RESEARCH ARTICLE

Socio-Demographic Determinants of Diabetes among Men attending Tertiary Hospitals in Port Harcourt Metropolis of Rivers State

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Abstract

This study investigated the socio-demographic determinants of diabetes among men attending tertiary hospitals in Port Harcourt Metropolis of Rivers State. The area of this study was tertiary institutions located in Port Harcourt metropolis whiz are University of Port Harcourt Teaching Hospital and Braithwaite Memorial Specialist Hospital. A hospital-based descriptive cross sectional survey design was adopted for the study. An estimated population of 1,865,000 men. Date was collected from 650 patient folders in both facilities. The proforma was used to collect data for the study. Data collected for this study were analyzed using Statistical Products for Service Solution (SPSS) version 25.0. The findings of the study illustrated that a statistically significant relationship between age and diabetes ($p<0.05$) specifically, men aged $\geq$70yrs years were about five times likely to be diabetic (OR= 5.15, 95%CI: 2.01–5.27) compared to those who were younger, aged 20-29 years. The findings of the study revealed that a non-significant relationship between occupation and diabetes ($p>0.05$). The result indicated that those who were overweight were about two times more likely to be diabetic (OR= 2.03, 95%) compared to those who were underweight, while those who were underweight were 1.15 times less likely to be diabetic. The findings of the study showed a statistically significant relationship between family history and diabetes ($p<0.05$). The findings of this study concluded that factors that determines diabetes were age, body mass index, family history while occupation showed insignificant. It was recommended among others that government should organize health education programme to address obesity, and non-diverse diets as necessary so as to reduce the occurrence of diabetes and others metabolic disorders.

Keywords: Determinants, diabetes, men, tertiary hospitals, Rivers state.

1. Introduction

Diabetes is condition that is characterized by either the inability of the pancreas to produce enough or required amount of insulin or when the body system cannot effectively use the insulin it produces (World Health Organization, 2021). Insulin is a hormone secreted by endocrine gland called the alpha cell of the pancreas that regulates the amount of glucose in the blood. The increase in glucose level in the blood is referred to as hyperglycaemia with the resultant effects of uncontrolled diabetes which over time leads to serious damage to many of the body's system.

Globally, WHO (2021) reported that in 2014 the prevalence of diabetes was 8.5% among adult aged 18 years and above and in 2019 diabetes was the direct cause of 1.5 death while 48% of all death was due to diabetes that occurred among older adult before the age of 70%. Diabetes is a serious health problem today, and has become a priority that requires urgent attention by world leaders. In the past few decades, both the number of cases and it prevalence rate is on the increase (WHO, 2014). In order to understand diabetes, it is it necessary to understand the normal physiological process occurring during and after

