collected from journals, papers, and other literature that explored the availability, use, and significance of life support equipment/devices in healthcare facilities. The data collected were analyzed using statistical parameters i.e. tables, frequency, percentage, bar charts and pie charts. The simple percentage formula is as follows: $Percentage (\%) = \frac{Number}{Total} \times 100$

RESULTS

Analysis of the Results on the PPE’s used and compliance in Radiology Unit

Table 3.1 showed some of the equipment found in radiology unit of the selected hospitals and the level of safety compliance of radiologists. Some equipment found in the radiology was CT scan, mammogram, x-ray machine, fluoroscope, MRI etc. The study showed that 80% of radiologist from the selected hospital complied with safety standards (i.e. outside operation) whereas 20% neglected or did not comply with outside operation. For MRI, 100% of patients with metals in their body notified the MRI staff or complied with safety awareness due to the risk of magnetic force or movement of metal in their body. Not complying with the safety measures could be most severe consequence of potential injury as a result of x-ray penetration or even death of a worker (Safetybank, 2023).

Table 1
Showed the PPEs used in radiology unit

Unit	Equipment	Safety Measures (PPE)	Safety Compliance				Total (%)
			Yes	%	No	%	
Radiology	CT Scan Mammogram X-ray machine Fluoroscope	Outside Operation or Control room	80	80%	20	20%	100(100%)
	MRI	Present of metal on patient	100	100%	-	-	100(100%)

Source: Field Survey, 2023

Result on the Equipment and PPE's Used in Dialysis Unit

Table 3.2 shows some of the equipment and responses of physicians / technicians to PPE in the dialysis unit of the selected hospitals. The study showed that 80% of the respondents made use of surgical mask and disposable shoe, while 20% did not, 70% made use of isolation coat, while 30% did not, 95% made use of disposable plastic apron, while 5% did not and 100% made use of disposable gloves. The major equipment found in the dialysis unit was the dialysis machine. Wearing personal protective equipment (PPE) can prevent accidents from happening. Not complying could lead to exposure to potential hazards and accidents (Opentextbc, 2023).

Table 2
Showed Equipment and PPE used in Dialysis Unit

Unit	Equipment	Safety Measures (PPE)	Safety Compliance				Total(%)
			Yes	%	No	%	
Dialysis	Dialysis machine	Surgical mask	80	80%	20	20%	100(100%)
		isolation coat	70	70%	30	30%	100(100%)
		Disposable Plastic Apron	95	95%	5	5%	100(100%)
		Disposal gloves	100	100%	-	-	100(100%)
		Disposable shoe	80	80%	20	20%	100(100%)
			-	-	-	-	-

Source: Field Survey, 2023

Result of the Equipment and PPE used in Special Care Baby Unit (SCBU)/Neonatal Intensive Care Unit (NICU)

Table 3.3 shows some of the equipment used and the responses of physician/technicians to safety measures (PPE) in the pediatric wards of the selected hospitals which are listed below; 70% made use of disposable apron and scrub trouser with top, while 30% did not. 100% made use of disposable gloves and face mask completely, 80% made use of disposable shoe while 20% did not and lastly 90% made use of disposable cap whereas 10% did not. some of the equipment found in SCBU were infant incubator, radiant warmer, autoclave, phototherapy light, suction pump, oxygen mask and nebulizer. Not complying with safety standards in SCBU could result to workplace injuries and accidents which are not only tragic and harmful to workplace morale but are also potentially very expensive (Cleanlink, 2023).

Table 3
Showed Equipment and PPE used in Special Care Baby Unit (SCBU)/Neonatal Intensive Care Unit (NICU)

Unit	Equipment	Safety Measures (PPE)	Safety Compliance				Total(%)
			Yes	%	No	%	
SCBU/ NICU	Infant incubator	Disposable apron	70	70%	30	30%	100(100%)
	Radiant warmer	Disposable glove	100	100%	-	-	100(100%)
	Autoclave	Face Mask	100	100%	-	-	100(100%)
	Phototherapy Light	Eye Google	70	70%	30	30%	100(100%)
	Suction Pump	disposable shoe	80	80%	20	20%	100(100%)
	Oxygen Mask	Disposable Cap	90	90%	10	10%	100(100%)
	Nebulizer	Scrub trouser and Top	70	70%	30	30%	100(100%)

Source: Field Survey, 2023

3.4 Result on the Equipment and PPE's Used in Theatre

Table 3.4 shows some of the equipment used and the level of safety compliance and safety standard (PPE) by physicians (Doctors and nurses) working in theatre of the selected hospitals to prevent or control medical hazards. The equipment found here were suction pump, operating table, microscope, operating lamp/ light, Anesthetic machine, operating bed, sterilization and cleaning equipment. Also the response of technicians to PPE were as follows; 100% made use of surgical hand glove and disposable, 70% made use of disposable plastic apron, filtering face piece respirator and isolation, while 30% did not. 80% made use of disposable fluid resistant gown and disposable shoe, while 20% did not. 90% made use of surgical mask and scrub trouser with top, while 10% did not. Ninety-five percent (95%) made use of protective overall while 5% did not and lastly 60% made use of disposable sleeves while 40% did not. Wearing personal protective equipment (PPE) can prevent accidents from happening while not complying could lead to exposure to potential hazards and infection (Opentextbc, 2023).

Table 4
Showed Equipment and PPE used in Theatre

Unit	Equipment	Safety Measures (PPE)	Safety Compliance				Total (%)	
			Yes	%	No	%		
Theater /Operating Room	Suction Pump,	Surgical hand glove	100	100%	-	-	100(100) %	
	Operating table,	Disposal plastic Apron	70	70%	30	30%	100(100) %	
	Microscope,	Disposable fluid-resistant gown	80	80%	20	20%	100(100) %	
	Operating lamp/light,	Filtering face	70	70%	30	30%	100(100) %	
	Anesthetic machine,	piece respirator	80	80%	20	20%	100(100) %	
		Disposable shoe	100	100%	-	-	100(100) %	
	Operating bed,	Disposal cap						
		Surgical mask	90	90%	10	10%	100(100) %	
	Sterilization and cleaning equipment		Protective overall with hook	95	95%	5	5%	100(100) %
			Isolation Coat	70	70%	30	30%	100(100) %
Scrub trouser and top			90	90%	10	10%	100(100) %	
Disposal sleeves			60	60%	40	40%	100(100) %	

Source: Field Survey, 2023

Result on the Equipment and PPE's used in Laboratory

Table 3.5 shows some equipment used, the level of safety compliance and standard PPE by physicians/ technician working in the laboratory of the selected hospitals to prevent or control health hazards. The equipment found here are water bath, centrifuge machine, autoclave, microscope, glucometer etc. The compliance of medical staff was as follows: 100% made use of lab coat (i.e. Apron, scrubs, coverall etc.) and gloves appropriate to the hazards. Again 80% complied with the usage of safety glasses or splash goggle and fully enclosed foot wear (no sandal, flip-flop or ballet shoes), while 20% donot comply to safety measures. Compliance with safety standards in the laboratory makes the workplace safe. This is done by providing instructions, procedures, training and supervision to encourage people to work safely and responsibly.

Table 5:
Showed Equipment and PPE used in Laboratory

Unit	Equipment	Safety Measures (PPE)	Safety Compliance				Total (%)
			Yes	%	No	%	
Laboratory	Water bath	Lab Coats (i.e. Apron, scrubs, coverall etc.)	100	100%	-	-	100(100%)
	Centrifuge machine	Safety glasses or splash goggles	80	80%	20	20%	100(100%)
	Autoclave	Gloves appropriate to the hazards	100	100%	-	-	100(100%)
		Fully enclosed foot wear (no scandal, flip-flop or ballet shoes)	80	80%	20	20%	100(100%)
	Microscope						
	Glucometer						

Source: Field Survey, 2023

Table 3.6 Results on the Equipment and PPE's used in Intensive Care Unit (ICU)

Table 3.6 portrayed some of the equipment used, the level of safety compliance and standards necessary for ICU workers in the selected hospital to prevent and control the spread of infection, through contaminated devices, chemical hazards etc. The following equipment were found in the ICU, ICU bed, NG tube, ventilator, dialysis machine, nebulizer,

stethoscope, ultrasound machine etc. from the table above, 100% complied with the usage of disposable glove, 85% complied to disposable plastic apron, while 15% did not. 80% complied with filtering face pie respirator, while 20% did not. Seventy percent (70%) complied with disposable fluid resistant gown, eye/face protection and disposable shoe, whereas 30% did not comply with these measures. Not complying could lead to exposure to oxygen-deficient atmospheres, dusts, gases and vapors.

Table 6
Showed Equipment and PPE's used in Intensive Care Unit (ICU)

Unit	Equipment	Safety Measures (PPE)	Safety Compliance				Total (%)
			Yes	%	No	%	
Intensive Care Unit (ICU)	ICU bed	Disposable gloves	100	100%	-	-	100(100%)
	Nasogastric tube (Ng tube)	Disposal plastic Apron	85	85%	15	15%	100(100%)
	Ventilator	Disposable fluid	70	70%	30	30%	100(100%)
	Dialysis machine	Resistant gown					
	Nebulizer	Filtering face piece respirator	80	80%	20	20%	100(100%)
	Stethoscope	Eye & Face Protection					
		Disposable Shoe	70	70%	30	30%	100(100%)
	Ultrasound machine		70	70%	30	30%	100(100%)

Source: Field Survey, 2023

Result on the Equipment and PPE's used in Accident and Emergency Unit (A& E)

Table 3.7 shows some of the equipment found, level of safety compliance and safety standard (PPE) used by physicians in the Accident and Emergency Unit of the selected hospitals to prevent or control health hazards. The following life supporting machines were found and they include dialysis machine, ECG, ventilator, incubator etc. The physicians responded with the following PPE; 80% complied with the use of face mask, air purifying respirator and eye protection, while 20% did not comply. One hundred percent (100%) complied with the use of disposable glove and coveralls. Lastly 70% complied with the usage of half face respirator, while 30% did not comply. Noncompliance in the use of PPE could lead to infection since most of the equipment is prone to be stained with blood and other fluid.

Table 7
Showed Equipment and PPE's used in Accident and Emergency Unit (A& E)

Unit	Equipment	Safety Measures (PPE)	Safety Compliance				Total (%)
			Yes	%	No	%	
Accident and Emergency	All life supporting machines i.e. dialysis machine, ECG, medical ventilator, incubator etc.	Full face or half mask	80	80%	20	20%	100(100%)
		Air purifying respirator	80	80%	20	20%	100(100%)
		Disposable glove	100	100%	-	-	100(100%)
		Hooded chemical resistant clothing (coveralls)	100	100%	-	-	100(100%)
		Eye protection					
		Usually added is a half face respirator worm	80	80%	20	20%	100(100%)
		70	70%	30	30%	100(100%)	

Source: Field Survey, 2023

Result of the Equipment and PPE's used in Anesthesia

Table 3.8 shows some of the equipment and PPE used by Physicians/ Technicians in Anesthesia operation of the selected hospitals to prevent or control health hazards. The

following equipment were found; Anesthetic machine, anesthetic vaporizer, oxygen mask, endotracheal tube, epidural catheter. According to table 7, 100% complied with the use of surgical gloves, coveralls and disposable cap completely. 95% complied with the use of isolation coat, disposable shoe and surgical mask, while 5% donot comply with these standards. Lastly (80%) made use of scrub trousers and tops whereas (20%) donot. Noncompliance in the use of PPE in this unit may lead to infection with communicable diseases.

Table 8
Showed Equipment and PPE's used in Anesthesia

Unit	Equipment	Safety Measures (PPE)	Safety Compliance				Total (%)
			Yes	%	No	%	
Anesthesia	Anesthetic machine	Surgical gloves	100	100%	-	-	100(100%)
	Anesthetic vaporizer	Protective overall with hook	100		-		
	Oxygen Mask	Isolation coat	95	100%	5	-	100(100%)
	Endotracheal tube	Disposal cap	100	95%	-	5%	100(100%)
	Epidural catheter	Scrub trousers and tops	100	100%	-	-	100(100%)
		Disposable shoe	80	80%	20	20%	100(100%)
		Surgical Mask	95	95%	5	5%	100(100%)
			95	95%	5	5%	100(100%)

Source: Field Survey, 2023

Result on the Equipment and PPE's used in Dental

Table 3.9 shows some equipment and PPE used by physician/ Dentist in the dental unit of the selected hospital to prevent or control health hazards. The dental equipment found were suction pump, x-ray machine, dental drill, tonometer, dental syringe, saliva ejector, scaler and mouth mirror, etc. The following level of respondent to safety standards was recorded; 100% made use of surgical gloves, 65% made use of procure mask while 30% did not, 70% made use of surgical disposable shoe and Eye goggle while 30% did not, 70% made use of coverall (protective) while 20% did not, lastly 60% made use of surgical mask while 40% did not. Noncompliance in the use of PPE in this unit may lead to stains; infection and possibly particles from denture could cause injury.

Table 9
Showed Equipment and PPE's used in Dental

Unit	Equipment	Safety Measures (PPE)	Safety Compliance				Total(%)
			Yes	%	No	%	
Dental	Suction pump	Surgical gloves	100	100%	-	-	100(100%)
	X-ray machine	Procure mask	65	65%	35	35%	100(100%)
	Dental drill	Surgical Apron	70	70%	30	30%	100(100%)
	Tonometer	Disposable shoe	70	70%	30	30%	100(100%)
	Dental syringe	Protective coverall	80	80%	20	20%	100(100%)
	Saliva ejector	Surgical mask	60	60%	40	40%	100(100%)
	Scaler	Eye google	70	70%	30	30%	100(100%)
	Mouth mirror						

Source: Field Survey, 2023

Result on the Equipment and PPE’s used in Pharmacy/Pharmaceutical

Table 3.10 shows equipment and PPE used by pharmaceutical staff in the selected hospitals to prevent or control health hazards. The following equipment were found, automatic tablet printing machine, spray coating machine, mechanical shifter, dust extractor, rotary tablet press, industrial stirrer, planetary mixers etc. the level of PPE are listed below; 100% made use of disposable cap and gloves, 95% made use of protective overall while 5% did not, 90% made use of disposable shoe and lab coat while 10% did not, 83% made use of air printing respirator while 15% did not, 80% made use of isolation coat and surgical mask while 20% did not, lastly 70% made use of eye protection while 30% did not. Non-compliance in the use of PPE may lead to chemical burn when equipment is stained with spilled chemical and also inhaling dangerous fumes.

Table 10
Showed Equipment and PPE used in Pharmacy/Pharmaceutical

Unit	Equipment	Safety Measures (PPE)	Safety Compliance				Total(%)
			Yes	%	No	%	
Pharmaceutical	Automatic tablet printing machine	Protective overall with hook	50	50%	50	50%	100(100%)
	Spray coating machine	Disposal cap					
	Mechanical shifter	Disposal gloves	100	100%	-	-	100(100%)
	Dust extractor	Disposal shoe	100	100%	-	-	100(100%)
	Rotary tablet press	Lab coat	90	90%	10	10%	100(100%)
	Industrial stirrer	Isolation coat	90	90%	10	10%	100(100%)
	Planetary mixers	Eye protection	80	80%	20	20%	100(100%)
		Air purifying respirator	70	70%	30	30%	100(100%)
		Surgical mask	85	85%	15	15%	100(100%)
		80	80%	15	15%	100(100%)	

Source: Field Survey, 2023

DISCUSSION

The research showed that, greater percentage of the respondents complied with safety standards with respect to the use of personal protective equipment (PPEs) in the health care facilities visited. The main hazards in the operating room were due to their direct involvement in the surgical operation. Operating room nurses may suffer from cuts, stabs, scratches and stings stemming from the use of syringes and scalpel. Operating room nurses may be exposed to anesthetic gases, drugs and radiation. Another risk here is the leakage of oil from Durable Medical Equipment (DME) like operating table or bed because Hydraulics can leak out oil. A major hazard in the laboratory is the risk presented by the dangerous properties of hazardous chemicals when dangerous chemical is not handled in a safe and compliant manner. They can cause a number of health hazards. These complications include burns, eye injuries, lung disease, asphyxiation and suffocation, the study showed. Most side effects of General anesthesia are minor and temporary such as nausea (vomiting), chills, dry mouth, shivering, itching, muscle aches, sleepiness, confusion for a few days and a sore throat caused by a breathing tube. Exposure to anesthetic gases, drugs and radiation were very common issues here. Another problem encountered was the seizure of flow meter to regulate oxygen during operation and the effect of anesthetic agent.

Finding from Table 9 showed that the dental clinic exposes physicians/dentist to infections (including Human Immunodeficiency virus and viral hepatitis); percutaneous exposure incidents, dental materials, radiation and noise; musculoskeletal disorders,

psychological problems and dermatitis, respiratory disorders and eye insults. General health risks associated with the production of pharmaceutical products include exposure to formaldehyde, repetitive motion disorders, dust and noise, and UV radiation. During manufacturing, dust becomes airborne and becomes a concern for the operators. Additionally, dust from the filling and packing of the final product may present an allergy risk. The product is frequently exposed to formaldehyde and UV light to ensure its sterility. Lung cancer may be triggered by formaldehyde, both prostate cancer and Hodgkin's disease. Acute exposures can result in pneumonia that can be fatal as well as respiratory failure, which causes the lungs to fill with fluid and make breathing difficult. Dermatitis is also brought on by formaldehyde. The use of ultraviolet lamps to maintain sterility is problematic as well. Despite not being ionizing (meaning the radiation does not have an electrical charge and therefore causes less damage to cells). Skin cancer can be brought on by ultraviolet radiation, which is harmful. The first symptom of excessive exposure is wrinkling and dry, inelastic skin. Different localized skin lesions could appear and should be seen as a warning indicator. People with light skin are much more likely to have their skin damaged by UV rays (and to get skin cancer) since their skin lacks pigments that would shield them from excessive exposure (American Cancer Society, 2023).

CONCLUSION AND RECOMMENDATIONS

Conclusion

Safety is the absolute protection from danger or accident. Safety standard in the successful operation of biomedical equipment cannot be overstretched. Biomedical equipment are those machines used to aid treatment, diagnosis and monitoring of diseases and medical conditions. There are different types of biomedical equipment such as diagnostic equipment, durable medical equipment (DME), treatment equipment, life support equipment and medical laboratory equipment. In this study safety standards were observed in the operation of biomedical equipment. But safety of these equipment is sometimes neglected which often results to wrong diagnosis, wrong treatment and frustration to medical care.

Recommendations

From the result of this study, the under listed recommendations were made:

- (1) That hospital management should ensure routine inspection and maintenance of the biomedical equipment.
- (2) That preventative maintenance program be developed to ensure that equipment is kept in good repair.
- (3) That staff operating the biomedical machine be trained and retrained quarterly on the safe use of equipment and PPEs.

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Physical Development Control Measures in Nigerian Cities: An Overview of Contemporary Issues in Uyo, Akwa Ibom State

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Abstract

Land is the platform upon which every activity of man takes place. Especially in urban areas, man's activities are many and they struggle for the limited available space. To curtail the rate of chaos and ensure compatibility among the various uses that land is put to, the activation of control mechanism becomes necessary. This study was undertaken to identify the various issues that come with development control in urban areas using Uyo Capital City as a case study. Data for the study were obtained from the staff of Uyo Capital City Development Authority and some identified property developers. Findings revealed the major problems of the area as: flood, erosion menace and poor solid waste management. The study highlighted the benefits of development control to include orderliness, safety, beauty and convenience. From the study also, Zoning Regulation has been found out to be the major tool used in controlling physical development in the study area. Other tools used include building code, subdivision and Environmental Impact Assessment. Major challenges faced by Uyo Capital City Development Authority in its task of controlling and managing the area are; non-compliance by property developers with building regulations, corruption and lack of effective monitoring mechanism. The study recommends that developers should always obtain approval for every building project, that charges for approval should be brought to the barest minimum and that there should be effective monitoring mechanism in place to enforce compliance with the laws.

Keywords: control, development, issues, measure, physical

1. Introduction

Land in urban areas is in limited supply in relation to demand. This is so because land in the urban area unlike the one in rural area, is needed for a variety of purposes some of which are commercial, industrial, recreational and industrial in addition to the primary one, residential. Also, most Nigerian urban areas have the tendency of developing at a very fast, chaotic and haphazard manner. This naturally exerts much pressure on the available supply with the attendant consequences ranging from deterioration to pollution, traffic congestion and poor waste management etc. thereby necessitating some form of guide backed by relevant legislations to control physical development. Development control aims at exercising some form of control over man's activities in an urban area.

In Uyo, Akwa Ibom State, diverse challenges with negative social, economic and environmental impacts have been noticed. In order therefore to forestall these problems from becoming worse, there is need therefore to find out what the primary agency of government charged with the task of taking good care of the city is doing about the situation and how it can be made to become more effective to deliver on its core mandate. The agency responsible

for controlling physical development on land in Uyo is the Uyo Capital City Development Authority (UCCDA).

2. Concept of Development Control

Land use development control is essentially a public administration process that ensures the availability of sufficient land for necessary uses such as residential, commercial, recreational, transportations, etc and ensures equitable resolution of conflicts among and between land use categories. Land use controls are instituted to ensure that uses of land particularly in the urban areas conform to public interest. Robert (2000) and Alder (2018) defined Development Control as the way and manner in which land use or physical development of land is regulated. It seeks to ensure the orderly arrangement and control of man's activities in space. Alder (2018) opined that it is a guide through which land use is licensed for building and other purposes backed up by planned law. Development control is the process that regulates the development and use of land. This includes the construction of new building, the extension of existing ones and change in use of buildings or land to another use (Uoro, 2022).

2.1 Planning Authorities

According to Omole (2001), it is the direct duty of planning authorities to approve building plans. The planning authorities use their building bye laws and codes before approval of building plans. Building codes and regulations are a sort of complied standard that spell out minimum standard, the 'mean' or average standard and the desirable standard. These are indirect ways of implementing the provisions of the master plan. A Planning Authority is an agency of Government created by law and saddled with the responsibility of regulating the land use pattern in line with the master plan of the city. It also works with the development plan or zonal plan or layout plan or any other spatial plan which is legally enforceable under the applicable Act (Uoro, 2022).

2.1.1 Uyo Capital City Development Authority

Uyo Capital City Development Authority (UCCDA) was created by the Akwa Ibom State Edict. No. 13 of 1988 which established it as the primary instrument of development control in Uyo metropolis (Udoudoh, 2007). In exercise of its mandate, the development authority requires that any developer desiring to commence any construction project within the capital city should through written application apply to the executive chairman of the authority for approval. The application should be accompanied with relevant documents and evidence of payment of the prescribed fees. The relevant documents required for submission include: Architectural/Building Drawings, Site Plan Analysis, original copy of Survey Plan and Certificate of Deposit (CoD) and Registered Land Agreement (Power Attorney/Letter of Allocation).

Etim (2007) listed the responsibilities of the development control agency to include: a) Guiding orderly development by applying the development codes. b) Providing permit for orderly development of land use in Uyo. c) Helping to stabilize the values of land and buildings with different zones of Uyo. d) Implementing community plans and preserving architectural/historic landmarks within the city. e) Granting of approval to all development proposals on government estates and private lands within the city. f) Promoting the development of safe, healthy and economically viable capital city. g) Ensuring the availability of land for orderly residential, commercial, industrial, agricultural development that supports urban development.

2.2 Development Control Measures/Tools

Agencies of government charged with the responsibility of managing and controlling physical development in Nigerian cities use diverse measures/tools to achieve their purpose. Ugonabo, Okafor & Igwe (2020), Etim (2007), Keeble (2001), Ratcliff (2018) and Usoro (2022) were able to identify the following measures:

2.2.1 Zoning: According to Keeble (2001), zoning is a term generally used to describe the concept of grouping compactable land uses together. It is one of the land use control measures used to guide, direct, limit and control the use of land. Usoro (2022) discussed the basic purpose and function of zoning as dividing a municipality into residential, commercial and industrial districts (or zones) that are for the most part separate from one another, with the use of property within each district being reasonably uniform. Ratcliff (2018) viewed zoning as the commonest method of controlling land use all over the world.

2.2.2 Density Control Regulation: Ugonabo et al. (2020) defined this as land use control measure used to ensure that all types of development conform to the number of building units in an area and the number of habitable rooms per plot. This is to enhance space for air circulation, movement, landscaping and recreation.

2.2.3 Building Code: This defines the way new structures are to be built and the materials to be used. It may equally be applied to enhance the maintenance and improvement of existing building. This code provides for the minimum standards of building construction and the condition for human occupancy. It is concerned with such factors as lighting, ventilation, sanitation, plumbing, fire prevention and protection, minimum number of habitable rooms allowed, minimum building height, etc. (Ugonabo et al., 2020).

2.2.4 Environmental Impact Assessment (EIA): This measure aims at reducing environmental and social impact of physical developments as much as possible and looking for benefits for the affected community (Omole, 2001).

2.2.5 Subdivision Regulation: This according to Ugonabo, Okafor & Igwe (2020), involves the division of land into lots in order to prevent undesirable land use pattern, traffic congestion, insufficient open space etc. The impact of subdivision regulation is more permanent than zoning, because once land is divided into lots and streets layouts, development pattern is set.

2.3 Permissibility of Development Control:

Development control regulations have been noted to restrict the rights of owners to use their property as they otherwise would want to. This development has generated dissatisfaction and conflict over time. The scope and limits of government's ability to regulate land use is hard to define with specificity. Courts have held that development control is permissible if it is reasonable and not arbitrary; if it bears a reasonable and substantial relation to the public health, safety, comfort, morals and general welfare; and if the means employed are reasonably necessary for the accomplishment of its purpose (Usoro, 2022).

2.4 Challenges of Development Control

There are numerous challenges encountered in the process of controlling and managing physical development in an urban centre. Some of the challenges as noted by Etim (2007) and Udoudoh (2007) include: a) The location, size and physical characteristics of land b) The

character of the neighbourhood and its effects on the value of property involved c) Non-compliance with development control regulations by property developers. d) Corruption e) Lack of effective monitoring mechanism on the part of the government’s agents.

3. Methodology

The study adopted the use of a well-structured questionnaire to elicit information from 20 identified property developers and 20 Staff of Uyo Capital City Development Authority serving in the 3 relevant departments: Lands, Estates and Town Planning. Out of the 40 copies of questionnaire administered, 25 copies representing 62.5% were correctly filled and returned for analyses. The data obtained from field were analyzed using Relative Importance Index (RII).

$$RII = \frac{\sum a_i n_i}{\sum x_j}$$

- Where: i= response category index
- x_j = the sum of j factors 1,2,3N
- a_i = constant expressing the weight given to the ith response.
- n_i = the variable expressing the frequency of the ith

4. Data Analysis and Presentation

Primary sources of data for the study were basically the returned copies of the questionnaire. The data collected were presented and analyzed with the aid of simple statistical methods.

4.1 Results and discussion on the benefits of controlling physical development in Uyo

Table 1 shows the result of the Relative Importance Index (RII) on the benefits of controlling physical development in Uyo..

Table 1: Benefits of controlling physical development in Uyo

Options	Weight(s)					Total	RII	Ranking
	5	4	3	2	1			
Orderliness	19 a _i n _i = 95	5 a _i n _i = 20	1 a _i n _i = 3	0 a _i n _i = 0	0 a _i n _i = 0	25 118	4.72	1st
Safety	11 a _i n _i = 55	7 a _i n _i = 28	3 a _i n _i = 9	4 a _i n _i = 8	0 a _i n _i = 0	25 100	4.00	5 th
Beauty	16 a _i n _i = 80	7 a _i n _i = 28	2 a _i n _i = 6	0 a _i n _i = 0	0 a _i n _i = 0	25 114	4.56	2nd
Convenience	10 a _i n _i = 50	12 a _i n _i = 48	3 a _i n _i = 9	0 a _i n _i = 0	0 a _i n _i = 0	25 107	4.28	4 th

In Table 1, all the benefits of controlling physical development have been seen to exist in Uyo Capital City. What this means is that there is an appreciable degree of orderliness in the study area. Same with safety, beauty and convenience.

