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GENERAL INFORMATION

NOUN Journal of Physical and Life Sciences is a joint publication of the Faculties of Agricultural Sciences, Health Sciences and Sciences of the National Open University of Nigeria. It is funded by the university.

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The NOUN Journal of Physical and Life Sciences (NJPLS) is a harmonised journal of the National Open University of Nigeria jointly worked by three science-based faculties: Faculty of Sciences, Faculty of Health Sciences and Faculty of Agricultural Sciences. It boasts of peer review by sound scholars and cohorts of academically accomplished editorial board members.

It is my delight to introduce to you the *NOUN Journal of Physical and Life Sciences*, the first in the series of the university's harmonized journals to be funded by the Tertiary Education Trust Fund (TETFUND).

Professor Olufemi Peters
Vice-Chancellor
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EDITORIAL

The *NOUN Journal of Life and Physical Sciences* as the title suggest covers areas in Agriculture, Sciences and Health Sciences. The Previous editions delved into Sciences and Agriculture while the 4th Edition mainly centered on Health Sciences with some papers on Agriculture and Sciences. In this edition, there is a report on a study that was conducted to assess the profitability of farming broilers by small-scale farmers and the outcome showed a high profit margin, this is good research as it will address both protein shortage and unemployment. Another study in this edition is on the socioeconomic status and the risk of breast cancer among Nigerian women: an exploratory study, considering the high rate of breast cancer among women, the study explores the socioeconomic status of women in Nigeria and assesses their risk of getting the disease.

The 4th edition articles are mainly on healthcare, another paper assessed the Knowledge, Attitude, and Practice towards Hepatitis B Infection among non-Medical Students in Nigeria, the study used Usmanu Danfodiyo University Students as a case study and it was found that less than 30% of the students knew Hepatitis B, therefore call for advocacy to enlighten students on the risk of Hepatitis B. Similarly, the same Author conducted a study on Perception and Acceptance of Cesarean Section and Pregnancy Outcome by Mothers Attending Antenatal Care at Primary Health Care in Zamfara State, their findings showed that about 40% of respondents dislike CS when it comes to giving birth and prefer to give birth through their vaginal canal. Other articles in the Editions also focused on Health care system and disease control. The Edition will surely serve as a source of literature and bridge the gap in knowledge and literature in so many aspects that the papers covered.

Professor Shehu Usman Adamu
Editor-in-Chief

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1. Analysis of Profitability of Small-Scale Broiler Farmers Production in Okpe Local Government Area of Delta State.

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Abstract

This study examined the profitability of small-scale broiler farmers production in Delta State, Nigeria. The small-scale broiler farmers were those who raised not more than 100 chicks for meat in a production process. The specific objectives were to evaluate the profitability of small-scale broiler farmers' production. The study used a multistage random sampling technique. A structured questionnaire was used to obtain information from a randomly selected sample of 120 small-scale broiler farmers from Delta State, Nigeria. Descriptive Statistics and Regression models were used in analyzing the data. Among the findings were that 45% were aged between 31 and 40 years. Male-headed households were 74%. Findings also showed that 58.3% were married while 89.1% had formal education either at the primary, secondary, or tertiary level. The average household size was 4-6 persons, some had farming experience between 6 and 10 years. The gross margin was ₦74,900 while the net farm income was ₦50,100. The farmers' return on investment (ROI)was ₦0.67 implying that for every one naira spent by broiler farmers in the study area attracted a gain of sixty-seven (67) kobo. Some of the major constraints on broiler production were the high cost of feeds, lack of capital, pest/disease outbreaks, pilfering, high mortality rate and shortage of water. It was recommended that the government and private sectors should provide feed to poultry farmers at a subsidized rate as

that would encourage more farmers to venture into the business. Veterinary services should be provided to the farmers at affordable rates.

Keywords: Profitability, Small–Scale, Broiler Farmers

INTRODUCTION

Providing sufficient animal protein for human consumption is of paramount concern to animal scientists and veterinarians. Animal protein, apart from its profitability in terms of income to the farmers, is essential for the normal physical and mental development of man (Ugwu, 1990). Poultry remains the largest livestock group estimated to be about 14000 million, consisting of chickens, ducks and turkeys in the world (FAO, 2013). FAO (2021) poultry can be defined as domesticated fowls including chickens, turkeys, geese and ducks raised for the production of meat or eggs and the word is also used for the flesh of the birds as food. The interest in poultry was due to several reasons. For instance, poultry meat and eggs are highly desirable in all parts of the country. Just two eggs a day are sufficient to meet 17.2% of an adult person's protein needs as well as essential vitamins and trace elements (FAO, 2013). Poultry meat contains more proteins than beef. In addition, poultry housing can be provided at a relatively low cost and the growth period is short (usually about 6 weeks for broilers). The poultry industry has become very popular during the past few years due to the growing rate of unemployment and population explosion in Nigeria (Nwandu, 2019).

The poultry industry in Nigeria has undergone a significant transformation since the early fifties, from a small-scale poultry enterprise in backyard, peasant and primitive household-oriented husbandry to modern and large-scale poultry which can be found in the countryside and urban centers today. However, small-scale poultry production still thrives in Nigeria as 80% of

poultry production is with small-scale farmers. Shehu *et al* (2007) defined small-scale poultry farmers in Nigeria as flock of less than 100 birds unimproved and improved breed raised in either extensive and intensive farming system. Labour is low usually drawn from farm families. Small-scale poultry are small flocks managed by individual farm families in order to obtain food security, income and gainful employment. Small-scale poultry is rarely the sole means of livelihood for the family but is one of a number of integrated and complementary family activities contributing to the overall well-being of the households (Shehu *et al,* 2007). Though the value of livestock resources has grown in absolute terms in recent years, its overall contribution to agricultural output remains dismally low (Eke and Effiong, 2016). In Nigeria, animal protein, especially meat is expensive, in short supply and out of reach to a majority of the population. The effect of inadequate animal protein intake is felt more by a large proportion of the population especially in rural areas, whose inhabitants constitute over 70% of the Nigerian population and who constitute over 85% of the extremely poor in the country (Nwandu, 2020). There is therefore need to explore the different sources of animal protein including poultry production towards meeting these needs. Agriculturists and Nutritionists generally agree that developing the poultry industry in Nigeria is the fastest means of bridging the protein deficiency gap presently prevailing in the country (Netherlands Enterprise Agency, 2020). Despite these advantages, the industry is yet to attain the desired level of productivity in Nigeria due to the high cost of production (Ogba, *et al*., 2020). For instance, poultry farmers are faced with the problem of extremely high costs of day-old chicks, drugs and other poultry inputs. The situation has forced small-scale poultry farms to close down and those still managing to survive are producing at very high cost and contending with serious input limitations. Availability of credit and capital accumulation within the agricultural sector, poultry sector inclusive is very

slow (Nwandu, 2021). There is also a low level of productivity (Ogba, *et al 2020*). Amid these problems, there is a need to investigate the profitability of embarking on poultry production.

This study aimed to evaluate the profitability of small-scale broiler production in Okpe Local Government area of Delta State. The objectives were to: describe the socio-economic characteristics of poultry farmers in study area, estimate the cost and return components of small-scale broiler production, determine the effects of poultry farmer's characteristics on profit and identify constraints to profitability of small-scale broiler production.

Hypothesis

The null hypothesis is that socio-economic characteristics of small-scale broiler farmers do not affect profit. This study on profitability of broiler production by small-scale farmers will help to identify the best input combinations to use in order to attain the desired maximum level of output.

Methodology

The study was conducted in Okpe LGA of Delta State. The area has a latitude of $S^{o}26'N$ and the longitude is $5^{0}57'E$. It has a tropical climate characterized by both dry and wet seasons, a mean rainfall range of about 2652mm and a mean temperature of $31.2^{o}C$ (Delta State Ministry of Lands and Survey, 2005). The major occupation of the people is farming and trading.

Sample and Sampling Procedure

A multi-stage sampling procedure was adopted for the study. The first stage was the random selection of 8 communities from the 11 communities that made up Okpe Local Government Area. The communities selected include Amuokpoko, Osubi,

Okuokoko, Ejume, Oyelie, Olin, Ogiedi, Olan, Okuoke and Igbimidika. The population of the study was all the small-scale broiler farmers in the communities randomly selected for the study. The list of small-scale broiler farmers in the communities were obtained from the Department of Agriculture of Okpe LGA. In all, 1056 small-scale broiler farmers raise poultry birds. The second but last stage was the random selection of small-scale broiler farmers who rear broiler birds on small-scale (below 100 birds) from the 8 communities selected. Random sampling techniques were then used to select 15 small-scale broiler farmers using from each of the 8 communities giving a total of 120 small-scale broiler farmer respondents that were used for the study.

Data Collection: Primary data was used for this study. The primary data was collected utilizing a well-structured questionnaire. The questionnaire was administered to the respondents and had a 100% return rate.

Method of Data Analysis: Data was analysed using descriptive statistics, cost analysis, net income analysis and regression analysis. To achieve the objective of the study the following analytical techniques were used: Socio-economic characteristics of poultry farmers in the study area and identification of constraints to profitability of small-scale broiler production were achieved using descriptive statistics; estimate of the cost and return component of small-scale broiler production was achieved using cost analysis while the effect of broiler farmer's socio-economic characteristics on profit was achieved using regression analysis.

Cost and Return Analysis

The short-run cost function was used to determine the monetary value or cost component of input in the small-scale broiler production. In poultry production Olayide and Heady (1982) gave the mathematical cost function equation:

The cost function was expressed as follows:
C=rixi + htbt ……...1
TC= TVC + TFC

Where:
ri = prices of variable input used in poultry production
xi = Variable input used in poultry production
ht = prices of fixed input used in poultry production
bt = fixed input used in poultry production
TC = Total cost of inputs
TVC = Total variables cost of inputs
TFC = Total fixed costs of inputs

Net Income Analysis

The general profit function was used to estimate the net profit. Adegeye and Dittoh (1985) expressed the profit equation mathematically as:
π = TR – TC when >0 ……..... Equation 2

Where
π = Profit
TR = Total Revenue
TC = Total Cost

Regression Analysis

$Y = f (X_1, X_2 \ldots\ldots Xn)$ ……Equation 3

$Y = b_0 + b_1 x_1$ ----------$x_9 + e$ …… equation 4

Y = Value of output of broiler farming (Naira)
X_1 = Cost price (Naira)
X_2 = Selling price (Naira)
X_3 = Transport cost (Naira)
X_4 = Age (Years)
X_5 = Marital status (1 married, 0 otherwise)
X_6 = Household size
X_7 = Experience (Years)
X_8 = Primary occupation
X_9 = Membership of association (1member, 0 otherwise)
X_{10} = Credit access (1 access, 0 otherwise)
X_{12} = Education (1 formal, 0 otherwise)

Results and Discussion

Socio-Economic Characteristics of Respondents

The socio-economic characteristics of the respondents include age, gender and marital status, level of education, household size and farming experience.

Age: Most of the small-scale broiler farmers (45%) fell within the productive age range of 31-40 years with a mean age of 36.9 years. Therefore, for small-scale broiler farmers, there was a tendency that productivity will continue to rise. The mean age of 36.9 showed that the poultry farmers were most likely to be productive in the next decade and broiler production in the country will likely increase.

Sex: Table 1 showed that men accounted for 61.7% while females were about 38.3%. This finding showed that both men

and women were actively involved in broiler production but the percentages of men were more.

The high number of males might be attributed to hard tasks (such as building of the poultry house, changing poultry litter, processing fish meal/blood meal etc.) while women may not have the stamina to undertake such tasks.

Marital Status: The distribution of the respondents showed that about 58.3% of the respondents were married, 21.7% were single, 11.7% were divorced and 8.3% were widowed. The high number of married people in the business reduces labour costs as most married persons have children that constitute the labour force in poultry production as also observed by Otitoju, *et al*, (2018).

Educational level of respondents: About 58.8% of the poultry farmers had formal education at the tertiary level, 20.8% attended secondary education, and 12.5% of the respondents had their primary education while 10.8% had no formal education. This implied that there were more educated people in small-scale broiler production. However, this does not suggest that in poultry production education was a barrier but rather an added advantage for efficient management. With this level of education, there was a tendency for the farmers to be able to increase their level of adoption of technology and skill acquisition. This study agreed with the findings of Ologbon and Ambali, (2012) that a greater percentage of small-scale poultry farmers in Ogun state had formal education. The findings disagreed with the findings of Gbigbi (2012) that a greater percentage of Artisanal fishing households in the Niger Delta had no formal education. The disagreement might be due to the geographical location of the studies and the type of occupation.

Household Size: Table 1 showed that the majority of the respondents (58.3%) fell within the household size of 4-6 persons, and 10% fell within the household size of 10 and above persons. This result agreed with the findings of Ugbome (2006) who found out that the majority of the respondents (small-scale poultry farmers in Delta state) had an average family size of 6 people.

Farming Experience: Table 1 shows that 54.2% had farming experience of about 6-10 years while 45.8% had 1-5 years. Findings also revealed that 11-15 years of farming experience had a rating of 13.3% and above 15 years had the lowest rating of 5%. This result showed that the majority of the broiler farmers had been in production for 10 years. However, the more experienced the broiler farmers are, the more technically efficient they will be in production.

Table 1: Frequency Distribution of respondents according to their Socio-economic Characteristics

Variables	Frequency	Percentage (%)	Mean
Age			
11-20	6	5	
21-30	18	15	
31-40	54	45	36.9
41-50	20	16.7	
51-60	12	10	
Above 60	10	8.3	
Gender			
Male	74	61.7	Male
Female	46	38.3	
Marital Status			
Single	26	21.7	

Married	70	58.3	Married
Divorced	14	11.7	
Widowed	10	8.3	
Education			
Tertiary	67	55.8	
Secondary	25	20.8	
Primary	15	12.6	Tertiary
No Education	13	10.8	
Family Size			
1-3 persons	23	19.2	
4-6 persons	70	58.3	4-6 persons
7-9 persons	15	12.5	
Above 10	12	10	
Farming Experience			
1-5 years	33	27.5	
6-10 years	65	54.2	6-10 years
11-15 years	16	13.3	
Above 15 years	6	5	

Source: Field Survey, 2021

Cost and Returns of Broiler Production

This section gave the summary of the cost and returns of the broiler production and consequently the gross margin and the net farm income. The result in Table 2 revealed that the total cost incurred in broiler production in the study area was ₦74,900 while the total revenue generated was ₦125,000. The gross margin was ₦73,100 while the net farm income was ₦50,100. The farmers' return on investment (ROI) was ₦0.67 implying that for every one naira spent by poultry farmer in the study area it attracted a gain of 67 kobo. This implied that the

business of poultry production in the study area was profitable venture. The finding was in tandem with the result of Emokaro and Eweka, (2015) who reported that broiler production was a profitable enterprise. This result implies that farmers who want to venture into broiler production can easily do that without any doubt since the business is lucrative.

Table 3: Net Farm Income Statement for Broiler Production

Item	**Quantity**	**Price/ Unit (₦)**	**Total (₦)**
A. Output (Broiler)	50	2,500	125,000
B. Variable Cost			
Cost of Day-old Chicks	50	500	25,000
Feed	237.5kg	80	19,000
Labour (Man/days)	2	1500	3,000
Veterinary Services			4,000
Transport			900
Total Variable Cost (TVC)			51,900
C. Fixed Cost			
Feeding trough			3,000
Watering trough			2,000
Battery Cage			18,000
Total Fixed Cost (TFC)			23,000
D. Total Cost (B + C)			74,900
E. Gross Margin GM (A – B)			73,100
F. Net Farm Income = A – (B + C)			50100
Return on Investment = NFI/TC			0.67

Sources: Field Survey, 2021

Estimated Coefficient of Effects of Broiler Farmer's Characteristics on Profit

The result of the linear regression analysis for the broiler farmers' characteristics showed that the independent variables explained the variations in the profit of broiler farmers. The R^2 was 0.717 which implied that the relevant variables entered into the model determined over 72% changes in the profit margin of the broiler farmers. An F-ratio of 24.54 indicated that the overall regression equation was significant at a 1% level. The various variables entered in the model, the cost price of day-old chicks, selling price of matured chicken, transport cost, household size, experience in poultry production and access to credit were statistically significant in their effect on the profit margin of the broiler farmers. The details of the effect of each variable are discussed below:

Cost Price of Day-Old Chicks: The cost price of day-old chick had a coefficient of -10.66 with a t-value -2.55 and statistically significant at 5% level. This implied that as the cost price increased the profit which is the dependent variable reduced.