meal. Food passes through the digestive system where nutrients including protein, fats and carbohydrates are absorbed into the blood stream. The presence of sugar, a carbohydrate sends signal to the endocrine gland mostly pancreas to secrete required amount of insulin. Insulin causes the uptake and storage of sugar by almost all tissue type in the body, particularly fat tissue, liver and muscles. Diabetes is a disease that results from the presence of too much sugar in the blood. It also affects how the body uses blood sugar (glucose). Nyenwe, et al (2003) described this health problem as clinically classified by World Health Organization as Diabetes Mellitus, which is further classified as Type 1, and Type 2. The normal functioning of the body requires glucose, because it is an important source of energy used by the muscles, tissues, and the brains main fuel source. Diabetes underlying cause varies by type, and in all types' excess sugar in the blood is recorded. Diabetes mellitus is seen as a common and devastating chronic illness that has affected the health of mankind adversely (Aldasoqui & Alzahrani 2010). Diabetes generally disrupts the normal functioning of the body system, mainly due to hyperglycaemia. The existing case of diabetes in the population is high as it is an endemic disease. World Health Organization (2020) reported in developing countries leads the world with over 32million diabetes patients and project an increase to 79-4million by 2030. Diabetes is a terminal illness that is not easily managed successfully, because the sufferer meeting all the demands of self-management is difficult. The demands ranges from measurement of glucose level through several finger pricks, need to estimate the quantity of carbohydrates in the diet, insulin injection on multiple basis, hypoglycaemia prevention and treatment. Health care providers face great challenges, as they try to address the continued needs and demands of people suffering from diabetes. Diabetic patients' needs are not limited to blood sugar control but also prevention of health complications. In recent time, more responsibility has been shifted to diabetic patients, through the introduction of blood glucose monitors, glycosylated hemoglobin. Nigeria precisely Port Harcourt has suffered so much from this menace called diabetes mainly due to lifestyle, reported family history (genetic factor), age related factor, among others. Age of men could be predisposing or determinant factors to diabetes. This is because as a man advance in his age so there is degeneration of cellular growth and metabolic functions such as dysfunctions of the pancreatic glands. It could be pertinent that men over the age of 50 years are risk of diabetes as compared with young men as their body is active. National Health Insurance Scheme (NHIS 2005) reported that age adjusted men prevalence of diabetes rose over 4.5% for the past five years. Ali et al (2018) illustrated that age of men statistically significant associated with the occurrence of diabetes (p<0.001). Abdulrahman and Omar (2013) indicated in their study that there was significant variation in the knowledge of diabetes among mothers with different ages (p<0.05). Previous studies reported that diabetes in developing countries to which Nigeria is inclusive are within the age range of 30 to 60, this age range can be described as productivity age range. Siddique et al (2017) illustrated that respondents over 50 years are over 5 times more likely to suffer for diabetes as they continue to increase or advance in their age. The socioeconomic status is the standard of living of the population especially occupation has effect of the well-being of the men. It could be clear that men with low socioeconomic status may not be able to manage his health such as having consideration on the dietary intake. Siddique et al (2017) illustrated that income status of the respondents was statistically associated with the prevalence of diabetes (p<0.001). Ali et al (2018) revealed that low socioeconomic status of men showed negative attitude towards diabetes and indicate a sign of diabetes prior to diagnosis. Family history could be another factor that predispose to diabetes because this metabolic disorder has been linked with genetic undertone. It could possible that if diabetes was identified in the family that there is a likelihood that it can be a sex-link disease because trait and conditions are possibly transmitted from parent to offspring. Asamoah-Boaheng, et al (2019) revealed that family history of diabetes are about 4 times more likely to significantly associated with diabetes among respondents. Previously, Jenum et al (2005) revealed that men from families with reported case of increase glucose level are likely to develop diabetes in future as they grow older. Recently, studies of Uloko, et al (2018) in Nigeria indicated that family history of diabetes are over 4 times likelihood to determine increase prevalence of diabetes in future especially among men. Jenum et al (2005) revealed that low educational level has high odd ratio to contributes to persistent diabetes among men as compared with high educated respondents. Contrary, Talukder and Hossain (2020) illustrated that the occurrence of diabetes was 62% higher for respondent with higher educated participants, 42% higher for the individuals who came from rich family. Additionally, Mirzaei, et al (2020) showed a significant association between

diabetes prevalence rate and education (P<0.0001). The adverse effects of diabetes mellitus in Nigeria and the world at large cannot be overemphasized. Diabetes has contributed to millions of deaths among population of low- and middle-income countries including Nigeria. In adult, diabetes has a two-to-three-fold increased risk of heart attacks and stroke. Several factors have contributed or predict the occurrence of diabetes among the population especially men.

2. Objectives of the Study

The aim of this study was to investigate the socio-demographic determinants of diabetes among men attending tertiary hospitals in Port Harcourt Metropolis, Rivers State.

2.2 Hypotheses

1. There is no significant association between age and diabetes among men attending tertiary hospitals in Port Harcourt Metropolis of Rivers State.

2. There is no significant association between occupation and diabetes among men attending tertiary hospitals in Port Harcourt Metropolis of Rivers State;

3. There is no significant association between body mass index and diabetes among men attending tertiary hospitals in Port Harcourt Metropolis of Rivers State;

4. There is no significant association between family history and diabetes among men attending tertiary hospitals in Port Harcourt Metropolis of Rivers State;

3. Methodology

Study setting: The study settings were University of Port Harcourt Teaching Hospital and Braithwaite Memorial Specialist Hospital all which are located in Port Harcourt metropolis of Rivers State, Nigeria. UPTH is located along East west road of Port Harcourt which is most tertiary hospital in the Rivers State exhibiting tertiary care and research facility comprised of 500 beds.

Research Design: A hospital-based descriptive cross sectional survey design was adopted for the study. A 2 years retrospective study of all cases of diabetes managed at the tertiary hospitals in Port Harcourt metropolis was conducted.