4.2 Results and discussion on the problems of Uyo

Table 2 shows the result of the Relative Importance Index (RII) on the problems of Uyo

Table 2: Problems of Uyo Capital City

Options	Weight(s)					Total	RII	Ranking
	5	4	3	2	1			
Flood	21 $a_i n_i =$ 105	4 $a_i n_i =$ 16	0 $a_i n_i =$ 0	0 $a_i n_i =$ 0	0 $a_i n_i =$ 0	25 121	4.84	1st
Overcrowding	3 $a_i n_i =$ 15	4 $a_i n_i =$ 16	3 $a_i n_i =$ 9	15 $a_i n_i =$ 30	0 $a_i n_i =$ 0	25 70	2.8	5 th
Traffic congestion	6 $a_i n_i =$ 30	2 $a_i n_i =$ 8	11 $a_i n_i =$ 33	5 $a_i n_i =$ 10	1 $a_i n_i =$ 1	25 82	3.28	4 th
Erosion	19 $a_i n_i =$ 95	5 $a_i n_i =$ 20	1 $a_i n_i =$ 3	0 $a_i n_i =$ 0	0 $a_i n_i =$ 0	25 118	4.72	2 nd
Poor solid waste management	18 $a_i n_i =$ 90	6 $a_i n_i =$ 24	1 $a_i n_i =$ 3	0 $a_i n_i =$ 0	0 $a_i n_i =$ 0	25 117	4.68	3 rd

Source: Authors' fieldwork

In Table 2, the major problems bedeviling the study area are flood, erosion and poor solid waste management. Traffic congestion and overcrowding are not seen as problems of the area going by the RII scores both variables have attracted.

4.3 Results and discussion on the challenges faced by Uyo Capital City Development Authority

Table 3 shows the result of the Relative Importance Index (RII) on the challenges faced by Uyo Capital City Development Authority

Table 3: Challenges faced by Uyo Capital City Development Authority

Options	Weight(s)					Total	RII	Ranking
	5	4	3	2	1			
Non-compliance with building regulations by property developers	13 $a_i n_i =$ 65	10 $a_i n_i =$ 40	2 $a_i n_i =$ 6	0 $a_i n_i =$ 0	0 $a_i n_i =$ 0	25 111	4.44	1st
Lack of sufficient staff	5 $a_i n_i =$ 25	11 $a_i n_i =$ 44	7 $a_i n_i =$ 21	2 $a_i n_i =$ 4	0 $a_i n_i =$ 0	25 94	3.76	4 th
Lack of effective monitoring mechanism	8 $a_i n_i =$ 40	11 $a_i n_i =$ 44	6 $a_i n_i =$ 18	0 $a_i n_i =$ 0	0 $a_i n_i =$ 0	25 102	4.08	3 rd
Corruption	9 $a_i n_i =$ 45	13 $a_i n_i =$ 52	3 $a_i n_i =$ 9	0 $a_i n_i =$ 0	0 $a_i n_i =$ 0	25 106	4.24	2 nd

Source: Authors' fieldwork

Table 3 gives non-compliance with building regulations and byelaws, corruption on both the part of government officials and private property developers and lack of effective monitoring mechanism as the acceptable challenges that Uyo Capital City Development Authority faces and which impinge on its performance.

4.5 Results and discussion on the solutions to the problems in the study area

Table 4 shows the result of the Relative Importance Index (RII) on the solutions to the problems in the study area

Table 4: Solutions to the problems in the study area

Options	Weight(s)					Total	RII	Ranking
	5	4	3	2	1			
Approval for every physical development should be sought and obtained	14 $a_i n_i =$ 70	10 $a_i n_i =$ 40	1 $a_i n_i =$ 3	0 $a_i n_i =$ 0	0 $a_i n_i =$ 0	25 113	4.52	1st
Processing fees should be brought to the barest minimum	11 $a_i n_i =$ 55	11 $a_i n_i =$ 44	3 $a_i n_i =$ 9	0 $a_i n_i =$ 0	0 $a_i n_i =$ 0	25 108	4.32	2 nd
Established cases of corruption should be decisively dealt with	8 $a_i n_i =$ 40	11 $a_i n_i =$ 44	6 $a_i n_i =$ 18	0 $a_i n_i =$ 0	0 $a_i n_i =$ 0	25 102	4.08	4 th
There should be effective monitoring mechanism in place	9 $a_i n_i =$ 45	13 $a_i n_i =$ 52	3 $a_i n_i =$ 9	0 $a_i n_i =$ 0	0 $a_i n_i =$ 0	25 106	4.24	3 rd

Source: Authors' fieldwork

In Table 4, suggestions as to how to provide solution to the problems of the study area are advanced. These are seeking and obtaining approval for every physical development project, bringing processing fees to the barest minimum, putting in place an effective and efficient monitoring mechanism in place and dealing decisively with established cases of corruption.

5. Conclusion and Recommendations

Physical development control is the power of government to control development by granting or refusing or attaching conditions to permission for it to take place (Nze, 1995). It is the way and manner in which land use or physical development of land is regulated. It is basically an administrative process that ensures the availability of sufficient land for necessary uses such as residential, commercial, recreational, transportations, etc and ensures equitable resolution of conflicts among and between land use categories. Land use controls are instituted to ensure that uses of land particularly in the urban areas conform with public interest and that the various land uses complement and not conflict each other. This goes a long way to enhance environmental and public safety.

Based on the findings from the study, the following recommendations are advanced; In order to realize the objectives of physical development control as an instrument of proper urban land use planning, management and control. Every development proposal must be made to meet acceptable standards and approval for such must be sought and obtained before its commencement can be effected. In order to ignite the interest of property developers, processing fees for approval of projects should be brought to the barest minimum. Government and its agencies must put in place effective and efficient monitoring mechanism

to ensure compliance to building regulations and restrictions. Finally, cases of corruption should not be treated with levity.

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Dynamics of *Plasmodium falciparum* Parasitaemia and Uncomplicated Malaria among School-Age Children living in Omoku, Southern Nigeria

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Abstract

This cross-sectional study determined the mean parasitaemia and prevalence of *Plasmodium falciparum* malaria parasites among school-aged children in Omoku, Ogba Egbema Ndoni Local Government Area, Rivers State, Southern Nigeria. A total of 200 blood samples were randomly collected through convenience sampling method from the study subjects. Malaria diagnosis was carried out using standard parasitological techniques. The demographic data of the subjects showed that more females, 126(63%), were examined compared with males, 74(37%). Overall prevalence of *Plasmodium falciparum* recorded was 49%. Gender-based prevalence showed that more females were infected 58(29%) with mean parasite density of 16524(1611) parasites/ μ L of blood than males, 40 (20%) with mean parasite density of 14886(1794) parasites/ μ L of blood. The difference in prevalence between them was statistically significant ($P < 0.05$). Age-related prevalence showed that those within the age range of 5 to 7 years had the highest prevalence, 48(24%), with mean parasite density of 14909(1244) parasites/ μ L of blood, followed by those within the age range of 8 to 10 years, 34(17%), with mean parasite density of 11434(1244) parasites/ μ L of blood, while those within the age range of 11 to 13 years had the lowest prevalence, 16(8%), with mean parasite density of 5067(568) parasites/ μ L of blood. However, the difference between them was not statistically significant ($P > 0.05$). The prevalence of malaria based on schools attended by the subjects showed that BMA had the highest, 12%, and mean parasite density of 6995(827) parasites/ μ L of blood, while SIS, and EIS had the lowest percentage of infections, 8%, respectively ($P > 0.05$). The association between mother's level of education, household size and *P. falciparum* parasitized children was statistically significant ($P < 0.05$). In conclusion, malaria is endemic in the study area, and among other interventions, scaling up investment in primary health care is necessary to effectively prevent, detect, and treat malaria in local communities.

Keywords: children, malaria, Nigeria, Omoku, parasitaemia, *Plasmodium falciparum*

1. INTRODUCTION

Malaria is a mosquito-borne parasitic disease which poses public health challenge in Nigeria. Millions of Nigerians are at risk of malaria. Recent report from World Health Organization (WHO) shows that malaria accounted for an estimated 241 million cases and 627000 deaths in 2020 worldwide, of which 96% of the malaria deaths occurred in Africa (WHO, 2022a). Nigeria is leading in terms of global burden of malaria; a preventable and treatable disease. In 2001, Afolabi et al. (2001) reported that malaria was attributed to over 200,000 deaths in children annually in Nigeria. Malaria-associated deaths had increased by 6.9% in recent time in Nigeria from 25% in 2017 to 31.9% in 2020 (Barikuura et al., 2019; WHO, 2018). The marked increase in malaria cases and deaths was partly attributed to disruptions of malaria intervention services during COVID-19 pandemic and newly adopted revised method of estimating malaria mortality (WHO, 2022a). Infants, children under the age of 5 years, pregnant women, naïve adults, and immunosuppressed individuals are more vulnerable to contracting malaria and developing severe disease, particularly *P. falciparum* malaria which can readily progress to severe illness and death within a day (WHO, 2022a).

Nevertheless, in recent years, global efforts to fight malaria have yielded significant reductions in malaria mortality and morbidity in some countries through preclusion of 10.6 million malaria-induced deaths and 1.7 billion malaria cases from 2000 to 2020 (WHO, 2022b). More recently in the year, 2021, China and El Salvador joined the league of certified malaria-free countries (WHO, 2022b). Malaria cases continue to rise across Nigeria and consequently cause illness and deaths, particularly among the high risk group such as children of school age living in poverty and rural areas.

Human malaria parasites which belong to the phylum *Apicomplexa* are *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium ovale*, *Plasmodium malariae*, and the recent species, *Plasmodium knowlesi* which causes zoonotic malaria. These parasites are transmitted to people mainly through the bites of infected female *Anopheles* mosquitoes. In Nigeria, *Plasmodium falciparum* is the most prevalent species which causes the severest form of malaria with characteristic high levels of parasitaemia (Cheesbrough, 2006). Parasitaemia associated with *Plasmodium falciparum* can exceed 250,000 parasites per microlitre of blood (Cheesbrough, 2006). Malaria is basically characterized with fever, chills, and flu-like illness (CDC, 2022). Basic complications associated with severe *falciparum* malaria are cerebral malaria, haemoglobinaemia, severe anaemia, hypoglycaemia, and complications in pregnancy (Cheesbrough, 2006). Consequently, continued evaluation of the levels of *falciparum* malaria parasitaemia among vulnerable people living in malaria endemic settings is imperative. This becomes necessary to avert likely progression of mild asymptomatic *Plasmodium falciparum* malaria to severe disease, which might have deleterious complications. The socio-economic impacts of malaria are enormous; communities with high malaria parasitaemia have more chronically ill members, resulting in absenteeism from work and school. Repeated malaria attacks among others result in heavy spending on treatment, also affect education of school age children, the amount of food the family can grow, and continuously drain family earnings. Lack of knowledge about malaria, poverty and chronic disease together form a vicious circle, which is difficult to break (WHO, 2010). Among other interventions, malaria can be prevented by proper sanitation, sleeping under well treated insecticide net, and the use of insecticide.

Several reports of recent studies conducted in Rivers State, Niger Delta region of Nigeria, demonstrated marked variations in prevalence rates of *Plasmodium falciparum* parasites among children, pregnant women, and adults residing in different geographical or geopolitical zones (Abah et al., 2017; Wokem et al., 2018; Barikuura et al., 2019; Uzor et al., 2020). These variations might strongly suggest the influence of both human factors and

abiotic variables in transmission of malaria parasites. Notably, as malaria curves remain steep in Nigeria, it is pertinent to sporadically evaluate the epidemiology and levels of *P. falciparum* parasite load in susceptible children to avert possible progression to severe disease.

Malariometric indices of school-age children have been studied over the years to determine malaria burden at community levels. An understanding of malaria burden in a given setting is crucial for health planning, policy development, and control interventions. This study, therefore, evaluated the dynamics of *Plasmodium falciparum* parasitaemia and uncomplicated malaria among school-age children in Omoku, Rivers State, Southern Nigeria.

2. MATERIALS AND METHODS

2.1 Study area

The study was conducted in Omoku (5.342°N 6.656°E), one of the major towns in Rivers States, Southern Nigeria. It is the headquarters of Ogba/Egbema/Ndoni Local Government Area, and it is bordered by Delta State. The climate of the study area is basically rainy and dry season. The dry season lasts from November to March while the rainy season lasts from April to October every year. Residents are mostly farmers, artisans, and traders, while many are civil servants and indigenous oil company workers.

2.2 Study design

This cross-sectional and community-based study was conducted from April to July in 2022, during rainy season, among children attending various schools in Omoku. The quantitative method of socio-demographic data collection was used through pre-tested structured questionnaire. Some of the data obtained were age, gender, schools' admitted and attending, mother's level of education, mother's occupation, and household size. The inclusion criteria were non-febrile children between 5 and 13 years, with body temperature < 38°C, being a resident of the study area for a minimum of 6 months, completing the questionnaires, and willingness of caregivers to give written or oral informed consent. Children who recently took antimalarial drugs and those who declined participation were excluded.

2.3 Sample and sampling

The sample size was determined using a previous malaria parasite prevalence of 9.4% according to Oboro et al. (2021) at a confidence interval (CI) of 95% and a precision of 5% following the formula, $N = Z^2P(1-P)/d^2$ for calculating sample size (Naing et al., 2006) which gave rise to a total of 131 subjects. Nevertheless, a simple random sampling was used to select 200 subjects for this study.

2.4 Blood sample collection and laboratory procedures

Blood samples were collected using venipuncture technique. A 3mL blood sample was obtained from each participant. The blood samples were transferred into ethylenediaminetetraacetic acid (EDTA) tube to prevent the blood from coagulation. Thick and thin blood films were prepared immediately on the same slide to detect and identify malaria parasite species. For thick film, 10µL of blood was spread to cover a diameter of 15mm, while 2µL of blood was used for thin blood film. The thin blood film was fixed in absolute methanol for 2 seconds and air dried. Next, the dried blood films were stained with 3% Giemsa stain solution for 45 minutes at pH 7.2. The stained blood films were examined under x100 oil immersion objective and x10 paired ocular lens of the light microscope by two competent independent microscopists for the presence or absence of malaria parasites. Discrepancy in malaria microscopy result and parasite counts was resolved as reported by

Agomo et al. (2009). Each slide was pronounced negative only when a minimum of 100 microscopic fields have been carefully examined for the presence of parasites (WHO, 2010). Parasite density was estimated using the relative method as the number of parasites per microlitre of blood (WHO, 2010). The level of parasitaemia was classified as described by Adesina et al. (2009).

2.5 Statistical analysis

Data collected were analyzed separately according to gender, age, schools, and other sociodemographics. The statistical analysis was performed using both descriptive and inferential statistics. Data were presented as mean and standard deviation, and percentages (%). Chi squared (χ^2) test was done to test association of variables, and p -value of ≤ 0.05 was considered as significant.

3. RESULTS

Gender-related prevalence and density of *Plasmodium falciparum* malaria

Table 1 shows gender-based distribution of mean parasitaemia and prevalence of *Plasmodium falciparum* malaria parasites among infected school children. The female children had higher prevalence of 29% and mean parasite density of 16524(1611) parasites/ μ l of blood compared with the male children who had a prevalence of 20% and mean parasite density of 14886(1794) parasites / μ l of blood. And the difference between them was statistically significant ($\chi^2=15.440$; $P<0.05$).

Age-related prevalence and density of *Plasmodium falciparum* malaria

Table 2 shows the age-related distribution of mean parasitaemia and prevalence of *Plasmodium falciparum* malaria parasites among infected school children. Those within age group of 5-7 years had the highest prevalence of 24% with mean parasite density of 14909(1244) parasites/ μ l of blood while those within the age group of 11-13 years had the lowest prevalence of 8% and mean parasite density of 5067(568) parasites/ μ l of blood, however the association between malaria parasites and age of infected children was not statistically significant ($\chi^2= 2.802$; $P>0.05$).

School-related prevalence and density of *Plasmodium falciparum* malaria

Table 3 shows the distribution of mean parasitaemia and prevalence of *Plasmodium falciparum* malaria parasites among infected children according to their various schools. Blessed Montessory Academy (BMA) had the highest prevalence of 12% with mean parasite density of 6995(827) parasites/ μ l of blood. Those who attend Favour Model Academy (FMA) had a total prevalence of 11% with mean parasite density of 6844(892) parasites/ μ l of blood. The lowest prevalence of 8% of *falciparum* malaria was observed among children of Shiloh International School (SIS) and Ellah International School (EIS) respectively, although the association between malaria parasites and schools attended was not statistically significant ($\chi^2=2.583$; $P> 0.05$).

Socioeconomic-related prevalence of *Plasmodium falciparum* malaria

Table 4 shows the association between the mother's levels of education, mother's occupation, and the household size of school-age children in relation to the prevalence of *Plasmodium falciparum* infection among the study subjects. School-age children whose mothers' level of education is primary had highest prevalence of *P. falciparum* infection, 21.5%, while those whose mothers' level of education is tertiary had the lowest prevalence of *P. falciparum* infection, 8%. The association between infection with malaria parasite and the levels of the

mother’s education was statistically significant ($\chi^2=35.705$; $P<0.05$). Association between mother’s occupation and malaria parasite infection shows that children of self-employed mothers had the highest prevalence of 20.5%, followed with civil service, 14.5%, while others without specific occupation had the lowest prevalence of 1%. However, this association was not statistically significant ($\chi^2=2618$; $P>0.05$). Also school-age children of household size of 5 to 6 persons had the highest prevalence of *P. falciparum* infection, 26%, compared with those of ≤ 4 and ≥ 7 household sizes with prevalence of 16.5% and 6.5% respectively. Association between malaria parasite infection and household size of children was statistically significant ($\chi^2=11.396$; $P<0.05$)

Table 1. Gender-based distribution of mean malaria parasitaemia and prevalence of *Plasmodium falciparum* malaria parasites among school age children in Omoku

Gender	No. Examined(%)	No. Infected(%)	Mean (SD) Parasites / μ l	P
Female	126 (63)	58(29)	16524(1611)	< 0.05
Male	74 (37)	40(20)	14886 (1794)	< 0.05
Total	200(100)	98(49)	31410	

SD: standard deviation; Note: We calculated P values using χ^2 test

Table 2. Age-related distribution of mean malaria parasitaemia and prevalence of *Plasmodium falciparum* malaria parasites among school age children in Omoku

Age(years)	No.Examined(%)	No. Infected (%)	Mean(SD) Parasites / μ l	P
5-7	86(43)	48(24)	14909(1244)	NS
8-10	70(35)	34(17)	11434(1813)	NS
11-13	44(22)	16(8)	5067(568)	NS
Total	200(100)	98(49)	31410	

NS: not significant; SD: standard deviation; Note: We calculated P values using χ^2 test

Table 3. Distribution of mean malaria parasitaemia and prevalence of *Plasmodium falciparum* malaria parasites among school age children in Omoku according to their various schools

Schools	No. Examined (%)	No. Infected (%)	Mean(SD) Parasites / μ l	P
FMA	40(20)	22(11)	6844(892)	NS
BMA	40(20)	24(12)	6995(827)	NS
CPS	40(20)	20(10)	6306(786)	NS
SIS	40(20)	16(8)	5595(781)	NS
EIS	40(20)	16(8)	5670(231)	NS
Total	200(100)	98(49)	31410	

NS: not significant; SD: standard deviation; Note: We calculated *P* values using χ^2 test ; Abbreviations: FMA;Favour Model Academy.BMA;Blessed Montessory Academy CPS;Community Primary School; SIS; Shiloh International School. EIS; Ella International School

Table 4. Association of sociodemographic characteristics and prevalence of *falciparum* malaria parasites among school age children in Omoku

Variables	No. Examined (%)	No. Infected (%)	P
Mother's Education			< 0.05
Primary	54(27)	43(21.5)	
Secondary	81(40.5)	39(19.5)	
Tertiary	65(32.5)	16(8)	
Mother's Occupation			NS
Self-employed	84(42)	41(20.5)	
Trader	37(18.5)	15(7.5)	
Farmer	21(10.5)	11(5.5)	
Civil Service	52(26)	29(14.5)	
Others	6(3)	2(1)	
Household size			< 0.05
≤4	83(41.5)	33(16.5)	
5-6	102(51)	52(26)	
≥7	15(7.5)	13(6.5)	

NS: not significant; Note: We calculated *P* values using χ^2 test

4. DISCUSSION

The overall prevalence of 49% observed in this study suggests the level of malaria endemicity in the study area. This high prevalence of *falciparum* malaria infection agrees with other earlier studies which reported high prevalence of malaria in Nigeria (Abah et al., 2017; Ozuogwu et al., 2020; Uzor et al., 2020). This corroborates the fact that malaria is still endemic in Nigeria (WHO, 2022a). However, the prevalence rate found in this study is lower compared with the prevalence of 63.3%, 55%, and 69.4% earlier reported by Abah and Temple (2015), Otu et al. (2020), and Wokem et al. (2018) in Bayelsa State, Cross River State, and Rivers State in Niger Delta, Nigeria respectively. Although, more recently, Omonijo et al. (2021) reported a relatively lower prevalence of 16.98% and 16.83% among school-age children in Oye and Ikole Local Government Areas of Ekiti State, Southwestern Nigeria respectively. Also, in the previous year, a significantly low prevalence of 9.4% of malaria infection was reported among children less than five years in Rivers State (Oboro et al., 2021). The differences in trend of prevalence rates may be attributed to changes in season and locations where the studies were conducted. Transmission of malaria parasites may be influenced by myriad of factors ranging from environmental to climatic factors among others that enhance the breeding of malaria parasites arthropod vector, *Anopheles* mosquito.

Plasmodium falciparum was the only malaria parasite species detected and identified in this study which is similar to reports from other recent studies among school-age children

in Nigeria (Abah et al., 2017; Ifebi et al., 2020; Nwaneli et al., 2020). This further validates the fact that *P. falciparum* is the most prevalent and virulent malaria parasite in Nigeria, occasionally implicated for children's morbidity and absenteeism from school. In this study, there was a significant association between gender and malaria prevalence among school-age children with females having higher prevalence than males. Females had a prevalence of 29% and mean parasite density of 16524 parasites per micro litre of blood than the males with a prevalence of 20% and mean parasite density of 14886 parasites per micro litre of blood. Though there is no available scientific evidence linking malaria prevalence to gender. The reason for this finding may be due to the fact that majority of the population sampled were female participants.

It was observed in this study that the age of a child was an independent determinant of a child's malaria status. School children between 5 to 7 years, and those between 8 to 10 years were more at risk of malaria infection compared with children between 11 to 13 years. This trend on age-related prevalence corroborates with the study conducted 8 years earlier in a community in Bayelsa, Southern part of Nigeria (Abah & Temple, 2015). This may suggest the fact that younger children may not have either partial or naïve immunity making them more susceptible to malaria infection. However, Nwaneli et al. (2020) reported higher prevalence rate in older children than younger children in a study conducted in Southeast Nigeria. The researcher hypothesized that it might be due to the short term effect of focused malaria control measures on younger children in the study population.

The report of this study shows that school attended by a child has no significant effect on the child's malaria status. Prevalence of *P. falciparum* infection in this study shows a significant association between socioeconomic statuses of the family and a child's malaria infection status. This finding may suggest a linear relationship exist between level of education, standard of living, and malaria parasitaemia.

5. CONCLUSION

This study observed high prevalence of malaria infection caused by *Plasmodium falciparum* parasite. These findings provide evidence-based facts for strategic policy decision and implementation on effective malaria treatment, control and eradication in the affected region in particular and Nigeria at large. The State Ministry of Health in collaboration with the region's Primary Health Care unit should carry out a door-to-door health education and promotion interventions which may significantly reduce malaria burden on school children in the study area.

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Awareness of Environmental Hazards of Black Soot Induced by Illegal Oil Refiners in Aleto Community in Eleme Local Government Area of Rivers State

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Abstract

This study was carried out on black soot pollution induced by illegal oil refiners in Aleto Community in Eleme Local Government Area of Rivers State. To achieve the aim of this study, three objectives were formulated. Descriptive research design was used for the study. The population of the study comprises of all members of Aleto community, and a sample size of 260 respondents was selected from the total population. A structured questionnaire was used for the study. Data collected were analyzed using frequency tables and percentage. Results from findings showed that the attitude of the people in Aleto contributed to black soot pollution to the environment. Hence, the researcher recommended that environmental impact assessment should be carried out before any development in order to prevent the occurrence of black soot, also sensitization and education of the public on the dangers of some of the activities on the environment by government and non-governmental agencies should be carried out.

Keywords: pollution, environmental hazards, black soot, illegal refineries

INTRODUCTION

Environmental health hazard occurs when pollutants are discharged directly into the air without adequate treatment to remove environmental health hazard and it affects the human health which can induce a higher level of air pollutant by damaging not only individual species and the environment, but also the natural biological communities in Eleme Local Government Area as a major global problem that can lead to nasal diseases, acute disease.

When the environment gets contaminated due to the presence of various pollutants, it becomes dangerous for living beings and causes several diseases with harmful effects when consumed in different ways (WHO, 2001).

Various illegal oil refining activities are one of the major contributors of black soot pollution in Aleto in Eleme Local Government Area of Rivers State. The industrial discharges in various forms such as particulate matters, harmful chemicals, dust and cloudy smoke emission which are irritating and poisonous to human's health are the main source of black soot pollution in the environment. The word pollution is a qualifying adjective to describe the condition or the state of the environment in terms of its purity.

It is a broad dependable variable which appears and disappears in other factors as the environment is being manipulated by independent, industrial variable. Achalu (2014) stated that pollution is any unwanted contaminant in the environment that may be detrimental to human health. He concluded that environmental soot pollution is any undesirable change or addition to the environment that has the potential of harming or threatening human beings and other living things in the ecosystem.

Horsefall and Spitt (2018) further explained that black soot pollution is due to by-product of man's actions, through direct or indirect changes in industrial pattern, radiation

level, chemical and physical constitution and abundance of living organisms. The environmental health hazard and health implication as a result of soot pollution covers the entire gamut man; these implications depend on the type of black soot pollution and available protection to prevent unwanted diseases in environment. No polluted part of the environment is health promoting to man and the environment itself, it is detrimental in all facets in terms of denial of man of good environment, air and good food thereby promoting disease occurrence, sad and unfulfilled life span and ambition and eventual untimely death in the environment. Environmental black soot pollution gives rise to various health hazards and some times results into life threatening diseases in the environment. Nowadays, one of the major sources of environmental health hazard is emission from industrial unit in Aleto in Eleme Local Government Area Rivers State known as industrial black soot pollution.

Newton (2018) states that industrial emission act as an agent for polluting the air and the environment; natural and man-made factors are largely responsible for this. As the population is increasing, new sites are being set up to meet the various demands of human beings which in turn gives rise to this problem in Aleto, Eleme Local Government Area of Rivers State.