Selling Price of Matured Broiler: The coefficient of selling price for culled chicken was 7.55 and significant at 1% level with a t-value of 3.56. This implied that 1% increase in the selling price will lead to a 7.6% in profit margin which was the dependent variable. Cost price was negatively related to selling price.

Household Size: The household size had a coefficient of 3537.80 with a t-value of 2.25 and statistically significant at 5%. This implied that as the household size increased, the dependent variable which was the profit increase. This was interpreted to mean that the more the household size, the more family labour can be employed in the poultry business This observation was made by Shirani *et al* (2007).

Experience: It had a coefficient of 376.15 with a t-value of 7.44 and was statistically significant at 1%. This implied that the more the experience of the broiler farmers the better the application of inputs to maximise profit.

Access to Credit: The coefficient of access to credit was 61333.65 with a t-value of 4.18 and statistically significant at 1%. This implied that if access to credit to poultry farmers increased, there may be an increase in output if the credit received by the broiler farmers were properly managed and not diverted to other unproductive ventures.

Educational Level: The education level had a coefficient of 130.63 with a t-level of 3.83 and was statistically significant at 1%. This suggests that as the level of education increases the profit efficiency also increases.

Table 3 Effects of poultry farmer's characteristics on profit.

	Standardized Coefficient	**Standard Error**	**Unstandardized coefficient Betta**	**t – value**	**Significance**
Constant	190334.917	71893.993		2.648	.009**
Cost Price	-10659	4.187	-.074	-2.546	.009**
Selling Price	7.548	2.067	.131	3.651	.000***
Transport Cost	-974.156	1356.785	-.065	-.718	.474
Age	-145.374	407.728	-0.32	-.357	.722
Marital Status	235.680	333.506	.064	.707	.001

Household Size	3537.802	1570.199	.206	20253	.026**
Experience	3761.147	505.240	.066	7.441	.000***
Primary Occupation	-2085.665	5499.698	-.035	-.379	.705
Membership of Poultry Farmers Association	897.735	859.122	.105	1.045	.298
Credit Access	61333.654	14680.104	.392	4.178	.000***
Education	130.630	34.147	.004	3.826	.001

	R^2	0.717216
	F-Ratio	24.536

Dependent Variable: profit

NB: *significant at 10%, **significant at 5%, ***significant at 1% Constraints on Broiler Production as Perceived by the Farmers

Table 4 presents the identified constraints on small-scale broiler production as perceived by the farmers. The major constraint encountered by small-scale broiler farmers was the cost of feed (45.8%). This is because most small-scale broiler farmers do not produce their feed but purchase their feeds from feed manufacturers and dealers. This finding agreed with the findings of Ugbome (2006) that feed cost was the major constraint on poultry production. Lack of capital was estimated to be 26.7%. Other problems included pest/disease outbreaks (8.3%), pilfering (5.8%), high mortality rate (8.3%) and shortage of water (4.2%). One could then say that the constraints to poultry

production were mainly due to input factors rather than management factors.

Table 6: Constraints Associated with Small-Scale Poultry Production

Constraints	Frequency	Percentage (%) Rank
Pilfering	7	5.8 5th
Pest/Disease outbreak	10	8.3 3rd
Feed Cost	55	45.8 1st
Lack of Capital/Fund	32	26.7 2nd
High Mortality rate	10	8.3 3rd
Shortage of water	5	4.2 6th
Total	120	100

Source: Field Survey, 2021

Conclusion

This study was carried out with the view to examine the profitability of small-scale broiler farmers in Delta State, Nigeria. Specifically considering the socio-economic characteristics of small-scale broiler farming households in the study area, estimate the cost and return components of small-scale broiler production, determine the effects of poultry farmer's characteristics on profit and identifying constraints to profitability of small-scale broiler production. A greater percentage of the small-scale broiler farmers about 45% of them fell between the age range of 31-40 years in the study area.

Males with 61.7% dominated broiler production in the study area. The majority of the respondents, about 58.3% were married. A greater percentage of about 58.8% of the broiler farmer respondents had tertiary education in the study area. Greater percentage of about 58.3% of the poultry farmer household fell within the household size of 4-6 persons. Greater percentage of about 54.2% was found to have farming experience of 6-10 years. Findings also revealed that broiler production was found to be a profitable venture. Recommendations include that the government and private sector should make the feed available to broiler farmers at a subsidized rate as that will encourage more farmers to venture into the business. Small-scale broiler farmers should be taught how to improvise and produce broiler feeds to help reduce the cost of feed production. This can be done through the use of extension agents, non-governmental organisations and relevant government agencies. Improved technology should be provided by both government and private enterprises to boost poultry production in the study area. Since the majority of the broiler farmers are educated, workshops, seminars and symposiums should be organized for the poultry farmers at intervals on poultry production. This will help boost their level of understanding which in turn will affect the business positively. Veterinary services should be provided to the farmers at affordable rates.

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2. Early life socioeconomic status and the risk of breast cancer among Nigerian women: an exploratory study

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Abstract

There is evidence that socioeconomic circumstances at the time of birth and childhood influences health outcomes including breast cancer incidence. Unfortunately, no such investigation has been carried out in Africa. The study explored the association between parental educational attainment and breast cancer risk among Nigerian women. A semi structured questionnaire was used to collect relevant data from 372 cases and 403 controls in five public hospitals in Nigeria. The participants were interviewed in person between October2016 and May 2017. Multivariable logistic regression was used to estimate odds ratios (ORs) and 95% confidence intervals (CI). After adjusting for relevant covariates including adult socioeconomic status, women with at least a first degree had a significantly increased risk of breast cancer compared to women with non-formal education (OR 2.21, 95% CI:1.07, 4.57). Paternal educational attainment was not associated with a significantly increased risk of breast cancer. It is hypothesized that early-life socioeconomic circumstance related to high parental socioeconomic status could increase the risk of breast cancer among Nigerian women later in life. Future investigations should be carried out to confirm the findings.

Keywords: early life socioeconomic status, women, breast cancer, risk factor, Nigeria

Introduction

The rising burden of breast cancer among women remains a potential threat to the social and economic well-being of many families in Nigeria (Azubuike et al., 2018). A previous report based on Nigeria's breast cancer risk factor study (NBRS) suggests that high adult socioeconomic status (SES) was associated with a reduced risk of breast cancer among women in Nigeria (Azubuike et al., 2022). The Nigeria breast cancer and risk factor study was instituted in 2016 to investigate several risk factors associated with the risk of breast cancer in Nigeria. The details of the study methodology have been previously reported (Azubuike et al., 2022). The observed increased breast cancer risk associated with adult SES in NBRS contrasts observations in high-income countries where increased socioeconomic status was associated with increased risk of breast cancer.

All the same, besides the role of adult SES, reports in the existing literature suggest that an association may exist between high parental socioeconomic status (such as maternal educational attainment) and an increased risk of breast cancer in high-income countries (Pudrovska & Anikputa, 2012). However, there seem to be no investigation concerning this in low and middle-income countries (including Africa) to the best of my search. There is evidence that socioeconomic circumstances at the time of birth and childhood could influence health outcomes including chronic diseases such as cardiovascular diseases, lung cancers, colorectal cancers, basal cell carcinomas as well as breast cancer later in life (Galobardes et al., 2006; Melchior et al., 2006; Næss et al., 2004; Smith et al., 2001; Vohra et al., 2016). Hence, an exploratory study based on data from NBRS was carried out to determine if an association exists between early life socioeconomic status (based on parental educational attainment) and the risk of breast cancer among Nigerian women.

Material and methods

The study location, participants recruitment, data collection methods, adjusted covariates and general statistical consideration has been previously reported (Azubuike et al., 2022).

Measurement of study variables

Early life socioeconomic circumstance was assessed using parental socioeconomic status based on parental educational attainment (educational achievement). For this study participants with a Higher National Diploma Certificate (HND) were classified as first-degree holders. Those with any training including technical and vocational education leading to an award of certificate following completion of secondary education but falling below HND or first degree were categorized as having postsecondary education. Educational attainment was classified, for analysis, as non-formal/primary, secondary, postsecondary, first degree/HND first degree. These considerations were also applied to parental educational attainment.

Selection and adjustment of relevant covariates

All the adjusted covariates were selected based on existing literature. The analysis was presented in four models. In model 1 (minimally adjusted model, age [as continuous variable), study sites, and ethnicity [Yoruba, Igbo, Niger Deltans, other northern tribes]) were adjusted for. Model 2 adjusted for reproductive variables - parity (continuous variable), age at first pregnancy/birth-AAFB (continuous variable), menopausal status (premenopausal & post-menopausal), total months of breastfeeding-TBF (continuous), age at menarche-AAM (≤13yrs >13yrs), oral contraceptive use-OCU (Yes & No) as well as family history of breast cancer and other lifestyle variables - alcohol consumption (Yes & No), body mass index, total

physical activity-PA (tertiles). Model 3 adjusted for participants socioeconomic status -educational attainment (non-formal/primary, secondary, postsecondary, first degree/HND & >first degree), income (< ₦18,000; ₦18,000 - ₦49,000; ₦50,000 - ₦100,000; > ₦100, 000) and place of residents (less urbanised, more urbanised). In the 4th model, maternal and paternal educational attainments were mutually adjusted.

Results

A total of 372 cases and 403 controls participated in the study. Descriptive analyses (Table 1) show that cases did not differ significantly from controls concerning age, ethnicity, marital status, age at first birth, age at menarche, body mass index, total months of breastfeeding, and parity.

Table 1: Selected characteristics of participants

Characteristics	**Control n (%)**	**Case n (%)**	**∞P-**
Age Mean ± SD	46.8 ± 10.8	47.1 ± 10.7	0.556β
Ethnicity			0.098
Yoruba	192 (47.9)	155 (41)	
Igbo	100 (24.9)	128 (33.9)	
Hausa/Fulani	14 (3.5)	13 (3.4)	
Niger Deltans	51 (12.7)	42 (11.1)	
Other Northern ethnic groups	44 (11)	40 (10.6)	
Marital status	33 (8.3)	36 (9.5)	0.545
Never Married	32 (8.0)	26 (6.9)	
Widowed	9 (2.3)	14 (3.7)	
Divorced/separated	325	301 (79.8)	
Married	(81.5)		

Religion			0.145
Christianity	315 (78.8)	310 (82.9)	
Islam	85 (21.3)	64 (17.1)	
Body mass index-BMI (Kg/M^2)	27.77 (7.29)	26.76 (7.26)	0.265[δ]
Median (IQR)			
Parity	3.0 (2)	3.0(2)	0.09
Median (IQR)			
Total months of breast Feeding (TBF)	36(36)	36.5(41)	0.61
Median (IQR)			
Age at menarche (AAM)			0.57
≤ 13yrs	127 (33.1)	129 (35.1)	
>13yrs	257 (66.9)	239 (64.9)	
Menopausal Status			0.02
Premenopausal	229 (56.8)	161 (42.5)	
Unknown/artificial*	20 (5.0)	64 (16.9)	
Post-menopausal (Natural	154 (38.2)	154 (40.6)	
Age at first birth (AAFB)			0.577[β]
Mean ± SD	25.5 ± 4.8	25.3± 5.1	
Physical activity-PA (MET-hr/wk)			0.082
< 128.20	134 (36.9)	112 (29.5)	
128.20 - 184.29	118 (32.5)	131(34.5)	
≥184.30	111 (30.6)	137 (36.1)	
Education			<0.001
Non-formal / Primary	37 (9.3)	63 (16.6)	
Junior / Senior secondary	96 (24)	109 (28.8)	
Post-secondary	73 (18.3)	71 (18.7)	
1st degree / HND	134 (33.5)	110 (29)	
>1st degree	60 (15)	26 (6.9)	

Respondents' income			<0.001
< ₦18,000	71 (18.9)	100 (28.7)	
₦18,000 - ₦49, 000	106 (28.3)	128 (36.7)	
₦50,000 -₦100,000	123 (32.8)	77 (22.1)	
> ₦100,000	75 (20.0)	44 (12.6)	

[ð]M-W=Mann-Whitney U test (p value) SD = standard deviation ∞differences between cases and controls based on LRT (likelihood ratio test). *Excluded (cases with contradictory answers /Participants whose menstrual flow ceased as a result of other reasons apart from the natural process). [β] Based on t-test of independent samples. * Missing values includes 'not applicable'

Significant differences in proportion between cases and controls were observed with respect to menopausal status, income, and education. The proportion of participants with higher levels of educational attainment, and income was higher for controls than cases, but the differences were not significant ($p>0.05$).

The unadjusted analysis did not suggest that the likelihood of breast cancer among women whose mothers had at least a first degree was significantly higher than the experience among women whose mothers had non-formal education ($P<0.05$). A similar observation was made concerning paternal educational attainment.

Table 2 Relationship between parental educational attainment and breast cancer risk (unadjusted analysis)

Parental educational attainment	**Control n (%)**	**Case n (%)**	**OR (95% CI)**	**∞P-value**	**Missing values (%)**
Paternal education Non-formal Primary/Junior secondary Secondary/Post-secondary 1st degree & above	107(28.3) 110(29.1) 102(27.0) 59(15.6)	110(31.1) 116(32.8) 73(20.6 55(15.5)	1.00 (ref) 1.03 (0.71,1.49) 0.70 (0.47, 1.04) 0.91 (0.58, 1.43)	0.223	6.5
Maternal education Non-formal Primary/Junior secondary Secondary/Post-secondary 1st degree & above	147(38.0) 116(30.0) 92(23.8) 32(8.3)	152(41.8) 120(33.0) 58(15.9) 34(9.3%)	1.00 (ref) 1.00 (0.71,1.41) 0.61 (0.41, 0.91) 1.03(0.60, 1.75)	0.063	4.0

Model 1: Adjusted for age, study sites, ethnicity

Model 2: Additionally, adjusted for menopausal status, parity, TBF, AAFB, AAM, OCU, total PA, BMI, alcohol consumption, FHBC,

Model 3: Additionally, adjusted for personal income, personal education, urbanicity,

Model 4: Mutually, adjusted for paternal/maternal' educational attainments.

Table 3: Relationship between parental educational attainment and the risk of breast cancer (multiple regression)

The multivariable analysis showed that the risk of breast cancer among women with maternal educational attainment above first degree (compared to those with non-formal education) increased progressively across the models, and became significant (OR 2.21, 95% CI:1.07, 4.57) following adjustments for the effects of women's income, personal education, urbanicity (model 3, Table 3). The estimate, however, attenuated and became non-significant following mutual adjustments for the effect paternal educational attainment. Table 3 further showed that the likelihood of breast cancer among women with paternal educational attainment above first degree was not significantly different in any of the four models compared to women whose fathers had non-formal education.

Maternal educational attainment	**Menopausal status stratification**	
	Premenopausal	**Postmenopausal**
	[a]OR (95% CI)	**[a]OR (95% CI)**
Non-formal	1.00(ref)	1.00 (ref)
Primary/Junior secondary	0.62(0.27, 1.44)	1.40(0.68,2.87)
Secondary/Post-secondary	0.37(0.15, 0.93)	1.18(0.43, 3.29)
1st degree & above	1.97(0.74, 5.25)	2.02(0.43, 9.43)
P for trend	0.008	0.711
	Age stratification	
	Age < 50yrs	**Age ≥ 50yrs**
Non-formal	1.00(ref)	1.00 (ref)
Primary/Junior secondary	0.67(0.29, 1.54)	1.39 (0.67, 2.91)
Secondary/Post-secondary	0.36(0.13, 0.94)	1.50 (0.54, 4.16)
1st degree & above	2.42(0.88, 6.67)	1.98(0.42, 9.34)
P for trend	0.003	0.675

Main effects	**Model 1** **[a]OR (95% CI)**	**Model 2** **OR (95% CI)**	**Model 3** **OR (95% CI)**	**Model 3** **OR (95% CI)**
Maternal education Non-formal Primary/Junior secondary Secondary/Post-secondary 1st degree & above P for trend	1.00(ref) 0.95 (0.67, 1.36) 0.62 (0.40, 0.95) 1.05(0.59, 1.84) 0.109	1.00(ref)[c] 0.99 (0.62, 1.59) 0.88 (0.33, 1.06) 1.06 (0.56, 1.98) 0.264	1.00(ref)[c] 1.01 (0.60, 1.70) 0.73 (0.39, 1.39) 2.21 (1.07, 4.57) 0.056	1.00(ref)[c] 1.01 (0.50, 2.03) 0.83 (0.35, 1.98) 2.09 (0.82, 5.34) 0.179
Paternal education Non-formal Primary/Junior secondary Secondary/Post-secondary 1st degree & above P for trend	1.00(ref) 0.98 (0.66, 1.44) 0.69 (0.45, 1.05) 0.97(0.60, 1.58) 0.265	1.00(ref)[c] 1.02 (0.62, 1.66) 0.77 (0.45, 1.32) 1.04 (0.54, 1.99) 0.679	1.00(ref)[c] 1.11 (0.65, 1.91) 0.87 (0.48, 1.59) 1.63 (0.78, 3.42) 0.369	1.00(ref)[c] 1.15 (0.56, 2.36) 0.83(0.36, 1.92) 1.17 (0.44, 3.10) 0.724

Although a linear trend was not observed among premenopausal or younger women, differences in the estimates across the groups were significant (P= 0.011 and 0.003 respectively). On

the other hand, non-significant linear trends were observed among postmenopausal and older women.