Population of the Study: In this study, the population may be made up of people living in Port Harcourt metropolis, especially those within the age bracket of 20-55 and above men were used for the study. It has an estimated population of 1,865,000 men was use for the study (Demographic World Urban Areas, 2016). a proforma was used to collect data from 650 patient folders/case notes tertiary hospitals for the study. The proforma was validated by three experts who included a statistician, a professionals in public health and internal medicine. The validated proforma was used to collect data based on referred and diagnosed cases of diabetes me from the patient's folder and case note which was used for study. Proforma does not undergo reliability test but was checked on whether it can obtain information recorded on the patient's folder or case note for a specific duration.

Data analysis: Data collected for this study were analyzed using Statistical Products for Service Solution (SPSS) version 25.0. Inferential statistical tools such as multiple regression model was used test the null hypotheses at 0.05 alpha level.

3.1 Findings

Hypothesis 1: There is no significant relationship between age and prevalence of diabetes among men attending public health facilities in Port Harcourt

Table 1. *Binary logistic regression showing relationship between age and prevalence of diabetes among men attending public health facilities in Port Harcourt*

Age	Normal F(%)	Diabetic F(%)	Total	p-value	Odds Ratio (OR)	95%CI	
						Lower	Upper
20-29yrs	1(14.3)	6(85.7)	7(100)	0.00*	Ref.		
30-39yrs	3(25.0)	9(75.0)	12(100)		1.50	1.04	6.01
40-49yrs	30(61.2)	19(38.8)	49(100)		2.10	1.01	2.94
50-59yrs	45(47.9)	49(52.1)	94(100)		3.18	1.02	3.56
60-69yrs	106(50.7)	103(49.3)	209(100)		4.16	1.01	4.36
≥70yrs	82(52.6)	74(47.4)	156(100)		5.15	2.01	5.27

*Significance

Table 1 revealed the binary logistic regression of relationship between age and prevalence of diabetes among men. On bivariate analysis, the findings of the study showed a statistically significant relationship between age and diabetes (p<0.05). However, those who were aged 50-59 years were about three times more likely to be diabetic (OR= 3.18, 95%CI: 1.02–3.56), those aged 60-69 years were about four times more likely to be diabetic (OR= 4.16, 95%CI: 1.01–4.36) while those aged ≥70yrs years were about five times likely to be diabetic (OR= 5.15, 95%CI: 2.01–5.27) compared to those who were younger, aged 20-29 years. Thus, the null hypothesis which stated that, there is no significant relationship between age and prevalence of diabetes among men attending public health facilities in Port Harcourt was rejected.

Hypothesis 2: There is no significant relationship between occupation and prevalence of diabetes among men attending public health facilities in Port Harcourt

Table 2. *Binary logistic regression showing relationship between occupation and prevalence of diabetes among men attending public health facilities in Port Harcourt*

Occupation	Normal F(%)	Diabetic F(%)	Total	p-value	Odds Ratio (OR)	95%CI Lower	95%CI Upper
Business	93(47.0)	105(53.0)	198(100)	0.72*	Ref.		
Retired	74(52.1)	68(47.9)	142(100)		.76	.48	6.01
Civil servants	85(54.5)	71(45.5)	156100)		.69	.44	2.94
Public servant	6(66.7)	3(33.3)	9(100)		.80	.42	3.56
Lecturer	2(100)	0(0.00)	2(100)		.41	.10	4.36
Students	2(40.00)	3(60.0)	5(100)		.00	.00	5.27

*Not Significance

Table 2 revealed the binary logistic regression of relationship between age and prevalence of diabetes among men. The result indicated that those who were lecturers were 2.44 times less likely to be diabetic (OR= 0.41, 95%CI: 0.10–4.36), and public servants were 1.25 less likely to be diabetic (OR= 0.80, 95%CI: 0.42–3.56) compared to those who were into business. On bivariate analysis, the findings of the study showed a non-significant relationship between occupation and diabetes (p>0.05). Thus, the null hypothesis which stated that, there is no significant relationship between occupation and prevalence of diabetes among men attending public health facilities in Port Harcourt was not rejected.