The research and studies carried out to determine toxicity of this environmental black soot pollution focused on the environment. Health is wealth and a healthy nation is a wealthy one. There are a lot of problems arising from handling the environment as a result of interaction between man and his environment which if not looked into, will cause serious problem to the public. The need for more environmental health education could be seen also as a tool needed in changing the attitude of citizens and public towards the improvement of the environment in order to prevent environmental health hazards caused by black soot pollution to environment. According to Ashley (2014), Nigerians do not know how or where they dispose their waste products as long as they get rid of waste from their place of work or home, they believe that cleanliness of the environment is the responsibility of the government. Therefore, waste products can be dumped anyhow for government to collect and dispose to the appropriate dumping sites to prevent environmental black soot pollution.

Bernard (2016) on the objectives of the environmental health to develop resistance skills states that when appropriate, promotive and protective factors ensure resilience in terms of the ability to prevent or to record from environmental black soot pollution, sickness and to promote health literacy which can also be applicable in Eleme Local Government Area of Rivers State.

Research Questions

1. What are the attitude of the people towards the sue of environmental health resources which gives rise to black soot pollution in Aleto in Eleme Local Government Area of Rivers State?
2. What is the effect of black soot on the people of Aleto community in Eleme Local Government Area?
3. Will environmental health education help to reduce black soot pollution in Aleto?

METHODOLOGY

Descriptive survey research design was adopted for the study. The study was carried out in Aleto community in Eleme local government area. The population for the study consisted of 2 million residents of Aleto community in Eleme Local Government Area of Rivers State. A stratified random sampling technique was used in selecting one community from each of the five communities. A sample size of 260 participants were used for the study and a total of

260 copies of questionnaire were also designed and distributed to members of the Aleto Community in Eleme Local Government Area of Rivers State.

RESULTS

Table 1: Percentage of response on environmental health protection programme to create environmental awareness among the people of Eleme LGA

S/No	Response Item	A	D	Total	A%	D%	%
1.	Environmental health protection programme are organized regularly in my community.	200	60	260	77%	23%	100
2.	Effective environmental health protection can help to reduce black soot pollution.	220	40	260	85%	15%	100
3.	Effective environmental health protection programme can make individuals to be conscious of their environment.	230	30	260	88.5%	11.5%	100

Source: Researcher's Field survey, 2022

From table 1 above, it is observed that 77% (200 respondents), 85% (220 respondents) and 88.5% (230 respondents) responded to item 1, 2 and 3 respectively agreed that environmental health protection programme organized to raise environmental awareness among the people of Aleto in Eleme LGA. On the other hand 60 (33%), 40 (15%) and 30 (11.5%) responded to items 1, 2 and 3 respectively, disagreed with the statement. Therefore, it can be said that the environmental health protection programme organized, are capable of creating environmental health awareness among the people of Local Government Area of Rivers State.

Table 2: Percentage response on the attitude of the people towards environmental black soot pollution

S/No	Response Item	A	D	Total	A%	D%	%
1.	Improper disposal of gaseous pollutant can lead to black soot pollution	180	80	260	69.2%	30.8%	100
2.	Negligence of environmental care can lead to black soot pollution	215	45	260	83%	17%	100
3.	Poor management of gaseous industrial waste can cause black soot pollution	220	40	260	84%	15.4%	100

Source: Researcher's Field survey, 2022

From table 2 above, it reveals that 69.2% or 180 participants, 215 (83%) and 220 (87%) respectively agreed that the attitude of the people toward the environment contribute to environmental black soot pollution in Aleto community. On the other hand, 80 (30.8%), 45 (17%), 40 (13%) of the respondents to item 4, 5, and 6 respectively, disagreed with the statement. People towards the environment contribute to environmental black soot pollution

in Eleme Local Government Area. It can therefore be said that the attitude of the people contribute immensely to environmental black soot pollution in the area.

Table 3: Percentage analysis of response on the environmental health education help to reduce black soot pollution in Aletto in Eleme Local Government Area

S/No	Response Item	A	D	Total	A%	D%	%
1.	Effective enlightenment campaign will increase the participation of the people toward protecting their environment	253	7	260	97.3%	2.7%	100
2.	Educating the people about their environment may improve their attitude towards the environment.	208	52	260	80%	20%	100
3.	Adequate environmental awareness would improve the attitude of the people toward their environment	212	48	260	81.5%	18.5%	100

Source: Researcher’s Field survey, 2022

From Table 3, it shows that 253 (97.6%), 208 (80%) and 212 (81.5%) respondents 7, agreed that environmental health education help to reduce black soot pollution in Eleme petrochemical company. On the other hand, 7 (2.7%), 52 (20%) and 48 (18.5%) respondents disagreed with the statement. Before it can be said that environmental health education will not only reduce environmental black soot pollution in this study but it may also affect the lives of the people in the environment and man activities in the environment.

Discussion of Findings

From the above analysis, it showed that 77%, 88.5 and 88% of the respondents agreed that environmental health protection porogramme organized to create environmental awareness among the people of Eleme, because environmental health protection programme organized may help to change the attitude of the people positively toward the environment. According to Miller (1975), the term environmental could be perceived as the aggregate of external conditions that influence the life of an individual or pollution, especially the air of man and other living organism on the earth surface.

It further showed that 69.2%, 83% and 87% of the respondents were of the opinion that the attitude of the people towards environment contribute to black soot pollution in the Eleme. While 30.8%, 17% disagreed, indicating that the attitude of the people contributes to black soot pollution to the environment. Anderson (2005) stated that the atmosphere is a complex dynamic natural gaseous system that is essential to support life on planet earth.

Furthermore, the result showed that 97.6%, 80% and 8 1.5% of the respondents agreed that environmental health education could help to reduce black soot pollution in Eleme petrochemical company. Environmental health education may help to improve the knowledge of the people on how to prevent environmental black soot pollution. Andrew (2011) stated that black soot pollution was also found to be associated with increased incidence and mortality from coronary stroke in a cohort study in 2011.

Most adults need to be conscientised on the need to be environmentally conscious by protecting and promoting the environment against industrial black soot pollution and environmental health hazards. Anderson (2005) black soot pollution is something that we can not really ignore these days.

Conclusion

The results of this study clearly highlighted the environmental health hazards induced by activities of illegal oil refiners in Aleto Community Eleme Local Government Area of Rivers State in general. Furthermore, the high rates of environmental health hazards induced by black soot pollution in Aleto community in Eleme Local Government Area is due to the release of toxic emission, traffic emission, industrial emission generated from different industries in chemical fertilizer industry, gas flaring, dusts, cloudy smoke emission from refinery and petrochemical (PHRC), heavy machine, vehicles, war machines and of course domestic activities such as cooking with firewood. This study revealed that environmental health hazard induced by black soot pollution in Aleto community in Eleme Local Government Area of Rivers State have been sensitized or informed on the dangers of indiscriminate dumping of waste thereby increasing their general awareness.

Recommendations

Based on the findings of this study, the following recommendations were made:

- 1) Environmental health impact assessment should be carried out before any development project is executed to prevent the occurrence of environmental air pollution.
- 2) Government should have practicable and enforceable environmental laws and policies which will protect and reduce environmental air pollution problems.
- 3) Sensitization and education of the public on the dangers of some of their activities on environment by the concerned government and non-governmental agencies.
- 4) Environmental health programmes should be provided for members of communities on development strategies.
- 5) Provide the necessary logistics for industrial emission and environmental air pollution.
- 6) Regular post-project monitoring should be made in order to determine the effect on the environment.
- 7) Attention should be paid to effective solid waste, management in the communities.
- 8) There is need to increase the general awareness of the citizen in Eleme communities in environmental black soot pollution.
- 9). There should be total ban on the activities of artisanal refiners in the community.
- 10). Clean-up project should be implemented to take care of the pollution in the area.

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Ethnocentrism in Multicultural Society: Intrigues, Challenges and Way Forward in the Nigerian Society

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Abstract

This paper examines the challenges of ethnocentrism in a multicultural Nigerian society with the view to proffering solutions to the exacerbated issues orchestrated by the ethnocentric disposition. The paper adopted qualitative approach where seminar papers, articles, documents; interviews were all examined in relation to the issues of ethnocentrism and multiculturalism in Nigeria. The paper, therefore affirms that ethnocentrism poses a serious concern to national development and unity in Nigeria, hence, recommends the adoption of salad bowl model which promotes social relationship in the society. The study further recommends that prominent cultural traits of individual cultures in Nigeria should be adopted and adapted into the school curriculum in the school system.

Keywords: challenges, ethnocentrism, intrigues, multicultural, society

INTRODUCTION

In every human race, there are divers people with different beliefs, cultures, norms, values, folkways, languages etc. that tend to distinguished them from others. The totality of ways of life is commonly referred to as culture. For instance, in Nigeria, there are three major ethnic groups with distinct cultural heritage. These ethnic groups are Hausa, Igbo and Yoruba. Apart from these three major ethnic groups, there are also other minor ethnic groups in Nigeria with distinct cultural traits. The distinctiveness of the varied cultural groups sometimes creates a feeling of superiority among these groups, some, believing that their cultural values are superlative or important than others. This disposition and worldview towards others have led to the practice of “Ethnocentrism”, which has continued to set a center stage for acrimony, spirit of secession, religious intolerance, divisiveness, conflict, or war in Nigerian society. The cultural variations and intermixing commonly referred to as multiculturalism or cultural pluralism and the concept of ethnocentrism in no small measure have continued to be a bane or cog in the wheel of developmental progress of any multicultural society, Nigeria not exempted.

Hence, this paper therefore seeks to examine the issues and challenges of ethnocentrism in multiculturalism with particular reference to the Nigerian society, with the view to proffering solutions to its exacerbated issues bedeviling cultural pluralistic society such as Nigeria. The study adopted qualitative research approach where secondary data were used as the main sources of data collection. The secondary data were collected from published journals, articles, seminar papers, interview, documents and periodicals. The data collected from secondary sources were used to confirm and support the findings.

Concept of Ethnocentrism

Ethnocentrism, a concept derived from cultural lexicon has been viewed differently by different scholars of cultural studies. The concept was advanced by Williams Graham Sumner (Thomas, 2005). According to Levine (2015), the term moved from Social Science

Theory into common English usage during the 20th Century. Levine agreed that the term was invented in 1906 by an American Sociologist Williams Graham Sumner who conceptualized the word as a means of promoting solidarity within what he called “ingroup and antagonism toward “out groups” Graham introduced the concept in his book entitled “Folkways” Published in 1906. Uriah (2019) explaining the concept asserts that “ethno” means race, nation or people while “centric” means centre, hence, ethnocentrism is the belief that one's own race, nation or group is the best. It is a person's belief that his own group or culture is superior to all others and treats other people's culture with suspicion and some degree of hatred, hostilities or disdain.

In the view of Benjamin (2008), ethnocentrism is the habit of seeing from the point of view of one's own group, and that it is sometimes, described as the “Cardinal Sin of Comparative Method” It is the habit of studying and making judgments about other societies in terms of one's cultural assumptions or bias. Ethnocentric habit can be expressed in such phrases as “Chosen People” “Progressive” “Superior Race” “True Believer” and by epithets like “Foreign Devils” “Infidels” “Heathen” “Backward People” “Barbarians” “Savages” “Underdeveloped” Etc. (Benjamin, 2008). Ethnocentrist often believes that their culture is the best in all aspects even in the face of contradictory evidences. This prejudice often brings about conflict, confusion, hatred and suspicion in the society.

Ethnocentrism is a type of prejudice which makes one believe and behave in a way that one's own culture is right and better than others. It is a tendency of judging the goodness or badness of other people's cultures. Virtually, all cultures often believe that their culture is the best in all aspect (Ahamfula, 2008). This has resulted to so many violent crises in a multicultural society.

Multiculturalism: The concept of multiculturalism is a compound word, consisting of multi (many) and cultural pluralism (many culture). Multiculturalism is the way in which a society deals with cultural diversity both at the national and at the community level.

Sociologically, multiculturalism assumes that society as a whole benefits from increased diversity through the harmonious co-existence of different cultures. Multiculturalism can take place on a nation-wide scale or within a nation or communities. It may occur naturally through immigrations or artificially when jurisdictions of different cultures are combined through legislative decree as in the case of Nigeria where the various ethnic groups, Hausa, Igbo, Yoruba and other minor groups were amalgamated in 1914 by their colonial masters (British). The proponents of multiculturalism believe that people should retain at least some features of their traditional cultures while the opponent said that multiculturalism threatens the social orders by diminishing the identity and influence of the predominant culture. These are issues embedded in the concept of multiculturalism.

Types of Ethnocentrism

According to Thomas (2005) recent cross-cultural measurement of ethnocentrism has suggested that there are two kinds of ethnocentrism

- Intra Group Ethnocentrism
- Inter Group Ethnocentrism

The Intra Group Ethnocentrism occurs when there is strong belief that an individual culture is better and should be preferred to other culture within multicultural society. For instance, in Nigeria as a nation, there are various cultural groups such as Igbo, Hausa, Yoruba, etc. When any of these groups preferred their individual cultures within the group, it is referred to as intra-group ethnocentrism.

On the other hands, when a group has a strong devotion and preference for its own group and hatred against members of the out group, for example, if Nigeria and India have a strong hatred against each other due to cultural differences, it is referred to as Inter Group Ethnocentrism.

Characteristics of Multicultural Society

- It is characterized by people of different races, ethnicities and nationalities living together in the same community.
- People share their unique cultural ways of life, languages, tradition and behaviour with others.
- Characteristics of multiculturalism often spread into the community public schools where curriculum is crafted to introduce young ones to the qualities and benefits of cultural diversity.

Robert (2020) in his article titled "*What is multiculturalism? Definition, Theories and Examples*" avers that multiculturalism describes the manner in which a given society deals with cultural diversity. It expresses the view that society is enriched by preserving, respecting and even encouraging cultural diversity.

Theories of Multiculturalism

According to Robert (2020) the two primary theories or model of multiculturalism are:

- The Melting Pot Theory
- The Salad Bowl Theory

The Melting Pot Theories

This is a multiculturalism theory that emphasizes that immigrant groups will tend to "melt together" by abandoning their individual cultures and eventually becoming fully assimilated into the predominate society. For example, in 1782, French-American immigrant J. Hector St. John DeCrevecoeur wrote that in America "individuals of all nations are melting into a new race of men, whose labours and prosperity will one day cause great changes in the world"

However, the Melting Pot Model has been criticized for reducing diversity, causing people to lose their traditions and for having to be enforced through government policy. For examples, the US India reorganization Act of 1934 forced the assimilation of nearly 350, 000 indigenous people into American society without any regard for diversity of their heritage and lifestyles (Robert, 2020).

Also, the French assimilation policy introduced in French West African colony during the colonial period is a prime example of melting pot theory. In Nigeria today, many of the regions cultural heritage are shrinking into extinction due the obsession of foreign culture.

The Salad Bowl Theory

This Multiculturalism theory stresses that in a heterogeneous society, people can co-exist but retain at least some of their unique characteristics or their traditional culture rather than coalescing into a single homogenous culture. This implies that diversity can exist but individuals or group can still maintain their unique features that they are known for. The metaphor of salad bowl was coined in 1959 by historian Carl Degler who sought a better image of cultural change. For example, in the United States, New York city, with its many unique ethnic communities like "Little India" and even encourage cultural diversity :Little Odessa" and "China Town" is considered an example of a salad bowl society. The salad theory emphasizes that, it is not necessary for people to give up their cultural heritage in

order to be considered members of the dominant society. For example, African Americans do not need to stop observing Kwanzaa (a secular festival observed by many African Americans from 26 December to 1 January as a celebration of their cultural heritage and traditional values) and start celebrating Christmas in order to be considered Americans.

However, on the negative side, the cultural differences encourage by salad bowl model can divide a society resulting in prejudice and discrimination. In addition, critics point to a 2007 study conducted by American political scientist, Robert Putnam showing that people living in salad bowl multicultural communities were less likely to vote or volunteer for community improvement project. This is a case in Nigeria where general project meant for the public good are not taken seriously due to diversity in cultures and the question of who will benefit more among divers group.

Challenges of Ethnocentrism in a Multicultural Society: The Case of the Nigerian Society

The challenges of ethnocentrism in a multicultural society cannot be overlooked. This is because ethnocentrism which is the feeling that ones cultural norms, values or way of life is better than others has continued to be a hotspot to many problems bedeviling any multicultural society. In Nigeria, naturally, every human being has that ambivalent mental tendency or consciousness to secure his interest first or to identify with his or her ethnic group (Etuk, 2022).The challenges of ethnocentrism in Nigeria as a multicultural society has continued to rear its ugly heads in all spheres of the nation's life ranging from politics, religion, economy, education inter alia. No wonder, Etuk (2020) laments that ethnocentrism has remained a festering sore manifesting its devastating impact on Nigeria socio-political and economic development. Thus, the challenges of ethnocentrism can be delineated as follows:

1. It leads to genocide
2. It promotes obnoxious policy of segregation(apartheid)
3. It engenders slavery
4. Promotion of Violent conflict/war
5. It leads to false assumptions
6. It serves as a hindrance to learning other culture
7. It promotes discrimination in employment, appointments, allocation of projects etc

Genocide

Ethnocentric beliefs and action can lead to most detrimental effects such as genocide. Genocide is the intentional destruction of a people in whole or in part (Wikipedia). The term was coined by Raphael Lemkin in 1944.It is a deliberate killing of a large number of people from a particular nation or ethnic group with the aim of destroying a group or a nation. Ethnocentrism can lead to mass killing of people (Genocide). For instance, the Nazi Germans under the leadership of Adolf Hitler were under the impression that the Jewish people were inferior and this led to Holocaust. (Genocide) in which about six million persons were killed (www.annefrank.org.go-in-dept). The motive of this mass killing is associated with Anti-Semitism, racism or ethnocentrism. This killing occurred around 30th January, 1933 – 8thMay, 1945 (www.britanica.com).In Nigeria, there are a lot of mass killings which stem from cultural differences. For instance, many lives have been lost through herdsmen and farmers clash. According to Sahara reporters, herdsmen have killed 4000 farmers in south west Nigeria since 2015 (saharareporters.com) Similarly, This Day live.com also reported that herdsmen killed 2,539 in 654 attacks between 2017 and May 2,2020.The author of the

report Jose Luis Bazan, an independent researcher and analyst based in Brussel, Belgium, said, Nigerians are suffering widespread and systemic terrorist attacks by mainly Boko Haram, the ISIL-aligned Islamic State West Africa province (ISWAP), Fulani militias, Ansaru. It is pertinent to note that most of the issues that cause conflict or violent crisis among various ethnic groups in Nigeria is directly or indirectly related to cultural ethnocentrism. It is in the nature of each cultural group to hold most of her cultural contents as superior and to repudiate those of others as inferior (O'Donohue in Chinwuba, 2020). This is the epicenter of Nigerian's case.

Policy of Segregation (Apartheid)

This is a policy of racial segregation. The Apartheid (1948-1994) in South African was the racial segregation under the All-White government of South Africa which dictated that non-white South Africans were to live in separate areas from the Whites and use separate public facilities. This is orchestrated by ethnocentric disposition, because the White felt that their culture was superior to the Blacks, hence, the policy of segregation. The policy also dictated where South Africans could live, work, the type of education to acquire, whether they could vote or not, who they could associate with. They classified South Africans as Bantu (Black African). This policy continued until Nelson Mandela changed the narrative through his emergence as South Africa president.

In the same vein, there are a lot of segregations in Nigeria as a result of ethnic considerations. Chinwuba (2020) states that in Nigeria, states create social inequality that provokes conflict through its practices that recognize some ethnic cultural contents more than those of others. This disposition is more crystal in the area of project allocations, political appointments, distribution of resources all undertoned in cultural ethnocentrism and ethnic bias inter alien. According to Business day Report, (2017) the former President of Nigeria, Muhammed Buhari appointed 80 Northerners out of 100 members of his cabinet. This raises a question in the mind of all rational people of what need for the enunciation of the federal character principle, which stresses that appointment into government offices should be done based on the equal representation of the various regions of the country. This principle came into being in 1979 which the constitution then captured. It stands to reason that the appointment of personnel into any federal establishment or agency or as a minister is to be done to reflect federal colouration. The total neglect of this principle is tantamount to apartheid mentality exacerbated by ethnocentric disposition. Today, some languages viewed as major cultures are incorporated into the school curriculum while others seen as minor language group are neglected. This is ethnocentrism under the guise of common nation. No wonder Rotimi (1996) laments that the problems of Nigeria ethnic minorities have resulted directly from specific contradictions and tensions in the evolution and operation of the Nigeria federal system.

Slavery

Ethnocentrism can also promote slavery. Many who believe that their own culture is better than others always take advantage of any opportunity to enslave those who may need their support and who is from the opposite culture. They see such people as second class citizens whose cultural heritage is inferior to theirs. For example, in the Eastern part of Nigeria, those who practice Caste System known as "OSU" are usually described as "Second Class" or "Half-Humans" or "impure humans" because of ethnocentric belief. Many of these people are turned into slavery to serve the village "gods" throughout their life. Ogbonda (2016) asserts that the Aros in South Eastern part of Nigeria are regarded as inferior, unclean, and are highly segregated even in marriages. This disposition is informed by the belief of the ethnocentrist

which hinges on the principle of cultural superiority, hence, leading to servitude of those perceived to possess inferior culture in a cross-cultural society.

Violent Conflict

Ethnocentrism may lead to situations that are terrible like death and war in a given country. When communities view others from a negative perspective, it may lead to animosity that may cause ethnic or tribal clashes or violent conflict that may end up leading to several injury and death cases within the society. This is due to the fact that ethnocentrism closes the minds of individuals from understanding the way of life and cultures of other people (Ivypanda, 2022). In Nigeria, violent conflict has erupted several times in the areas of religious bigotry, politics, etc. due to the issue of ethnocentric beliefs occasioned or caused by cultural pluralism or multiculturalism. The case of herders' farmers' clash has been observed by many to have an ethnocentric undertone. These conflicts resulted in over 800 deaths by 2015 (www.en.m.wikipedia.org)

False Assumption

According to Ivypanda (2022), ethnocentrism is a bad practice because it leads to individuals making false assumptions about other cultures. Ethnocentrism leads people to make generalizations about the customs and cultures of other people that are not true. This leads to a false judgment of others using their own ethnic lens as a yardstick, as a result, individuals may end up making harmful judgments concerning other communities.

Secession

Secession, which means the belief or tendency of breaking away from others, is one of the effects of ethnocentrism. When a group feels that their values, cultures, and ways of life are not in tandem with other groups, the desire to secede (breakaway) looms. This is the topical case of Nigeria's society where the three major ethnic groups—Hausa, Igbo, and Yoruba—look at their amalgamations of 1914 by the colonial masters as a false marriage. This is orchestrated and romanced by cultural differences among the varied ethnic groups. This disposition has stimulated agitations from some groups to ask for secession as they feel that there is no correlation in terms of cultural heritage with the other groups. However, if sentiments and attitudes of cultural superiority will be stripped and common identity, aspirations, equality, justice, and a strong adherence to cultural relativism among groups resurface, the desire for secession may not arise.

Developmental Retardation

This is another challenge that results from ethnocentric beliefs. When a group feels that their culture is superior to the other group that it co-exists with, it makes the minority group feel not obligated to contribute towards the developmental effort in the community. This is premised on the belief that the dominant groups are the people who should be in charge. This, to a large extent, retards development since development needs joint or collaborative effort. However, Ivypanda (2022) observes that despite the negative effects of ethnocentrism, it may be good for the society especially, if practised in the form of patriotism. For example, a person being proud of their own country may be ready to fight for their country, tribe, or nations. This was a case in Nigeria, during the colonial era when people like Nnamdi Azikiwe, Herbert Macaulay, Obafemi Awolowo, and other Nigerians' nationalists resisted the policy of assimilation brought by the colonialist which aimed at the imposition of western culture on Africans. This is a big lesson contrary to an ambivalent mentality of Nigerians of today in terms of cultural safeguard and intermixing.

Conclusion

Ethnocentrism as a cultural terminology refers to the tendencies of people believing that their own race, culture or ethnic group is better than others. Such individuals measure and judge all the other culture or ethnic groups using their culture as a standard. Multiculturalism on the other hand refers to the presence of several distinct cultural or ethnic groups within a given society. It is also referred to as cultural pluralism or pluralistic society. However, Ethnocentrism in multiculturalism has some challenges or effects, such as, facilitating violent conflict, retardation of development among others. Despite the effect of ethnocentrism, it can be good in promoting patriotism and solidarity among groups or nation. Suffice to say, that in Nigeria, as multicultural society, ethnocentrism has promoted dysfunctional tendency, developmental retardation, disunity amongst others.

Way Forward

The following recommendations are suggested as a way to minimize cultural ethnocentrism among Nigerians as well as improve cultural tolerance within Nigeria context.

1. There should be an emphasis on the Salad Bowl Model which stresses that all groups should maintain their cultural heritage while having regard for others culture in intermixing associations. This will encourage cultural tolerance within multicultural society.
2. There should be adequate legislations to prohibit cultural intolerance as well as effective implementation mechanism, so as to discourage extreme ethnocentric attitude but enthroned relativist culture among the people.
3. The prominent cultural traits of various groups should be harness and synchronized into national culture which can be adopted and adapted into the school curriculum.
4. The national culture and individualistic culture of distinct groups should be allowed to co-exist in the atmosphere free from bitter rancor and acrimony.
5. Appointment of leaders should be strictly premised on the basis of cultural groupings to give all a sense of belonging in a multicultural society.
6. The government should invest in culture through training and retraining of cultural scholars and building of institute for cultural studies.

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Examining the Evolutionary Trends of Mobile Banking Platforms in Nigeria

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Abstract

This paper takes a critical review of the evolutionary trend of mobile banking platforms deployed by commercial banks in Nigeria, with the aim to recommend a more secure and robust one. It identifies the strengths and weaknesses of each and highlights the factors that led to the invention of the next succeeding one. The mobile banking platforms reviewed includes Short Messaging Service (SMS), Interactive Voice Response (IVR), Unstructured Supplementary Service Data (USSD), Wireless Application Protocol (WAP), SIM Application Toolkit (SAT), and Application (APP) based platforms. Many of these mobile banking platforms are still utilized by most commercial banks in Nigeria today. However, it is obvious that, although most commercial banks combine two or more of the mobile banking platforms in order to get better result, there are inherent security problems and other challenges in them, which need to be addressed. Having a mobile banking platform (APP-based) with inbuilt ability to confirm a user's authenticity before his transaction is completed, would bring a better security check and thereby bring enhancement to mobile banking transactions. The Application is made more flexible for users by allowing more than one user to use the application to transact once installed in a phone. It is as well equipped with more functionalities like including means for users to: enable/disable their SMS alerts, Change their SMS phone number, Edit their residential address, and Update their next of kin information, as their needs may arise.

Keywords: enhancement, evolutionary trend, mobile banking, platform, transaction.

I. INTRODUCTION

Mobile banking is a platform with which certain banking transactions can be performed from anywhere and at any time using mobile devices basically mobile phones or PDAs (Tiwari, Buse and Herstatt, 2006). The essence of introducing this technology into the banking sector is to make things easier for both banks' customers and staff (Gavin, 2007); such that one must not necessarily visit his bank's local branch before one can successfully perform any transaction. This achievement has gone a long way to increase the interest of several capitalists, industrialists, entrepreneurs, and in fact, all who have anything to do with a bank, to identify with banks that offer such services. They then explore the benefits of the technology since they most times have a lot to do with financial transactions of assorted types. This can be risky, cumbersome or time-wasting if they must have to visit their banks' local branch for all such transactions each time the need arise. Although, there are alternative banking platforms that can be used like Internet Banking (i-banking), ATM, POS, etc, mobile

banking have got numerous and outweighing advantages over all the above and their likes, which cannot in any way be overemphasized (Odumeru, 2013).