Table 4 :The relationship between maternal educational attainment and the risk of breast cancer stratified by age and menopausal status.

Discussion

The findings suggest that early-life socioeconomic status based on high maternal educational attainment was associated with an increased risk of breast cancer later in life. The observation, however, was not independent of paternal educational attainment. On the other hand, assessment based on paternal educational attainment was not significantly associated with an increased risk of breast cancer.

The findings were consistent with a previous observation based on Wisconsin longitudinal studies where maternal education was associated with increased risk of breast cancer while paternal education was unrelated with breast cancer incidence (Pudrovska & Anikputa, 2012). However, while that study suggests that the role of maternal education was mediated by that of daughter own educational attainment, the estimate in the present study was independent of daughters' socioeconomic status. This may reflect differences in population behaviours (linked to breast cancer) associated with socioeconomic status across life course (Akinyemiju et al., 2016). Another related study that investigated the association between parental socioeconomic status and mammographic density (a marker for breast cancer risk) did not observe a significantly higher per cent density increase after adjustments for adult SES and early life factors (Tehranifar et al., 2017). Unfortunately, the present study lacked data on other early life factors such as (birth weight) which could influence breast cancer risk (Ahlgren et al., 2003; Michels & Xue, 2006). That can contribute to the discrepancy

between the findings of that study and the present study. Other available studies did not observe an association between parental SES based on paternal occupation (De Kok et al., 2008). Differences in findings could vary depending on ethnicity and SES measures used (Braveman et al., 2005). This suggests the need to determine which SES variable is more sensitive and more reliably captures early-life socioeconomic circumstances that may be related to breast cancer in Nigeria and other sub-Saharan African countries (Metcalfe et al., 2005; Vohra et al., 2016). Unfortunately, the role of parental SES in breast cancer has not been reported in any previous African study. Hence it was not possible to make a comparison with previous indigenous studies. The current study is the first African study to explore this association.

All the same, the finding was at variance with the protective effect of adult SES against breast cancer as reported in a previous publication based on NBRS (Azubuike et al., 2022). This suggests that the role of parental SES and adult SES about breast cancer in Nigeria may be independent. They may also not strictly follow the same mechanism of action. It is possible that while adult SES primarily act by influencing behaviours, attitudes associated with other breast cancer risk factors (such as reproductive behaviours, lifestyle factors -alcohol use and physical activity) parental SES could have a more direct effect on biological mechanisms that could predispose to breast cancer later in life. For example, children born to parents of high SES tend to have higher access to higher nutritional exposures resulting in higher growth rates owing to increased mitotic activities of the body cells. A complex interaction between early nutritional factors and genetic environment in utero during childhood and adolescence has been associated with an increased risk of breast cancer (Adebamowo et al., 2003; Ahlgren et al., 2004; World Cancer Research Fund/American Institute for Cancer Research., 2017). Early-life nutritional exposures can also promote early reproductive maturation which

is also known to increase breast cancer risk. (He & Karlberg, 2001; World Cancer Research Fund/American Institute for Cancer Research, 2017). Interestingly, a significant positive (although weak-Cramer V =0.11, p=0.007) correlation between higher maternal educational attainment and increased height was observed in the present study (supplementary file). The weak correlation was not surprising since a significantly increased risk of breast cancer was observed only among women with either first or more than first degrees. Previous Nigerian studies have shown that increased height was associated with an increased risk of breast cancer among pre and postmenopausal women (Adebamowo et al., 2003; Ogundiran et al., 2010). The findings suggest the need for a life course approach towards breast cancer prevention in Nigeria. This will help in controlling early-life SES-related circumstances that could predispose to breast cancer later in life. Comparison of the estimate based on paternal education with that based on maternal educational attainment suggests that maternal socio-economic circumstance might have a higher contribution than paternal SES with respect to developing breast cancer in daughters later in life. This was consistent with our previous report on the association between adult SES and breast cancer risk among Nigerian women. Although there was a suggestion that the association between parental education and breast cancer risk might vary by age and menopausal status, none of the associations was significant.

These notwithstanding the limitations of the study should be taken into consideration. In interpreting the findings. The study lacked data on early life exposure such as birthweight which could partially explain the findings. Hence, I am not certain if the findings could have been different had that been taken into consideration. There could be a lack of uniformity regarding the time or childhood period when different parents acquired their highest level of education. Sometimes parents could acquire their first degrees at the same time, or even after their daughters had acquired such degrees. The potential for discrepancies with

regard to the time when different parents acquired their highest level of education could lead to information bias. Nevertheless, such a problem will apply to both cases and controls. These in addition to other potential methodical issues previously reported (Azubuike et al., 2022) should be taken into consideration while interpreting the findings. Noteworthy is the fact the increased risk of breast cancer observed in the present study was only associated with women with first-degree and above compared to women with non-formal education. The direction of the association was not consistent across the groups. It is therefore recommended that the study be confirmed in future taking into consideration the issues highlighted.

All the same, the study is the first analytical study in Africa to report such findings to the best of my search. Hence, it will provide a basis for hypothesis-driven studies to be conducted in future. This will be necessary to confirm the findings.

Conclusion

The findings suggest that early life socioeconomic status measured based on maternal educational attainment was associated with an increased risk of breast cancer, but the association was not independent of the role of paternal educational attainment. The study suggests the need to consider life course approaches and events in early childhood in designing breast cancer intervention strategies in Nigeria. It is, however, recommended that a hypothesis driven study be designed in future to confirm the findings.

Supplementary File

	< 1.58	**1.58 - 1.63**	**1.64+**	**TOTAL**
Non-formal/Arabic	86(31.2)	97(35.5)	93 (33.7)	276 (100.0)
Primary/Junior Secondary	71(34.1)	75(36.1)	62(29.8)	208 (100.0)
Secondary/Post-secondary	31(22.5)	50(36.2)	57(41.3)	138(100.0)
1st degree & above	9 (14.3)	21(33.3)	33(52.4)	63(100.0)
TOTAL	197 (28.8%)	243 (35.5%)	245 (35.8)	685(100.0)

Cramer V =0.11, p = 0.007

Correlation between participants' maternal educational attainment and participants' height.

	< 1.58	**1.58 - 1.63**	**1.64+**	**TOTAL**
Non-formal/Arabic	61 (30.8)	68 (34.3)	69 (34.8)	198 (100.0)
Primary/Junior secondary	68 (34.0)	71 (35.5)	61 (30.5)	200 (100.0)
Secondary/Post-secondary	39(24.2)	58 (36.0)	64 (39.8)	161 (100.0)
1st degree & above	24(22.2)	36 (33.3)	48 (44.4)	108 (100.0)
TOTAL	192 (28.8)	233 (34.9)	242 (36.3)	667 (100.0)

Cramer V =0.085, p = 0.143

Correlation between participants paternal educational attainment and participants personal height

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3. Assessment of Knowledge, Attitude, and Practice towards Hepatitis B Infection among non-Medical Students in Nigeria

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Abstract

Hepatitis B infection is one of the major health problems worldwide and Africa in particular. The objective of the study was to assess the knowledge, attitude and practice of Hepatitis-B Virus (HBV) among undergraduate university students. The study was conducted at Usman Danfodiyo University (UDUS) Sokoto, Nigeria where 390 undergraduate university students were selected randomly from all faculties except for medical and veterinary faculties. Their HBV-related knowledge; attitude and practice were measured between April and December 2015 through a self-administered questionnaire containing three sections with 47 questions. HBV-related knowledge, HBV-related attitude and HBV-related practice were analyzed using SPSS version 22. The level of significance was fixed at α level 0.05. Of the 385 respondents included in the analysis, 254 (66%) were males, and 131 (34%) were females. The mean age was 21 years and ranged from 17 to 24 years old and the response rate was 98.7%. The overall findings showed the knowledge mean score was 9.03 [SD=0.98]. Less than a third (31.7%) of the respondents had sound knowledge while two-thirds (68.3%) had low knowledge. The mean attitude score was 54.51 (SD=4.88). Similarly, less than half (46.2%) of the respondents had a positive attitude while (53.8%) had a negative attitude. The overall mean practice score was 5.47 (SD=0.76). Furthermore, (48.8%) had good practice while (51.2%) had poor practice.

This study revealed poor sound knowledge, negative attitudes and poor preventive practices towards HBV infection.

Keywords: Undergraduate, Knowledge, Attitude, Practice**,** Hepatitis-B

Introduction

Hepatitis B virus (HBV) infection is a potentially life-threatening liver infection caused by the Virus Hepatitis B (HBV). More than two billion people are infected with the virus globally at some point in time in their lifetimes, and up to 350 million are chronic carriers, representing 5% of the world population (WHO, 2008).

Out of the estimated 350 million chronic carriers of (HBV) in the world; more than 64 million of these chronic carriers are predominantly living in Africa (WHO,2004). Out of the 1.3 million deaths worldwide attributed to HBV, 250, 000 are from African countries (Kew M, 1992). In Nigeria, the prevalence of HBV varies from 9 to 39% and a carrier rate of 7% in any population is identified to be hyperendemic (Emechebe, 2009). The major significant factors contributing to the HBV spread include blood transfusion, mother-to-child transmission, unsafe use of therapeutic injections, tattooing, unsafe sexual practices and shaving by commercial barbers (Lauer & Walker, 2001). The concentration of HBV in infected persons is high in almost all body secretions including blood, serum, saliva, vaginal fluid, semen, serous exudates and most other body fluids (Anjum *et al.*, 2005).

An estimated 3.6 million (2.1 million male, 1.5 million female) are living with HBV in Nigeria between the period of 2007 to 2011 (WHO, 2012).

Lack of awareness of the risk of HBV and its consequences is recognized as a major deterrent to immunization among HBV high-risk groups (Global Policy Report, 2013). Having proper

knowledge, attitudes, and practice is critical to prevent the spread of viral hepatitis infections.

To reduce the transmission of hepatitis B in Nigeria, it is important to assess the population's knowledge, attitude and practice about the disease, especially towards modes of transmission,

control, and preventive measures. From the literature review, it has been shown that there is no sufficient research on hepatitis B in Nigeria (Global Policy Report, 2013).

The present study aimed to assess the related knowledge, attitude and practice of undergraduate non-medical and non-veterinary university students in Nigeria toward Hepatitis B virus infections. It will help in establishing a basis for the necessity to integrate hepatitis B preventive program into tertiary education curriculum and introducing HBV screening for all university students in the country as a requirement for enrollment.

Materials and Methods

1.0 Study Area: A cross-sectional study was conducted to determine the proportion of university students with related sound knowledge, positive attitudes, and good practice of hepatitis B virus infection. The study was carried out between April and December 2015 in Usman Danfodiyo University Sokoto.

2.0 Sampling techniques: Three hundred and ninety participants (390) were randomly selected and enrolled in the study. The site for the study was Usman Danfodiyo University (UDUS) Sokoto State Nigeria.

3.0 Inclusion and exclusion criteria

The criteria for inclusion in this study included all students of Usman Danfodiyo University Sokoto less than 25 years of age at the point of study enrollment, and only Nigerian students willing to complete and return the questionnaire within the time frame. Using multi-stage random sampling techniques, the sample frame was the complete list of names of all the twelve (12) faculties in the university which served as the sampling frame for the first stage. The list of the departments in the selected faculties served as the sampling frame for the second stage. A list of all students in all the selected departments from the selected faculties served as the sampling frame for the third stage. A total of 400 students were assessed for their eligibility, out of which 15 were excluded. Students excluded from the study were those students with disability rendering them from participating or who were away from the school for industrial training, students that were above 25 years at the point of recruitment, the main exclusion criteria include all non-medical and non-veterinary students and students who declined consent. The main reasons for exclusion included seven students who did not meet the specified inclusion criteria (all were above 25 years of age) and three students who deferred their study enrollment for one semester, and five students who did not complete the questionnaire. Eligible students who completed and returned their signed consent form were recruited for the survey.

Data collection

A validated and pre-tested self-structured questionnaire was used as the data collection tool. The questionnaires were developed following extensive literature review (Yonatan and Kelemu, 2013). The questionnaires consisted of six sections; section one captured socio-demographic variables, section two consisted of questions on the respondent's history of hepatitis B, section three consisted of questions on the respondents sources of information's on hepatitis B infection, section four assessed knowledge of respondents regarding hepatitis B prevention and

transmission and had 19 statements in a 'yes' and 'no' format. Section five consisted of 19 statements to determine respondent's attitude towards hepatitis B. Responses were a 5-point Likert scale ranging from strongly agree, agree, neutral, disagree and strongly disagree. Section six consisted of 9 statements to address respondent's preventive practices of hepatitis B (such as screening of blood before transfusion, compliance to vaccination schedule, avoidance of reuse of unsterilized syringes and needles. Answers had the options of 'yes' and 'no'. The questionnaires were pilot tested on a convenient sample of 20 students who were not part of the study. The questionnaires were also validated by a panel of expert specialists on hepatitis B prevention. Reliability tests for knowledge, attitude and practice gave Cronbach's alpha values of 0 .835, 0 .779 and 0.792 respectively.

The co-indicators used in defining youths in this study were all person of 15 and 24 years of ages. Knowledge, attitude, and practice of the respondents were classified as sound or not sound knowledge, positive or negative attitude, good or poor practices based on the criteria that, low sound knowledge score represents a low summated score on the knowledge related to hepatitis-B scale which is represented by a range of 0 to 10; negative attitude scores it represents a low summated score on the attitude related to hepatitis-B scale which ranges from 0 to 10 marks; poor practice scores it represents a low summated score in the practice related to hepatitis-B scale which ranges from 0 to 5 marks. Similarly, sound knowledge scores it represent a high summated score of the knowledge related to hepatitis-B scale which is represented by a range from 10 to 19 marks; positive attitude scores it represents a high summated score of the attitude related to hepatitis-B scale which is represented by a range from 10 to 19 marks and good practice score it represents a high summated score of the practice related to hepatitis-B scale which is represented by a range from 6 to 9 marks in

general, a 50th percentile was used for low scores and above for high scores (Hamit *et al.,* 2011).

Ethical clearance

Ethical approval was obtained from the University Human Research Ethics Committee of the Faculty of Medicine and Health Sciences University of Putra Malaysia before conducting the study. Ethical clearance was also obtained from the University Ethics Committee of Usman Danfodiyo University Sokoto Nigeria.

Data analysis

Data was analyzed using SPSS version 22. For the socio-demographic characteristics of the study respondents, descriptive statistics was used in describing the respondents while inferential statistics was used to analyse the participant's responses. A correct response to a knowledge statement earned a mark of 1 and an incorrect response 0. For the attitude scores, a 5-point Likert scale used, ranging from strongly disagree, disagree, neither, agree and strongly agree, a mark of 1 was awarded for strongly disagree, 2 for disagree, 3 for neither, 4 for having agreed and 5 for strongly agree. For the practice response, practice statement earned a mark of 1 for a correct response and 0 for an incorrect response. All scores were added to give an aggregate score. Test of significance was at α level 0.05. Primary outcome variables were sound/not sound knowledge on HBV transmission and prevention; positive /negative attitudes towards HBV and good practice/poor practice towards HBV.

