

Knowledge and perception of diabetes mellitus among civil servants in Oyo state, Nigeria

Oluwatosin T. Ola^{1*}, Akintayo O. Ogunwale² and David B. Olawade³

¹Department of Health Promotion and Education, University of Ibadan, Nigeria

²Department of General studies, Oyo State College of Agriculture and Technology, Igboora, Nigeria

³Department of Environmental Health Sciences, University of Ibadan, Ibadan, Nigeria

Corresponding author: Oluwatosin Ola **E-mail:** oluwatosinola44@gmail.com

Received: 4 February 2021

Revised: 19 March 2021

Accepted: 27 March 2021

Available online: May 2021

ABSTRACT

Diabetes mellitus (DM) is a public health problem worldwide. This study was designed to investigate the knowledge and perception of DM among civil servants at the Oyo State Government Secretariat, Ibadan, Nigeria. A cross-sectional design was adopted and a multi-stage sampling technique was used to select 446 civil servants from 10 randomly selected parastatals at the Government Secretariat. A semi-structured questionnaire which included a 30-point DM knowledge scale and a 16-point DM perception scale was used to collect data. Data were analyzed using descriptive statistics, T-test and ANOVA at $p < 0.05$. Respondents' ages ranged from 26 - 59 years with a mean of 41.1 ± 8.3 years. Mean knowledge score of respondents was 15.7 ± 5.3 . Many participants (44.8%) had fair knowledge. Respondents' mean perception score was 10.9 ± 9.0 , with 22.2% having a risky perception of diabetes. Many (63.7%) participants perceived the disease to be a serious health problem. Respondents aged <30 years were significantly more knowledgeable about diabetes ($P=0.001$, $X^2=23.034$) than others. Only age, marital status and ethnic group were demonstrated to have an association with overall knowledge ($P<0.05$), while age and ethnic group were associated with overall perception ($P<0.05$). A great proportion of participants had fair knowledge of DM, implying gaps in knowledge of the disease. In addition, risky perceptions relating to DM exist among them. Workplace educational interventions as well as advocacy are recommended to address these concerns.

Key words: civil servants, diabetes mellitus, diabetes- related knowledge, diabetes related perceptions

INTRODUCTION

Diabetes mellitus is a chronic disease caused by inherited and/or acquired deficiency in production of insulin by the pancreas; it could also be due to the ineffectiveness of the insulin produced.¹ The condition results in increased concentrations of glucose in the blood and the damage of many of the body's systems, including the blood vessels and nerves.¹ Diabetes mellitus is one of the major Non-Communicable Diseases (NCDs) of public health concern worldwide.¹⁻² A Recently compiled data by WHO, 2018 showed that approximately 150 million people have diabetes mellitus worldwide; it is been estimated that this number may double by the year 2025. About 70–80% of the disease burden is borne by the developing countries.³ Diabetes has negative effect on work productivity and leads to high economic burden in terms of healthcare expenditure.⁴ Most persons with diabetes in developing countries are persons within 35 to 64 age range and this age range includes a significant segment of the productive work force.¹ The high prevalence of diabetes mellitus is strongly related to the various risk factors which include the following: aging of the populations, urbanization, unhealthy diets, obesity and socio-economic changes which favor sedentary habits and alcohol consumption.⁵

Epidemic of diabetes is increasing around the world and awareness of this disease remains low.¹ Lack of knowledge about diabetes is common among various categories of adult populations in Nigeria and in many African countries.⁶⁻⁸ A study conducted among Outpatients in Imo State, Nigeria revealed that 40% of the respondents did not know the cause of diabetes, while a few attributed it to pregnancy and hypertension.⁹ Similarly, many people have misconception related to the causes and control of diabetes

mellitus.¹⁰ A study conducted among employees of Onitsha North Local Government Area, Anambra State, Nigeria revealed that Only 39.9% of the participants correctly associated the disease to lack of insulin while 30.8% linked it with failure of the body to use insulin. Majority of the participants (72.2%) perceived the disease to be due to consumption of lots of sugary substances while 34% perceived the disease could be caused by poison.¹⁰