There is a daily increasing need for means of payment and financial transaction that would be both safer and more convenient. This can best be achieved by making payments and financial transactions without necessarily involving physical cash. Mobile banking among other platforms like ATM, POS, etc. give a good room for cashless transactions (Odumeru, 2013). Though, there may still be the need to move about with some physical cash, it would be in some rare cases. How be it, it may not need to be much amount of cash. Then, robbers and other criminals would not have wreaked much havoc by intercepting such a cash person. With it, the opportunities of criminals who would always seek chances to rob others of their cash will be reduced. This is because, it requires high level of security breach technologies like hacking, spoofing, Identity Theft to make an attempt (Agwu, 2015). The attempt so made still has tendency of failing, since several security techniques were deployed in the technology. Serious efforts are still being made to heighten and tighten up the security even the more.

Historically, fraudsters have targeted the various payment vehicles (ISACA, 2011), for which mobile banking is not an exception. There have been some reported cases of bank customers incurring some enormous financial losses as a result of some security breaches on their bank account via mobile banking platforms. This is one of the bottlenecks that have watered down the interest of some victims of such frauds and those close and/or dear to them from making use of the mobile banking technology. Of course, it would have eased the banks' staff workload as the banking halls each day get overcrowded with customers seeking one financial transaction or the other physically. It would have as well, brought about convenience and safety on the side of the banks' customers. This paper recommends ways to improve the security of the mobile banking technology by confirming a transaction before it is finally completed. Also by bringing in some new features/functionalities such as means to Enable/disable SMS alerts, Change SMS phone number, Edit residential address, and Update next of kin information.

Confirmation a user's authenticity before completing his transaction is involved here. For instance, at a certain stage in the course of performing a transaction, the system deploys One Time PIN/Password (OTP) technology. This OTP technology is also a good avenue of making the rightful owner of the bank account to know that his account is under attack. He can then contact the bank's customer care unit to help out by taking some immediate security actions. The user may as well decide to immediately change his mobile banking PIN. Mobile Banking has got several platform, which are SMS, IVR, USSD, WAP, SAT and APP-based platforms. Each is to be treated in detail hereunder.

II. EVOLUTIONARY PROGRESSION OF MOBILE BANKING PLATFORM

In this section, the researcher describes the history of mobile banking. It begins with Short Messaging Service (SMS) as a mobile banking platform.

1. Short Messaging Service (SMS) Based Option: This is the first and oldest mobile banking service offered to bank customers since 1997, which banks use to send bank account details to their customers (Tomi and Joe, 2002). Generally, SMS allows users to send/receive text messages on a mobile phone using the numbered keypad on the mobile handset to input characters. SMS mobile banking requires a registered customer to initiate a transaction by sending a Structured Short Messaging Service (SSMS) message to the bank's service provider. For instance, '*bank_balance_PIN*' for balance enquiry; or

'bank_transfer_current_savings_amount_PIN' for transfer of a specified amount of money from a user's current account to his savings account.

In each of these examples, the SSMS would be sent using a SMS short address or code (a short phone number) through the GSM Network to the Mobile Network Operators SMS Centre, which stores and forwards the SSMS message to the mobile banking service provider via the SMS gateway allocated to the short address/code. The service provider uses the user's mobile number, forwarded by the SMS Centre with the SSMS message, to identify the user and respond to his request. Initially, SMS option was unidirectional; but much later, the bidirectional SMS-based option was invented.

a. Strengths of SMS Based Mobile Banking Option

- i. Simplicity: SMS based mobile banking is the simplest form of mobile banking platform.
- ii. Compatibility: It is compatible with all phones (Gavin, 2007).
- iii. Download: It requires no download, updating nor pre-configuration for a customer.
- iv. Internet Connection: Internet connection is not required for one to use SMS based option.
- v. Memory Consumption: It does not take much storage space in the phone memory.

b. Weaknesses of SMS Based Mobile Banking Option

- i. Syntax Memorizing: This option has the difficulty of memorizing transactions syntaxes.
- ii. Transaction Limits: It is the narrowest in transaction limit per day (Omeye, 2018).
- iii. Access to Scammers: It can be manipulated just with a user's PIN (Omeye, 2018).
- iv. Limited Functionalities: It has the limitation of enabling just a few functionalities.
- v. Transaction Charges: The user is charged both by his bank and his network provider.
- vi. Status Check Delays: A transaction's success/failure confirmation may at times delay.
- vii. Network Problem: Limited/no mobile network coverage (not internet) hinders its use.

These are the bottlenecks of SMS-based option that led to the invention of the next – IVR.

2. Interactive Voice Response (IVR) Based Option: In telephony, IVR is a phone technology that allows a phone caller to select options from a voice menu and interact with the phone system, just like the initial process of calling in order to speak with a mobile network representative, say MTN (Gavin, 2007). A pre-recorded voice prompt is played and the caller presses a number on a phone keypad to select an option. Speech recognition can also interpret the caller's simple spoken answer such as *'Yes'* or *'No'*; more complex words, sentences and business names, or even a number as a valid response to the voice prompt. IVR requires a registered user to dial a published phone number and be answered by a pre-recorded voice that presents menu options to the user, who in turn, responds. It is session-based and not *'store-and-forward'* based as it is in SMS option. In IVR, one is either immediately responded to, within the same session he called, or he is not responded to at all, and that session goes. In such case, the user starts afresh when he wishes to continue with/complete the transaction.

The IVR system takes instructions from the user by recording the tones of the number selected on the keypad or spoken commands, and creates an instruction that is forwarded to the service provider, which uses the user's forwarded phone number to identify him as factor of authentication and to get back to him. IVR based option is one of the old options, now rarely used.

a. Strengths of IVR Based Mobile Banking Option

- i. User-friendliness: It is user-friendly, as the user hears and responds to the pre-recorded voice prompts played, especially those who finds it difficult to read (Gavin, 2007).
- ii. Compatibility: It is also highly compatible with almost all mobile phones (Omeye, 2018).
- iii. Memory Space: No much memory is needed as no application is housed (Omeye, 2018).
- iv. No Syntax Memorizing: The voice prompts take care of it (Gavin, 2007).
- v. Status Check: The transaction success/failure is instantly known as it is session-based.

b. Weaknesses of IVR Based Mobile Banking Option

- i. Cost Intensive: The user spends much money placing the calls. At times, his airtime gets exhausted along the line, making him to loose even the one he has spent fruitlessly (Gavin, 2007).
- ii. Vulnerable to Interceptions: It is vulnerable to hackers’ interception with the voice call.
- iii. Limited Functionalities: It supports only few of the expected mobile banking functionalities.
- iv. Complexity: Its complexity emanates from language barrier, unclear voices, etc.
- v. Network Problem: Network unavailability or shortage completely encumbers its use.

The above are weaknesses that led to the quest for and invention of the next option – USSD.

3. Unstructured Supplementary Service Data (USSD) Based Option: This is simply a menu-driven form of SMS option, where after initiating his transaction, a customer receives a text menu as opposed to a string of words (Gavin, 2007). A registered bank customer initiates his transaction by dialing the banks published number usually containing asterisks (*) and harsh (#) signs, that is, a bank’s published USSD string/code.

Like SMS, it transports small messages between the mobile handset and the network; but unlike SMS’ ‘store-and-forward’, USSD is session-based. USSD is of two forms – USSD1 and USSD2. USSD1 only allows one way communication, but USSD2 allows two ways communication – Duplex Mode, full one, as it can be full or half (Mbam, 2002). With USSD2, the interaction between the user and the service provider would be held in the same session. USSD is available in an estimated 95% of all mobile handsets in the market today according to Gavin (Gavin, 2007). For instance, an Access Bank registered user can dial her published USSD code (*426# or *901#) (Diamond, 2018). The reply can come as shown in Figure 1 below (not in voice form).

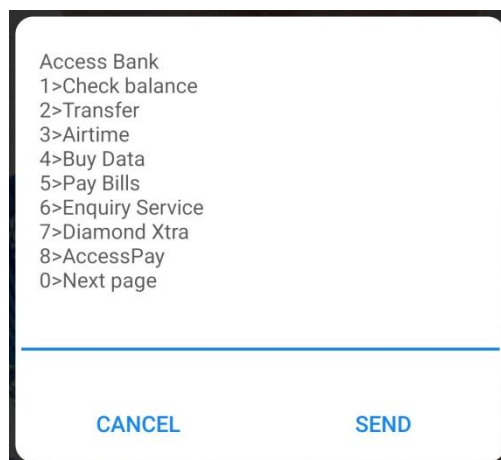


Figure 1: Access Bank USSD Code Initial Response Interface

A user, to whom this interface is presented, is expected to look closely, see the number associated with the transaction of his interest, and type it back into the interface using the provided space. With that, his request is conveyed to the bank's service provider, who in turn, processes the request and gets back to him accordingly. The interface guides the user till completion of his task. More so, the user can still decide to dial the number that will deliver an SMS message for his intended transaction directly to the bank's service provider.

a. Strengths of USSD Based Mobile Banking Option

- i. **Simplicity:** Like SMS option, USSD is a simple option too considering its general nature.
- ii. **Compatibility:** From Gavin (2007), it is compatible with estimated 95% of phones.
- iii. **No Download:** No Download or update, as it is already built into most GSM networks.
- iv. **Pre-configuration:** No pre-configuration is required for a registered bank customer/user.
- v. **Internet Connection:** This is not required. Network provider's service is just enough.
- vi. **Memory Consumption:** It takes only negligible storage space in the phone memory.
- vii. **Cost Effectiveness:** USSD option incurs little/no cost (depending on the bank), as opposed to the first two – SMS and IVR.
- viii. **Security:** The data being transmitted via the USSD channel are encrypted, and so, safe.

b. Weaknesses of USSD Based Mobile Banking Option

- i. **Transaction Limits:** This is faced with limited transactions per day (Diamond, 2018).
- ii. **Criminals' Chances:** It can easily be manipulated if only a criminal access a user's PIN, as there is no other factor of authentication except the PIN (Omeye, 2018).
- iii. **Functionalities' Limitation:** It enables just a few functionalities (Diamond, 2018).
- iv. **Lack of Completeness:** USSD option mostly would still need SMS for its final response (example in account balance inquiry), and so, it lacks completeness on its own.
- v. **Network Problem:** Network unavailability or shortage can bar the use of USSD option.

These are the issues with USSD option that led to the quest for and invention of WAP option.

4. Wireless Application Protocol (WAP) Based Option: WAP is an open international standard for applications that use wireless communication (Gavin, 2007). It is to enable access to the Internet via mobile phones. WAP is now the protocol used for the majority of the world's mobile internet sites, known as WAP sites. WAP sites are websites written in, or dynamically converted to Wireless Mark-up Language (WML) and accessed through the WAP browser via mobile phones. WAP offers the user a similar experience to that of internet banking but utilizes phone instead of computer. The mobile phone and General Packet Radio Service (GPRS) is used to display or transmit the data between the user and the bank.

a. Strengths of WAP Based Mobile Banking Option

- i. **Syntax Memorization:** No Syntax memorizing is associated with this (Gavin, 2007).
- ii. **Transaction Limit:** This option has loose transaction limit per day (Omeye, 2018).
- iii. **More Functionalities:** WAP based option has wider range of transactions it supports.
- iv. **Cost Effectiveness:** Only the multipurpose data for internet connection is required.
- v. **Ready Balance/Brief Statement:** On login, user's balance/brief statement displays.
- vi. **Security:** This option is secure provided the user guards his login details jealously.

b. Weaknesses of WAP Based Mobile Banking Option

- i. Internet Connection: There must be internet connection for this to be used (Gavin, 2007).
- ii. Pre-configuration: The phone must be properly configured as provided by the MNO.
- iii. Downloads: It requires download and updates of the WAP browser.
- iv. Memory/Graphic Ability: Needs enough memory/graphic ability to store/display browser.
- v. Complexity: It is complex to operate, as less educated fellows may find it difficult to use.
- vi. Scammers Chances: Much loss can be incurred if a scammer accesses the user's login details, as the transaction limit per day is loose (Omeye, 2018; Onozure, 2018).
- vii. Compatibility: It is incompatible with so many phones, as many of them in the market today cannot take care of the bottlenecks pointed out from numbers (i) to (iv) above here.

These are the limitations that led to the quest for and invention of the next option – SAT.

5. SIM Application Toolkit (SAT) Based Option: SIM Application Toolkit (SAT) also referred to as SIM-Based Application allows for the service provider or bank to house the user's mobile banking menu within the SIM card (Gavin, 2007). SAT consists of a set of commands programmed into the SIM card that defines how the SIM interacts directly with the outside world and initiate commands independent of the handset and the network. This enables the SIM to build up an interactive exchange between a network application and the end user, and control access to the network. The SIM also gives commands to the handset, such as 'display menu' and 'ask for user input'.

If the SIM card already exists in the market, the service provider can either send the application/its updates Over the Air (OTA), which entails the delivery of several encrypted text messages that self-configure the application on the SIM card; or provision new SIM cards with the updated application already embedded in it. Once the application is on the SIM, instructions from the customer can be entered, encrypted, and transported by SMS to the bank or her service provider.

a. Strengths of SAT Based Mobile Banking Option

- i. Syntax Memorizing: All platforms using application take care of this, as they display the list of all the possible transactions it can offer in a menu form (Gavin, 2007).
- ii. Transaction Limit: It is also loose in terms of transaction limit per day (Omeye, 2018).
- iii. Limited Functionalities: It supports wide range of functionalities/transactions.
- iv. Security: SAT is secure enough, as the transmitted data are encrypted (Gavin, 2007).
- v. Compatibility: It is compatible with all phones, once it can accept and read SIM cards.

b. Weaknesses of SAT Based Mobile Banking Option

- i. Updating: It is difficult to update the application, since the SIM cards bearing them are already far away from the service providers. It will cost both parties much (Gavin, 2007).
- ii. Memory Space: The application takes a considerable space in the SIM card's memory.
- iii. Fixed Storage: The application must be in the SIM card occupying the supposed contacts' space, whereas the device memory or SD card may be spacious enough (Gavin, 2007).
- iv. Cost: This option makes user spend a lot in the course of his transactions (Gavin, 2007).
- v. Network Problem: Network unavailability or shortage can hinder its use totally.

The above are its weaknesses that led to the quest for and invention of APP-based.

6. Application (APP) Based Option: This is the latest mobile banking platform. It requires a phone that supports the GPRS download of the application and subsequent updating from time to time (Gavin, 2007). The phone also needs to have enough memory/graphic ability to house/display the application when launched – all obtainable in all android phones. Once installed, the application uses GPRS (USSD or SMS for ordinary phones) to carry the user data from the device to the service provider encrypted (Gavin, 2007).

The user browses and finds the application, launches it, and follows the application stepwise directions to complete his transaction. This application can be pushed to the mobile phone by a service provider Over the Air (OTA) or the user can download it by accessing the service provider's/bank's WAP-site or even from the Google Play Store.

According to Gianni and Pier (2015), the services for off-branch banking offered by several banks, show that mobile applications have surpassed the mobile web channel in completeness of the offer, due to the fact that additional capabilities of mobile devices make possible advanced features and applications; serious works are still being done to add more.

a. Strengths of APP Based Mobile Banking Option

- i. Syntax Memorization: Not applicable, the application displays all needed (Gavin, 2007).
- ii. Transaction Limit: It is the loosest in terms of daily transaction limit (Omeye, 2018).
- iii. Limited Functionalities: It has the widest range of functionalities, as it supports all supposed transactions as far as mobile technologies and solutions are concerned.
- iv. Security: It is 95% secure as transmitted data are encrypted. It also utilizes many factors of authentication like i-banking ID, PIN, etc (David, 2006; DiamondMobile, 2018).
- v. Compatibility: It is compatible with all android phones (bearing in mind that this paper is focusing on enhancement of android application mobile banking option precisely).
- vi. Application Updating: It is easy to update the application, just like any other application.
- vii. Memory Space: This is not an issue as android phones have enough device/SD memory.
- viii. Unfixed Storage Location: The application can reside anywhere accessible to the phone.
- ix. Scammers' Chances: Scammers have little or no chance once a user's details are guarded.
- x. Cost Effectiveness: This takes care of the cost problems of the earlier options; charges are only at the back end (bank), from the front end, only the multipurpose data is required.

b. Weaknesses of (the Existing) APP Based Mobile Banking Option

- i. Network Problem: This is a general issue to all options; APP-based is not an exception.
- ii. Internet Connection: This is fully required in Application based mobile banking option.
- iii. Complexity: It is really complex, requiring some level of education to operate/use it.
- iv. Downloads: It requires downloading, installing and updating the application.
- v. Pre-configuration: It requires internet configuration settings; and that for the activation of the application itself, which requires the bank's staff directives (DiamondMobile, 2018).
- vi. Security Issue: No alert for the rightful user in case of unauthorized access/login before completing most transactions. Also, the loss will be enormous if a scammer accesses the user's details, as it has the loosest transaction limit per day (Omeye, 2018).
- vii. Inflexibility: It is not flexible, as only a user can make use of it (DiamondMobile, 2018).
- viii. No means to Enable/Disable SMS Alert: A user cannot enable/disable SMS alert.
- ix. No means to Change SMS Alert Phone Number: A related case with No. (viii) above.
- x. No means to Update Next of Kin Details: The existing system has no means of this (DiamondMobile, 2018).

The above-shortcomings, especially from numbers (vi) to (x) are the lapses of the existing APP-based option that led to the main objectives of this paper, which seeks to recommend ways of tackling the lapses of the existing system.

III. CHALLENGES OF THE CURRENT SYSTEM

The APP-based mobile banking platform has some challenges associated with it, which are:

- i. In case of unauthorized access, the rightful user has no way of being alerted of the inimical activity going on with his account prior to the completion of some transactions.
- ii. The system is inflexible; as the installed application is restricted to one person/user.
- iii. There is no means with which a user can to enable/disable his SMS alert at will.
- iv. The system has no way of a user to change his SMS phone number if the need arises.
- v. No means for a user to update his next of kin details without physically visiting his bank.

IV. SOLUTIONS TO THE CHALLENGES

These challenges can be checked using the following approaches:

- i. Use of One Time PIN/Password (OTP). This was deployed to alert the rightful user in case a criminal gained access to his bank account prior to the completion of any of his transaction via the user's linked phone number or email (in case of loss of initial SIM card/phone number).
- ii. The system was made flexible to allow more than one users use an installed application.
- iii. Means of a user to enable/disable his SMS alert at will was included with OTP deployed.
- iv. A module for 'Change SMS phone number' if need arises was provided, utilizing OTP.
- v. Means of 'Update next of kin details' as need may arise was included, utilizing OTP.

V. CONCLUSION

The evolutionary trend of mobile banking platform, which chronologically includes SMS, IVR, USSD, WAP, SAT and APP based platforms, showed the strengths and weaknesses of each. With closer focus on the android APP based option, the existing system is faced with several challenges. There comes the need for enhancing the option, so as to forestall the outlined weaknesses. The new system has the relative advantages of making banking customers friendly. The services for off-branch banking offered by banks show that mobile applications have surpassed the mobile web channel, due to additional capabilities of mobile devices made possible (Gianni and Pier, 2015). GPRS can be used to improve the security and capabilities of fraud detection according to ISACA (ISACA, 2011).

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Prevalence of Baby Factory and Educational Access in Public Secondary Schools in Rivers State

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Abstract

This paper examined the prevalence of baby factory and educational access in public secondary schools in Rivers State. Specifically, the paper aimed at determining the impacts of baby factory prevalence on educational access of students, identifying areas mostly used for baby factory in Rivers State, determining factors responsible for the prevalence of baby factory in Rivers State, and to ascertain the extent baby factory prevalence impacts on educational access of students in Rivers State. The study adopted qualitative and descriptive research approach where secondary data were used as the main sources of data collection. The secondary data were collected from published journals, articles, seminar papers, periodicals, as well as interviews and semi-structured questionnaire. The population of the study consisted of all 185,146 senior secondary schools Students in Rivers State. A sample of 400 students was used. This was derived using Taro Yamane population determination formula. A self-designed questionnaire instrument titled: “Prevalence of Baby Factory and Educational Access Questionnaire (PBEAQ)” was used to elicit information from the respondents. Test re-test method was used to determine the reliability of the instrument which reliability co-efficient of 0.84 at 0.05 level of significance. Data collected was analysed using mean and standard deviation with the criterion mean of 2.50 as accepted while below is rejected. The study revealed that maternity, clinics, water bottling companies, prayer houses etc., are areas mostly used for the perpetuation of baby factory. The study further revealed that poverty, lack of information on human trafficking, corruption, are among the factors responsible for the prevalence of baby factory and can impact on access to education .Based on the confirmation, the following recommendations were made among others; intensive advocacy against baby factory prevalence, promulgation of laws, enlightenment of the teenage girls on prevention of unwanted pregnancy among others.

Keywords: baby factory, educational access, prevalence, public secondary schools

Introduction

The universalisation of education is one of the central concerns of many nations and international organizations in terms of provision of education. This concern has led international bodies like United Nations to enshrine in its Millennium Development Goals (MDGs) in the second goal target of Universal Primary Education. This goal specifically, is to ensure that children have access to full course of basic education.

In Nigeria, the quest to expand education to ensure accessibility and inclusivity in education led to the introduction of Universal Basic Education launched in 1999 which gained its legal backing in 2004. However, despite all efforts towards access to education, the prevalence of Baby Factory Syndrome has continued to threaten accessibility of education in Nigeria. For instance, on 27th February, 2020, the Rivers State Police Command arrested five women at Rumuokwuta Junction in the Capital City of Port Harcourt for allegedly trading in babies using pregnant teenagers in their baby factory. Also, a couple was apprehended at a church in the Rumuolumini area of Port Harcourt on 4th July, 2020 for operating a baby factory where three pregnant teenagers were reportedly found. Similarly, on August 11, 2020 two teenagers were paraded by the State Police Command for selling their babies for N900,000 the sum of N600,000 had already been paid before they were arrested with four syndicates.

In the same vein, on August 2020, a magistrate court in Port Harcourt sentenced 49 year old United State Based Nigerian woman to 10 years imprisonment for buying children produced by young girls who were of school age. In recent time, precisely, January 11, 2023 the Daily Trust reported that the police command in Rivers State Nigeria rescued 12 pregnant teenagers in a baby factory during a sting operation on two suspected baby factories. This phenomenon has continued unabated and many young girls denied access to education. According to UNESCO report (2006) the first case of baby factory in Nigeria occurred in 2006 and has continued to increase unabated over the years. This report further revealed that among the pregnant women who were at the baby factory premises were teenage girls of 16 years who by Nigerian standard should be in secondary school. Today, access to education seems illusive as the problem of baby factory continue to increase astronomically, due to the new dimension it has assumed in the form of child trafficking and abuse. Studies have shown that this practice has continued to rise as a relative business in Nigeria despite its discovery and reports of the UNESCO in 2006. Also, despite the public knowledge of this phenomenon, it has continued to deny many young teenagers access to education, thereby contributing to 18.5 million out school children estimated in Nigeria (UNICEF, 2022). This exponential increase of lack of access to education orchestrated by baby factory prevalence among other factors is a source of worry and concern, according to Hence, the need for this study as to ascertain its impact on educational access of students in senior secondary schools with particular reference to Rivers State.

The concept of baby-factory is relatively new to English lexicon. Several authorities have conceptualised the term differently according to their own perceptions. Reproductive Biomedicine online (2016), viewed baby factories as institution where young people give birth to children who are then placed for sale or illegal adoption market. It further stated that the term refers to any place where pregnant women and young teenage girls are kept voluntarily or forcefully impregnated and kept illegally until their babies are born and then sold for monetary gains.

IGI Global (2020) refers to the term “Baby-Factory” as being used interchangeable with baby farmers, or baby harvesting and that it refers to children that fall within the category from birth to the age of 12 months found in these factories or farms. It is all acts involved in the transfer, sale or receipt of baby/babies within national or across international

boundaries through stealing or false adoption, fraud or deception to be used for satisfying social, material and ritual purposes amongst other. It is important to note that these young women who are or may be of school age are usually held captive, access to education denied until their babies are delivered and illegally sold to illegal adoptive parents. Oluwatobi, (2018) opined that baby factory which is illegal breeding of babies for marketing purposes otherwise known as “Infant Commodification” is increasing in Nigeria and that this menace is a vice that threaten the lives and well-being of babies, young girls and women. These young girls are always kept long until after the period of gestation (pregnancy) and their babies sold while access to education becomes unrealistic. In over a decade, the emergence of this practice has continued to jeopardize and deny young girls their educational access as stipulates in UBE ACTS, 2004 section 2 (2) that states that every parents should ensure that his children or wards attend and complete his/her education. The ACT proceeded in section four to pose a fine or imprisonment against the contravention of section 2 (2) yet the monster of baby factory continued to wax stronger on daily basis thereby denying teenage girls their access to education. Many have continued to ask the cause of the emergence of this social problem bedeviling the society. Chiedvaet al, (2015) declared that the leading causes of baby factory in Nigeria include poverty, childlessness, lack of ethical behaviour on the part of medical Professional, and greed among others. They therefore opined that providing counselling, developing positive self-image in the youth and providing family counselling for childless couples by encouraging them to go for proper adoption at the social welfare and to seek advanced medicare will help in curbing the prevalence of baby factory.

Heuntley in Onyinyechi (2017) agreed to the prevalence and stated that according to recent mass media reports, teenage girls and young women are brought by traffickers to the so-called “Baby Factory” with the false promise of jobs or safe abortion. This very practice has undoubtedly continued to deny children access to education, despite the fact that education is seen around the globe as a right, instrument to social change and a vehicle for national development. Onyinyechi (2017) observed that the trend of baby factories are usually disguised as maternal homes, Non-Governmental Organisation (NGO), hospitals, social welfare centre, clinics and even water bottling factory where Doctors, nurses and midwives pose as those rendering humanitarian help to these victims. Baby factories are seen as another form of child labour in modern time and have in no small measure denied young teenagers access to education.

In education, the concept of access to education has become a thing of necessity. The glossary of educational reform conceptualised educational access as the ways in which educational institutions and policies ensure or at least strive to ensure that students have equal and equitable opportunities to take full advantage of their education. Access to education is a global concern among educational policy makers; economist and social service. Studies have shown that female have had less access to education than their male counterpart (Erin & Gobte, 2015). This implies that less female attend school than male counterpart.

According to UNESCO reports on Global Education Monitoring, approximately 263 million children and youth are out of school globally equivalent to about one quarter of the population of Europe. This report further revealed that the total includes 61 million children of primary school age, 60 million of lower secondary school age, and the first ever estimated of those upper secondary school ages at 142 million. This implies that access to education has eluded many especially the female folks who by one reason such as baby factory syndrome have left school or drop-out. Social Survey Africa (2009) observed that out of the causes why students are out of school, teenage pregnancy emerged as the primary reason for girl learners not being in school in the seventeen to eighteen age groups. According to the survey, other factors may include; social and economic factors which may involve use of drugs in and

outside school, sexual abuse, in and outside school, poorly resourced schools and insufficient educators in school (teachers) which devalued the experience of education and poor prospect of finding employment after school in some communities. In all, pregnancy was mentioned as one of the biggest problems facing female youths in the participating or accessing education.