Results

Socio-demographic characteristics of respondents

Out of the 390 respondents, 385 completed the questionnaire given a response rate of 98.7%. Of the 385 that completed and returned the questionnaire 254 (66%) were male and 131 (34%)

female. Most 166 (43.11%) respondents were between the ages of 22 to 24 years. The largest tribe among the respondents were the Hausas tribe consisting of a total of 191 (49.61%). The majority were not married 377 (97.91%). Two hundred and ninety-nine (77.66%) were all Muslim while 86 (22.34) were Christian. Most respondents; 305 (79.22%) were from urban areas, and most of the respondents 268 (69.61%) were in year three at the university. No civil servants (not employed) made up 358 (92.98%) of the respondents but 27 (7.02%) were employed. Most of the respondents 213 (55.32%) have heard about HBV from the Internet (Table 1).

Knowledge of HBV transmission attitudes towards HBV prevention and practices towards HBV control measures

Tables 2, 3, and 4 show the frequencies of respondents' responses to knowledge, attitude and practice statements. Overall 123 (31.7%) and 263 (68.3%) of respondents had sound knowledge and not sound knowledge on HBV transmission and prevention respectively. One hundred and seventy-eight respondents (46.2%) had a positive attitude towards HBV while two hundred and seven respondents (53.8%) had negative attitudes towards HBV. Similarly, 188 (48.8%) and 197 (51.2%) of the respondents had a good practice and poor practices on HBV transmission and prevention respectively (Table 5).

Table 1. Socio-demographic characteristics of respondents on HBV by groups.

Variables	Frequency, n= 385(%) Study respondents	Total
Age group (years)		
16-18	100 (25.97)	100
19-21	119(30.91)	119
22-24	166 (43.12)	166
Ethnicity		
Hausa	191 (49.61)	191
Yoruba	138(35.84)	138
Ibo	44(11.42)	44
Others	12(3.12)	12
Gender		
Male	254 (65.98)	254
Female	131 (34.02)	131
Place of Birth		
Rural	80 (20.77)	80
Urban	305 (79.23)	305
Religion		
Islam	299(77.66)	299
Christian	486(22.34)	86

Marital status		
Married	8 (2.02)	8
Non-married	377 (97.98)	377
Year in University		
Year three	268(69.61)	268
Year two	77(20.)	77
	40(10.39)	40
Year one		

Table 2. Knowledge of HBV transmission and prevention of the study respondents.

Variable	Yes (%)	No (%)	Total (%)
Does a virus cause hepatitis B?	143 (37.1)	242 (62.9)	385 (100)
Does hepatitis B primarily affect the liver?	152 (39.5)	233 (60.5)	385 (100)
Can hepatitis B cause cancer?	113 (29.4)	272 (70.6)	385 (100)
Can hepatitis B affect any age group?	154 (40.0)	231 (60.0)	385 (100)
Does contaminated blood transmit hepatitis B?	165 (42.9)	220 (57.1)	385 (100)
Can unsterilized syringes transmit hepatitis B?	187 (48.6)	198 (51.4)	385 (100)
Can used blades of barbers transmit hepatitis B?	205 (53.2)	180 (46.8)	385 (100)
Does shared toothbrush transmit	187	198	385

hepatitis B?	(48.6)	(51.4)	(100)
Is hepatitis B transmitted by tattooing, ear and nose piercing?	218 (56.6)	167 (43.4)	385 (100)
Can polluted water or food transmit hepatitis B?	165 (42.9)	220 (57.1)	385 (100)
Is there an available vaccine for hepatitis B?	211 (54.8)	174 (45.2)	385 (100)
Does infectious hepatitis have types?	206 (53.5)	179 (46.5)	385 (100)
Do you know the most dangerous type of hepatitis?	193 (50.1)	192 (49.9)	385 (100)
Can hepatitis B be transmitted from a mother to her baby during pregnancy?	167 (43.4)	218 (56.6)	385 (100)
Is there a cure for hepatitis B?	169 (43.9)	216 (56.1)	385 (100)
Can hepatitis B be transmitted through sex?	192 (49.9)	193 (50.1)	385 (100)
Can a person be protected by taking antibiotics for not contracting hepatitis B?	210 (54.5)	175 945.5)	385 (100)
Is specific diet required for the treatment of Hepatitis B?	201 (52.2)	184 (47.8)	385 (100)
Can Hepatitis B be self-cured by the body?	217 (56.4)	168 (43.6)	385 (100)

Table 3. The attitude of respondents regarding HBV among the study respondents

Statement	Strongly Agree (%)	Agree (%)	Neutral(%)	Disagree (%)	Strongly disagree (%)	Total (%)
Hepatitis B is an important health problem in Nigeria	0 (0.0)	134 (34.8)	190 (49.4)	54 (14.0)	7 (1.8)	385 (100)
Have you ever thought of going in for hepatitis B screening?	4 (1.0)	104 (27.0)	209 (54.3)	68 (17.7)	0 (0)	385 (100)
Have you thought of being vaccinated against hepatitis B?	0 (0)	111 (28.8)	192 (49.9)	79 (20.5)	3 (0.8)	385 (100)
Infection with infectious hepatitis B can affect the ability of the person to visit his or her friends or for traveling?	0 (0)	134 (34.8)	190 (49.4)	54 (14.0)	7 (1.8)	385 (100)
If I know my friend has hepatitis B, I will be afraid of catching the infection, and I will not visit him or her	86 (22.3)	79 (20.5)	153 (39.7)	63 (16.4)	4 (1.0)	385 (100)
If you visit a hepatitis B patient, will you sit close to him or her?	84 (21.8)	160 (41.6)	114 (29.6)	19 (4.9)	8 (2.1)	385 (100)
Will you kiss him or her?	45 (11.7)	86 (22.3)	176 45.7)	78 (20.3)	0 (0)	385 (100)
Can you use his or her cup of water?	32 (8.3)	97	161 (41.8)	83 (21.6)	12 (3.1)	385

		(25.2)				(100)
Should an infected person with hepatitis B be isolated away from the people to prevent their infection?	25 (6.5)	142 (36.9)	139 (36.1)	41 (10.6)	38 (9.9)	385 (100)
Will you ask for screening against hepatitis B of blood before transfusion?	0 (0)	109 (28.3)	193 (50.1)	80 (20.8)	3 (0.8)	385 (100)
Would you like to get vaccinated for hepatitis B free of charge?	0 (0)	132 (34.3)	190 (49.4)	56 (14.5)	7 (1.8)	385 (100)
If you are found positive for hepatitis B, would you like to have further investigations or treatment?	4 (1.0)	103 (26.8)	209 (54.3)	69 (17.9)	0 (0)	385 (100)
Do you think you can get Hepatitis B?	0 (0)	109 (28.3)	193 (50.1)	80 (20.8)	3 (0.8)	385 (100)
I will be confused when diagnosed with hepatitis B infection.	7 (1.8)	55 (14.3)	190 (49.4)	133 (34.5)	0 (0)	385 (100)
I will consult my Doctor if found hepatitis B positive	4 (1.0)	62 (16.1)	153 (39.7)	80 (20.8)	86 (22.3)	385 (100)
I will report myself to the nearest health facility if suspected of hepatitis B symptoms	8 (2.1)	18 (4.7)	114 (29.6)	161 (41.8)	84 (21.8)	385 (100)
I will report myself to the nearest health facility when confirming with hepatitis B infection immediately	0 (0)	81 (21.0)	175 (45.5)	86 (22.3)	43 (11.2)	385 (100)

Do you think diagnosis and treatment of Hepatitis B are expensive?	30 (7.8)	97 (25.2)	161 (41.8)	86 (22.3)	11 (2.9)	385 (100)
I will be worried if am diagnosed with Hepatitis B	26 (6.8)	138 (35.8)	133 (34.5)	45 (11.7)	43 (11.2)	385 (100)

Table 4. The practice of respondents regarding HBV among the study groups.

Statement	Yes (%)	No (%)	Total (%)
I have been tested for hepatitis-B	211 (54.8)	174 (45.2)	385 (100)
I have been vaccinated for hepatitis B	286 (74.3)	99 (25.7)	385 (100)
Have you asked for medical staff to use new syringes when required for you?	51(13.2)	334 (86.8)	385 (100)
I always avoid using commercial barbers.	53 (13.8)	332 (86.2)	385 (100)
I always used my personal blades for shavings and cutting of nails.	232 (60.3)	153 (39.7)	385 (100)
I always asked for a screening of blood before transfusion.	222 (57.7)	163 (42.3)	385 (100)
I go for further test if diagnosed with hepatitis-B	159 (41.3)	226 (58.7)	385 (100)
I always avoid sharing eaten tools with hepatitis-B patients.	264 (68.6)	121 (31.4)	385 (100)
I always attend health education program related to hepatitis-B	209 (54.3)	176 (45.7)	385 (100)

Table 5. Sound knowledge, positive attitude, and good practice by gender, place of birth and religion (n=385)

	Frequency, n=385 (%)			
Variables	**Sound knowledge**	**No-Sound knowledge**	**Total**	P-value
Gender	Yes	No		
Male	83(21.6)	171(44.4)	254(66)	
Female	39(10.1)	92(23.9)	131(34)	0.561
Place of birth				
Urban	94(24.4)	211(54.8)	305(79.2)	
Rural	28(7.3)	52(13.5)	80(20.8)	0.474
Religion				
Islam	94(24.4)	205(53.2)	299(77.)	
Christianity	28(7.3)	58(15.1)	86(22.4)	0.844
	Frequency, n=385 (%)			
Gender	**Positive attitude**	**Negative attitude**	**Total**	
Male	115(29.9)	139(36.1)	254(66)	0.600
Female	63(16.3)	68(17.7)	131(34)	

Place of birth				
Urban	139(36.1)	166(43.2)	305(79.)	0.612
Rural	39(10.1)	41(10.6)	80(20.7)	
Religion				
Islam	137(35.6)	162(42.1)	299(77.)	0.761
Christianity	41(10.6)	45(11.7)	86(22.3)	
	Frequency, n=385 (%)			
Gender	**Good practice**	**Poor practice**	**Total**	
Male	120(31.2)	134(34.8)	254(66)	0.386
Female	68(17.6)	63(16.4)	131(34)	
Place of birth				
Urban	149(38.7)	156(40.5)	305(79.2)	0.987
Rural	39(10.1)	41(10.7)	80(20.8)	
Religion				
Islam	147(38.2)	152(39.5)	299(77.7)	
Christianity	41(10.6)	45(11.7)	86(22.3)	0.808

p-value calculated using Chi-square test (χ^2)

Discussions

Infectious hepatitis virus is one of the major public health problems worldwide. Transmission of the viruses could be through oral routes involving HAV and HEV. Hepatitis B is transmitted parentally from mother to child, by sexual contact, due to injury with contaminated sharp objects or sharing of contaminated needles. Hepatitis B is an important health problem globally causing an enormous burden on the healthcare delivery system and a significant source of patient misery (Haley and Hischer, 2001). These are major causes of hepatocellular carcinoma and may likely to remain a serious threat to health resulting in substantial morbidity and mortality for many decades to come (Khan et al., 2000). Studies on knowledge, attitude and practices are useful steps to measure and assess the extent to which individual, population or community is in a position to adopt a risk-free disease behavior for this important health disease.

Knowledge of hepatitis-B transmission and prevention among the respondents

The result of the study at baseline showed inadequate knowledge or inadequate sound knowledge about hepatitis B. The percentage of the respondents with sound knowledge was (31.7%) while the majority had low sound knowledge (68.3%). The scores were compared to the respondents about gender, place of birth and religious affiliations. The majority (21.6%) had sound knowledge when compared with females with (10.1%) scores, no statistical difference was seen. Likewise, those from urban areas had (24.4%) sound knowledge scores compared to those from rural areas with (7.3%), no statistical difference was seen. Similarly, Muslims had sound knowledge scores of (24.4%) than Christians with (7.3%), no statistical difference has been seen in sound knowledge scores. The study

revealed that the students had poor knowledge of the mode of transmission of the disease, causative agents, infectious nature, symptoms, preventive and control measures of the disease. The studies which were conducted in Turkey and Iran reported not sound knowledge of HBV or poor knowledge of HBV, which are consistent with our present study results (Razi *et al.,* 2010; Al-Jabri *et al.,* 2004). However, other studies conducted in Oman and Pakistan had reported sound knowledge of the disease or good knowledge of the disease (Anjum *et al.,* 2005). The findings of this study may be attributed to the absence of formal school-based health education in Nigeria, which could be an important reason for not sound knowledge of HBV.

Attitudes towards HBV among study participants

The present study was able to determine the percentage of respondents who had positive attitude related to HBV. The results of the present study showed that 46.2% of the respondents had a positive attitude of HVB which had similar findings with the study conducted in Saudi among high education school students which reported 45.3% positive attitude though the study was conducted among high education school students (Razi *et al.,* 2010). Similarly, the present study revealed that 53.8% of the respondents had a negative attitude towards hepatitis B preventive measures. The scores were compared to the respondents in relation to gender, place of birth and religious affiliations. The majority (29.9%) had a positive attitude when compared with females with (16.3%) scores, no statistical difference was seen. Likewise, those from urban areas had (36.1%) positive attitude scores compared to those from rural areas with (10.1%), no statistical difference was seen positive attitude. Similarly, Muslims had positive attitude scores of (35.6%) then Christian with (10.6%), no statistical difference was seen positive attitude scores. The majority of the respondents 49.4% reported that they would not like to be vaccinated for HBV free of charge and up to 39.7% reported not

visiting their friends if confirmed to have HBV infection. Also, 49.4% of the respondents were neutral to the statement that HBV is an important health problem in Nigeria. This study is in line with a study conducted in Ethiopia whereby majority of the respondents, 85.7% never screened for HBV and 86.6% stated a negative immunized status against HBV. It was interesting to know that nearly one-third 31.7% of the respondents never asked for a screening of blood and blood products before transfusion, and 16.5% of the respondents never asked for a new syringe when required. The majority, 76.1% of the respondents, were never participated in any education program (Al-Jabri *et al.,* 2004).

Practice towards HBV among study participants

The present study was able to determine the percentage of youth that had good practice related to HBV using self-structured questionnaire with nine core indicator questions on the practice score. The result of the present study showed that 48.8% of the respondents had a good practice of HVB. The majority of the respondents in this study were found not to have asked for medical staff to use new syringes when required for use (86.8%) which represents poor preventive practices. The scores were compared to the respondents about gender, place of birth and religious affiliations. The majority (31.2%) had a good practice when compared with females with (17.6%) scores, no statistical difference was seen. Likewise, those from urban areas had (38.7%) good practice scores compared to those from rural areas with (10.1%) good practice, no statistical difference was seen. Similarly, Muslims had good practice scores of (38.2%) then Christian with (10.6%), no statistical difference was seen good practice scores. These results are inconsistent with results of a study on knowledge, attitude and practice of university students in Pakistan where most of the students were found to have used new syringes when required of them (86.8%) which is a good preventive practice. Many other published studies reported that excessive use of unnecessary injections and reuse of unsterilized

syringes are one of the leading factors for HBV/HCV transmission in Pakistan (Hamit *et al.*, 2011). In this study, participants do not agree to avoid using commercial barbers (13.8%) although the majority accept using their personal equipment for shaving and removing of nails (60.3%). Most of the respondents avoid sharing eaten tools with HBV patients (68.8%). A study conducted in Pakistan in the year (2008) among 205 participants that included students and administrative staff of the University of the Punjab Quaid-e-Azam campus, Lahore reported that a high proportion of hepatitis B and C-positive subjects had a trend of sharing common use personal things with friends (Tanveer et al., 2008).

Conclusion

Knowledge, attitudes, and practices about hepatitis B among university students were partial, with significant gaps which need to be strengthened especially in non-medical and non-veterinary students. Non-medical and non-veterinary students have less opportunity to be exposed to health information. A critical level of public awareness, especially among young students, is essential to decrease the burden of the disease in Nigeria in future. There is also an urgent need to the university management and the government to introduce and implements preventive measures by running awareness programs to avoid the occurrence and spread of the disease.

Recommendations

Hepatitis B Virus infection is an important health issue affecting more than 10% of the population needs an urgent and serious planning strategy to combat its major risk factors. There is a need to design a strategic plan for multiple educational approaches directed to all strata of the population at an early stage for converting its menace. University students are one of the best groups to be addressed for better health education

regarding HBV, who could then facilitate and act as a resource for their peers and their respective families.

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Conflicts Of Interest

Author declares that there is no competing interest.