As a result of modernization and adoption of western lifestyles in Nigeria, the burden of diabetes is on the rise among various segment of the population including civil servants and top executives.¹¹ Awareness and Knowledge of diabetes, its risk factors, complications and management are important aspects for better control and better quality of life.¹² Research revealed that risk perception regarding the development of diabetes is rather low among lay people as well as among certain health professionals.^{13,14,15}

A study carried out in Nigeria among civil servants revealed that only 28% of respondents agreed with statements relating to willingness to engage in physical activity, changing eating habits and maintaining “good” body weights by.¹⁶ Previous studies conducted in Nigeria have observed that many public service workers/ civil servants adopt unhealthy lifestyles including reduced physical activity, excessive intake of calories and sedentary lifestyles, which directly contribute to the problem of obesity and diabetes.^{16,17}

It has been noted that to combat diabetes in Nigeria, it would be best achieved by continuous monitoring and assessment.¹⁸ Health Information can help people assess their risk of diabetes, motivate them to seek proper treatment and care, and inspire them to take charge of their disease.⁶ Awareness of the level of knowledge and perception of diabetes mellitus among the civil servants is crucial

as baseline information for designing educational interventions aimed at preventing and controlling the disease among them. Hence, the research was therefore designed to investigate the knowledge and perception relating to diabetes among civil servants at the Oyo state secretariat, Agodi, Ibadan, Nigeria.

METHODS

Study design and setting

The study was a descriptive cross-sectional survey. It focused on Civil servants at the state secretariat, Agodi Ibadan. The model adopted to guide this study is the Health Belief Model (HBM). The study was carried out at the Oyo State Secretariat, Agodi, Ibadan among Civil servants. Ibadan is the capital of Oyo state in the south-west geopolitical zone in Nigeria. The state covers a total of 28,454 square kilometers of land mass. Based on the last population census conducted in 2006, Oyo State is the fifth most populated State in Nigeria and the second most populated in south-west geopolitical zone with a population of 5,580,894.¹⁹ The 2019 projected population for Oyo State is close to 8 million.¹⁹ Oyo state consists of 33 Local Governments and 29 local Council Development areas. The state secretariat is located in Ibadan North Local Government Area of Oyo state. The Secretariat which is the administrative headquarters of the Oyo state Government has 37 Government parastatals with a total of 8,650 civil servants. The parastatals are grouped into Ministries, Departments and Agencies.²⁰

Study Population and Sampling

The study population consisted of civil servants of both sexes and varying socio-demographic characteristics who work in various Government parastatals located at the State Secretariat, Agodi, Ibadan. Junior civil servants who were on

contract employment such as cleaners and security guards were excluded from the study. Civil servants who were on posting outside the State Secretariat as well as those who work with agencies that are not resident within the secretariat premises were also excluded from the study. The minimum sample size required was calculated using the Leslie-Kish formula for estimating sample size for a single proportion. A three step multistage sampling technique was used to select 446 civil servants from the parastatals. Firstly, simple random sampling was used in selecting ten of the thirty seven parastatals in the State Secretariat; this was done to ensure a fair representation of the entire population. Each parastatal has various units of operations. Consequently, Proportionate sampling was used to determine the number of civil servants to be recruited from each of the ten selected parastatals. Lastly, each unit in all the ten selected parastatals was visited and simple random sampling using balloting was employed in selecting participants across the various units. The data collection was done for a period of four weeks. The administration of the questionnaires was done during the official working hours (from 8am-4pm) at the State Secretariat.