The prevalence of baby factory in no doubt has continued to threaten educational access in Nigeria, particularly in the Southern part of the Nigerian Nation. This phenomenon which involves confining young girls of school age impregnated in specific area for a period of gestation (pregnancy) until they deliver of their babies which are meant for marketing purposes. This practice has continued unabated despite efforts or measure put in place to checkmate the menace. Social survey Africa (2009) has confirmed that pregnancy among teenagers is the most reason for females of school age not to participate or access education. This is due to the fact that the prolonged period of pregnancy, nursing the babies until they are strong for sale, orchestrated non-participation in school activities. International America Development Bank (ADB, 2011) found that majority of teenage mothers do not attend school despite having attended in the past. This goes to reveal that the baby factory prevalence is a disincentive to schooling and deny access. This is why many teenagers who had experienced pregnancy early in their educational pursuit easily quit schooling due to shame associated with giving birth to illegitimate babies and marriage out of wedlock. Baby Factory indeed, is a strong disincentive to education and immensely denies access in Nigeria. Some of the causes can be delineated as follows;

Poverty

Poverty is a state or condition in which a person lacks the financial resources and essentials for a certain standard of living. It is a situation where a group of people do not have enough money or the basic necessities needed to survive. No wonder Atioma (2021) stated that several factors which contribute to existence of baby factory in Nigeria are social stigma and poverty. Hamilton, (2020) opined that extreme poverty, lack of education and guidance and the perversion of cultural traditions and religious rituals are several potential causes that allow baby harvesting and women's abduction to increase. National Bureau of statistics in its press release on November 2022, stressed that 133 million Nigerians are multidimensional poor. According to the report; two-third (67.5%) of children 6-17yrs are also multidimensional poor. Young girls from large family size, who may have experienced poverty absolutely, may resort to indulging in this unwholesome activity of baby-factory to produce babies and get paid when the baby is sold by their patrons. The multidimensional level of poverty has occasioned multi-faceted problems, of which the proliferation of baby factory is one. A teenage girl of school age that lack required materials for learning at school, food for quenching hunger while in school may not have the moral prowess to resist the temptation of being turned into a baby factory.

Lack of Information on Human Trafficking

Many of the teenage girls lack adequate information on the activities of human traffickers who may subtly disguise as "Good Samaritan". Most times, the traffickers will promise of taking them abroad for greener pasture and assured them of quality and better education which they will claim to provide if they (females) decide to follow them. In a bid to enjoy all the unconfirmed assurances, by these unscrupulous human beings, the innocent girls will fall prey to the traffickers.

High Unemployment Rate

According to National Bureau of statistics (NBS) in 2022, the unemployment rate in Nigeria is estimated to reach 33%. This figure was projected at 32.5 in the preceding year. Chronological data show that the unemployment rate in Nigeria rose constantly in the past years. The astronomical rise in the unemployment in Nigeria has given birth to varied problems; baby-factory proliferation inclusive. Many of the baby-factory syndicates or patrons usually cite the issue of no job when caught. Many go into this illicit trade due to their claim of no employment or job, hence, their involvement. Though many have critiqued this claim as they argued that, there are other legitimate trades one can engaged for sustenance. However, unemployment remained a contributory factor to the prevalence of baby factory menace.

Social Stigmatization

The stigma associated with women who are childless/barren in Africa and Nigeria specifically is a factor that has led many women to patronise the patrons of those baby-factories. A woman without a child is seen as being responsible for her childlessness. This position has occasioned the proliferation of baby-factory as the childless women are usually the potential customers for these babies. Olusesana (2017) asserted that infertile women are noted to be major patrons of these baby factories due to the stigmatization of childless couples in southern Nigeria and issues around cultural acceptability of surrogacy and adoption. This very practice has undoubtedly continued to deny teenage girls used in this illicit act access to education.

Poor Socialization

Poor socialization of the teenagers (male & female) can be linked to the causal factor of the baby factory prevalence. Socialization which is the process of learning to behave in a way that is acceptable to the society is a sine qua non in every human race.

In Africa culture, value for life is usually held in high premium and the younger generations are groomed to attuned to the moral chastity of their culture and strict adherence to moral stipulations of the families were communally enforced through collaborative effort of other members of the community. Most of the teenagers due to poor socialization have taken wrong path such as involving in the unwholesome practices of baby factory in a bid to make quick money thereby throwing the norms, values, principles and cultures to the thin air. This massive erosion of cultural values that was once cherished and held in high esteem by the Nigerian people has contributed immensely to degeneration of Nigeria cultural value.

Globalization

This is another pertinent factor that as well contributes to a large extent to the prevalence of baby factory. Globalization can be conceptualized as the transfer, adoption and development of values, knowledge, technology and behavioural norms across countries and societies in different parts of the world. Chinnammai (2005) examining globalization in his work entitled "Globalisation and education, challenges and opportunities" stated that the negative effect of globalization include exploitation of local resource and destroying indigenous cultures of less advanced countries to benefit a few advanced countries inter alia. The negative impact of globalization has taken a tow on African culture of which baby factory is one of the outcome. Most of these babies produced in the baby factories are sold to syndicates or patrons who are international child traffickers.

Corruption

This is another factor that promotes the proliferation of baby factory in Nigeria. Eniola & Omoleye (2018) observed that, there have been several reports in the median on raids on baby making factories, most of these cases are not diligently prosecuted. They further asserted that concerted efforts are lacking to deal with the operators of these factories and dismantle them. It is alleged that some unscrupulous security agents and state officials are working in cahoots with the baby sellers in return for rewards (Eniola & Omoleye, 2018). This practice has continued to contribute to the increase of baby factory. Dike (2023) lamenting on the increase opined that Nigeria has a baby factory crisis and that this illicit operation calls for more attention to tackle this grave issue.

Theoretical Framework

The theory which underpinned this study is the sociological theory referred to as Structural Functionalism. The main proponents of this theory are August Comte (1798-1857), Herbert Spencer (1820-1903), Emile Durkheim (1852-1919) amongst others. The theory posits that the society is like a human body with a number of inter-related parts which performs essential functions for the survival of the society and that when each part fails in its roles or function, there will be collapse of the entire system. The society parts that perform various roles for the stability of the society are; education, family, economic, religion, polity (Government) among others. When there is failure in each of these institutions with regards to role-performance, the society will experience abnormality and collapse in the system. Hence, baby factory prevalence results due to the inability of the society to function properly. According to the functionalist perspective, baby factory prevalence emanates due to the inability of the family, education Religion, economic and the political institutions to perform their roles or function adequately.

Research Questions

The following research questions guided the study:

- (i) What are the areas mostly used for baby factory in Rivers State?
- (ii) What are factors responsible for the prevalence of baby factory practices in Rivers State?
- (iii) To what extent does baby factory prevalence impacts on educational access of students in Rivers State?

Methodology

The study adopted qualitative and descriptive research approach where secondary data were used as the main sources of data collection. The secondary data were collected from published journals, articles, semi-structured questionnaire, seminar paper, interview, documents and periodicals. The data collected from secondary sources were used to confirm and support the findings. The analysis of the data collected was done through mean and standard deviation using the following as a range for decision; 1.00-1.49 (very low extent), 1.50-2.49 (low extent), 2.50-3.49 (High extent), 3.5-4.00 (very high extent) The decision level was 2.50, hence, using modified 4-point like scale ,any item that has 2.50 above was accepted, while below is rejected.

DATA ANALYSIS/DISCUSSION

Research question 1: What are the areas mostly used for baby factory prevalence as it relates to educational access of students in Rivers State?

Table 1: Mean responses on the areas mostly used for baby factory in Rivers State.

S/N	ITEM	MEAN	STD	REMARK
1	Social welfare	3.83	0.43	Very High Extent
2	Water bottling company	3.87	0.39	Very High Extent
3	Maternity	3.81	0.49	Very High Extent
4	Church/Prayer house	3.73	0.71	Very High Extent
5	Hospital	3.39	0.78	Very High Extent
Grand mean		3.72	0.58	Very High Extent

N=400 criterion =2.50

The data in table I showed that respondents indicated that social welfare, water bolting companies, maternity, church/prayerhouses and hospitals to a Very High Extent are the areas baby factory practices are usually carried out and hinder access to education.

Research question 2: What are the factors responsible for the prevalence of baby factory in Rivers State?

Table 2:Mean responses on the factors responsible baby factory prevalence in Rivers State

S/N	ITEM	MEAN	STD	REMARK
1	Poverty	3.68	0.73	Very High Extent
2	Lack of information on human traffic	3.66	0.70	Very High Extent
3	High unemployment	3.86	0.47	Very High Extent
4	Social stigmatization	3.70	0.70	Very High Extent
5	Corruption	3.61	0.77	Very High Extent
Grand mean		3.70	0.68	Very High Extent

N=400, criterion mean = 2.50

The data in the table showed that respondents, indicated that poverty, lack of information on human trafficking, high unemployment and social stigmatization to a very high extent contribute to prevalence of baby factory in Rivers State.

Research question 3: To what extent does baby factory prevalence impact on educational access of students in Rivers State?

Table 3: Mean responses on the impact of baby factory prevalence in Rivers State

S/N	ITEM	MEAN	STD	REMARK
1	It interferes with ones education	3.90	0.33	Very High Extent
2	Hinderaccess to compulsory the education	3.67	0.55	Very High Extent
3	Denial of right to education	3.81	0.42	Very High Extent
4	Leads to late completion	3.75	0.54	Very High Extent
5	Causes trauma/abuse which affect school attendance	3.80	0.51	Very High Extent
Grand mean		3.78	0.47	Very High Extent

N=400 criterion mean=2.50

The data in table 3 showed that the respondents indicated that baby factory prevalence interferes with oneseduction, hinder access to free and compulsory education, denied right to education and causes traumatic condition and abuse. All the items to a very high extent have a significant negative impact on educational access of students.

Discussion

Area Mostly Used For Baby Factory Practices

The data in table 1 showed that social welfare, water bottling companies, maternity, churches/prayer houses and hospital are area mostly used for practices of baby factory. This is also in agreement with the view of Onyinyechi (2017) that the areas disguised as maternal home, Non-governmental organization, hospital, welfare centres, clinics and even water bottling factory where they pose as those rendering humanitarian help to these victimsare area responsible for baby factory prevalence.

Factors Responsible For Baby Factory Prevalence

The data in table 2, also revealed that poverty, lack of information on human trafficking, high unemployment rate, social stigmatization, corruption among others are the causes or factors responsible for the prevalence of baby factory. This is also in consonance, with the report of National Bureau of Statistics in its press release on November, 2022 that 133 million Nigerians are multidimensional poor. The multidimensional level can lead to young teenage girls into the act(baby factory) in a bid to get daily life sustenance. Also, lack of information about human trafficking, unemployment among others can also contribute to proliferation of baby factory.

Impact of Baby Factory Prevalence on Educational Access

The data in table 3 showed that baby-factory interferes with ones education, hinder access to education, denied the right to education, leads to late completion of compulsory education and causes traumatic conditionand abuses which affect school attendance. This revealed that, young teenagers especially females suffer a great deal as a result of the impact of baby factory as it interferes with their schooling and access to education. This is also, in agreement with Social Survey Africa (2009) that confirmed that pregnancy among teenagers is the most reason for females of school going age not to participate or access education. In the same vein, the traumatic impact of baby factory as revealed by the study agreed with the view of Oluwatobi (2018) who opined that baby factory which is illegal breeding of babies for marketing purpose threaten the lives and wellbeing of young girls and women who are kept after a period of gestation (pregnancy) and their babies sold.

Conclusion

The prevalence of baby factory to a great extent impacts on educational access of students especially the female folks. This has indeed put the student in a state of confusion and denial of educational rights. Education is said to be a right and should be granted to all in order to create an opportunities or access to individuals to develop their potentials. Denying an individual this opportunity through any form of inhuman experience or treatment such as baby factory syndrome should be condemned in toto as it hindered them from realizing their potentials, hence, the right of individual to educational access should be protected and granted by all in the society in order to maintain stability in the society and promote adequate maximization of potentials of individuals, especially the female folks.

Recommendations

The study therefore recommends that;

1. There should be intensive advocacy on the negative impact of the baby-factory menace by the government agencies such as National Orientation Agency amongst others.
2. There should be enactment of legislations (laws) banning baby-factories and infant trafficking in the country by the legislative aim of government both at the state and federal levels.
3. There should be adequate enforcement of harsh consequences on baby factory patrons by the government through military and paramilitary officials such as the police, civil defense amongst others.
4. Adequate programmes to educate young girls on preventing unwanted pregnancies are necessary by the educational institutions through collaboration with ministry of health
5. There should be as well creation of job opportunities by the government to cushion the effect of poverty and unemployment through establishment of cottage industries and skill acquisition centers.
6. Similarly, adequate sensitization of teenagers/students in public secondary schools should be greatly carried out, as well as establishment of task force to monitor the activities of baby factories syndicates by the ministry of education through paramilitary agency

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Identities and Aesthetic Representations in the Black Diaspora Literature

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Abstract

The representation of black identity in African American literature is a subject of great and critical concern. Scholars have made deliberate efforts to address the racial issues, language, its oral nature among others; but little attention has been given to the identity and the representation of these identities in African American Literature. This study therefore, is an attempt to examine the concept of identity and its aesthetic representations in African American literature. The study engages a survey of texts in fiction, nonfiction, poetry, drama, speeches, musical forms, rap and film which are selected as a result of their relevance to the research focus. These texts are subjected to critical analysis while references are made to secondary texts where applicable. It is discovered that the literature of the black diaspora considers identity as a major theme in its discourse and this is represented in all forms of their literature. Identity, which could refer to a sense of ownership, is a major concern in the literature of the Black diaspora.

Keywords: aesthetic representation, African American literature, identity, self-recovery

INTRODUCTION

African American literature is primarily anchored on history. The history that sustains African American literature is not just what has happened, but what has been seen to have happened. The historical background that serves as the raw materials with which African American literature is built revolves around the traumatic experiences of Africans, uprooted from their homes (Africa) and transported across the Atlantic ocean to a new world (America) within the context of slavery. Slavery has left indelible marks in the lives and experiences of Africans in Diaspora, ranging from the forced capturing of Africans, the dehumanization of Africans, enslavement, loss of identity and even to the struggle for self-discovery. The process which involves what the slavers called sweetening was an attempt to engage cruel and violent means to subjugate Africans to be subservient to their masters thereby ripping them off their primordial ethos and culture.

The event and history of slavery has been a major concern for African Americans who are constantly faced with the challenge of "Double consciousness" according to W.E.B. Dubois. The great identity question stares closely at the face of every Black American, who is constantly reminded of their origin of servitude and despised by their white counterparts within the context of segregation and cultural intolerance. Within the introductory pages of Du Bois (1903) *The Souls of Black Folk* lies buried the great challenge plaguing the Black folks:

Here, then is the dilemma and has given earnest thought to the situation of his people in America has failed, at some time in life to find himself at these cross-roads; has failed to ask himself at some time: what after all, am I? Am I an American or am I a Negro? Can I be both? Or is it my duty for me to cease

to be a Negro as soon as possible and be an American? If I strive as a Negro, am I not perpetuating the very cleft that threatens and separates Black and White America? Is not my only and possible practical aim the subduction of all that is Negro in me to the American? Does my Black Blood place upon me any more obligations to assert my nationality than German, or Irish or Italian blood would? (P. xii)

The excerpt here foregrounds the state of the slaves and ex-slaves in their new world. They have lost their identity and left in a state of "To be or not to be". This challenging situation has instigated many reactions from African Americans who seek to represent themselves even in the face of misrepresentation. Slavery then becomes the source of Black Diaspora literature which is evident in the peculiar fluid nature of the literature. African American literature defies conformity with the traditional style of writing that respects genre. African American literature is fluid such that it accommodates the integration of the oral elements in their works which give it its uniqueness. African American literature stems from the work songs and verbal stories at the plantations and as such, it introduces these oral components in their literary works. Dasylyva and Jegede (2005, P. 191) lend their voices to the very nature of African American literature:

By its very naming, *African American* literature is a unique tradition that is informed by a sense of cultural dualism right from inception. Historically, the socio-cultural undercurrent responsible for the emergence of this literature is the experience of slavery and the attendant contact and dialogue of the African personality with a new culture. The Africans who were transported to the United States of America (the New World, as it was known then) took with them the intangible but enduring properties of their cultural heritage; the customs, values, traditions, and histories of Africans were reprocessed to compose the peculiar experience and vision of the (black) American writer of African descent. Invariably the overriding thematic preoccupation of the black writer in America has been a passionate concern for race and identity, nationhood and dignity, self-integration and self-assertion and a general *quest* for roots and freedom stemming from the physical and psychological dislocation which slavery had caused.

It is however clear that the coexistence of the transplanted Africa and Europe in the Caribbean has led to the layering and multiplicity of cultural identities. The Black Diaspora identity becomes a recurrent theme in the literary representation of the African Americans.

IDENTITY

The concept of identity and identity development was initially presented by Sigmund Freud, who referred to identity or "inner identity...as an individual's link with the unique values, fostered by a unique history of his people" (Erikson, 1959, p. 102). While introducing the notion of an individual and group identity to resolve personal conflicts between himself and the Jewish people, Freud in 1923 was one of the first to introduce the social and historical dynamics of personal development. According to Freud, identity is the integration of an individual within the group and how he or she learns to interact within that group as well as how he or she interacts with other groups. According to Merriam Webster's Dictionary, identity means 'sameness of essential or generic character in different instances', 'the distinguishing character or personality of an individual', 'the condition of being the same with something described or asserted'. In the same vein, the Free Online Dictionary defines identity as 'the distinct personality of an individual regarded as a persisting entity'. The origin of identity is the Middle French word 'Identite', from Late Latin 'Identiate'. 'Identitas'

probably from Latin 'Identidem', repeatedly contradiction of 'idem et idem' literally 'same as same'. The first known use of identity was in 1570. According to Marx, 'Identity is sense of self, a social, economic location.' One other source reads, 'It is not the consciousness of men that determines their being but on the contrary it is their social being that determines their consciousnesses.

Identity is a set of "comprehensive gains which the individual, at the end of adolescence, must have derived from all of his pre-adult experience in order to be ready for the tasks of adulthood" (Erikson, 1959, p. 101). Therefore, the concept of identity can be understood as who we are as individuals as well as who we are as members within a group (or groups); and how we equip ourselves (or are equipped) to deal with our past, present, or future environments (Winsell, 1971). Although identity is being shaped and formulated from the minute a child is born, it is most significantly shaped and stabilized during late adolescence and young adulthood (Chickering, 1969). For this reason therefore, a child grows consciously with a mark of identity culturally and otherwise. To be uprooted from your identity or denied its place in the life of an adolescent becomes a major crisis physically and psychologically. This loss of primordial ethnic specificity constitutes the identity crisis faced by African Americans.

In 1959, Erikson described Black identity as a very precarious one, asserting that "any disruption of the 'child like' demeanor of the Negro identity" such as education or unrestricted freedom, would "thrust these Negroes into a dangerous and evil identity stage" (p.37). Erikson went on to postulate that a positive Negro identity was "mild, submissive, dependent, somewhat querulous, but always ready to serve, and with occasional empathy and childlike wisdom" (p.37). Admittedly, Erikson had little or no contact with the "Negro" citizens during that time, however, there are many misrepresentation of the Black identity by onlookers who are merely driven by their sentimental judgment of the black folk. It is therefore this misrepresentation that instigate African Americans to begin to write, act or sing in order to correct and regain their identity.

Unfortunately, the experience of African Americans was, and in many cases is, viewed through the lens of the dominant culture which has resulted in a consistent misdiagnosis or distorted interpretation of the African American experience (Baldwin & Bell, 1985; Banks, 1981; Cross, 1995, 1991; Hauser & Kasendorf, 1983; Helms, 1990a; Hilliard, 1992; Mc Ewen et al., 1990; Myers, 1985; Semaj, 1981).

In an effort to explain the "Negro identity" of the 1950s and 1960s, in his publication *Who Speaks for the Negro?*, Warren (1965) conveyed how the African American felt "alienated from the world to which he is born and the country of which he is a citizen, yet surrounded by the successful values of that new world, and country, therefore...how can the Negro define himself' (P. 17)? According to Warren, African Americans shared a collective sense of alienation and forced estrangement from a world that not only refused to acknowledge their presence but also denied them access to those things which contributed to the attainment of not only a healthy identity but also a healthy existence.

Du Bois in his famous work, *The Souls of Black Folks* (1903) described the experience of being an African American as "hindered in their natural movement, expression, and development"(pp. 130-131). The author also introduced the concept of "dual consciousness" or double identity, equating the African American identity with a split or counterpart identity:

The history of the American Negro is the history of this strife - this longing to attain self-conscious manhood, to merge his double self into a better and truer self. In this merging he wishes neither of the older selves to be lost. He would not Africanize America, for America has too much to teach the world and

Africa. He would not bleach his Negro soul in a flood of White Americanism, for he knows that Negro blood has a message for the world. He simply wishes to make it possible for a man to be both a Negro and an American, without being cursed and spit upon by his fellows, without having the doors of Opportunity closed roughly in his face. (p. 4)

Erikson (1959, 1968) reported that both history and experience impact on the identity development of minority groups and other people of colour. While some may view the problems of African American identity development as deficient or negative, Erikson described Negro identity as an adaptive coping technique in which African Americans have learned to protect themselves from potentially troublesome circumstances. "Negro[s] are apt to develop a 'surrendered identity' [which] has reduced many Negro men to the reflection of the 'negative' recognition which surrounds them like an endless recess of distorting mirrors" (p.302).

One of the most widely used and widely known theory of Black identity and Black identity development was developed by researcher Cross (1971, 1991). According to Cross, Black identity is developed within a transformative paradigm within which Blacks first go through a pre-encounter stage in which they identify with the dominant White culture and reject their own culture. In the second stage of Black identity, encounter, individuals reject previous identification with the White culture, seeking instead to identify with Black culture. During the immersion-emersion stage, individuals were completely engrossed in Black culture while completely rejecting White culture. In the last two stages of Cross' model, individuals internalize their Black culture transcending racism and confronting all forms of cultural oppression. The highest level of Black identity development is a stage in which the individual reaches a level of self-concept where he or she is comfortable with his or her identity and is committed to transcending racism and ~~in~~ confronting all forms of cultural oppression.

The African self-consciousness is subject to social-environmental forces and influences. One of the most important aspects of the African self-consciousness phase is that it represents "the conscious embodiment and operationalization of Africanity, or the African survival thrust (the conscious expression of Africanity in Black people)" (Baldwin, 1981, p. 174). Under normal conditions, this phase includes:

- (a) the recognition of oneself as 'African' (biologically, psychologically, culturally, and so forth) and of what being African means as defined by African cosmology;
- (b) the cognition of African survival and proactive development as one's first priority value;
- (c) respect for and active perpetuation of all things African, including African life and institutions;
- (d) a standard of conduct toward all things 'non-African' and toward those things, peoples, and so forth, that are 'anti-African'. (pp. 174-175)

Based on the literature available on identity and the influence of race and ethnicity on identity development of African Americans, several consistent themes have emerged: (a) contemporary African American college students are strongly influenced and affected by their families and community; (b) racial and ethnic relationships between not only White Americans but also between other significant cultural and ethnic minorities must be considered; and (c) historical circumstances have substantially shaped the experiences of African American people. How congruently African Americans are able to consolidate and make sense of their external and an internal environment determines how effectively they

will function, not only within the African American community, but also within society as a whole.

Identity can be classified in different ways. In fact, it is better described as an interdisciplinary concept which can be racial, individual, social, sociological, anthropological, philosophical, cultural, ethnical, national and interpersonal. Notable names in the concept include. Benedict Anderson, Gayatri Chakravorty Spivak, Homi K. Bhabha, Raymond Williams, Mathew Arnold, Heidegger, Camus Sartre etc. They are the spokespersons of this theme, without them if one talk about identity, the issue will be incomplete. If we focus on fiction Vikram Seth, Amitav Ghosh, Kamala Markandaya, Anita Desai, Alice Malsenior Walker, Toni Morrison, Arundhati Rai, Chinua Achebe, Ngugi Thiango, Margaret Atwood, Bharti Mukherjee, Meena Alexander, Rasipuram Krishnaswami Iyer Narayana, Raja Rao, Mulk Raj Anand, Rohinton Mistry, Vijay Tendulkar, Simon de Beauvoir, Girish Karnad etc. are common names.

BLACK IDENTITY REPRESENTATION

African American literature from its inception has always questioned the idea that humanity is White, the idea that the White man must define the Black man and equally give him space in the scheme of things. This literature signifies that this act of defining is not just because the White defines the Black man but because he will not define the Black man as a separate and independent entity except in relation to him (the white man). In this case, the Black man is not seen as an autonomous being, and if this is to happen, the Black man can never think of himself without the White man. But the White man can think of himself without the Black man which is unfair. In this case, also, the Black man is simply what the White man decrees; hence, the Black man is referred to as the 'other', no more, no less. The Black man is the incidental, the inessential as opposed to the essential. The White man is the subject; he is the absolute, and so the Black man is the 'other'. It is this representation of Blacks as the 'other' which African American literature seeks to fight using different literary genres. The Whites had developed the concept of inferiority and distinction through preconceptions rooted in images of blackness and physical differences between the two people. Those negative images were created by English adventurers and traders who visited the African continent. The literature read at that time in England offered a negative portrayal of Africans and their ways of life. The Africans were described as ruthless and even as ugly people. African Americans were given different names like "colored", "Negros", "black" and African American (Baldwin, 1981, Cross, 1991). Therefore, African American literature embodies novels, poems and plays showing the status of race as a whole. The writer's works reflect their identities. What would it mean for representation when representation is marked by an ethical failure on the part of the 'selves', thinkers, writers, activists, and artists? How can one come to terms with this ethical failure toward representation? Perhaps, the desire might be to think of this failure as not a failure on their part as it were owing to de Beauvoir's idea that otherness is a fundamental category of human thought. Of course one cannot remain passive in the face of the trend today.

The failure to represent is not a failure as it were, but the origins of a possible ethical way to relate to another; to see in this the beginnings of a community, a collectivity, and a sociality that comes *to be*, allows the — coming-*to-be* to occur, in the mutual telling and re-telling of one another's inaudible narratives. Thus, what is often seen is a situation whereby one group sets itself up as the absolute 'one' and then setting up the 'other' against itself.

Throughout American history, African Americans have been discriminated against and subjected to racist attitudes. This experience inspired some Black writers, at least during the early years of African American literature, to prove they were the equals of European

American authors. As Henry Louis Gates, Jr, has said, —it is fair to describe the subtext of the history of black letters as this urge to refute the claim that because blacks had no written traditions they were bearers of an inferior culture (Warren, 1965). Exclusionary practice is an ancient phenomenon. The policy of exclusion possibly stems from the same source as classism, racism, sexism, ageism etc., which simply shows the urge to dominate, oppress and exclude others from the scheme of things. Exclusion, mentally, physically, economically, socially and/or politically, remains the basis where power is derived. From the beginning, the urge to dominate, showing off the weaknesses of others has been there. One group has always enjoyed ordering the other Back to the background; one group has always considered the emancipation of the other as a menace; and one group has always detested the other and presented a dangerous competition to the other's existence.

To perpetuate this, one group has always drawn on whatever it could to subjugate the other, drawing especially on philosophy, religion and even science. The American society has tirelessly sought to prove that the African American is inferior, it deems itself superior because it is what it is; therefore, one is not at all surprised to see the kind of treatment meted out to the Black man in the society as he is not given the chance to explain his experience. The Black man's contributions are rarely mentioned because as the — 'other' in society, he is not permitted success, and this may be why his literary production has been seen as inferior. However, by countering the claims of the dominant culture, African American writers are not just proving their worth; they are equally attempting to subvert the literary and power traditions of the United States. Scholars expressing this view are said to be asserting that writing has traditionally been seen as *something defined by the dominant culture as a white/male activity*. This means that, in American society, literary acceptance has traditionally been intimately tied in with the very power dynamics which perpetrated such evils as racial discrimination. By borrowing from and incorporating the non-written oral traditions and folk life of the African Diaspora, African American literature thereby broke *the mystique of connection between literary authority and patriarchal power*. This view of African American literature as a tool of struggle for Black political and cultural liberation has been stated for decades, perhaps most famously by W. E. B. Du Bois (1903).