Hypothesis 3: There is no significant relationship between weight and prevalence of diabetes among men attending public health facilities in Port Harcourt

Table 3. *Binary logistic regression showing relationship between weight and prevalence of diabetes among men attending public health facilities in Port Harcourt*

Weight	Normal F(%)	Diabetic F(%)	Total	p-value	Odds Ratio (OR)	95%CI Lower	95%CI Upper
Underweight	11(44.0)	14(56.0)	25(100)	0.01*	Ref.		
Normal	209(53.3)	183(46.7)	392(100)		.87	.71	1.06
Overweight	28(49.1)	29(50.9)	57(100)		2.03	.61	2.74

*Significance

Table 3 revealed the binary logistic regression of relationship between weight and prevalence of diabetes among men. The result indicated that those who were overweight were about two times more likely to be diabetic (OR= 2.03, 95%CI: 0.61–2.74) compared to those who were underweight, while those who were underweight were 1.15 times less likely to be diabetic (OR= 0.87, 95%CI: 0.7–1.06) compared to those who were underweight. On bivariate analysis, the findings of the study showed a statistically significant relationship between weight and diabetes (p<0.05). Thus, the null hypothesis which stated that, there is no significant relationship between body mass index and prevalence of diabetes among men attending public health facilities in Port Harcourt was rejected.

Hypothesis 4: There is no significant relationship between family history and prevalence of diabetes among men attending public health facilities in Port Harcourt

Table 4. *Binary logistic regression showing relationship between family history and prevalence of diabetes among men attending public health facilities in Port Harcourt*

Family history*	Normal F(%)	Diabetic F(%)	Total	p-value	Odds Ratio (OR)	95%CI	
						Lower	Upper
Father	7(41.2)	10(58.8)	17(100)	0.04*	Ref.		
Mother	8(47.1)	9(52.9)	17(100)		1.12	.43	2.91
Brother	1(50.0)	1(50.0)	2(100)		1.01	.06	5.98
Sister	4(0.00)	0(0.00)	4(100)		.00	.00	.00
Yes(Not specified)	27(41.5)	38(58.5)	65(100)		1.41	.85	2.30
None	220(52.1)	202(47.9)	422(100)		0.45	.07	.93

*Significance

Table 4 revealed the binary logistic regression of relationship between family history and prevalence of diabetes among men. The result indicated that those whose mother had diabetes were 1.12 times more likely to be diabetic (OR= 1.12, 95%CI: 0.43–2.91) and those whose brothers were had diabetes were 1.01 times more likely to be diabetic (OR= 1.01, 95%CI: 0.06–5.98) compared to those whose fathers were diabetic. On bivariate analysis, the findings of the study showed a statistically significant relationship between family history and diabetes (p<0.05). Thus, the null hypothesis which stated that, there is no significant relationship between family history and prevalence of diabetes among men attending public health facilities in Port Harcourt was rejected.

4. Discussion

4.1 Age as a Determinant of Diabetes

The findings of the study illustrated a statistically significant relationship between age and diabetes (p<0.05) specifically, men aged ≥70yrs years were about five times likely to be diabetic (OR= 5.15) compared to those who were younger, aged 20-29 years. The result of this study is not surprising because as one advances in age is deterioration of body system which affect the metabolic activities. The result of this study is in credence with studies of Li, et al (2022) that the associated risk factors identified for diabetes was age especially a high prevalence of diabetes among adults. The result of this study is in credence with Talukder and Hossain (2020) that the prevalence of diabetes was found to be 33.3% in 50–54 age group of adult men. Uloko, et al (2018) affirmed that older men are over 6 times more likely to come down with diabetes with the high prevalence of diabetes mellitus. Nordström, et al (2016) added that the prevalence of type 2 diabetes was 14.6% in men and was statistically associated with age especially in older men. Yang, et al (2010) buttressed that the prevalence of diabetes increased with increasing age (3.2%, 11.5%, and 20.4% among persons who were 20 to 39, 40 to 59, and > or = 60 years of age, respectively). It is plausible that the chances of developing diabetes increase as a man advances in his age because of physiological functions may reduce especially in metabolizing sugar or glucose. As of the time of this study, there was no prior studies that contradict with the findings of this study but the differences in the result were based on sample and design of the study. Hence age is a risk factor of diabetes among men.

4.2 Occupation as a Determinant of Diabetes

The findings of the study showed a non-significant relationship between occupation and diabetes (p>0.05). The result of this study is necessary because the type of job perform by men determine the physicality and whether he would come down with diabetes. The result of this study is in line with Wang, et al (2017) and Mayega, et al (2013) that men whose occupation involve physical activity were less related with the likelihood diabetes while the prevalence of diabetes was high among men whose occupation does not support physical activity. The result of this study is concurrent with Uloko, et al (2018) and Nordström, et al (2016) that occupation of men showed no significant association with development of diabetes especially among casual and temporary staff. In the contrary, Mihardja, et al (2009) and Jenum et al (2005) whose studies revealed that occupation showed a significant relationship among respondents. The variation between the prior studies and current studies were due to sample and design of the study.