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4. Perception and Acceptance of Cesarean Section and Pregnancy Outcome by Mothers Attending Antenatal Care at Primary Health Care in Zamfara State

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Abstract

Cesarean delivery (C-section) is a surgical procedure used to deliver a baby through incisions in the abdomen and uterus. A C-section might be planned ahead of time if you develop pregnancy complications or you've had a previous C-section and aren't considering a vaginal birth after cesarean section. Caesarean section (C-section) is a major obstetric life-saving intervention for the prevention of pregnancy and childbirth-related complications. Globally, Cesarean section (CS) has immensely contributed to improved obstetric outcomes in circumstances where vaginal delivery is not feasible. However, in some low-income countries, there is aversion to the procedure.The study was conducted in Dr Karima Women and Children Welfare Primary Health Care in Gusau, Local Government, Zamfara State Nigeria. The facility provides care for children and pregnant mothers at a subsidized rate.The main purpose of this study was to determine the possible factors responsible for the perception and acceptance of cesarean section among women attending Antenatal clinics at Dr Karima Women and Children Welfare Primary Health Care.A cross-sectional descriptive study design was carried out among women aged 14 - 50. Primary data was collected using structurally administered questionnaires, a total of 350 respondents were sampled using convenience sampling

technique. Data was run using frequencies and percentages, and the results presented in form of pie chart, bar charts and tables. The results indicated that over one-third 140/350 (40%) of the respondents strongly disagreed that CS is the preferred method of delivery while 85/350 (24.3%) of the respondents agreed that planned CS would be the preferred method of delivery. Based on these findings, the study offered recommends regarding delivery through CS.

Keywords: Caesarian section (CS), Mortality, Morbidity, Knowledge, Attitude

Introduction

Maternal mortality is a death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes (World Health Organization 2012).

Cesarean section (C/S): is an operative technique that has contributed immensely to improved obstetric care throughout the world. It serves as a surgical procedure performed by surgeon on a pregnant woman after the 28th week of gestation through incisions in the abdomen and uterus to facilitating rapid delivery of the baby when prolongation of the pregnancy and/ or labor is deemed undesirable and the vaginal delivery would put the baby or the mother at risk of complications or death. It was named after Julius Ceaser who was the founder of the procedure declared that the procedure should be carried on live women which was not the case at the beginning of the procedure which was to remove babies from dying mother's or those who have already died in other to save the life of the baby but not the mother or to bury the baby and the mother separately (Acient Roman Law).

In recent times, women in Nigeria have expressed worries about choices of childbirth especially the issues surrounding vaginal birth. The joy of every woman is to deliver a baby normally. Some decades ago, the most available or preferred option for most women was vaginal birth. Some of the women had their babies at home with traditional birth attendants but we quite often with difficult labour resulting from obstruction and the women died before any meaningful interventions. Today, however, many babies have been delivered successfully through cesarean sections. Cesarean section is becoming more acceptable to women and their families with better education and enlightenment. However, in some low-income countries like Nigeria, many women and their families still have numerous negative perceptions regarding cesarean delivery. In these settings, women who had cesarean delivery were considered as weaklings and a reproductive failure. Failure to deliver vaginally may be attributed to a "curse" of an unfaithful woman in South Western Nigeria (Adeoye and Kalu 2012). Other reasons adduced for the aversion to cesarean section by women in developing countries include the morbidity and mortality from the procedure, prolonged hospital stay and perceived high cost of hospital bills (Lawani et al 2014).

Furthermore, in most Sub-Sahara African countries including Nigeria, cesarean section is being accepted reluctantly even in the face of obvious clinical indications (Adeoye and Kalu 2012). Despite the causes of maternal mortality often obstetric in origin, underlying cultural factors and beliefs also affect access to and use of health facilities and thus contribute to avoidable maternal death Mboho et al 2023).

Moreover, Aziken et al in 2007; reported that 1.8% of women rejected cesarean delivery because it was not acceptable to their culture.

Orji et al and Bello et al documented that these cultural reasons also include the fact that cesarean delivery was felt to be due to spiritual attacks, retribution for women infidelity and failure of a woman to fulfill her reproductive functions. It is necessary to note that the issue of vaginal birth is not only peculiar to developing countries but also in developed countries. Women still choose vaginal birth after having cesarean section even in case of post-dates stated for elective cesarean section (Cliot - Mathew, 2010). The author further highlighted the fact that woman women desperately wished to go into labour before their appointment dates because of not giving birth vaginally was a sign of failure.

In 1985, following the increasing disparity rate among nations in the number of cesarean births, the World Health Organization (WHO) set out to determine an optimal rate of 15% (percent) as ideal. The postulated 15 percent by WHO would optimally prevent injuries and deaths. In addition, many women and babies would avoid unnecessary and potentially harmful surgery (Harvard magazine 2013). However, World Health Organization (WHO) has since modified this particular recommendation in 2009, stating that the optimum rate is unknown but asserts the both very low and very high rates of cesarean sections can be dangerous. In other words, the procedure should be done only when it is absolutely necessary.

This study is aimed at the determination of the possible factors responsible for the acceptance of cesarean section among women attending Ante-natal clinic at Dr Karima Women and Children Welfare Primary Health Care (PHC) and their perceptions

Significance of the Study

The study is significant as its findings will help to foster attitudinal change toward the common misconceptions about cesarean section. The findings from this study would be used in planning strategies towards improving the knowledge, perception and acceptance towards Cesarean section in the community in order to possibly reduce the delay in presentation to the health facility when cesarean section is needed.

Materials and Methods

Study Setting

This study was conducted in Dr. Karima Women and Children Welfare Primary Health Care in Gusau Local Government, Zamfara State.

Study Design

This study was a cross-sectional descriptive study that relied on quantitative methods of data collection.

Study Population

The study population was drawn from the pregnant women attending Ante-natal clinic at Dr Karima Women and Children Welfare Primary Health Care.

Sampling Technique

Convenient sampling methods were used to select the respondents for the study.

Study Duration

The study was conducted from June to August 13th, 2021.

Data Collection

Data was collected using well-structured questionnaire.

Inclusive Criteria

All the pregnant women attended Ante-natal clinic during the study period.

Exclusive Criteria

Those who were absent during the data collections were excluded from the study.

Those who did not give consent to the study.

Data Collection Tool

This study used questionnaire as the main tool for gathering data on cesarean sections. The questionnaire was developed based on other studies and it constituted five sections, which are the following: Demographic of the respondents, the level of perception, the acceptance of the respondents, the awareness of the respondents towards the CS and the attitude of the respondents towards CS.

Data Analysis

The Questionnaires were cross checked at the conclusion of each day of data collection to make certain correctness and completeness of the collected data. Thereafter, data was analyzed. Statically test of significance were performed and the results were presented in tables and graphs.

Validation of the Instrument.

The instruments were validated through an expert in public health.

Pre-Testing of the Question.

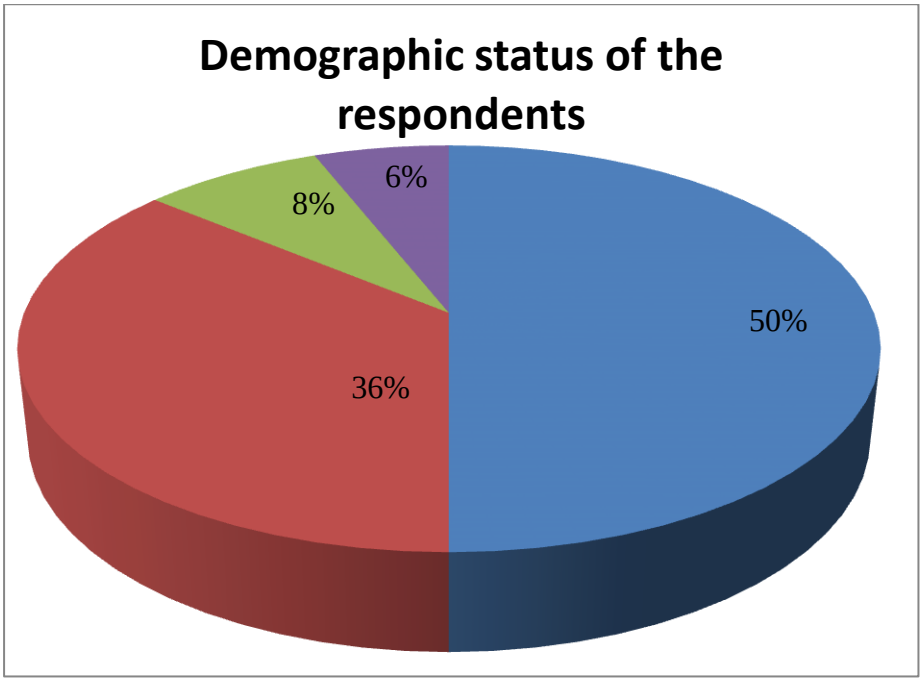
The questions were pre-tested among similar group of the study population who were not part of the study.

Ethical Issue.

Ethical clearance was obtained from the state ethical committee in the ministry of health, Zamfara State.

Results

A total of 350 questionnaires were suitable for analysis, giving a response rate of 100%. Half of respondents (175/350) 50% were within the age of 20 - 29 years and almost one-third (126/350) 36% were within the age of 14 - 19 years figure 1. The dominant religion was Muslim at 94% (329/350). More than three quarter 78% (273/350) of respondents were married, over one-third of the respondents 40% (140/350) were house wife and over one-third (140/350) 40% of the respondents were illiteracy who did not attend any school while only 21% (75/350) attained primary school. Over half of the respondents were in the second trimester of their pregnancy (See table 1).



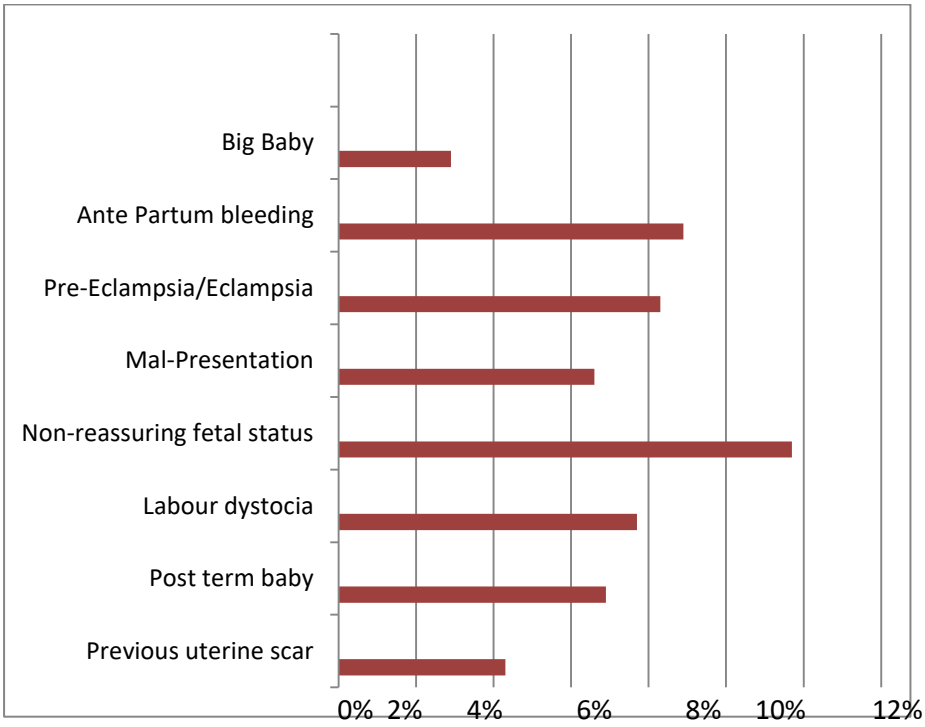
In Table 1, results assessed the awareness of Cesarean Section (C/S) which the majority of the respondents had a good awareness of Cesarean Section. A further analysis of the association between the level of knowledge about Cesarean Section and level of education of the women revealed a significant statistical relationship ($p<0.05$). Most women with tertiary education had a better knowledge of Cesarean Section when compared with their counterparts in the other categories.

TABLE 1: Awareness about Cesarean Section

Variable (n=350)	**Frequency (n)**	**Percentage (%)**
Do you have a child?		
Yes	189	54%
No	161	46%
Have you heard of Cesarean delivery before?		
Yes	203	58%

No	147	42%
If yes, where did you first hear it? Is it through		
Neighbors	65	18.6%
Hospital	130	38%
Social gathering	3	0.9%
School	5	1.4%
Have you, your friend or your family members went through Cesarean Section before		
Yes	134	38.3%
No	216	61.7%

Figure 2: Showing indications for Cesarean Section



Knowledge Regarding Cesarean Section

Regarding CS, most of the respondents 85.7% (300/350) said CS is a major surgery and blood transfusion before and after the procedure is required, 89.7% (314/350) said CS is done under anaesthesia, 3.4% (12/350) of the respondents said CS may lead to admission in intensive care unit, while 42.5% (34/80) of the respondents said there is severe headache in CS. There could be nerve damage was mentioned by 9.7% (34/350) of the respondents, CS cause injury to the bladder and the uterus 51.4% (180/350), the need for further surgery in the future was mentioned by 55.1% (193/350) and 86.3% (302/350) of the respondents aid an emergency operation to remove the uterus can happen in CS see figure 3.

Figure 3: Showing the knowledge regarding Cesarean section

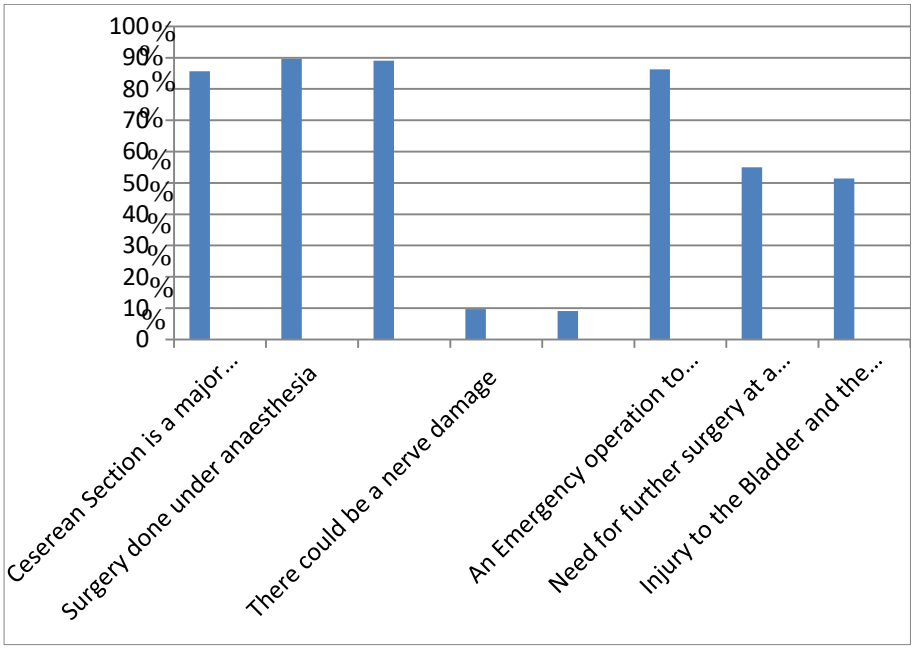
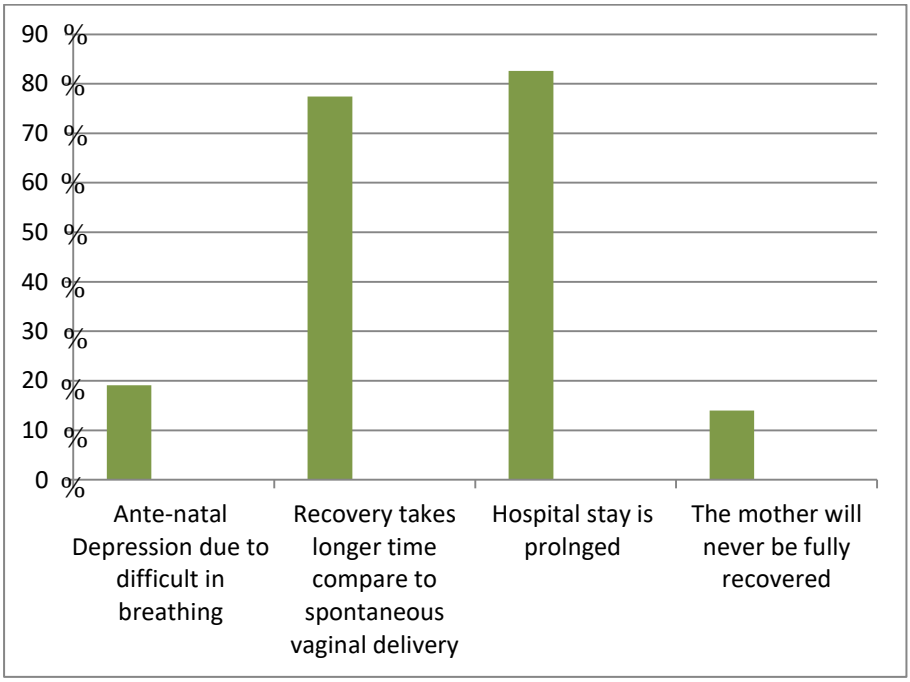