It has always been said that African American literature exists both inside and outside American literature. Somehow, African American literature has been relegated to a different level, outside American literature, yet it is an integral part of modern world literature. The same can be said for African American literature. While it exists fully within the framework of a larger American literature, it also exists as its own entity. As a result, new styles of storytelling and unique voices are created in isolation. The benefit of this is that these new styles and voices can leave their isolation and help revitalise the larger literary world (McKay, 2004). This artistic pattern has held true with many aspects of African American culture over the last century, with jazz and hip hop being just two artistic examples that developed in isolation within the Black community before reaching a larger audience and eventually revitalising American culture.

Some of the criticisms of African American literature over the years have come from within the community; some argue that Black literature sometimes does not portray Black people in a positive light and that it should. W. E. B. Du Bois wrote in the NAACP's *The Crisis* on this topic, saying in 1921: *We want everything that is said about us to tell of the best and highest and noblest in us. We insist that our Art and Propaganda be one*. He added in 1926, *All Art is propaganda and ever must be, despite the wailing of the purists*. DuBois and the editors of *The Crisis* consistently stated that literature was a tool in the struggle for African American political liberation. His belief in the propaganda value of art showed when he clashed in 1928 with the author Claude McKay over his best-selling novel *Home to*

Harlem. Du Bois thought the novel's frank depictions of sexuality and the nightlife in Harlem appealed only to the *prurient demand[s]* of White readers and publishers looking for portrayals of Black *licentiousness*. He said, '*Home to Harlem*' ... *for the most part nauseates me, and after the dirtier parts of its filth I feel distinctly like taking a bath.* (Du Bois, —Two Novels. *The Crisis* 35, June 1928: 202). Others made similar criticism of Wallace Thurman's novel *The Blacker the Berry* in 1929. Addressing prejudice between lighter-skinned and darker-skinned Blacks, the novel infuriated many African Americans, who did not like the public airing of their *dirty laundry*.

Of course, literature should be able to present the full truth about life and people, and this is what Hughes articulated in his essay "The Negro Artist and the Racial Mountain" (1926). He wrote that Black artists intended to express themselves freely no matter what the Black public or White public thought. More recently, some critics accused Alice Walker of unfairly attacking black men in her novel *The Color Purple*. In his updated 1995 introduction to his novel, *Oxherding Tale*, Charles Johnson criticized Walker's novel for its negative portrayal of African American males: *I leave it to readers to decide which book pushes harder at the boundaries of convention, and inhabits most confidently the space where fiction and philosophy meet*. For some critics, there is no such thing as Black literature. There's good literature and bad literature. And that's all. But White writers' literary treatment of the Black presence has been studied more by historians than literary scholars. While literary scholars – Toni Morrison, John Cooley, and Leslie Fiedler – have examined literary attitudes towards Black presence; they discuss major nineteenth and twentieth century fiction writers. Toni Morrison's definition of presence in analysing African American literature is worthy of note; she made reference to the transformation of Black physical presence into an imaginative literary presence. Thus, the literary depictions by African Americans demonstrate that Black writers reveal their cultural authority. They are able to adopt multiple perspectives to interpret the Black experience as a cultural text.

Black culture and the symbolic representation of major African American concerns within the film are the concerns of Johnson (2018) in his essay on the film titled *Black Panther*. In his analysis of the film text, Johnson comments on it as being beyond just a story of a super hero. He engages it as a text celebrating black skin, black identity, black origin and the ideological leanings within the black society, among others. Yet, Johnson does not engage the semiotic leanings of the text and how these represent or identify the Black diaspora.

In addition, music has erupted time and again in scholarly discourse as one that penetrates this issue of identity and representation in the Black diaspora, be it reggae, hymns, hip-hop, rhythm and blues, jazz or rap, among others. From the perspective of rap, Kendrick Lamar's music has also featured in researches targeted at understanding identity and representation. Petrusich (2018) focused on the fierce realness in Lamar's lyrical identity and unique form which she described as "unapologetic" about its "profitability". In the paper, she focused on the African American art of rap and its evolution over time within the American society but not on the semiotic depictions of identity and representation within the text.

CONCLUSION

Identity as a major concern in the literature of the Black diaspora has received many layers of interpretations in the aesthetic representations of the black diaspora. Over the years, Blacks in diaspora have become a force to reckon with in every sphere of life, be it literature; music; politics; sports; science; astronomy and film, to mention but a few. One major motif that one might find common in these various spheres is the way Blacks use these platforms to engage and represent the theme of identity, especially in aesthetic proportions. Identity, in whatever period, continues to reverberate as a very strong motif and an instigator in the literary art of

Blacks in diaspora, that is, African Americans and Caribbeans. This has led to the conceptualization of what is now called Black diaspora identity. Identity, here, could refer to a sense of ownership. As aforementioned, the concept of identity would engage both the way Blacks identify themselves and, on the flip side, how Whites identify them.

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Quality Assurance in Nigerian Technical and Vocational Education and Training Institutions: Strategies for Improvement

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Abstract

Technical and Vocational Education and Training (TVET) has become increasingly important in meeting the needs of the global workforce. The objective is to examine some activities that promote quality assurance in TVET institutions and recommend solutions to any challenges. A hundred and fifty questionnaires were administered only 50 responses were returned. Descriptive statistics was used to analyse the data collected. Results showed that the National Board for Technical Education curriculum is not reviewed regularly and the time span for the review varies from department to department. Also, local content is integrated into the NBTE curriculum. TVET institutions take accreditation seriously, all programmes for departments surveyed are accredited. 96% of the academic staff give feedback to students after continuous assessment and examination. Some equipment for students' practical are obsolete. TVET trainers do not attend conferences/workshops/seminars as regularly as expected due to lack of sponsorship. Most departments do not conduct industry needs assessment and about 90% are not in partnership with any industry for curriculum enhancement nor job placement. The study concludes, curriculum review should be done at least once in two academic sessions with more emphasis on local content. For quality assurance the accreditation pattern should be improved upon. Also, feedback mechanism must be improved. The obsolete equipment needs to be replaced through increased funding for TVET institutions. For continuous professional development, conspicuous allowance should be provided for TVET trainers for conferences/workshops/seminars. Invariably, collaborative curriculum development with the industries is a key to entrepreneurship, and relevance in the work environment.

Keywords: education, industry, methods, quality, training

1.0 Introduction

Technical and Vocational Education and Training (TVET) refers to educational programs and courses that focus on providing individuals with practical skills, knowledge, and competencies related to specific occupations or industries. It is a form of education and training that prepares students for employment, self-employment, and entrepreneurship in various vocational fields (United Nations Educational, Scientific and Cultural Organization. TVET programs are designed to equip individuals with the necessary skills to meet the demands of the labor market and contribute to economic development (United Nations Development Programme [UNDP], 2020). Unlike traditional academic education, which often focuses on theoretical knowledge, TVET emphasizes hands-on training, practical experience, and the development of specific technical skills (UNESCO, 2012).

TVET encompasses a wide range of occupational areas, including technical fields such as engineering, electronics, mechanics, construction, automotive, information technology, telecommunications, and renewable energy, as well as vocational fields such as hospitality and tourism, culinary arts, cosmetology, fashion design, graphic design, agriculture, health care, and business administration (World Bank, 2019, Okoroafor, 2019).

TVET institutions, including specialized vocational schools, training centers, community colleges, and polytechnics, collaborate with industries and employers to ensure that the curriculum is aligned with the skills and competencies required in the job market (UNDP, 2020). TVET fosters a smooth transition from education to sustainable employment opportunities.

TVET has a long history in Nigeria, dating back to the establishment of vocational schools and training centers in the colonial era. However, the formal recognition and institutionalization of TVET in Nigeria can be traced to the post-independence period. In 1977, the Federal government of Nigeria established the National Board for Technical Education (NBTE) by Act 9 of January 1977 as the principal regulatory body for technical and vocational education and training in the country (NBTE, 2023). The creation of the NBTE marked a significant milestone in the development and management of TVET in Nigeria.

Since its establishment, the NBTE has been responsible for setting standards, developing curricula, conducting accreditation of TVET programs, and promoting quality assurance in technical and vocational education across the country. The board works closely with TVET institutions, industries, and other stakeholders to ensure the relevance and effectiveness of TVET programs in meeting the needs of the labor market. It is important to note that while the formal establishment of the NBTE in 1977 played a crucial role in the institutionalization of TVET, the evolution and growth of TVET in Nigeria have been ongoing processes. Over the years, various policies, initiatives, and reforms have been introduced to enhance the quality, relevance, and accessibility of TVET in Nigeria. The establishment of the National Board for Technical Education in 1977 marked a significant milestone in the formal recognition and regulation of TVET in the country.

In addition to national efforts, international organizations and partners have played a role in supporting the development of TVET in Nigeria. The United Nations Educational, Scientific and Cultural Organization (UNESCO) has provided support and technical assistance to improve TVET policies, curriculum development, and teacher training (UNESCO, 2019). International partners like the World Bank and donor agencies have also contributed funding and technical support to enhance the infrastructure and quality of TVET institutions (Okoroafor, 2019).

In recent times, Technical and Vocational Education and Training (TVET) has become increasingly important in meeting the needs of the global workforce. To ensure that TVET programmes meet the needs of the industry, quality assurance is critical. Quality assurance refers to the systematic processes and measures implemented to ensure and enhance the quality, effectiveness, and relevance of education and training programs offered by TVET institutions. It involves establishing and maintaining standards, guidelines, and procedures to monitor, evaluate, and improve various aspects of TVET, including curriculum, teaching and learning practices, assessment methods, faculty qualifications, infrastructure, and industry relevance. Effective quality assurance requires the involvement of all stakeholders, including students, instructors, industry partners, and policymakers. The objective is to examine some activities that promote quality assurance in TVET institutions and recommend solutions to any challenges. The focus is on curriculum development and review, accreditation and certification, assessment and evaluation, continuous professional development and industry partnerships in TVET institutions.

2.0 Literature Review

Quality assurance in curriculum development and review for TVET Institutions

Quality assurance in curriculum development and review is of paramount importance in Technical and Vocational Education and Training (TVET) institutions. Collaboration with industry representatives, employers, educators, and learners helps ensure that TVET curricula meet the needs and expectations of all stakeholders (Hinchliffe & Jolly, 2011; Singh, 2019). Incorporating industry-relevant skills, knowledge, and competencies into the curriculum ensures that graduates are prepared for the current and future workforce requirements (Osuala & Obidike, 2016).

Competency-based curricula focus on identifying specific skills and abilities required for occupations and structuring the curriculum around these competencies. This approach enhances the relevance and effectiveness of TVET programs (Osuala & Obidike, 2016). Regular monitoring, assessment, and feedback from stakeholders help identify areas for improvement, ensure curriculum relevance, and enhance the quality of TVET programs (Singh, 2019; Zainun & Samsudin, 2019). The need for clear quality standards and guidelines in TVET curriculum development and review cannot be over emphasized. Establishing benchmarks and guidelines assists in maintaining consistency, coherence, and quality across different TVET programs (Hinchliffe & Jolly, 2011).

Quality Assurance in Accreditation and Certification for TVET Institutions

Quality assurance in accreditation and certification is a vital aspect of ensuring the credibility and standards of Technical and Vocational Education and Training (TVET) institutions. Accreditation serves as a mechanism for quality assurance in TVET institutions. It involves a comprehensive evaluation of an institution's programs, facilities, faculty, and administrative processes against predetermined standards. Accreditation helps ensure that TVET institutions meet specific quality benchmarks (Custer, 2016; Voogt & Roblin, 2012). Involving industry representatives, employers, educators, and students ensures that accreditation standards and criteria align with the needs of the labor market and industry demands (Kis, 2017; Singh & Ramasamy, 2017).

Certification plays a significant role in quality assurance by verifying the competencies and skills of TVET graduates. Industry involvement in the certification process helps ensure certificate relevance and acceptance (Grollmann & Rauner, 2013; Mulder, 2017). Again, quality assurance in accreditation and certification necessitates a culture of continuous improvement. A lot of emphasis is on the importance of periodic reviews, self-assessment, and feedback mechanisms for TVET institutions. These processes facilitate ongoing quality enhancement and ensure that institutions stay abreast of changing industry needs (Grollmann & Rauner, 2013). In addition, comparing accreditation and certification processes with global standards and best practices helps improve the quality and recognition of TVET programs at an international level (Custer, 2016; Voogt & Roblin, 2012).

Quality Assurance in Assessment and Evaluation for TVET Institutions

Quality assurance in assessment and evaluation is crucial for ensuring the validity, reliability, and fairness of assessment practices in Technical and Vocational Education and Training (TVET) institutions. Valid assessments align with the learning outcomes and objectives of TVET programs, while reliable assessments provide consistent and accurate measurements of students' knowledge and skills (Popham, 2018; Suto, 2017). Assessments should focus on evaluating learners' mastery of specific skills and competencies, reflecting the industry demands and expectations (Mulder, 2016; Zlatkin-Troitschanskaia et al., 2019).

Formative and summative assessment are both important in quality assurance. Formative assessment, conducted during the learning process, provides feedback to learners and instructors for improvement. Summative assessment, conducted at the end of a program, evaluates learners' overall achievement (Boud & Falchikov, 2006; Boud & Molloy, 2013). Quality assurance requires standardized and moderated assessment practices. Establishing clear assessment criteria, rubrics, and standards to ensure consistency across different assessors and locations is important. Moderation processes help maintain fairness and reliability in assessment outcomes (Knight, 2002; Newton & Baird, 2016). Ultimately, feedback and continuous improvement play a vital role in quality assurance in assessment and evaluation. The significance of providing timely and constructive feedback to learners, enabling them to understand their strengths and areas for improvement is worth mentioning. Institutions should also engage in regular evaluation and review processes to enhance assessment practices (Fisher et al., 2016; Tynjälä, 2013).

Quality Assurance in Continuous Professional Development (CPD) for TVET Institutions

Continuous professional development (CPD) plays a vital role in enhancing the quality and effectiveness of teaching and learning in Technical and Vocational Education and Training (TVET) institutions. CPD for TVET educators is a means to enhance their knowledge, skills, and instructional practices. CPD contributes to the continuous improvement of teaching and learning, ensuring educators stay updated with industry trends and advancements (Kis, 2017; Mulder, 2016). Assessing the needs and aspirations of educators helps tailor CPD programs to address their specific areas of growth and expertise (Newton & Baird, 2016; Zlatkin-Troitschanskaia et al., 2019). Collaboration among educators and other stakeholders is crucial for quality assurance in CPD. Hawley-Weld et al., 2017; Voogt & Roblin, 2012 highlight the benefits of collaborative approaches to include communities of practice, peer learning, and mentoring programs, in fostering professional growth and knowledge sharing.

Quality assurance in CPD necessitates a focus on industry relevance and emerging technologies. Integration of industry representatives and experts in CPD activities helps ensure relevance and currency (Giasecke et al., 2014; McLean & Wilson, 2010). It is important for CPD programs to align with current industry needs, technological advancements, and changing job market dynamics. There must be ongoing evaluation and feedback mechanisms in quality assurance for CPD. Regular assessment and feedback from participants help measure the effectiveness of CPD programs, identify areas for improvement, and ensure alignment with educators' needs (Hawley-Weld et al., 2017; Voogt & Roblin, 2012).

Quality Assurance in Industry Partnerships for TVET Institutions

Industry partnerships play a vital role in enhancing the quality and relevance of Technical and Vocational Education and Training (TVET) institutions. Industry partnerships for TVET institutions are important in ensuring the alignment of curricula and programs with industry needs. Such partnerships foster collaboration between TVET institutions and industries, enabling the development of relevant and up-to-date programs (Mulder, 2016; Zainun & Samsudin, 2019). Collaborative curriculum development is a key aspect of quality assurance in industry partnerships. The importance of involving industry representatives in curriculum development processes, ensuring that programs incorporate industry-relevant skills and knowledge was discussed extensively by Mulder, 2016.

Through industry partnerships, TVET institutions can provide students with opportunities for practical learning experiences in real work environments. This enhances their skills and prepares them for the demands of the job market (Grollmann & Rauner, 2013;

Kis, 2017). Quality assurance in industry partnerships extends to assessment practices. This collaboration ensures that assessments align with industry standards and expectations, providing students with relevant and meaningful evaluations (Grollmann&Rauner, 2013; Kis, 2017). Invariably, regular communication and evaluation between TVET institutions and industry partners help identify areas for improvement, address emerging skills needs, and ensure ongoing relevance of TVET programs (Singh, 2019; Zainun & Samsudin, 2019).

3.0 Methods

Description of Study Area

A sample of lecturers, technologists, and instructors of a public TVET institution located in the North Central region of Nigeria were the participants in this research project. All the lecturers, technologists, and instructors under studied belonged to the School of Engineering Technology, School of Applied Sciences and Technology, School of Environmental Studies, and School of Management Studies.

Data Analysis

Descriptive statistics is used to analyse the data collected. Tables, pie charts and bar charts were used to present the results of the sample survey.

4.0 Results and Discussion

4.1 Curriculum Development and Review

Some respondents (38 %) attest to the fact that their curriculum was reviewed about two years ago, while some have not had theirs reviewed for over five years. On local content, almost all the respondents (40) confirmed their curriculum had local contents (See Figure 1)

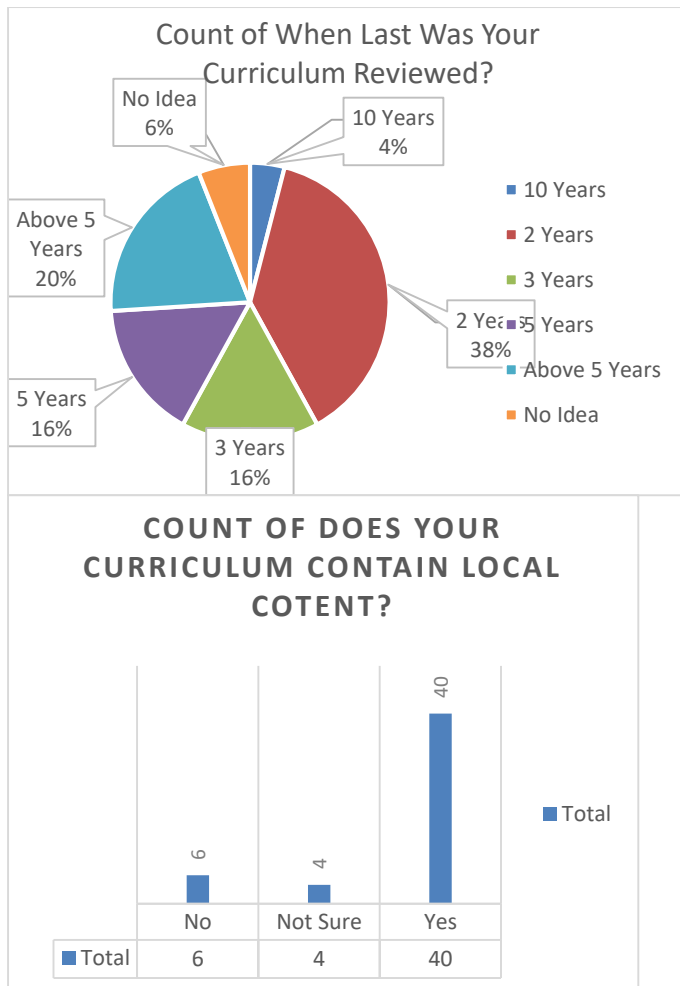


Figure 1: Results of curriculum reviewing and local content

4.2 Accreditation and Certification

92% of lecturers, technologists, and instructors from School of Engineering Technology, School of Applied Sciences and Technology, School of Environmental Studies and School of Management Studies confirmed all their causes are accredited. These programmes include Mechanical Engineering, Electrical Electronic Engineering, Computer Technology Engineering, Survey and Geoinformatics, Statistics, Biological Sciences, Applied Physics, Mathematics, Science Laboratory Technology, and Accountancy. The time of last accreditation visit for the programs varied between three to five years (see Figure 2).

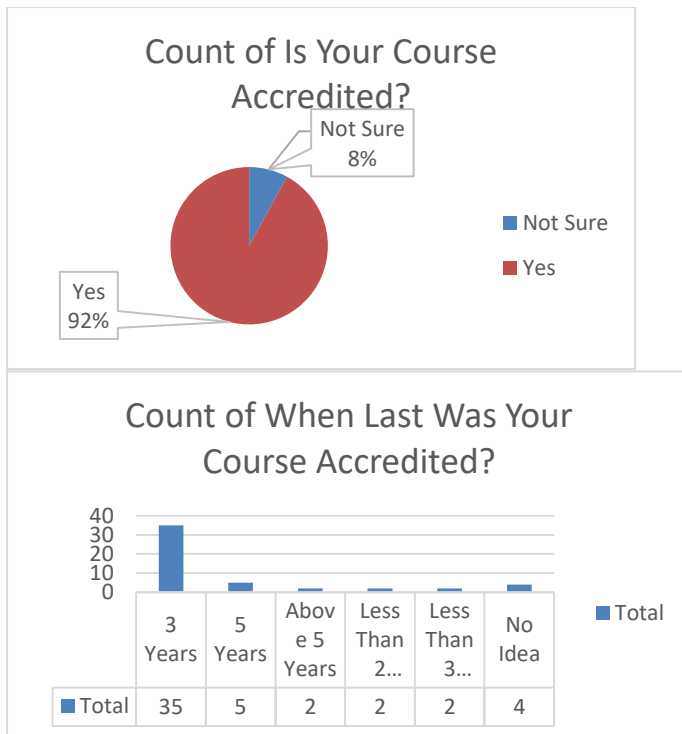


Figure 2: Results on accreditation

4.3 Assessment and Evaluation

96% of the academic staff give feedback to students after continuous assessment and examination. Some of the equipment for students' practical are modern ones while some are said to be obsolete (See Figure 3). Some respondents claim not to have all necessary equipment for the required practical. Most of the TVET trainers have had to conduct practical in batches because of limited space and equipment in the laboratories.

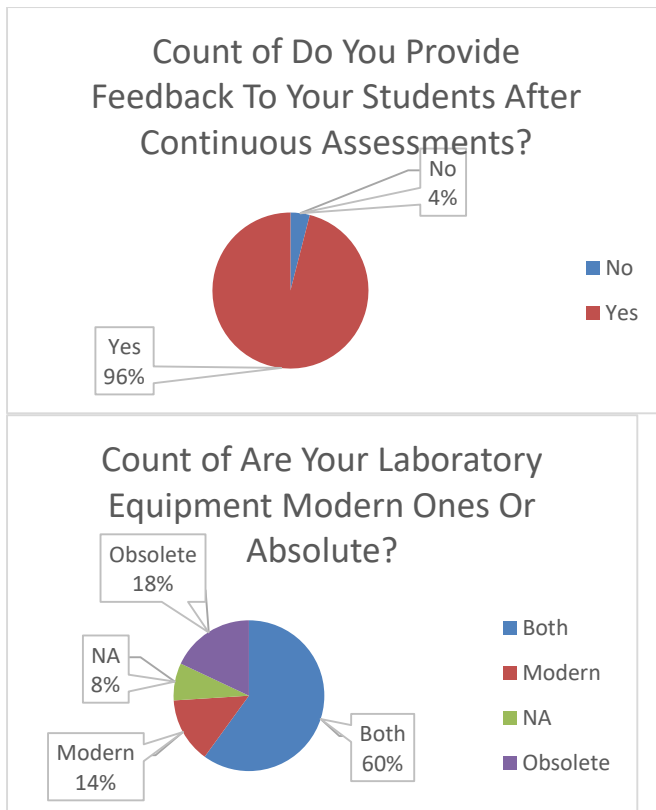


Figure 3: Results of feedback on assessment and state of equipment

4.4 Continuous Professional Development

All the TVET trainers attend conferences/workshops/seminars but 40% attend not in any particular order. Some attend once in a year, some once in two years and some will attend only when they are qualified for promotion. The major reason for the inconsistencies in conferences/workshops/seminars attendance by TVET trainers is lack of funding and scholarships. Most trainers sponsored themselves for conferences/workshops/seminars.

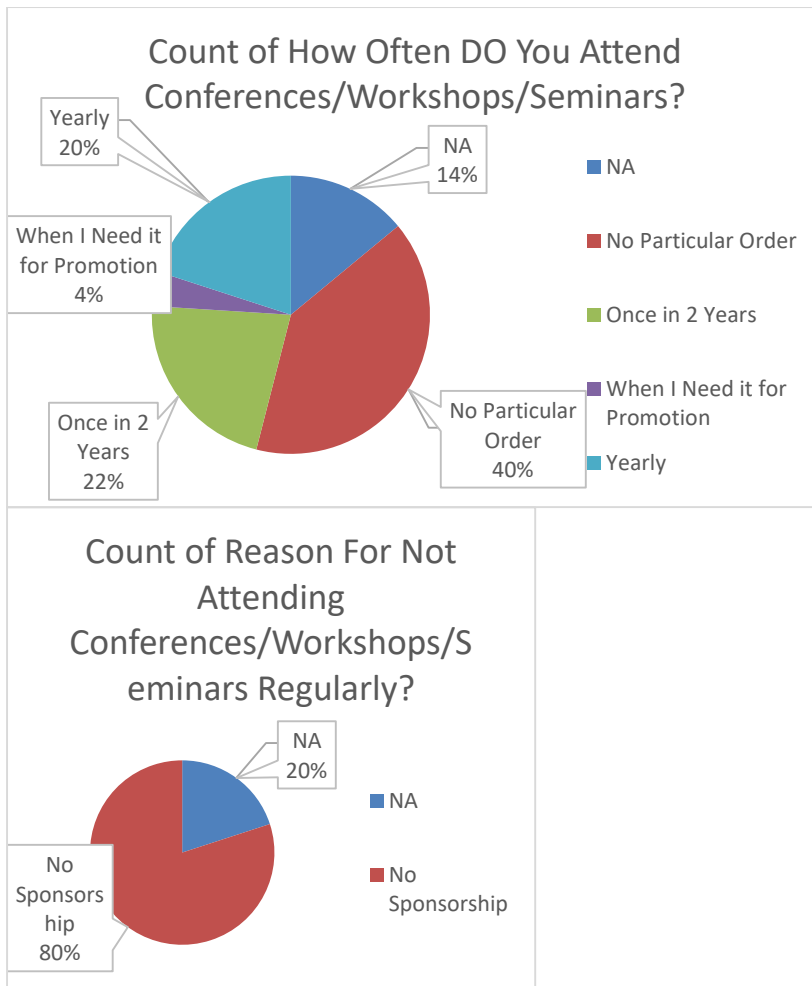


Figure 4: Results of conferences/workshops/seminars attendance

4.5 Industry Partnerships.

The survey results show most departments under studied do not conduct industry needs assessment. Most Departments (98%) are not in partnership with any industry for curriculum enhancement. Similarly, no department is in partnership with any industry for job placement (See Figure 5).