Instruments for Data Collection

A pre-tested researcher-designed semi-structured questionnaire was used to facilitate the process of data collection for the study. The questionnaire was used to capture information about the respondents' socio-demographic characteristics, knowledge of diabetes mellitus and perceptions relating to diabetes mellitus. The socio-demographic information assessed were age, gender, ethnicity, religion, marital status, highest level of education and parastatal of affiliation. For the purpose of analysis, the ethnic groups were categorized as Yoruba, Hausa, Igbo

and others (Akwa-Ibom and Ibibio). Respondents' knowledge was measured using a 30-point diabetes knowledge scale that captured various pertinent issues including definition, risk factors and symptoms of diabetes mellitus as well as complications that could result from untreated diabetes mellitus and measures for preventing complications of diabetes mellitus. Overall, the 30-point diabetes knowledge scale covered 29 items. All the 29 items except one (definition of diabetes mellitus) was given a score of either 1 or 0 depending on appropriateness of the option. The item/question on definition of diabetes mellitus was given scores between 2 – 0. Respondents' knowledge scores were categorized as poor, fair or good. Scores of <50 percentile (i.e. <15 points) were grouped as poor; scores of 50 – <75 percentile (i.e. 15 – 22 points) were grouped as fair while 75 percentile and above (i.e. scores of 23 – 30 points) were grouped as good knowledge. Respondents' diabetes mellitus perception was measured using a 16-point diabetes mellitus perception scale that covered 16 perception items, focusing on perceived susceptibility to diabetes mellitus, perceived seriousness of diabetes mellitus, perceived barriers to diabetes mellitus prevention as well as perception related to diabetes prevention through lifestyle modification. Perception scores were categorized as non-risky (appropriate) or risky (inappropriate). Perception Scores of <50 percentile (i.e. <8 points) were categorized as risky while 50 percentile and above (8 – 16 points) were grouped as non-risky. Risky perception of diabetes within the context of this study implies a perception which is not in line with the biomedical world view. They are perceptions which have potential for predisposing people to diabetes. On the other hand, a non-risky perception was operationally defined as a perception which is in line with the biomedical world view.

The study instrument was developed in English language and peer-reviewed to ensure its validity. The instrument was then pre-tested among 45 civil servants (approximately 10% of the sample size) at the Ilorin Secretariat, Kwara State. Copies of the pretested questionnaire were coded and Cronbach's alpha analysis of SPSS was carried out to determine the internal consistency of the items in the questionnaire. The Cronbach's alpha value obtained was 0.70.

Data Analysis

Copies of the questionnaires were collated, cleaned and assigned serial numbers to prevent the possibility of having missing questionnaires. The responses in each questionnaire were hand-coded with the aid of a coding guide. Data entry and analysis were facilitated by Statistical package for Social Sciences (SPSS) version 21. Descriptive statistics including mean, standard deviation, frequency distribution, percentages and charts were used to present univariate data. T-test and ANOVA statistics were used to test the association between dependent and independent variables at a level of significance set at 0.05. Independent variables that were considered include respondents' age, sex, highest education qualification and some other socio-demographic characteristics. The dependents or outcome variables measured in the study include knowledge of diabetes and perception of diabetes.

Compliance with Ethical Standards

The ethical principles guiding the use of human participants in research were adhered to. Ethical approval was sought from the Oyo State Ministry of Health Ethical Review Committee. Information relating to the objectives and nature of the research was provided and clarifications were made so that participants could decide whether to freely participate or not.

Participation in the study was made voluntary and written informed consent was obtained from each participant prior to enrolment in the study.

RESULTS

The socio-demographic characteristics of the respondents' are presented in **Table 1**. The respondents' ages ranged from 26 - 59 years with a mean of 41.1 ± 8.3 years. Respondents aged 40 - 49 years topped the list. Nearly all the respondents had tertiary education. Majority were married and from the Yoruba ethnic group. Respondents in the Accountant General's office topped the list. Results relating to awareness of diabetes mellitus are illustrated in **Table 2**. The three top sources of information on diabetes mellitus were Television (54.7%), Radio (52.0%) and Friends (51.0%). Many of the civil servants had never attended any educational session on diabetes mellitus. Majority were not aware of persons with diabetes and only few had received advice from persons with diabetes. The proportions of respondents with good, fair and poor knowledge of diabetes mellitus were 39.5 %, 44.8%, 15.7% respectively as shown in **Figure 1**. Knowledge of diabetes mellitus related issues are shown in **Table 3**. The mean knowledge score was 15.7 ± 5.3 . The correctly mentioned causes of diabetes mellitus included: too much consumption of sugary substances or drinks, too much alcohol consumption, heredity, lack of physical activity, obesity and smoking of tobacco products. The symptoms of diabetes mellitus correctly listed by respondents included frequent and excessive urination, delay in healing of wounds, weight loss and excessive thirst. Majority (62.6%) correctly stated Leg ulcers that would not heal, as a complication of diabetes mellitus. As much as 40.4% and 45.3 % respectively did not