4.3 Body Mass Index as Risk Factor of Diabetes

The result indicated that those who were overweight were about two times more likely to be diabetic (OR= 2.03) compared to those who were underweight, while those who were underweight were 1.15 times less likely to be diabetic. The result of this study

is expected because as one increase in weight as a result of high amount of calories so one has a high likelihood of developing diabetes. The result of this study is in credence with Li, et al (2022) that the prevalence of pre-diabetes was 10.92% obesity and triglycerides (TG) and high-density lipoprotein cholesterol (HDL-C) were significantly associated with risk factors of diabetes. Yang, et al (2010) that the prevalence of diabetes was among men with the body weight of over 30.0 amounting to 18.5% rate. Talukder and Hossain (2020) illustrated in their study that obese person is more likely to be diabetic than un-obese person. Zhang et al (2019) affirmed that men with high weight are about 3 times more likely to come down with diabetes than low weight men. Mayega, et al (2013) indicated that the prevalence of AGR was 2 times higher among obese persons compared with normal BMI persons. The result of this study is in corroboration with Nordström, et al (2016) that BMI was slightly higher in men than in women (27.3 vs 26.6 kg/m2; P = .01), with a greater difference in mean visceral fat mass (P < .001) It is plausible that high intake of calories rapidly increases the weight of the body and sugar may likely to be high resulting into development of diabetes. In the contrary, Nordström, et al (2016) reported that body mass index was not associated the prevalence of diabetes among the population. As of the time of this study difference between the prior findings and current study was due to sample and design of the study. Hence, body mass index could be a risk factor of diabetes among men.

4.4 Family History as a Determinant of Diabetes

The findings of the study showed a statistically significant relationship between family history and diabetes (p<0.05). The result of this study is expected because if diabetes has been diagnosed in the family over the recent times it is more likely that people of same genealogy are likely to develop diabetes. The result of this study is in line with Talukder and Hossain (2020) that the prevalence of diabetes was high among men with reported cases of diabetes among parents. Pati, et al (2019) affirmed that diabetes was significantly associated with family history of diabetes and more prevalent among men from diabetes reported families. Wang, et al (2021) revealed that diabetes is traceable to family history among male population. Mirzaei, et al (2020) showed a significant association between diabetes prevalence and positive family history (P<0.0001) with high prevalence rate among men with diagnosed case of

previous medical condition. Asamoah-Boaheng, et al (2019) revealed that family history of diabetes are about 4 times more likely to significantly associated with diabetes among respondents. Previously, Jenum et al (2005) revealed that men from families with reported case of increase glucose level are likely to develop diabetes in future as they grow older. Recently, studies of Uloko, et al (2018) in Nigeria indicated that family history of diabetes are over 4times likelihood to determine increase prevalence of diabetes in future especially among men. Previous medical history on most degenerative ailments may contributes to the development of metabolic disorder such as hyperglycaemia or increase glucose in the blood. It is plausible that diabetes has a genetic trait that can be transmitted from parents to offspring. As cases of diabetes is diagnosed in the family so as there is increase chances of developing diabetes future. As of the time of this study, there was no prior studies that are in contrary with the outcome of this study. Hence, family history is a risk factor of diabetes.

5. Conclusion

The findings of this study concluded that the prevalence of diabetes was determine by socio-demographic factors was high among men which were age, family history, while occupation showed insignificant.

Recommendations

In regards to this study, the following recommendations were made:

1. Government should organize health education programme to address obesity, insufficient physical activity and non-diverse diets as necessary so as to occurrence of diabetes and others metabolic disorders.

2. Diabetic counseling on physical activity by physicians during routine visits, along with tailored or patient-specific interventions should be considered for vulnerable group.

3. Government should focus on social support for positive behavioral changes and motivation play a central role in diabetes control among population. This in turn would improve health lifestyles such as inculcating physical activity, and dietary regulation among others

4. Individual should prioritize their health seeking for early diagnosis of glucose test to ascertain the health status so that proper care and management would give to reduce the severity of metabolic disorder.

5. Government should provide welfare service to diagnosed patients of metabolic disorder such as diabetes in order to control and adequate care.

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