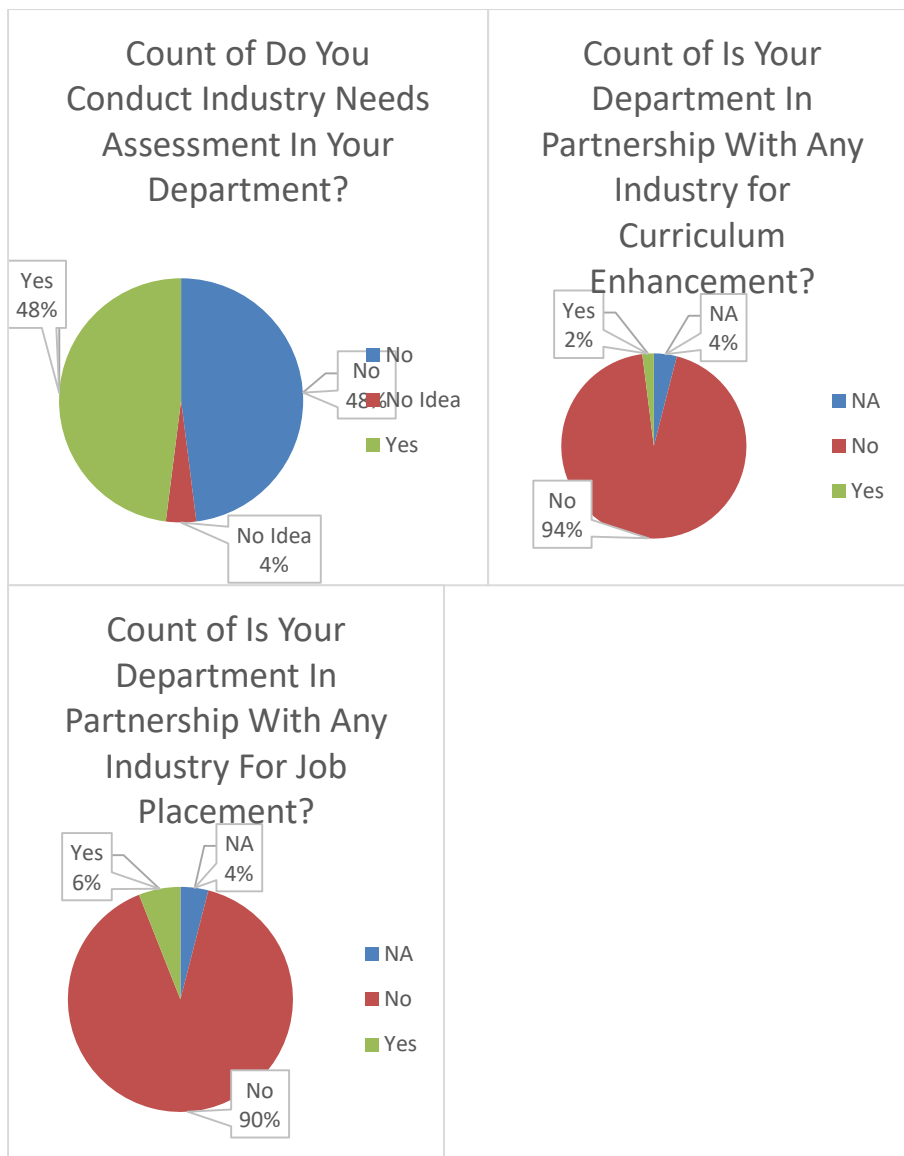


Figure 5: Results of industry partnerships

5.0 Conclusions and Recommendations

Due to the current trend in technology, curriculum review should be done at least once in two years that is, after two academic sessions. More attention should be given to local content taking cognizance of available local and natural resources. Research works should be targeted at available natural resources such that commercialization of research outputs can take place. Ultimately, research projects can give birth to mini-industries that will create jobs for TVET graduates while simultaneously meeting the local needs of the Nigerian economy. The result of this survey shows that TVET institutions take accreditation seriously. For quality assurance the accreditation pattern should be improved upon.

Although, TVET trainers give feedback to students after continuous assessment and examination, there is a need to improve on the feedback mechanism. The guidance and counselling sessions for students should be more formalised at departmental levels.

The equipment for students' practical needs should be modern. The obsolete equipment needs to be replaced. This shows a need for the Federal Government to increase

funding for TVET institutions. This will enable the students access all necessary equipment for the required practical. With this opportunity Nigerian TVET graduates will compete favourably with her counterparts across the globe.

TVET trainers do not attend conferences/workshops/seminars as regularly as expected. Some trainers do not attend conferences/workshops/seminars until evidence for attendance is required for a promotion. As such the quality of their output is not favourable to the TVET ecosystem. For continuous professional development, conspicuous allowance for conferences/workshops/seminars should be provided for TVET trainers.

Also, departments under studied do not conduct industry needs assessment and are not in partnership with any industry for curriculum enhancement nor job placement. Collaborative curriculum development with the industries is a key to employment, entrepreneurship, and relevance in the work environment.

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Effects of Uncomplicated Malaria Parasitaemia on Selected Haematological Parameters and Phagocytes of Children Living in Port Harcourt, Southern Nigeria

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Abstract

This cross-sectional and case control study evaluated the effects of malaria parasites on selected haematological parameters of children living in Port Harcourt, Nigeria. A total of 352 participants were randomly recruited and their blood samples collected. Malaria diagnosis and estimation of haematological parameters were determined using standard parasitological and haematological methods respectively. Sociodemographics of participants showed that 109 (31%) of female children and 106 (30%) of male children were infected with malaria parasites. Overall prevalence of *Plasmodium falciparum* found was 215(61%). The study found a statistically significant difference in the mean values of packed cell volume (PCV), haemoglobin concentration (Hb), and white blood cell count (WBC) of *Plasmodium* parasitized children compared with their matched controls: PCV(34.83±2.76% versus 36.06±1.41%; P=0.001); Hb(11.58±0.92g/dL versus 11.98±0.46g/dL; P=0.001); WBC (8.96±4.56(x10⁹/L) versus 7.33±1.39(x10⁹/L); P=0.001). While the mean values of lymphocyte counts were relatively reduced in malaria infected children than their control participants (41.66±13.57(x10⁹/L) versus 42.95±8.36(x10⁹/L); P=0.27). A weak relationship was found to exist between density of parasitaemia and ages of children infected with malaria parasites (R²=0.0093; P=0.1584). Though more children had low parasitaemia (1-999 parasites/μL), followed with high parasitaemia (>10,000 parasites/μL), while few had moderate parasitaemia (1000-9999 parasites/μL). There was no case of complication with respect to WHO standard which described complicated or severe anaemia in malaria as haemoglobin (Hb) of < 5g/dl or packed cell volume (PCV) of < 15% with parasitemia of > 250,000 parasites/μL. Malaria parasites affect outcomes of some haematological parameters. We recommend that all febrile children in our study area should be tested for malaria parasites in conjunction with estimation of their full blood count for effective malaria diagnosis and treatment particularly in sub patent cases.

Keywords: children, haematological parameters, Nigeria, malaria parasitaemia

1. INTRODUCTION

Malaria is a major public health problem in Nigeria, and many parts of Africa. Malaria is caused by unicellular protozoan parasites, *Plasmodium* species, which belong to the phylum, Apicomplexa. The different species of malaria parasites that can cause infection in humans include *Plasmodium falciparum*, *Plasmodium ovale*, *Plasmodium malariae*, *Plasmodium vivax*, and *Plasmodium knowlesi*. Malaria mostly spreads to people through the bites of some infected female *Anopheles* mosquitoes. The first symptoms may be mild, similar to many febrile illnesses, and difficult to recognize as malaria. Left untreated, *P. falciparum* malaria can progress to severe illness and death within 24 hours (WHO, 2023)

Malaria infection largely affect children, especially children aged 6 months to 5 years and pregnant women (Marotta et al., 2018; Mehta, 2020). In 2019, about 409,000 people died of malaria, majority of which were 274,000 young children, and 94% of such infections and deaths occurred in Africa (CDC, 2019; WHO, 2020). In 2020 to 2021, a total of 492 million cases of malaria were reported globally with 1,244,000 associated malaria deaths (WHO, 2023). Nigeria leads with 31.3% among the four African countries with the highest global malaria cases and deaths (WHO, 2023). It has been hypothesized that malaria may cause as many as 10% of all deaths amongst children living in malaria endemic settings (Mehta, 2020). Children of all ages living in non malarious areas are equally susceptible to malaria.

Children who are diagnosed of uncomplicated malaria caused by *P. malariae*, *P. ovale*, *P. vivax*, could recover fully without any sequelae. However, malaria caused by *P. falciparum*, the dominant malaria parasite in Nigeria is highly virulent; if not detected, treated quickly and completely can progress to complicated severe malaria, which has grave prognosis (Mehta, 2020).

Generalized bleeding due to disseminated intravascular coagulation has been reported in non immune children with heavy malaria parasitaemia. Some degree of haemolysis is part of malaria, but some children have excessive haemolysis, putting them at risk for renal failure. This haemolysis may be related to glucose-6-phosphate dehydrogenase (G-6-PD) deficiency or an antibody-mediated destruction of erythrocytes. Anaemia is so common in malaria that it is considered as part of the disease. Some children have anaemia far exceeding that attributable to erythrocyte destruction by malaria parasite. Malarial anaemia can be quite severe, sometimes causing death (Mehta, 2020).

The malaria parasites consume glucose voraciously, thus heavy parasitaemia can result in hypoglycemia which is difficult to differentiate from cerebral malaria (Mehta, 2020). Therefore, notable features of severe malaria commonly expressed in children than adults include anaemia, cerebral malaria and hypoglycaemia (WHO, 2019).

Microscopic detection and identification of *Plasmodium* species in Giemsa stained thick blood films, for screening, and thin blood films, for species confirmation is accepted worldwide as the “gold standard” used for the routine diagnosis of malaria (Jain et al., 2012; WHO, 2011). However, the proficiency of the microscopist, quality of equipment, and reagent would determine the effectiveness of malaria microscopy. Other requirements are clean water supply, power supply and good quality management system (WHO, 2011). Therefore, during the past decades, various efforts to replace the traditional blood film for the diagnosis of malaria have revived interests in the possibility of using routine haematological blood parameters to aid the presumptive diagnosis of malaria infection (Jain et al., 2012). Alterations in the haematological parameters are also thought to have the capacity to act as an adjuvant tool in strengthening the suspicion of malaria, thereby prompting a more meticulous search for malaria parasites (George & Ewelike-Ezeani, 2011).

Changes in haematological parameters due to malaria parasitaemia could be as a result of biochemical changes that occurred during the asexual life cycle stage of the parasite. Malaria

infection causes destruction of erythrocytes and brings about changes in haematological parameters. Reports from studies have shown that episodes of malaria brings a lot of physiological disturbances in the haematological system of the host such as alteration in erythrocytes, leucocytes and thrombocytes subpopulations in the blood (WHO, 2009). Haematological parameter changes could be influenced by any pathological condition including malaria, that affects formation, development and differentiation of whole blood. Infection with malaria in human is associated with decrease haemoglobin concentration that brings about severe anaemia with high rate of mortality (Hussain et al., 2013).

Patients with malaria infection are liable to present significantly lower platelets, white blood cell counts, lymphocytes and eosinophils, red blood cells and haemoglobin level but have considerably higher monocyte and neutrophil count when compared with non-infected malaria patient (Bakhubaira, 2013). Some endemic regions lack these basic needs to accomplish microscopic examination to effectively diagnose malaria, therefore efforts have been made to replace malaria microscopy with other methods such as rapid diagnostic tests (RDTs) and automated machines including and using changes in haematological parameters to support malaria diagnosis (Jain et al., 2012). This study, therefore, determined changes in haematological parameters of children infected with malaria parasites in Port Harcourt, Rivers State, Nigeria.

2. MATERIALS AND METHODS

2.1 Study Area

This cross-sectional and case control study was carried out in three health care facilities; Rivers State University Teaching Hospital (formerly known as Braithwaite Memorial Specialist Hospital (BMSH), New Mile One Hospital (formerly known as Mile One Clinic) and Rivers State College of Health Science and Management Technology Health Centre, all located in Port Harcourt, Rivers State, South-South geopolitical zone of Nigeria. The study was conducted between the months of February to July, 2022. Port Harcourt is a metropolitan city in Niger Delta region, located at 4° 45¹N 6° 50¹E/ 4.750°N 6.833°E of Nigeria, proximate to the Atlantic Ocean. The climate in Port Harcourt is marked by two distinct seasons, rainy season which starts in May and ends in October, and the dry season which begins in November and ends in March. The main occupations of residents include trading, fishing, civil service, and oil and gas company workers.

2.2 Ethical Statement

Prior to the study, approval was obtained from committee on ethics, Rivers State Hospitals Management Board, Port Harcourt. Also, informed consent was obtained from the participants' parents or guardians before their blood samples were collected for malaria microscopic examination, and evaluation of haematological variables.

2.3 Determination of Sample Size

The sample size was ascertained using a prevalence rate of 35.5% of malaria parasites amongst children residents in Port Harcourt as reported by Abah et al. (2017) at a confidence interval (CI) of 95% and a precision of 5% following the formula, $N = Z^2 P (1-P) / d^2 = (1.96)^2 \times 0.355 \times (1-0.355) / (0.05)^2$ for calculating sample size (Naing et al., 2006) which gave rise to a total of 352 participants.

2.4 Eligibility Criteria

Children whose age falls between 2-12 years that were infected with malaria parasite, children whose age falls between 2-12 years that were not infected with malaria parasites (control group) and children whose age falls between 2-12 years that have not been treated of malaria for at least four weeks before the sample collection day. Children whose age falls below the age of 2 years and those whose age is above the age of 12, children that have been treated of malaria within the space of 2-3 weeks before the day of sample collection were excluded.

2.5 Sample Collection and Laboratory Analysis

Five milliliters (5mls) of whole blood were randomly collected into ethylene diamine tetra-acetate acid (EDTA) tubes through venipuncture technique from a total of 352 children, aged 2-12 years, who were visiting the aforementioned Health facilities. A structured questionnaire was used to obtain socio-demographic data and history of malaria treatment with antimalarial drugs from participants. Thick blood films were made on glass slide, dried and stained with 3% solution of Giemsa stain and examined under the microscope using 100X objective for the presence of malaria parasite. Haematological parameters such as haemoglobin concentration, white blood cells count, packed cell volume, lymphocyte count, and neutrophil count were determined using Sysmex XP-300 haematology auto-analyzer according to the manufacturer's instruction.

2.6 Estimation of Parasite Density

The absolute density of parasitaemia in each malaria infected participant was estimated as the product of malaria parasite counted and absolute values of each participant's white blood counts as against a predetermined set range of white blood cells as described by Agomo et al. (2009). And the level of parasitaemia in each infected participant was graded as low, moderate, and high as Adesina et al. (2009) and Azuonwu et al. (2019).

2.7 Statistical Analysis

The raw data collated from this study were analyzed using Graph Pad prism version 5.0.3. Means and standard deviations were calculated for appropriate variables, while student's t test was used to evaluate the difference between means of two groups. Pearson product moment correlation coefficient was used to test the difference between variables. Results were represented in table and graph. The level of statistical significance was set at p -value of ≤ 0.05 .

3. RESULTS

The findings from this study were presented below in Tables 1-3, and Figures 1-3. This study recorded an overall prevalence of 215 (61%) of *Plasmodium falciparum* malaria parasite among the participants. A total of 215 laboratory confirmed infected participants were used as the test group, while 137 non-infected participants of similar age group and gender were recruited as healthy-matched control groups.

3.1 Effect of Malaria Parasites on Haematological Values of Study Participants

Table 1 shows the difference in haematological values of malaria infected and non-infected children. Malaria infected children had a relatively low mean PCV values of $34.83 \pm 2.76\%$, compared with that of non-infected children of $36.06 \pm 1.41\%$. The difference between them was statistically significant ($P=0.001$). Children who were positive for malaria parasites had a relatively low mean Hb concentration of 11.58 ± 0.92 g/dl, compared with that of malaria negative children of 11.98 ± 0.46 g/dl. The difference between them was statistically significant ($P=0.001$). The total WBC counts of those infected with malaria parasites were

higher, 8.96 ± 4.56 ($\times 10^9/L$), compared with those of non-infected control participants, 7.33 ± 1.39 ($\times 10^9/L$). The difference between them was statistically significant ($P=0.001$). The mean Neutrophil count values of malaria parasite infected children were slightly higher 57.25 ± 14.00 ($\times 10^9/L$), compared with that of the non-infected children, 56.54 ± 8.36 ($\times 10^9/L$). But the difference between them was not statistically significant ($P=0.549$). The total mean count value for Lymphocyte was relatively low, 41.66 ± 13.57 ($\times 10^9/L$), compared with that of non-infected children, 42.95 ± 8.36 ($\times 10^9/L$). The difference between the two groups was not statistically significant ($P=0.27$).

Table 2 shows changes in haematological values of female children infected with malaria parasites. The mean percentage of PCV of infected female children was relatively low, $34.68 \pm 3.27\%$, compared with their non-infected counterparts, $36.06 \pm 1.41\%$. The difference between them was not statistically significant ($P=0.001$). The mean Hb values of malaria parasite infected female children was significantly different from those of non-infected female (11.52 ± 1.09 g/dl versus 11.92 ± 0.46 g/dl; $P=0.001$). The mean total WBC count of infected female children was relatively high, 9.86 ± 5.77 ($\times 10^9/L$), compared with that of non-infected female, 7.33 ± 1.39 ($\times 10^9/L$). And the difference between them was statistically significant ($P=0.001$). The mean counts for Neutrophils ($58.45 \pm 11.32 \times 10^9/L$, versus $56.54 \pm 8.36 \times 10^9/L$) and Lymphocyte ($40.69 \pm 11.31 \times 10^9/L$, versus $42.95 \pm 8.36 \times 10^9/L$) among infected female children and their non-infected counterparts were not statistically significant ($P=0.141$; 0.8).

Table 1. Comparison of haematological variables of malaria-infected children and control

Parameter	PCV	Hb	WBC	NEUT.	LYMP.
Test n= 215	34.83 ± 2.76	11.58 ± 0.92	8.96 ± 4.56	57.25 ± 14.00	41.66 ± 13.57
Control					
n= 137	36.06 ± 1.41	11.98 ± 0.46	7.33 ± 1.39	56.54 ± 8.36	42.95 ± 8.36
p-values	0.001	0.001	0.001	0.549	0.27
t Stat	5.511	5.506	4.904	0.598	1.1

PCV=Packed Cell Volume; Hb=Haemoglobin; WBC=White Blood Cell; NEUT.=Neutrophil; LYMP.=Lymphocyte

Table 2. Changes in haematological variables of malaria parasite infected female children and non-infected subjects control

Parameter	PCV	Hb	WBC	NEUT.	LYMP.
Female n=109	34.68 ±3.27	11.52 ±1.09	9.86 ±5.77	58.45 ±11.32	40.69 ±11.31
Control n= 69	36.06 ±1.41	11.98 ±0.46	7.33 ±1.39	56.54 ± 8.36	42.95 ± 8.36
<i>p</i> -values	0.001	0.001	0.001	0.141	0.8
<i>t</i> Stat	4.098	5.72	16	1.476	1.74

PCV=Packed Cell Volume; Hb=Haemoglobin; WBC=White Blood Cell; NEUT.=Neutrophil; LYMP.=Lymphocyte

Table 3 shows changes in haematological values of male children infected with malaria parasites. The mean percentage of PCV of infected male children was relatively low, $34.98 \pm 2.12\%$, compared with their non-infected counterparts, $36.06 \pm 1.41\%$. The difference between them was statistically significant ($P=0.001$). The mean Hb values of malaria parasite infected male children was significantly different from those of non-infected male ($11.62 \pm 0.71\text{g/dl}$ versus $11.98 \pm 0.46\text{g/dl}$; $P=0.001$). The mean total WBC count of infected male children was relatively high, $8.04 \pm 2.52(\times 10^9/\text{L})$, compared with that of non-infected male, $7.33 \pm 1.39(\times 10^9/\text{L})$. And the difference between them was statistically significant ($P=0.009$). The mean counts for Neutrophil ($56.02 \pm 16.27 \times 10^9/\text{L}$, versus $56.54 \pm 8.36 \times 10^9/\text{L}$) and Lymphocyte ($42.66 \pm 15.55 \times 10^9/\text{L}$, versus $42.95 \pm 8.36 \times 10^9/\text{L}$) among infected male children and their non-infected counterparts were not statistically significant ($P=0.764$; 0.859).

Table 3. Changes in haematological values of male children infected with malaria parasites and their matched control

Parameter	PCV	Hb	WBC	NEUT.	LYMP.
Male n=106	34.98 ±2.12	11.62 ±0.71	8.04 ±2.52	56.02 ±16.27	42.66 ±15.55
Control n= 68	36.06 ±1.41	11.98 ±0.46	7.33 ±1.39	56.54 ± 8.36	42.95 ± 8.36
<i>p</i> -values	0.001	0.001	0.009	0.764	0.859
<i>t</i> Stat	4.55	4.56	2.61	0.301	0.178

PCV=Packed Cell Volume; Hb=Haemoglobin; WBC=White Blood Cell; NEUT.=Neutrophil; LYMP.=Lymphocyte

3.2 Relationship between Malaria Parasite Density and Age of Participants

Figure 1 shows correlation between malaria parasite densities and different ages of participants infected with malaria parasites. There was a weak relationship between malaria parasite density and the age of children infected with malaria parasites ($R^2=0.0093$; $P=0.1584$). The graphic representation of the relationship between malaria parasites density and age of infected children shows that more of the infected children had low parasitaemia (1-999 parasites/ μ L), followed by high parasitaemia (>10,000 parasites/ μ L), while infected children with moderate parasitaemia (1000-9999 parasites/ μ L) was significantly low.

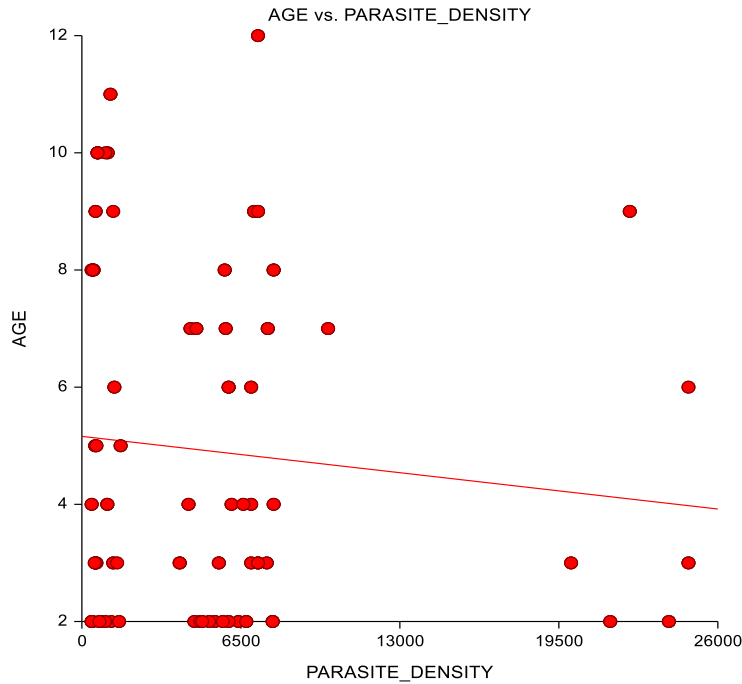


Figure 1. Correlation between age and parasite density of malaria infected children

3.3 Relationship between Packed Cell Volume (PCV) and Age of Infected Participants

Figure 2 shows correlation between different ages of participants infected with malaria parasites and their packed cell volume, PCV, values. There was a weak relationship between age of children infected with malaria parasites and their PCV values ($R^2=0.0104$; $P=0.1356$). The graphic representation of the relationship between the age of infected children and PCV values shows that more of the infected children had PCV values ranging from 30% to < 40%. Infected children within the age range of 2 to 4 years had a seemingly steady PCV values as represented graphically.

3.4 Relationship between White Blood Cells (WBC) and Age of Infected Participants

Figure 3 shows a relationship between age and white blood cell (WBC) in children infected with malaria parasites ($R^2=0.054$; $P=0.006$). Although no obvious linear relationship exist between the age and WBC of infected children but more of the WBC values are $>5 \times 10^9/L$ and $<15 \times 10^9/L$.

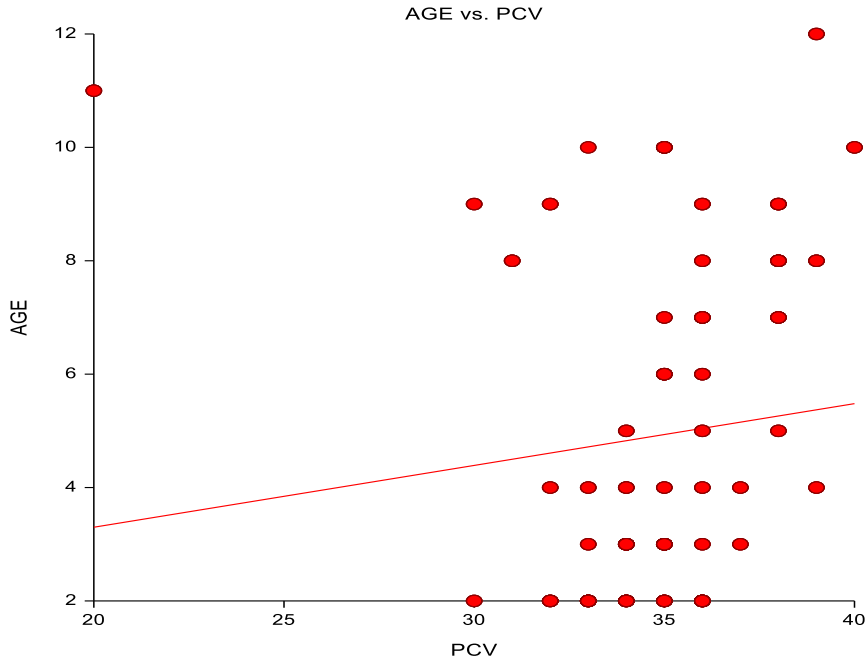


Figure 2. Correlation between age and PCV in malaria infected children

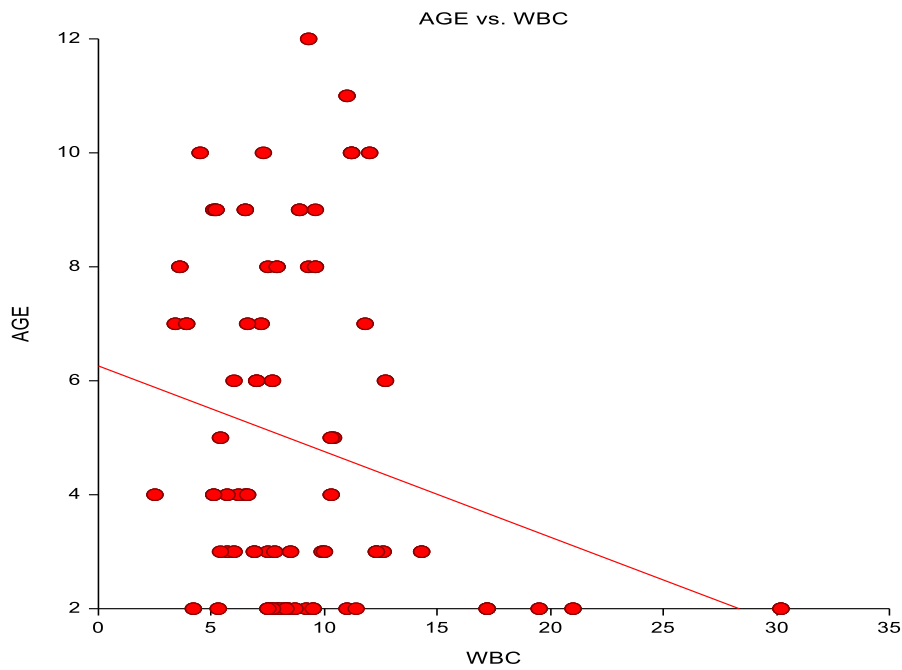


Figure 3. Correlation between age and WBC of malaria infected children

4. DISCUSSION

The deleterious impact of malaria is huge particularly on children living in endemic settings such as Nigeria. This study evaluated the effect of malaria parasite, *Plasmodium falciparum*, on some haematological parameters of children infected with the asexual stages of malaria parasites. Children are one of the high risk groups of individuals to malaria mostly due to undeveloped or partially developed immunity. This study found out an overall prevalence of 61% of malaria parasite infection among children. This finding is consistent with a prevalence of 62.5% reported by Nmadu et al.(2015) in a similar study conducted amongst children between the ages 2 to 15 years who visited Gwarinpa General Hospital Life-camp, Abuja, Nigeria. Although a relatively high prevalence of 87% of *Plasmodium falciparum* malaria parasite was earlier reported by Ayanful-Torgby et al. (2018). However, Azuonwu et al. (2019) published a comparatively low prevalence of 50% of *Plasmodium falciparum* malaria parasites among children living in Port Harcourt, Niger Delta. The high prevalence found in this study might be attributed to the rainy season of peak transmission of the parasite by female *Anopheles* mosquitoes which the study was conducted.