know that hypertension and stroke were complications of diabetes. **Table 4** shows the comparison of respondents' mean knowledge by socio - demographic characteristics. The results show a statistically significant difference ($p < 0.05$) in the mean knowledge scores of respondents by age, marital status and ethnic group. Respondents with non-risky and risky perceptions were 77.8% and 22.2 % respectively as shown in **Figure 2**. Perceived susceptibility and seriousness of diabetes mellitus are highlighted in **Table 5**. Mean perception score was 10.9 ± 9.0 . Majority did not share the view that diabetes mellitus is a disease for old people. About two-third perceived eating all kinds of food as much they could can make them get diabetes. Almost three-quarter (73.8%) were of the view that diabetes mellitus is a disease that is expensive to manage. Majority were of the view that diabetes is a serious health problem which can affect one's social life. Perceptions relating to diabetes prevention through lifestyle modification are shown in **Table 6**. Many were of the view that regular physical exercise cannot prevent diabetes, but can make one fit or healthy. As much as 64.6% of the respondents were of the view that eating fruits and vegetables regularly can help prevent the occurrence of diabetes. **Table 7** shows the comparison of respondents' perception by socio-demographic characteristics. The result showed a statistically significant difference ($p < 0.05$) in the perception scores of respondents by age and ethnic group. The comparison of respondents' mean knowledge score by perception is shown in **Table 8**. The mean knowledge score obtained by respondents with unfavorable perception was 14.9 ± 5.3 . The mean knowledge score obtained by those with favorable perception was 16.4 ± 5.2 . The difference in the mean scores was statistically significant.

Table 1 Socio- demographic characteristics of respondents

Characteristics	Number	%
*Age (N=446)		
<30	40	9.0
30-39	146	32.7
40-49	187	41.9
50-59	73	16.4
Sex		
Male	223	50
Female	223	50
Religion (N=446)		
Christianity	307	68.8
Islam	135	30.3
Traditional worshipper	4	0.9
Marital Status (N=446)		
Not currently married	107	24
Married	339	76
Highest level of Education (n=445)		
NCE	46	10.3
OND	191	26.9
HND	71	15.9
BSC	175	39.2
PGD	29	6.5
Masters	4	0.9
Ethnic Group (N=446)		
Yoruba	386	86.5
Hausa	26	5.8
Igbo	23	5.2
+ Others	11	2.5
Parastatal of affiliation (N=446)		
Office of Accountant General	97	21.7
Ministry of Land, Housing& Planning	96	21.5
Office of State Auditor General	79	17.7
Office of executive Governor	73	16.4
Ministry of Health	34	7.6
Ministry of Finance	19	4.3
Ministry of Trade Investment and Cooperation	16	3.6
Teaching Service Commission	14	3.1
Water cooperation	11	2.5
Ministry of Education	7	1.6

*Mean Age = 41.1±8.3 Range=26-5

± Others= 11 (2.5%) consists of Akwa-Ibom 7 (1.6%) and Ibibio 4(0.9%)