Figure 4: Showing knowledge Regarding Recovery from Cesarean Section:



Perception and Acceptance of the Respondent's Towards Cesarean Section

Some of the respondents 40% (140/350) strongly disagreed that CS is preferred method of delivery and 15.7% (55/350) of the respondents agreed that they are willing to undergo CS if it is indicated, and 24.3% (85/350) of the respondents disagreed and 25.7% (90/350) strongly disagreed to undergo CS even if it is indicated. Other results; 24% (84/350) of respondents agreed not to undergo (unwilling) CS even if it is indicated, that fear of dying is a reason for not going under CS 14.6% (51/350), the 25.7% (90/350) disagreed that the fear of being mocked is not are as on for not going under CS while the 16.6% (58/350) agreed and 11.4% (40/350) strongly agree that being mocked is one of the reasons that people do not want to go for CS,12.9%

(45/350) agreed that the culture viewed a woman as weak if delivered by CS, but 29.1% (102/350) disagreed with this point. Some respondents agreed that planned CS might be a preference method of delivery for some people 24.3% (85/350), willing to undergo a repeated CS was mentioned by 19.4% (68/350) (strongly agreed), while 35.7% (125/350) strongly agreed that its God's wish that some women deliver by CS, some respondent's 29.7% (104/350) agreed that it is desirous for client education on CS at ANC, but 18.6% (65/350) agreed that the health workers do CS for money and 28.3% (99/350) agreed that people go for CS even when the culture does not allow. Most respondents 51.4% (180/350) strongly agreed that CS delivery must first bed is cussed with their husband. Some respondents 62.9% (220/350) agreed that a woman can still achieve vaginal birth after one or two Cesarean sections

Table 6: Showing attitude of the respondents towards CS

Variable	Frequency (n)	Percentage
CS is the preferred method of delivery		
Strongly disagree	140	40%
Disagree	49	14%
Neutral	11	3.1%
Agree	80	22.9%
Strongly agree	70	20%
Planned CS is a preferred method of delivery		
Strongly disagree	72	20.6%
Disagree	78	22.3%
Neutral	34	9.7%
Agree	85	24.3%
Strongly agree	81	23%
Willing to undergo CS if indicated		
Strongly disagree	90	25.7%
Disagree	85	24.3%
Neutral	45	12.9%
Agree	55	15.7%

Strongly agree	75	21.4%
Unwilling to undergo CS even if indicated		
Strongly disagree	88	25.1%
Disagree	68	19.4%
Neutral	38	10.9%
Agree	84	24%
Strongly agree	72	20.6%
Willing to undergo a repeated CS		
Strongly disagree	90	25.7%
Disagree	78	22.7%
Neutral	43	12.3%
Agree	50	14.3%
Strongly agree	68	19.4%
Fear of dying is a reason for not going under CS		
Strongly disagree	100	28.6%
Disagree	88	25.1%
Neutral	43	22.3%
Agree	51	14.6%
Strongly agree	68	19.4%
Fear of being mocked is a reason for not going under CS		
Strongly disagree	97	27.7%
Disagree	90	25.7%
Neutral	65	18.6%
Agree	58	16.6%
Strongly agree	40	11.4%
View a woman as weak if delivered by CS		
Strongly disagree	110	31.4%
Disagree	102	29.1%
Neutral	63	18%
Agree	45	12.9%
Strongly agree	30	8.6%
CS delivery must first be discussed with your husband		
Strongly disagree	10	2.9%
Disagree	12	3.4%

Neutral	28	8%
Agree	120	34.3%
Strongly agree	180	51.4%
It's God's wish that some women deliver by CS		
Strongly disagree	35	10%
Disagree	45	12.9%
Neutral	38	10.9%
Agree	109	31.1%
Strongly agree	125	35.7%
Desirous of client education on CS at ANC		
Strongly disagree	33	9.4%
Disagree	29	8.3%
Neutral	60	17.1%
Agree	104	29.7%
Strongly agree	124	35.4%
People go for CS even when the culture doesn't allow		
Strongly disagree	53	15.1%
Disagree	57	16.3%
Neutral	52	14.9%
Agree	99	28.3%
Strongly agree	89	25.4%
Health workers do CS for money		
Strongly disagree	90	25.7%
Disagree	102	29.1%
Neutral	34	9.7%
Agree	65	18.7%
Strongly agree	59	16.9%
A woman can still achieve vaginal delivery after one or two cesarean section		
Strongly disagree	30	8.6%
Disagree	37	10.6%
Neutral	24	6.9%
Agree	180	51.4%
Strongly agree	79	22.6%

Variable	Frequency (n)	Percentage
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Disagree	49	14%
Neutral	11	3.1%
Agree	80	22.9%
Strongly agree	70	20%
Planned CS is a preferred method of delivery		
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Disagree	85	24.3%
Neutral	45	12.9%
Agree	55	15.7%
Strongly agree	75	21.4%
Unwilling to undergo CS even if indicated		
Strongly disagree	88	25.1%
Disagree	68	19.4%
Neutral	38	10.9%
Agree	84	24%
Strongly agree	72	20.6%
Willing to undergo a repeated CS		
Strongly disagree	90	25.7%
Disagree	78	22.7%
Neutral	43	12.3%
Agree	50	14.3%
Strongly agree	68	19.4%
Fear of dying is a reason for not going under CS		
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Disagree	88	25.1%

Neutral	43	22.3%
Agree	51	14.6%
Strongly agree	68	19.4%
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Strongly disagree	97	27.7%
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Agree	58	16.6%
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Strongly disagree	110	31.4%
Disagree	102	29.1%
Neutral	63	18%
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Strongly agree	30	8.6%
CS delivery must first be discussed with your husband		
Strongly disagree	10	2.9%
Disagree	12	3.4%
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Strongly disagree	35	10%
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Neutral	38	10.9%
Agree	109	31.1%
Strongly agree	125	35.7%
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Strongly disagree	33	9.4%
Disagree	29	8.3%
Neutral	60	17.1%
Agree	104	29.7%
Strongly agree	124	35.4%
People go for CS even when the culture doesn't allow		

Strongly disagree	53	15.1%
Disagree	57	16.3%
Neutral	52	14.9%
Agree	99	28.3%
Strongly agree	89	25.4%
Health workers do CS for money		
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Disagree	102	29.1%
Neutral	34	9.7%
Agree	65	18.7%
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A woman can still achieve vaginal delivery after one or two cesarean section		
Strongly disagree	30	8.6%
Disagree	37	10.6%
Neutral	24	6.9%
Agree	180	51.4%
Strongly agree	79	22.6%

Discussions of Results

The aversion to caesarean section among women in Nigerian was previously documented by Chigbu and Iloabachie in 2007 and Ezechi in 2004 respectfully. Unfortunately, after more than a decade of this finding, the results of the current study are still consistent with those of these researchers, indicating that barriers to the acceptance of CS still exist. The attitude of Nigerian women towards CS in the current study was influenced by socio-cultural factors, religious beliefs and economic reasons, a finding which is in tandem with previous reports. Approximately, half (50%) 175/350 of the respondents were within the age range of 20 - 29 years. Over half of the respondents were in the second trimester of their pregnancy. This is expectedly so as the subjects were mainly women of

representative age. This is similar to the finding of other researchers who reported that this was the commonest age group of women seen in antenatal clinics. In addition, over two-thirds (273/350) 78% of respondents in this study were married (both primiparae and multiparae combined) and 77/350 (22%) are Divorced/Separated. Majority of the respondents were Muslim (329/350) 94% while (21/350) 6% were Christians.

Approximately one-third (140/350) 40% of the respondents are illiteracy who did not attend any education while one-quarter (75/350) 21.4% attended primary school and 18% (63/350) are secondary leavers. Due to the low level of their education, the majority continue to have aversion to caesarean section even in the presence of obstetric indications. This finding is the opposite of other researchers in some parts of Nigeria, Indian and Brazil where education was found to economically empower women and their families and therefore made them more favorably disposed to have an improved health seeking behavior and less likely to refuse CS for economic reasons. However, in the present study, education did not dispel major militating socio-cultural factors affecting either acceptance or rejection of the procedure. Similarly, in Lagos, Nigeria, Ezechi et Al reported that education and social class had little or no effect on aversion to caesarean section. Hopefully, proper health education and counseling are expected to positively influence the attitude of parturient, as seen in high-income countries, with the prospect of translating such gains into better health-seeking behavior and outcome.

However, Jayleen et al in Enugu, south eastern Nigeria, were of the opinion that in order to meet the Sustainable Development Goal and decrease maternal mortality, increased access to CS as an obstetric intervention is of critical importance. They reported in their analysis that women in this region had limited access to caesarean delivery compared to the increasing global trend. Furthermore, similar to the current study, they found that socio-

economic variables like education, employment status and residence were key determinants of access to caesarean birth.

Conclusion

This study found that the majority of the women who accessed antenatal care services in Dr Karima women and children primary health care during the study period had a high awareness of CS. However, a vast majority had morbid aversion towards the procedure due to numerous, non-evidence based socio-cultural reasons, poverty and illiteracy.

The level of knowledge about caesarean section was very good as most of the respondents had heard about caesarean section before and some of them got the information from their neighbors and the health workers.

The study also found that the level of awareness of indications of caesarean section was good as most of the respondents mentioned previous scar, big baby, postpartum baby, mal-presentation, non-assuring fetal conditions, Labour dystocia and Pre-eclampsia/ clampsia as the main indications for caesarean section.

The level knowledge about caesarean section was good as most of the respondents mentioned that caesarean section is a major surgery done under anesthesia and blood transfusion might be required.

The study also found that the level of knowledge on recovery from caesarean section was good as most respondents stated that recovery caesarean section takes longer compared to spontaneous vaginal delivery and hospital stay is prolonged in CS.

The study also revealed that cultural and religious beliefs of the woman had great influence on the attitude of the woman regarding undergoing caesarean section.

Recommendations

For CS to become more widely accepted by parturient in our setting the following recommendations were offered:

1. All women with reproductive age and those Antenatal clients should understand the meaning of C-section in other to get enough education about C-section.

2. Right of women in choosing any preferred method of delivery and consent of the operation should be respected.

3. There is real need to provide better information for pregnant women and during the antenatal period about mode of delivery, their indications, advantages and consequences which enable them to make an informed decision.

4. Community leaders Increased level of the sensitization throughout the country in different languages to enhance knowledge on CS and related topics even by the community to their masses. The community leaders should also sensitize their community on the poor cultural regarding CS as some community and cultural discourages CS because they believe it is for weak women.

5. Health workers:The health workers should include a complete information on CS this will allow couples to make informed decision about the health of the mother during pregnancy regarding delivery during the ANC and pregnancy.

The health workers should first encourage their pregnancy women to have a normal delivery as it is the natural form of delivery.

The health workers should do CS at appropriate cost as it is the main way to save mother and baby lives in case the natural form of the delivery is not possible, this is because some health workers over charged money for the procedure making CS to be avoided by the women even if it is indicated.

The health workers should also maintain the ethics by only recommended CS when it is indicated.

7. Religious and traditional leaders also have a significant and massive role to play in correcting wrong religious and cultural beliefs and myth regarding caesarean delivery if we sincerely hope to achieve the sustainable development goals related to maternal health.

Conflicts Of Interest

Authors declare that there is no competing interest

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5. Assessment of Prevalence of High Blood Pressure and its Risk Factors among Staff of an Open and Distance Learning University in Federal Capital Territory, Abuja

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Abstract

High blood pressure is a silent killer and a global public health problem. The study assessed the prevalence of high blood pressure (HBP) and its risk factors among staff of an Open and distance learning University in the Federal Capital Territory, Abuja. A cross-sectional study was carried out among patients attending the outpatient clinic at National Open University of Nigeria, Jabi Abuja. Respondents were randomly selected (N=269). A structured pre-tested questionnaire was used to collect respondents' socio-demographic information and HBP risk factors. Blood pressure measurement was done three times at five-minute intervals using VBells WHO automatic blood pressure instrument (Model BP1304A). The anthropometric measurement of participants was carried out using a standard height and weight Meter. Self-reported diabetes was also assessed**.** Data was analysed using descriptive statistics at $p<0.05$.Mean staff age was 37±8.706 years. Gender was males (65.4 %) and females 34.6 %. Academic and non-academic staff were 9.3 % vs. 90.7 %. Overall overweight was 35.3 %

(academic 32.0%; non-academic 35.7 %) while obese were 20.1% (academic 24.0%; non-academic 19.7%). Self-reported diabetes was 2.2 % (academic 4.0%; non-academic 2.0%). The overall prevalence of HBP was 50.9 % (academic 24.0 %; non-academic 13.1 %). Prevalence of alcohol drinking was 27.5 % (academic 24.0 %; non-academic 27.9 %) while cigarette smoking was 4.5% (academic 8.0%; non-academic 4.1%). Age, gender and diabetes were statistically associated with HBP ($p<0.05$). BMI, alcohol consumption and cigarette smoking were statistically associated with staff gender ($p>0.05$). Prevalence of HBP, overweight, obesity and alcohol drinking were high among this study group. Health education and awareness creation are important among the respondents.

Keywords: High blood pressure, BMI, academic and non-academic staff, diabetes, alcohol drinking, smoking

Introduction

High (raised) blood pressure (HBP) is a leading risk factor for mortality and disability (Adam and Andrew, 2017). High blood pressure has been described as second only to cigarette smoking as a preventable cause of death in the United States (Adam and Andrew, 2017). It is estimated that 1.13 billion people are hypertensive globally with 7.5 million related deaths and approximately 12.8 % of total of all deaths (WHO, 2019a; WHO, 2019b). It has been reported globally that 1 in 5 women and 1 in 4 men are hypertensive (WHO, 2019b). Prevalence of high blood pressure has been reported to be highest in World Health Organizations (WHO) African regions (27 %) and lowest in WHO American regions (18 %) (WHO, 2019b). The 2017 American College of Cardiology (ACC) and American Heart Association (AHA) in partnership with other nine professional societies Guideline (JNC8) for the prevention, detection, evaluation and management of high blood pressure in adults

reduced Stage 1 category of HBP to 130-139/80-89 mm Hg and stage two to ≥140/90 mm Hg (Adam and Andrew, 2017).

A recent study reported a high prevalence of HBP among employees of Saudi Arabian University, teaching staff or faculty members (32.0 %) and non-teaching or administrative staff (50.0 %) (Amin et al. 2014). Another study found that 39.2 % of Faculty members of a College of Health Sciences in Saudi Arabia were hypertensive (Mohammad and Abdullah, 2017). For employees of a Public University in Malaysia, mean SBP was 128.6 mmHg, DBP was 80.1 mmHg and prevalence of hypertension was (28.8 %) (Eng et al. 2016).

An overall prevalence of HBP was reported as 28.9 % in Nigeria, 29.0 % in men and 25.0 % in women (Adeloye et al. 2014). Some studies carried out among University workers in Southwest Nigerian Universities reported HBP prevalence of (21.5 – 21.8 %) for University of Ibadan (Abdullahi and Amzat, 2011; Ige et al. 2013), 21.0 % OAU (Erhun et al. 2005); 33.0 % (Ambrose Ali University staff, Ekpoma) (Omorogiuwa et al. 2009); 34.9 % (Obafemi Awolowo University, Ile-Ife) (Adedoyin and Awotidebe, 2016), 21.3 % (University of Port Harcourt Medical School) (Ordinioha, 2013); and 36.1 % (University of Maiduguri, Borno State, Nigeria) (Emereole et al. 2007).