Findings in this study confirm that changes in haematological parameters are frequent in malaria parasite infection, even in uncomplicated malaria. This study demonstrated that the mean values of packed cell volume (PCV), and haemoglobin concentration (Hb), were significantly reduced, while that of total white blood cell counts were significantly increased among children infected with malaria parasites compared with their matched controls ($P=0.001$). This finding corroborates previous reports by Menendez et al. (2000), and Bashawri et al. (2002) which reported mild differences in white blood cell counts of *Plasmodium* parasitized individuals and their matched controls. However, earlier research works conducted by Erhart et al. (2004), Lathia et al. (2004) and Beale et al. (1972) observed leucocytopenia which is not consistent with some of our findings.

The reduced mean levels of PCV and Hb as observed in this study may suggest that *Plasmodium* induced anaemia which is primarily likely caused by mechanical destruction of infected children's red blood cells by malaria parasites. Other associated causes of possible anaemia could be nutritional status of *Plasmodium* parasitized children, and clearance of defected and infected red blood cells from the system.

The researchers found in this study a significant increase in the mean counts variations of WBC in both *Plasmodia* parasitized and non-parasitized children, however, the increase was not clinically significant, as the mean values of both infected and non-infected children were within the limits of normal reference range. In a similar study carried out by Gansane et al. (2013), showed that the differences in the mean values of total white blood cells and neutrophil counts of malaria parasite infected children and non-infected children were not statistically significant ($P>0.05$). The variation in differences of mean values of haematological parameters with that of this study could be due to different study settings and confounding factors. The increased levels of mean total white blood cell count observed among infected children in this study further affirms the basic immunological role of leucocytes in immunomodulation and defense against infectious agents such as *Plasmodium falciparum*.

This study also showed an increase in mean values of absolute neutrophil and a decrease in mean values of absolute lymphocyte counts in parasitized children against their control counterparts ($P>0.005$). This agrees with the report of Olliaro et al. (2011) on neutrophil count which was associated with higher *Plasmodium* parasitaemia. The reduced lymphocyte count observed in this study is consistent with report of earlier study conducted by Gansane *et al.* (2013). Lymphopenia according to findings of some researchers is sometimes profound but transient or temporary common in malaria vulnerable groups, such

as *Plasmodium* parasitized children living in malaria endemic areas and non-immune adults (Osaro et al., 2019; Maina et al., 2010).

This study has demonstrated the fact that the effect of malaria parasites on the haematological parameters of children is not gender specific as it affects both male and female children when compared to their various matched control groups. This study has pointed out that age is a factor in immunity against malaria parasites in children. As the age increases, the level of parasitemia decreases. This could be due to the immunity of the children becoming more matured and protective. This agrees with a study by Rodriguez-Barraquer et al. (2016) on blood parasite reduction and the ability to withstand a particular level of parasite without complication and observed that older children had less parasites as compared to the younger children, though with a p -value=0.1584 and $R^2=0.0093$ that makes it insignificant. Another related study done by Males et al. (2008) had same observation that parasite density is more in younger children. It was also found out in this study that older children have higher percentages of packed cell volume (PCV), which means a positive relationship exist between age of infected children and their PCV values ($p=0.1356$; $R^2=0.0546$).

5. CONCLUSION

Children infected with malaria parasites had significant changes in most of their haematological parameters. Findings of this study have shown significant decrease in PCV, Hb, and lymphocyte values of *Plasmodium falciparum*-parasitized children in our study area. These parameters could serve as malaria predictor markers in our study area. We recommend that all febrile children in our study area should be tested for malaria parasites in conjunction with estimation of their full blood count for effective malaria diagnosis and treatment particularly in sub patent cases.

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**Lassa Fever Situation Report For Week 1 to Week 15 From
2021 to 2023 in Nigeria: A Review**

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Abstract

Lassa fever is a viral hemorrhagic fever caused by Lassa virus. The Lassa virus is an enveloped single-stranded, non-lytic bi-segmented negative-stranded RNA virus belonging to the family Arenaviridae. Lassa fever is relatively common or endemic in West Africa or particularly in countries such as Benin, Ghana, Guinea, Liberia, Mali, Sierra Leone, and Nigeria. Humans usually become infected with the virus through exposure to food or household items contaminated with the urine or faeces of infected multimammate rat while spread of the disease between or among persons is by direct contact. The disease cases rises to the peak during the dry season particularly between December to April and falls in May annually. The incubation period for the disease is between 1 – 3 weeks, which can lead to spread from region to region. This review focuses on the secondary data for the epidemiological trend of the Lassa fever disease in Nigeria. The rodent host and reservoir is the primary driver of the Lassa fever seasonal trends. Therefore, to control the disease, it is necessary to control the rodent host by killing it. This can be achieved through the use of trap, poisoned bait and interference with their breeding by killing the newly born off springs.

Keywords: Lassa fever, multimammate, report, review

INTRODUCTION

Lassa fever is a viral hemorrhagic fever caused by Lassa virus (WHO, 2016). The Lassa virus is an enveloped single-stranded, non-lytic bi-segmented negative-stranded RNA virus belonging to the family Arenaviridae (Inegbenebor et al., 2009; Ezeomah et al., 2019; Akhiwu et al., 2018; Torriani et al., 2017). The virus was first reported in the town of Lassa in Bornu State, Nigeria (WHO, 2016). Lassa fever is relatively common or endemic in West Africa or particularly in countries such as Benin, Ghana, Guinea, Liberia, Mali, Sierra Leone, and Nigeria (WHO, 2016; Ogbu et al., 2007). It has been reported that about 300,000 to 500,000 cases occur yearly with about 5000 deaths recorded per year (Ogbu et al., 2007; Houlihan & Behrens, 2017). Humans usually become infected with the virus through exposure to food or household items contaminated with the urine or faeces of the infected multimammate rat (WHO, 2016) while spread of the disease between or among persons is by direct contact (WHO, 2016; Asogun et al., 2019). It has been reported that the virus uses a two step process to enter cells (Science Daily, 2014). The results show that the mechanism by which the virus causes the infection is more complicated than previously known and could lead to new approaches for the prevention of the disease (Science Daily, 2014). The researchers stated that the virus may require multiple receptors for delivering its viral load in order to cause infection. Torriani et al. (2017) stated that the first receptor was identified as dystroglycan (DG), a ubiquitously expressed conserved cellular receptor for extra cellular matrix (ECM) protein which is found in most human tissues where it provides molecular link between the ECM and the actin cytoskeleton. When the virus attaches itself to its receptor on the cell surface, it is first transported to lysosome inside the cell (Torriani et al., 2017). The

lysosome helps to break down different variety of molecules. Thus, in order to infect the cell, the virus must escape the lysosome, which is achieved by the virus getting attached to a protein called lysosome-associated membrane protein 1 (LAMP 1) as a late endosomal entry factor. The acidic conditions of the late endosome, causes dissociation of the virus from the first receptor and then fuses with LAMP 1 (Torriani et al., 2017). This review is focused on the comparison of the Lassa fever situation report for week 1 to week 15 from 2021 to 2023, peak periods. In addition, the signs and symptoms, diagnosis, treatment and prevention of the disease are also included.

Peak period

The disease cases rise to the peak during the dry season particularly between December to April and falls in May annually (Adeiza & Chinenye, 2019; WHO, 2022). The incubation period for the disease is between 1 – 3 weeks, which can lead to spread from region to region (Grace, et al, 2021). The rodent host and reservoir is the primary driver of the Lassa fever seasonal trends (WHO, 2019).

Table 1: Summary of Lassa fever Situation Report in Nigeria, Cumulative from Epi week 1 – 15, from 2021 – 2023.

Reporting period	Suspected cases	Confirmed cases	Probable cases	Deaths (confirmed cases)	Case fatality ratio (CFR)	States and LGAs affected (confirmed areas)
2021 cumulative (week 15)	1592*	247*	3	50*	20.2%	*State(s): 14 *LGA(s): 52
2022 cumulative (week 15)	4127*	733*	31	139*	19.0%	*State(s): 23 *LGA(s): 94
2023 cumulative (week 15)	4702*	877*	5	152*	17%	*State(s): 26 *LGA(s): 101

Source: WHO (2021, 2022 & 2023)

From the Table 1 above, it was observed that there is increase in suspected cases, confirmed cases and death cases for the Lassa fever cumulative result from Epi Week 1 – 15, from 2021 – 2023. Also, it was observed that the disease is spreading at a fast rate from state to state and local government to local government. If urgent actions are not taken or implemented, the disease will spread throughout the country in the nearest future. The methods used to derive this figures include surveillance, detection, monitoring of cases and outbreaks, laboratory testing and case management (WHO, 2023).

Table 2: Showing percentage of confirmed cases and major states affected in Nigeria

Year	Confirmed cases	Death (confirmed cases)	% of confirmed cases	Major states
2021	247	50	79%	Edo 44% Ondo 28% Taraba 7%
2022	733	139	68%	Ondo 28 % Edo 24% Bauchi 16%
2023	877	152	72%	Ondo 32% Edo 29% Bauchi 11%

Source: WHO (2021, 2022 & 2023)

Table 2 above shows the three major states with the cases for the period under review.

Signs and symptoms

The symptoms usually show up one to three weeks after infection. The mild ones manifest in form of slight fever, tiredness/weakness, and headache (Starkman, 2023). In about twenty percent of the cases, the disease manifest more serious symptoms such as bleeding from gums in the mouth, eyes or nose, difficulty in breathing, vomiting, swelling around the face, pain in the chest, back and belly, shock (Starkmam, 2023). The predominant age group affected is 21-30 years. Lassa fever is particularly severe in pregnant women in the third trimester; the foetus dies in about 95% of cases (WHO, 2023). The death rate for women in the late stages of pregnancy could be up to 30%. About a one-third of those who get infected end up with some form of deafness as a complication of the illness (Starkman, 2023). Overall, only about one percent of those who get infected with the disease eventually die (Starkmam, 2023; WHO, 2023).

Diagnosis

It is usually diagnosed through blood test. In the early stages of the disease, a nose or throat swab could be helpful to detect the Lassa fever virus (Starkman, 2023). Cleveland (2023) reported that Lassa fever can be diagnosed by testing samples of body fluids for the presence of the virus. These tests include blood test, throat swab, urinalysis, lumbar puncture (spinal tap). It is mostly diagnosed using enzyme-linked cimmunosorbent serologic assay (ELISA), which detects IgM and IgG antibodies as well as the Lassa virus antigen. Reverse transcription polymerase chain reaction (RT-PCR) can be used in the early stages of the disease. The virus can also be isolated by cell culture (WHO, 2017).

Treatment

Ribavirin, an antiviral drug, has proven to be successful in the treatment of Lassa fever (CDC, 2014). It has been shown to be most effective when administered in the early stages of the disease. Patients should also be given supportive care in form of maintenance of appropriate fluid and electrolyte balance, oxygenation and blood pressure, as well as treatment of any other complicating infections (CDC, 2014).

Prevention

According to CDC (2014) the following measures can be carried out to check the spread of the disease. These include: (1) avoid contact with rodents, store food in rodent-proof containers and keep the home clean to discourage rodents from entering the homes, (2) avoid eating rodents, set traps around the homes to kill and reduce their population, (3) wearing of personal protective clothing such as masks, gloves, gowns and goggles, (4) use of infection control measures, such as complete equipment stabilization, and isolation of infected persons from contact with unprotected ones. Also educating people in high risk areas on how to control and prevent the disease.

Recommendations

According to Richmind and Baglolo (2003) the following measures should be adopted:

- International collaboration over research
- A map with complete epidemiological and clinical story.
- Involvement of the communities affected.
- Effective and affordable diagnostic kits and treatments.
- Efficient and effective specialist treatment centers.
- Development of an effective and affordable vaccine to control the infection in its natural habitat, protect foreign visitors and deter the use of the virus as an agent of biological warfare.
- In addition, there should be enlightenment of the people particularly during the peak period of the disease outbreak because of the festivals that attract a lot of people to the rural areas within the peak period.
- People should be discouraged from hunting and eating rodents at the festive period within the peak period of the disease.

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Psycho-Socio Impediments of Media Advertising in the 21st Century Health Education Practice in Nigeria

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Abstract

It is the opinion of researchers that media advertising has positive effect on health education practice. However, this study examines psycho-socio impediments of media advertising in the 21st century health education practice in Nigeria. In addressing this study, information were gathered through content analysis, documentary or literature review. The study adopted expository method. Critical areas of media advertising and their major impeding variables among others were x-ranged in the study especially, with regard to the 21st century health education practice in Nigeria. Various concepts and theory that are related to the study were well utilized. Based on the literatures explored, the paper recommended that media advertising agents should always pay more attention on issues of health education in order to improve the wellbeing of individuals in the society.

Keywords: education, health, health education, media, advertising and media advertising

Introduction

The importance of health education or literacy remains a vital tool in developed and developing nations because of its role in bettering the living standard of people. Health education provides good opportunity through which people gain access to health information and improve their life span and, perform optimally in their day to day functions.

Health education provides opportunity for promoting good nutrition, best means relaxation among different individuals, disease prevention and positive prevention of teenage pregnancy among others. There is need for proper media advertising of health information as to meet the health need of the growing population of people in this 21st century. Amadi (2019) noted that the 21st century is characterized by rapid population growth which also requires rapid health communication for healthy living.

However, the media is an indispensable organization in providing necessary information to individuals including health information. The media advertising helps in quick and better understanding of most health information and also provides communication in health education. To guide this study properly the following emerging components were treated below:

Meaning of Health

The World Health Organization defines health as a state of complete physical, mental and social well-being, not merely the absence of disease or infirmity (WHO in Okoye, 2018). This definition is an acknowledgement that health is more than non-disease. Health education has been described as any planned activity, which promotes learning about illness or health so that there is some relatively permanent change in a person's knowledge and ideas (Royle & Walsh in Openi, 2016). Health education involves the whole person throughout the entire life, regardless or how ill or well that person may be at any given time. It involves helping people to help themselves, either individually, in families, or in larger communities, by using

a wide range of teaching techniques to achieve goals which often involve changing behaviours, attitudes and social circumstances (Royle & Walsh in Openi, 2016). Health education may be defined as a process with intellectual, psychological and social dimensions relating to activities which increase the abilities of people to make informed decisions affecting their personal, family and community well-being.

Significance of Health Education

Health education imparts knowledge to the individuals, which is essential to be put into operation to maintain good health. It is comprehensively understood that all the individuals are focused towards achievement of personal and professional goals. All individuals carry out different types of tasks and activities. Hence, in order to carry out one's tasks and activities in an appropriate manner, the individuals need to maintain good health, physically as well as psychologically. When the individuals are healthy, they are able to put into operation, their tasks and activities in a satisfactory manner and generate the desired outcomes (Obi, 2020).

The primary aim of health education is to impart information to the individuals in terms of methods and approaches, which are essential to maintain good health. To maintain good health, there are various factors, in terms of which the individuals need to generate awareness. These include, measures to maintain body weight, measures to prevent diseases and health problems, information in terms of diet and nutrition, ways of overcoming eating and sleeping disorders, significance of exercises and physical activities, techniques of yoga and meditation, measures of coping with psychological problems of anger, depression, anxiety, stress, trauma and loneliness and creating a clean and pleasant environment within as well as outside the homes.

Significance of Health Education

- (1) It improves practical ways of using health information to better our health.
- (2) It provides a level playing ground for patients and care providers to interact.
- (3) It reduces crowd in the health facilities because patients are already informed of their situations and what to do.
- (4) It reduces the level of drug abuse among patients and the general public (Sabastine, 2019).

Principles of Health Education

The principles of health in health education practice are highlighted as follow: credibility, interest, motivation, comprehension, reinforcement and participation.

Aims of Health Education

The aims of health education have been stated as follows:

Provide information in terms of health as community asset: One of the indispensable aims of health education is to provide information in terms of health as community assets. The main reason being, when the individuals will maintain good health, only then they will be able to carry out their tasks and functions in a well-organized manner, participate in various activities, promote well-being and enrich their overall quality of lives (Obasi, 2010).

Maintain Norms of Good Health: To maintain good health, there are various factors, which need to be taken into consideration. These are, diet and nutrition, exercises and physical activities, maintaining a clean environment within as well as outside the homes.

To take precautionary measures against communicable diseases: Taking precautionary measures against communicable diseases is of utmost significance for all individuals. The individuals belonging to all communities are imparted information in terms of the measures against communicable diseases.

Promote Mental and Emotional Health: Mental and emotional health of the individuals is important as physical health. To lead to enrichment of one's overall lives and achieve personal and professional goals, the individuals need to focus upon promotion of mental and emotional health.

Provide Assistance to Children in Understanding Nature and Purpose of Health Care Services and Facilities: From the stage of early childhood, the parents as well as teachers make provision of knowledge to the individuals in terms of health education and nature and purpose of health care services and facilities.

Materials used for Health Education

The following are some materials used in delivering health education (knowledge):

- (1) Social media, e.g WhatsApp platform, twitter, Facebook, to go, e-mails, YouTube.
- (2) Textbooks, journals, periodicals, pamphlet, newspapers, tracts and publications of different types.
- (3) Mass media, e.g television, radio, telegrams, multimedia, projectors, tape records, videos, films, etc.
- (4) Local method: town criers, religious heads or leaders, opinion leaders, etc (Nwialu, 2021).

Methods of Achieving Health Education

There are several ways of achieving health education but we shall group into three basic methods such as: Manual method, Electronic method and mechanized method.

- (1) The Manual method of achieving health education deals with the application of physical strength and much effort to achieve knowledge, which can be very stressful. E.g the community leaders using town criers, churches using pastors on pulpits, teachers using textbooks, journals, periodicals, pamphlets, newspaper in talking to their students about their health, opinion leaders gathering groups with the use of slogans just to pass information.
- (2) The electronic method of achieving health education entails the use of electronic devices to transmit structured information relating to the populace's health at any given point in time, example of materials used here are: social media i.e. WhatsApp, twitter, YouTube, to-go, Facebook, e-mail, skype, etc.
- (3) The mechanized method deals with the use of highly mobilized techniques with machines to deliver the health related information to enhance knowledge among the populace to change their perception on some health issues. Examples of materials used here are as follows: television, radio, telegram, multimedia projector, tape records, videos, films, etc (Nwialu, 2021).

Materials used in Media Advertising of Health Education

There are several materials used by the media in advertising health information technologically within and outside the hospital for effective health care services; they include the following:

Social media e.g WhatsApp, twitter, YouTube, skype, internet, etc., multimedia projector, computers, scanners, television, videos, films, digital cameras, digital versatile disk (DVD), video Compact Disk (VCD), tapes, close circuit television (CCTV), etc.

Some of them are discussed as follows:

- (a) **Videos:** These are captured or recorded vital events for records purposes which serve as a means of communication and data preservation medical record profession.
- (b) **Films:** These are also used in capturing moving objectives as pictures that can be shown on the screen of a television, which tells stories of real life situations that are movable. This can be used in theatres or in preserving patient's records.
- (c) **Television:** These are mechanical or electronic set that are used in communication as a system of sending pictures and sound through a signal over a distance where people can receive them at home. This serves as one major means through which people gather information.
- (d) **Social Media:** This depends on computers and their related network which provides knowledge or services to users provided you can afford to pay for the services. This has become a major source of information which is accurate and reliable. It engages the use of community support to deliver information (Yine, 2016).
- (e) **Close Circuit Television (CCTV):** This electronic gadget is used to enhance security network within the hospital environment to protect lives and properties from being destroyed.
- (f) **Multimedia Projector:** This is used in presenting synchronized data or information to persons who are in direct need of such information in organized settings. They are used in delivering audio-visual information, to entertain educate, inform and to communicate to the audience the needed information (Nwialu, 2021).

Theoretical Framework

Health education is based on the theory that health behaviours can be changed. Behavioural change theories are used to explain and influence health behaviours of both individuals and social groups. One theory or a combination of theories may be used to influence health related behaviour (Murphy in Oguogu, 2019).

At individual level, stages of change model and Health belief model may be utilized. Stages of change model describe individual's readiness to change or attempt to change toward healthy behaviours. Five distinct stages identified are: pre-contemplation, contemplation, decision, determination, action and maintenance. This is a circular model and not a linear model. The basic premise of this model is that behaviour change is a process and not an event, and that individuals are found at varying levels of motivation or readiness to change. Therefore, if health education is to be effective in changing negative health behaviours towards positive health behaviour, then health educators should design programmes that will facilitate health education at various level of society (Ahmed, 2013).

Concept of Media Advertising

The term 'media' means "channels of communication". Advertising media refers to the various media channels through which advertising is done. Advertising media is used for showcasing promotional content which is communicated in various forms such as text, speech, images, videos using TV, radio, online, outdoor etc. Basically these are channels through which issues and activities are communicated to people (Nwogu, 2016).

Advertising is an act of priority useful information to the general public on any contemporary issues through radio, television newspaper or internet for their benefits (Obasi, 2010).

Traditional media has been used in the advertising world for years. These include newspaper, magazines, radio, television, outdoor, cinema advertising and direct mail and so on. Traditional media are the most common form utilized by advertisers since decades. Over the course of last years, more businesses are making use of new age media to reach target audience.

Types of Media

Media advertising is categorized into five and they are:

- i. Print media (newspapers, magazines),
- ii. Broadcast media (TV, Radio)
- iii. Outdoor or out of home (OOH) media
- iv. Internet

- (i) **Newspaper:** newspaper is a major source of information for a large number of readers. It may be national or local, daily or weekly newspaper. Newspapers allow presentation of detailed messages which can be read at reader's conveyance. It allows prompt delivery of detailed coverage of news and other information with interesting features for readers. It is a high involvement media as readers are required to devote some effort in reading the message. It is classified into the following:

National newspaper, daily newspapers (local / regional), special audience newspapers. Its types include; magazine, classified advertisement, display advertisement, special inserts, free standing insert.

- (2) **Broadcast Media-Television Advertising:** TV is a principal source of information and entertainment for people exposed to mass media, it is believed to be the most authoritative, influential, exciting medium for reaching very large audience. It combines visual images, sound, motion and colour to achieve viewer's empathy. It allows development of creative and imaginative and messages in a unique way. It is considered intrusive in nature as the audience has no control over the nature and pace of advertisements.
- (3) **Radio:** Radio is a premier mass medium for users and advertisers. It has a wide spread reach, it delivers the ad message to a large number of people across the length and breadth of a country. Commercial broadcasting is undertaken in major cities even rural areas (Ahmed, 2013).
- (4) **Outdoor Advertising:** It is usually used as a supportive medium by advertisers. It includes bill boards, boarding, neon signs posters etc. It can generate considerable reach and frequency level at low cost, useful when introducing a new product. helps to remind the customers, helps to generate sales at point of purchase / point of sale.
- (5) **Internet:** Internet is a worldwide medium that provides means of exchanging information through a series of interconnected computers. It is a rapidly growing medium of advertising. It is a future medium which offers limitless advertising opportunities. It involves use of worldwide web to showcase a website or e-commerce portal to the world. Advertising through internet involves email marketing, social

media marketing, online ads and mobile marketing. It provides a sophisticated graphic user interface to users.

Types of Internet Advertisements

Websites – Online Brochure of product / services, virtual office

Ad buttons – icons which provide link to advertiser's website.

Ad banners – creative & dynamic display ads.

Sponsorship – companies sponsor bloggers to write about them.

Classified ads – similar to newspaper ads

E-mail – Electronic mails carrying ad message.

Importance of advertising media in health education

- (1) It helps in quick transmission of health knowledge
- (2) It makes health information accessible in different forms.
- (3) It helps in proper interaction and evaluation of health issues.
- (4) It helps in discouraging factors that may affect health practice among practitioners.

Psycho-Socio Impediments of Media Advertising of Health Education

The following have been stressed as psycho-socio of the impediments of media advertising of health education (Edem, 2015; Oguogu, 2019).

- (1) **Interest:** Media advertisers pay interest to areas of their concern in advertising health information. There cases where health issues are being skipped by advertising agent due to their lack of interest in such information which could affect the interest of others in the society positively.
- (2) **Attitude of Individuals:** The poor attitude of individuals towards health related information when it is been advertised discourages advertisers from subsequent attention to such area.
- (3) **Lack of Proper Health Knowledge:** Most advertising agents lacks deeper knowledge on health and this affects their capacity in delivery much information to the public on this regards.
- (4) **The nature of the Society:** The developing nature of our society impart negatively on a good of issues including limitation of the media carrying out their function adequately in areas health education.
- (5) **Lack of motivation of Media Advertising Personnel:** The lapses by employers in media industry in terms of alround payment motivation and other social security creates serious barriers in commitment of personnel in media advertising including advertisement of health education issues for individuals in the society. Media personnel need high motivation in areas of high payment and other entitlement. This will encourage them in the discharge of their functions effectively especially, on health education issues.
- (6) **Lack of security:** In a developing nation like Nigeria a lot of social issues that will enhance the wellbeing of individuals are carefully managed due to the fear of unknown. Most health issues are inter-related with a good number of social issues in the society and this in most cases calls for carefulness and reservation in health education.
- (7) **Lack of cooperation between health workers and media personnel:**Obasi (2020) explained that the synergy between health and media personnel's are crossly poor in most developing nations like Nigeria and this affects the ability of the two sectors in working together for knowledge enhancement and communication of health information effectively to the society.

- (8) **Government Factor:** The inability of the government to create conducive atmosphere through their policy and programme and through ministry of health and information affects media advertising of health education negatively.

The Role of Advertising Media in Health Education

- (1) Provision of proper health information to the individual in the society.
- (2) Provision of information to the government on outbreak of health disease in a particular society.
- (3) Collaborating with necessary government agencies and non-governmental agencies in solving health related disease in any area of the society.

Conclusion

Despite the challenges confronting the media advertising in our society, the role of the media in health education remains very essential in the actualization of healthy health information for optimal utilization and enhancement of the total wellbeing of the members of the society.

Recommendations

The following recommendations were made in this study.

- (1) Media advertising agents should always pay more attention on issues of health education. This will help in improving the wellbeing of individuals in the society.
- (2) Government should provide constant conducive social environment that will encourage media advertising in our society.
- (3) Professional in the health sector should always cooperate with the media in providing relevant health information that will enhance the wellbeing of members of the society.
- (4) Individuals in the society should always utilized relevant health information for their optimal health benefits at all time.

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