Male gender, family history of hypertension, BMI and physical inactivity were significant predictors of hypertension (Ofori and Obosi, 2019). The prevalence of HBP among the working adult population in Nigeria was cited as 41.0 % (25.0 % in females and 16.0 % in males) (Oyeyemi and Adeyemi, 2013).
High blood pressure is a major risk factor for coronary heart disease and stroke (bursting or blockage of arteries supplying blood and oxygen to the brain). If high blood pressure is not well treated, it leads to complications such as heart failure/heart attack, kidney failure, loss of memory, erectile dysfunction and

blindness (WHO, 2019a; WHO, 2019b, WHO, 2019c). One of the global targets of non-communicable diseases is to reduce high blood pressure by 25 % by 2025 (WHO, 2019b). This means that all hands must be on deck to eradicate this disease.

Risk factors of HBP could be modifiable or non-modifiable. Modifiable risk factors include unhealthy diets such as low intake of fruits and vegetables, excessive consumption of table salt, diet high in saturated fats; tobacco smoking, excessive alcohol consumption; obesity and physical in-activities. Non-modifiable risk factors include hereditary (family history), age (40 years and above) and co-existence of diseases such as diabetes and kidney disease. Increase in these risk factors have resulted in the rise of high blood pressure in low and middle-income countries especially Sub-Saharan African Countries (WHO, 2019b; Mbouemboue and Ngoufack, 2019).

The most prevalent risk factor among the employees of the University of Brasilia, a Brazilian Public University was BMI >25 kg/m^2 (overweight/obesity) (56.8 %), alcohol consumption (53.6 %) and smoking (19.5 %) (da Conceicao et al. 2006). For employees of a Public University in Malaysia, mean age was 46.2 years, BMI: overall (26.7 %), normal (24.7 %), at-risk (46. 0 %), current smokers (30.1 %) and non-smokers (33.3 %). Among smokers, only 7.0 % had normal blood pressure (BP) showing that smoking contributed to increase in BP (Eng et al. 2016).

University of Ibadan employees showed that regular smokers were 28.0 %, alcohol drinkers (32.0 %), drunkards (32.0 %) and regular smokers/drinkers (35.0 %). These risk factors were common among men especially, the older ones ≥ 60 years (Abdullahi and Amzat, 2011). Another study on non-communicable diseases and risky behaviour among the same university employees revealed that age was a significant predictor of HBP among the staff. According to age, staff ≤40

years (18.7 %) and ≥40 years (26.1 %) were hypertensive. However, sex was not a predictor of HBP among the staff. Current smokers were 1.9 % while alcohol users were 5.1 % (Ige et al. 2013). Another study cited the modifiable risk factors of HBP among the Lecturers of University of Port Harcourt Medical School as BMI: normal (17.33 %), overweight (60.0 %) and obese (22.67 %); current smokers (2.6 %) and occasional drinkers (94.67 %) (Ordinioha, 2013).

One of the consequences of high blood pressure is premature death because it is a 'silent killer' which shows no warning signs or symptoms. Besides, many hypertensive people are not aware of it. One of the strategies to reduce high morbidity and mortality arising from high blood pressure is regular blood pressure check. The aim of this study therefore is to determine the prevalence of high blood pressure and its risk factors among the staff of open and distance University in Federal Capital Territory, Abuja.

Materials and Methods

Respondents were randomly selected (N=269). A structured pre-tested questionnaire was used to collect socio-demographic and high blood pressure risk factors data from patients attending the outpatient clinic at the National Open University of Nigeria. Blood pressure (systolic and diastolic blood pressure) measurement was done three times at five-minute intervals using VBells WHO automatic blood pressure instrument (Model BP1304A). The HBP status of participants was classified using the 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/ PCNA Guideline (JNC8, 2017) recommendation. HBP status was classified as normal (<120 and <80), elevated (120 – 129 and <80), stage 1 hypertension (130-139 or 80-89) and stage 2 hypertension (≥140 or ≥90). HBP status was later regrouped into two (2) groups: non-hypertensive and hypertensive groups. The

anthropometric measurement of participants was carried out using a standard height and weight Meter. Participants body mass index (BMI) was calculated using the formula body mass (Kg) divided by the square of the body height (m^2) (Kg/m^2) and classified according to WHO BMI classification underweight (<18.5), normal (18,5 – 24.9), overweight (25.0 – 29.9) and obese (≥30.0) (CDC, 2021). History or self-reported diabetes was also assessed.

Data analysis

Data was collected and entered into an Excel sheet. Descriptive statistics and Chi-square, were used to determine the association between high blood pressure and its risk factors among the participants using SPSS version 23 at $p<0.05$. Data were presented in tables, means, standard deviation and percentages.

Results

Table 1 shows the socio-demographic information of study participants. The highest age range of staff that attended the out-patient clinic was 30-39 (40.9 %) and 40-49 (29.4 %) years. The mean age was 37±8.706 years. Three quarter of the participants were males (65.4 %) and non-teaching staff (90.7 %).

Table 1: Socio-demographic information of study respondents

	Freq (n=269)	%
Age as at last birthday (years)		
18-29	53	19.7
30-39	110	40.9
40-49	79	29.4
50-59	23	8.6
60^+	4	1.5

Mean (SD) years	**37±8.706**	
Gender		
Female	93	34.6
Male	176	65.4
Staff Position		
Academic	25	9.3
Non-academic	244	90.7
Faculty/Directorates		
Faculty of Health Science	10	3.7
Faculty of Management Sciences	5	1.9
Faculty of Arts	7	2.6
Faculty of Education	2	0.7
Faculty of Law	1	0.4
Faculty of Sciences	9	3.3
Faculty of Social Sciences	27	10.0
School of Post-Graduate Studies	6	2.2
DICT*	14	5.2
DPW&S**	18	6.7
Human Resource	26	9.7
Transport/ Security	37	13.7
Other Directorates	45	16.7
Senate building	62	23.0
Total	**269**	**100.0**

*Directorate of Information and Computer Tech
**Directorate of Physical Dev., Works & Services

Table 2 shows the BMI and diabetes status of the participants. Mean BMI of participants was 26.4 5.666 kg/m^2. Only 2.2 % of the staff reported that they were diabetic.

Table 2: BMI and diabetes status of study respondents

Category	Range (Kg/m^2)	Freq	%
Underweight	<18.5	7	2.6
Normal	18.5 – 24.9	113	42.0
Overweight	25.0 – 29.9	95	35.3
Obese	≥30.0	54	20.1
Mean (SD)	**26.4±5.666**		
Are you diabetic?			
No		263	97.8
Yes		6	2.2
Total		**269**	**100.0**

Table 3 indicates the prevalence of high blood pressure among the study participants. Mean systolic and diastolic blood pressure were 121±12.172 vs. 75±10.207. Half of the participants were hypertensive (50.9 %). The JNC8 recommendation is able to detect "white-coat hypertension." (ACC/AHA, 2017).

Table 3: Prevalence of high blood pressure among study respondents

Blood Pressure (mm Hg) *	Freq	%
SBP range		
<120	84	31.2
120 - 129	107	39.8
130 -139	50	18.6
≥140	28	10.4
Mean (SD)	**121 ±12.172**	
DBP range		
<80	144	53.5
80 - 89	96	35.7
≥90	29	10.8

Mean (SD)		**75±10.207**	
Category	**BP range**		
Normal	<120 & <80	55	20.4
Elevated	120-129 & < 80	77	28.6
Stage1 HBP	130-139 or 80-89	98	36.4
Stage2 HBP	≥140 or ≥90	39	14.5
HBP status			
Not-hypertensive		132	49.1
Hypertensive		137	50.9
Total		**269**	**100.0**

* Joint National Committee (JNC8); SBP=Systolic blood pressure; DBP= Diastolic blood pressure; HBP = High blood pressure, BP= Blood pressure

Table 4 indicated that the self-reported risk factors of high blood pressure were alcohol drinking (27.5 %) and smoking (4.5 %)

Table 4: Self-reported risk factors of high blood pressure among the respondents

Response	**Freq**	**%**
Do you drink alcohol?		
No	195	72.5
Yes	74	27.5
Do you smoke?		
No	257	95.5
Yes	12	4.5
Total	**269**	**100.0**

Table 5 shows the association between high blood pressure and its major risk factors. Age, gender and diabetes were statistically associated with HBP among the respondents ($p<0.05$).

Table 5: Assessment of association between high blood pressure and its major risk factors among the respondents

	High blood pressure status				
	Not-HBP n=231 (%)	**HBP n=38 (%)**	**Total N=269 (%)**	**$\chi 2$**	**p-value**
Non-modifiable risk factors					
Age (years)					
18-29	51(22.1)	2 (5.3)	53(19.7)	13.874	0.008
30-39	98(42.4)	12(31.6)	110(40.8)		
40-49	61(26.4)	18(47.4)	79(29.4)		
50-59	17 (7.4)	6(15.8)	23 (8.6)		
60^{+}	4 (1.7)	0 (0.0)	4 (1.5)		
Gender					
Male	145(62.8)	31(81.6)	176(65.4)	5.103	0.027
Female	86(37.2)	7(18.4)	93(34.6)		
Are you diabetic?					
No	229(99.1)	34(89.5)	263(97.8)	13.965	0.004
Yes	2(0.9)	4(10.5)	6 (2.2)		
Modifiable risk factors					
BMI (kg/m^2)					
Underweight	6 (2.6)	1 (2.6)	7 (2.6)	2.011	0.570
Normal	101(43.7)	12(31.6)	113(42.0)		
Overweight	79(34.2)	16(42.1)	95(35.3)		
Obese	45(19.5)	9(23.7)	54(20.1)		
Do you drink alcohol?					
No	171(74.0)	24(63.2)	195(72.5)	1.933	0.174
Yes	60(26.0)	14(36.8)	74(27.5)		
Do you smoke?					
No	219(94.8)	38(100.0)	257(95.5)	2.066	0.227
Yes	12 (5.2)	0 (0.0)	12 (4.5)		
Total	**231(100)**	**38(100)**	**269(100)**		

Table 6 shows the association between academic and non-academic staff and the modifiable risk factors of high blood pressure. None of the modifiable risk factors were statistically associated with academic and non-academic staff ($p>0.05$).

Table 6: Assessment of association between university staff and modifiable risk factors of high blood pressure among the academic and non-academic staff

	Academic staff n=25 (%)	**Non-academic staff n=244 (%)**	**Total N=269 (%)**	**$\chi 2$**	**p-value**
Modifiable risk factors					
BMI (kg/m^2)					
Underweight	2 (8.0)	5 (2.0)	7 (2.6)	3.620	0.306
Normal	9 (36.0)	104 (42.6)	113 (42.0)		
Overweight	8 (32.0)	86 (35.7)	95 (35.3)		
Obese	6 (24.0)	48 (19.7)	54 (20.1)		
Diabetes					
No	24 (96.0)	239(98.0)	263 (97.8)	0.396	0.446
Yes	1 (4.0)	5 (2.0)	6 (2.2)		
HBP status					
Not-HBP	19 (76.0)	212 (85.9)	231 (85.9)	2.215	0.139
HBP	6 (24.0)	32 (13.1)	38 (14.1)		
Drinking alcohol					
No	19 (76.0)	176 (72.1)	195 (72.5)	0.170	0.816

Yes	6 (24.0)	68 (27.9)	74 (27.5)		
Smoking cigarette					
No	23 (92.9)	234 (95.9)	257(95.5)	0.810	0.309
Yes	2 (8.0)	10 (4.1)	12 (4.5)		
Total	**25 (100)**	**244 (100)**	**269 (100)**		

Table 7 shows the association between gender and modifiable risk factors of high blood pressure among the staff. Body Mass Index (BMI), alcohol consumption and cigarette smoking were statistically associated with staff gender ($p>0.05$).

Table 7: Assessment of association between gender and modifiable risk factors of high blood pressure among the staff

Variables	**Male n=176 (%)**	**Female n=93 (%)**	**Total N=269 (%)**	**$\chi 2$**	**p-value**
BMI (kg/m^2)				19.342	<0.001
Underweight	4 (2.3)	3 (3.2)	7 (2.7)		
Normal	87(49.4)	26(28.0)	113(42.0)		
Overweight	62(35.2)	33(35.5)	95(35.3)		
Obese	23(13.1)	31(33.3)	54(20.1)		
Diabetes					
No	171(97.2)	92(98.9)	263(97.8)	0.870	0.668
Yes	5 (2.8)	1 (1.1)	6 (2.2)		
Drinking alcohol					
No	112(63.6)	83(89.2)	195(72.5)	20.014	<0.001
Yes	64(36.4)	10(10.8)	74(27.5)		
Smoking cigarette					
No	164(93.2)	93(100.0)	257(95.5)	6.637	0.010
Yes	12 (6.8)	0 (0.0)	12 (4.5)		
Total	**176(100)**	**93(100)**	**269(100)**		

Discussion

The mean age of participants was 37±8.706 years. The highest age groups that visited the clinic were 30-49 years old (40.9 %) and (40-49 years) (29.4 %). Also, more males (65.4 %) and non-academic staff (90.7 %) visited the clinic. A high number of the staff were overweight (42.0 %) and obese (20.1 %). This obesity result was similar to that reported among the staff of Port Harcourt Medical School but lower than the findings at Brasilia and Malaysia Universities (da Ordinioha, 2013; Conceicao et al. 2006; Eng et al. 2016). The obese were found more among the academics (24.0 %) than the non-academics (19.7 %) while overweight was more among the non-academics (35.7 %) than the academic staff (32.0 %) even though not statistically significant. But obesity was tripled in females (33.3 % vs. 13.1 %) and it was statistically significant ($p<0.05$). Few participants (2.2 %) reported having diabetes. Probably many did not know their status so there is a need for diabetes measurement in subsequent studies in this study population. Diabetes was prevalent more among academic staff (4.0 %) than non-academic staff (2.0 %) and also more among males (2.8 %) than females (1.1 %). Obesity and overweight are risk factors of HBP and so has to be checked among the staff of the University.

Approximately 28.0 % drink alcohol while 4.5 % smoke cigarette. Prevalence of alcohol consumption was lower than the values found among workers of Universities of Ibadan and Port Harcourt while the prevalence of smoking was lower than the result cited in the first study in Universities of Ibadan (28.0 %) but higher than that obtained in a second study from the same University (1.9 %) (Abdullahi and Amzat, 2011; Ige et al. 2013). Smoking prevalence in this study population was also lower that that reported among the employees of University of Malaysia ((Eng et al. 2016). Non-academic staff drank more alcohol than the academic staff (27.9 % vs. 24.0 %) but the reverse is the case for smoking. Academic staff smoked more

cigarettes than the non-academic staff (8.0 % vs. 4.1%) but they were not statistically significant ($p>0.05$). Smoking and excessive drinking of alcohol are another risk factors of HBP and these have to be checked also.

The mean systolic blood pressure (SBP) 121±12.172 mmHg was under elevated classification while the mean diastolic blood pressure 75±10.207 mmHg was under normal classification. Half of the participants were hypertensive (50.9 %) and these were more of males (65.7 %) than females (34.3 %). This was statistically significant ($p<0.05$). High blood pressure was statistically associated with all the non-modifiable risk factors: age, gender and diabetes among the staff ($p<0.05$). Hypertensive staff were more among 40-49 years old (47.4 %) followed by 30-39 years old (31.6 %) ($p<0.05$) and then 50-59 years old (15.8 %). Interestingly, none of the 60^{+} years were hypertensive (1.7 %). This was an interesting trend. HBP is shifting more towards the younger generation and no longer the aged. This shows that there might be other emerging factors outside age that might be triggering high prevalence of HBP among the young ones. Further research is needed in this area. More males (81.6 %) were hypertensive than the females (18.4 %). HBP is a risk factor of cardiovascular diseases. If it is not well treated and reduced among the staff, it could lead to complications such as kidney failure, heart failure/heart attack, blindness, sexual dysfunction, stroke, blindness, memory loss, sleep disturbances and premature death.

Approximately 11.0 % of the staff were diabetic and this was mainly among the academic staff (4.0 %) and males in particular (2.8 %). The BMI status showed that 42.1 % of the staff were overweight while 23.7 % were obese. Overweight was more prevalent among the non-academic staff (35.7 %) while obesity was mainly found among the academic staff (24.0 %) even though not statistically significant ($p>0.05$). About 36.8 % of the staff that drank alcohol were hypertensive and none of those

that smoke cigarette were found to be hypertensive. This smoking status was strange because smoking is a very strong risk factor of HBP but it also depends on the length of time they started smoking which was not verified. However, they are bound to be hypertensive at the long run except if they discontinue smoking at this stage.

None of the modifiable risk factors were statistically significant with academic or non-academic staff (P>0.05). However, more academic staff were obese (24.0 % vs. 19.7%) than the non-academic staff while more non-academic staff were overweight (35.7 % vs. 32.0 %) than the academic staff. More academic staff was more diabetic (4.0 % vs. 2.0 %) and hypertensive (24.0 % vs. 13.1 %) than the non-academic staff. Non-academic staff drank more alcohol than the academic staff (27.9 % vs. 24 %). Conversely, more academic staff smoked cigarettes than the non-academic staff (8.0 % vs. 4.1 %).

All the modifiable risk factors were statistically associated with gender except diabetes. Females were more underweight (3.2 % vs. 2.3 %) and obese (33.3 % vs. 13.1 %) than the male staff. overweight status was similar among male and female staff. However, the male staff were more diabetic (2.8 % vs 1.1 %), hypertensive (17.6 % vs. 7.5 %) and drank more alcohol than the female staff (36.4 % vs. 10.8 %). Only the male respondents smoked cigarettes (6.8 vs. 0.0); 8.0 % were academic staff while 4.1 % were non-academic staff. These results indicate that there is a need for a modification of life style by the respondents.

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Ethical Issues

The authors observed all ethical issues (including plagiarism, informed consent, misconduct, data fabrication and/ or falsification, double publication and/or submission, etc.)

Conflict Of Interest

The authors declare that they have no conflict of interest.

Authors' Contribution

FNU carried out the research, read and approved the manuscript; HM approved the use of the University clinic.

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6. Attenuation of *Schistosoma Mansoni Cercaria using Methanolic Extract of Jatropha Curcas.*

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Abstract

Twenty male albino mice of about three weeks old were obtained from national veterinary research institute (NVRI) Vom. Mice were divided into five groups of four each. The first group were challenged with 150-200 cercariae of *Schistosoma mansoni* which were attenuated by exposure to 0.5ppm of methanol leaves extract of *Jatropha curcas*(Lam) Euphorbiaecae (Navi and Mumbai). The second. Third and fourth groups were similarly challenged with Cercariae attenuated with 1.0,5 and 2.0ppm of *Jatropha curcas* respectively. The fifth group were challenged with non-attenuated Cercariae. On day 50 post infections, mice were sacrificed and worms were recovered by dissection method of recovery. A total number of 40 worms, (32 male worms and 8 female worms) 34 worms, (25male worms and 9 female worms) 21 worms, (15 male worms and 6 female worms) and 13 worms (9 male worms and 4 female worms) were recovered from the group 1, 2, 3, and 4 respectively. While in the control group, a total number of 62 worms (48 male worms, 14 female worms and 6 were found paired) were recovered. A reduction in worm burden of 35.4% was recorded among animals' challenges with cercaria attenuated with 0.5ppm while a reduction of 45.1%, 66.1% and 79% were recorded among animals challenged with cercaria attenuated with 1.0ppm, 1.5ppm and 2.0ppm

respectively. The liver of infected mice in the control were found to be sparsely and moderately mottled while there was no liver mottling in the attenuated cercaria group of animals. A significance difference was observed between treated group at 2.0ppm and control group at $P<0.05$ when subjected to student t. test. This result led to the conclusion that. The leaves extract of *Jatropha curcas* has an antiparasitic effect on cercaria which is the infective stage of Schistosome. These results in great reduction in the number of cercaria that penetrated the mice and reduction in the number of worms that finally matured to adult.

Introduction

Schistosomiasis or Bilharziasis is a disease caused by digenetic Trematodes (Blood Fluke) which are parasite of the blood stream of warm-blooded vertebrates which belongs to the family schistosomatidae and genus *Schsitosoma*. The genus *Schistosoma* contains at least nineteen (19) recognised species most of which are pathogens, although only seven (7) are recognised as parasite of man (Johnton *et al.* 1993). *Schistosoma haematobium* (Bilharz, 1852) and *Schistosoma mansoni* occurring mostly in Africa, Arabia, Madagascar, Khuzestan province in Iran and Mauritius. *Schistosoma japonicum* occurring only in far east countries such as china, Philippines and Indonesia. Other important but less wide spread species of schistosoma affecting man are *Schistosoma intercalatum* which occur in parts of Central Africa and *Schistosoma mekongi* occurring in part of south East Asia, Sourthen Loas and Kampuchea (Cambodia) (WHO, 1993).

Schistosomiasis in Nigeria has been in existence for over a century (Doumenge *et al.*, 1987). According Ukoli (1990). Frsh water habitats are more exposed in the savanna and semi-arid regions of Africa and therefore provide ecological conductions for the snails to transmit infective cercariae. Schistosomiasis was first reported in Nigeria among patients in Lagos by Butler

in 1926. Cowper, (1973) reported that the disease was thought to have been introduced by the Fulani herdsmen arriving from the upper Nile Valley.

According to Anon (1992), the least prevalence level of the disease among school children in Imo/Abia states and Rivers State was 1.4% while the highest levels were reported from Sokoto/Kebbi states with 2.3%. a report showed that Schistosomiasis was more prevalent in the Northern part of Nigeria than in the south (Peacock, 1932). At present about 20 million Nigerians are infected with Schistosomiasis and not less than 10 billion naira is spent annually in Nigeria by patients (Fabiyi, 1997). Although there are therapeutic drugs for the disease, their inaccessibility and cost led to research in to Natural products of plants origin that will be used to control the disease through snail control or killing the infective larval form of the parasite the cercaria.

Objectives and Justification of the Study

The study was aimed at determining whether the leaves extract of *Jatropha curcas* can attenuate cercariae of *Schistosoma mansoni* and reduce its capacity to generate adult worms in mice.

Also to determine whether the attenuation effect can be used to induce level of protection in mice towards further cercarial challenge.

Cercariae is the infectives stage of schistosoma. Therefore, to eradicate schissomiasis, cercaria has to be destroyed. The need then arose to research *Jatropha curcas* particularly that a sub species of *Jatropha gluaca* was found to have cercariacidal properties (Alzanbagi, 2013) and the leaves of *Jatropha curcas* was also reported to have antiparasitic effect (Vashi, 2000) and in particular anti schistosomal properties (Adamu, *et al.*, 2006)

METHODOLOGY

The study plant *Jatropha curcas (Lam*).

It belongs to Family euphorbiacae and genus *Jatropha*, it is commonly found in the savanna with English name of Bubble bush while the Hausa name is Bini da zugu. *J. curcas* plant is small tree with smooth grey bark, which exudes a whitish coloured watery. Latex when cut. It grows between 3-5 meters in high but can attain a height of up 8-10 meters under favourable conditions. It has large green to pale green leaves. The petiole length ranges between 6-23mm flowers are formed terminally individually with female flowers usually slightly larger and occurs in the hot seasons. Fruits are produced in winter when the shrubs is leafless, soil moisture is good and temperatutes are sufficiently high (Vashi *et al.,* 2000). Seeds becomes mature when the capsule changes from green to yellow after two to four months from fertilization. *J. curcas* is widely used as medicinal plant in Africa (Adam, 1974). The latex of *Jatropha curcas* which contains alkaloids Jatrophine has medicinal properties and is reported to have anti-cancerous properties. It is also used as an eternal application for skin diseases and rheumatism and for sores on domestic livestock. The juice of the leaves is used as an eternal application for piles and the roots are used to treat snake bite (Calvin, 1985).

Experimental Design

The experiment was divided into five phases to be carried out effectively. These phases are:

1. collection and rearing of infected snails
2. Collection, extraction and serial dilution of *J. curcas*.
3. Collection and infection of experimental animals with schistosome Cercariae.
4. Rearing of infected animals, sacrifice and observation

Collection and rearing of infected snails

About fifty (50) *Biomphalaria pfeifferi* snails were from Yelwa stream in Bauchi metropolis in a 500ml beaker. Snails were transported back to the laboratory and were then transferred into an aquarium containing de-chlorinated water. Baked lettuce was provided as food at libatum,

Harvest of and estimation of Cercariae

Snaisl were placed in one 400ml beaker containing 100ml de-chlorinated water. The beaker was allowed to stand under artificial illumination for a period of 1 hour, the snails were Stirred at 15minutes interval and were allowed to stand at room temperature. The number of cercaria in each suspension as estimated by Pippeting out 2mls of water from the Cercarial suspension and counting the number of cercaria in 2mls using a dissection microscope

Extraction of *Jatropha curcas*

The leaves of *J. curcas* were collected from Bauchi state in Nigeria. Samples of plants was deposited at department of Biological Sciences, ATBU Bauchi Herbarium. The leaves were dried under room temperature, grinded in wooden mortar to suitable size and filtered; 100g of the sample was weighed on a weighing balance and placed in a round bottom flask. Cold extraction method was adopted for the extraction process. Sequential extraction technique was adopted and Hexane and Methanol were used in accordance with technique described by (Alade *et al*. 1993). 1gm of Methanolic extract of *J. curcas* was serially diluted to obtain solutions of 0.5ppm, 1.00ppm, 1.5ppm and 2.0ppm in accordance with

collection and infection of experimental animal

Twenty albino mice of about 4 weeks old weighing 15-20gm were collected from the national veterinary research institute, Vom the animals were housed in five cages for about a week in the laboratory to acclimatise.

The different concentrations of plant extract was placed in four 4ml beakers and 150-200 $\pm$10 cercaria suspension was placed in each beaker and its was allowed to stand for ten minutes. Mice were infected cuteneously with cercaria in accordance with method described by Webbe and James, (1977). While the control animals were only challenged with 150-200 non attenuated cercariae. Drinking water and food were liberally provided to the animals after infection for 50 days.

Sacrifice and Observation

At day 50 post infection, faecal material from infected animals were collected and screened for schistosome ova. Thereafter animals were sacrificed using chloroform in a killing Jar. Animals were then subjected to dissection method of worm recovery according to the method of (Olivier *et al.*, 1973).

Statistical Analysis

The results of the total worm burden paired worms and individual worms recovered from each experimental group were subjected to T. Test analysis by (Smitters and Terry, 1977).

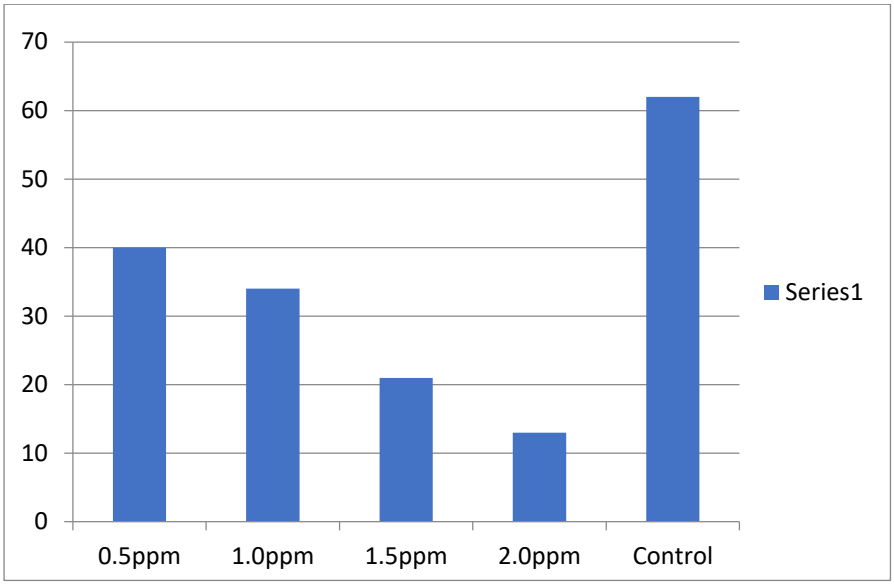
RESULTS

A total number of 40 worms (32 male and 8 female) were recovered from group one animals infected with cercaria attenuated with 0.5ppm of the extracts. Worms burden of 34 (25 males and 9 females), 21 (15 males and 6 females) 13 (9 males and 4 females) were recovered from groups 2,3 and 4 infected with cercaria attenuated with 1.0ppm, 1.5ppm and 2.0ppm

respectively while the Control group that were infected with un attenuated cercaria had a worm burden of 62(48 males and 14 Females) out of which 6 were paired worms. This is shown in the table below. The Liver of infected animals in the control group had some degree of mottling as a result of eggs deposited by the parasites while liver of all other animals had no mottling.

Table Showing number of worms recovered from experimental mice after exposure to *Schistosoma mansoni* cercaria attenuated with methanolic extract of *Jatropha curcas* at different concentrations.

Experimental group	No of Animals	Worms recovered Male Female Paired	Mean	% reduction in worm burden
0.5ppm	5	32 8 0	8	35.4
1.0ppm	5	25 9 0	6.8	45.1
1.5ppm	5	15 6 0	4.2	66.1
2.0ppm	5	9 4 0	2.6	79
Control	5	48 14 (6)	10.2	



Barcharts showing Bars indicating worm burden of experimental mice after exposure to *Schistosoma mansoni* cercaria attenuated with methanolic extract of *Jatropha curcas* at different concentrations.

Discussion

A study was conducted to determine the effect of *Jatropha curcas* extracts on *Schistosoma mansoni* Cercariae. From the study, higher worm burden was observed among the mice in the control group and there were paired worms. This may be due to high susceptibility of albino mice and their inability to produce specific antibodies against the infection. Albino mice were reported to be highly susceptible to *Schistosoma mansoni* infection. (Smitter and Terry, 1977, Purnel 1976. Adamu and Mohammed, 2004).

There was a reduction in worm burden of 35.4% among experimental mice exposed to cercaria attenuated with 0.5ppm of the plant. A reduction in worm burden of 45.1%, 66.1% and 79% were recorded among animals exposed to cercaria

attenuated with 1.0ppm, 1.5ppm and 2.0ppm respectively. These are depicted in the Table and chart below.

This could be attributed to the potency of the extract on the infective form of *Schistosoma mansoni*. The results indicates that higher the concentration, the higher the percentage reduction in worm burden showing that high concentration of *Jatropha curcas* has the ability to attenuate the cercaria thereby reducing their motility and ability to penetrate the mice, similar results have been obtained by Gebrehiwet *et al.,* (2013) when they attenuated the crecaria of Schistosoma with the fruit extract of *Glinus lotoides*. The higher the concentration of the plant extract used to attenuate cercaria, the lower the worm burden recovered from mice. In a related study, Mohammed and Ramzy (2005) reported that the cercariacidal properties of an Egyptian plant *Hanan nigrum* is directly proportionate to the concentration.

The total worms recovered from the entire experiment showed high number of male worms (124) than female worms (35) this is in conformity with the work of Mitchell *et al.,* (1990) Adamu and Mohammed, (2004), and Inbert-establet *et al.,* (1992) and Alzambaghi *et al.,* (2013) who reported larger number of male worms than the females Schistosome in vertebrates.

A significance difference was observed between animals infected with cercaria attenuated with 2.0ppm of *Jatropha curcas* versus the control at $P<0.05$. Similar trend was observed by Hanna *et al.,* (2002) and Alzanbaghi, (2013). The presence of eggs in the control group of mice is not an unusual phenomenon as it was observed in similar experiment by Cheever *et al.,* (1993) and Stirewalt *et al.,* (1951).

Finally, the study has shown that *Jatropha curcas* has shown potency as a cercariacidal plant according to the results of the present study, this is not surprising as the plant and its seed of the plant was reported to have Molluscicidal activity (Liu *et al.,*

2000 and Rug and Rupel, 2000), *invivo* antischistosmal activity in mice (Adamu *et al.*, 2006), reduction in Liver pathology mice treated with the methanolic extracts of the plant (Adamu *et al.*, 2007) in another study Ethanol extract of the plant also showed 82.96% efficacy against *Trypanosoma brucei brucei* in infected mice (Okwor, 2020). The antiparasitic activity of the plant is also reported by Vivina *et al*., against *Haemonchus contortus* infection (Vivina *et al.*, 2011) and a sub specie of *Jatropha*, *Jatropha glaudia* was also reported to have cercariacidal properties Alzambaghy *et al*., (2013) and can therefore be used in control of Schistosomiasis.

From the research, it can also be deduced that *Biomphalaria spp* of snails collected from Yelwa stream in Bauchi Metropolis were found to shed moderate to high number of cercariae which were found to be infective and the stream can serve as an infection focal point as earlier reported by Adamu *et al*., (2001).

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