Table2 Awareness of diabetes mellitus

Characteristics	Responses	
	Number	(%)
*Sources of Information on diabetes		
Television	244	54.7
Radio	232	52.0
Friends	228	51.1
Doctors /Health Workers/ Nurses	195	43.7
Parents	186	41.7
News Papers	178	39.9
Health Programs	70	15.7
Commercial Bill Boards	21	4.7
Ever attended any educational session on diabetes		
Yes	165	37.0
No	281	63.0
Awareness of persons with diabetes		
Yes	133	29.8
No	313	70.2
Ever received advice/ counsel from someone living with diabetes		
Yes	83	18.6
No	363	81.4

Multiple response were present

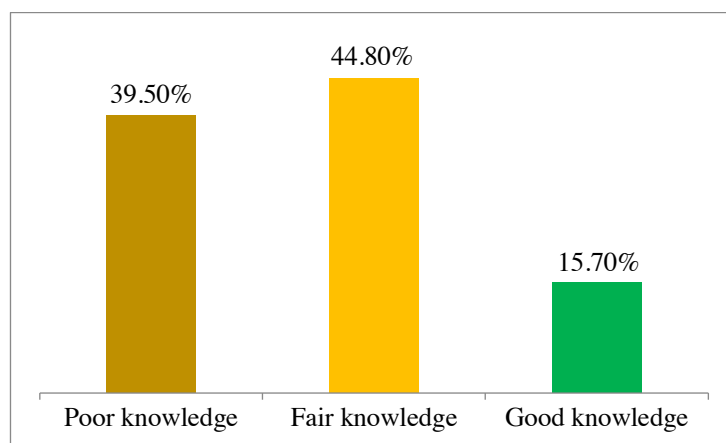
**Figure 1** Participants level of knowledge of Diabetes Mellitus

Table 3 Knowledge of DM among respondents

Causes of diabetes/Predisposing factors	Responses		
	True (%)	Don't know(%)	False (%)
Too much consumption of sugary substances or drinks	345 (77.4) *	17(3.8)	84 (18.8)
Too much alcohol consumption	333 (74.7) *	48(10.8)	65 (14.6)
Heredity/Inheritance	330 (74.0) *	54 (12.1)	62 (13.9)
lack of physical exercise or activity	282 (63.2) *	68 (15.2)	96(21.5)
Obesity (i.e. Fatness)	250(56.1) *	119 (26.7)	77 (17.3)
Smoking of Tobacco products e.g. Cigarette	243 (54.5) *	81 (18.2)	122 (27.4)
Supernatural forces (including witches and wizards	112 (25.1)	102 (22.9)	232 (52.0) *
Old Age	88 (19.7) *	127(28.5)	231 (51.80)
Symptoms of diabetes			
Frequent and excessive Urination	317(71.1) *	117(26.2)	12 (2.7)
Delay in healing of wounds	268 (60.1) *	143 (32.1)	35 (7.8)
Weight Loss	253(56.7) *	124 (27.8)	69 (15.5)
Excessive Thirst	208 (47.6) *	211 (47.3)	27 (6.1)
Complications of untreated diabetes			
Leg ulcers that won't heal	279 (62.6)*	104 (23.3)	63 (14.1)
Blindness	203(45.5) *	147(33.0)	96(21.5)
Kidney failure	160 (35.9) *	156 (35.0)	130(29.1)
Hypertension	158 (35.4) *	180(40.4)	108(24.2)
Stroke	147(33.0) *	202 (45.3)	97 (21.7)

*correct responses

Table 4 Comparison of Respondents' mean knowledge by Socio-demographic Characteristics

	No	$\bar{x}$ knowledge score	Std. deviation	Df	F/t –test	P value
Age						
<30	41	17.90	4.532	3	4.738 **	0.003+
30-39	145	14.63	5.510			
40-49	187	15.73	5.249			
50-59	73	16.22	4.762			
Sex						
Male	233	15.65	5.06	1	2.666 *	0.103
Female	233	15.65	5.48			
Religion						
Christianity	307	15.65	5.449	2	0.028 **	0.973
Islam	135	15.62	4.923			
Traditional worshipper	4	16.25	0.500			

	No	$\bar{x}$ knowledge score	Std. deviation	Df	F/t –test	P value
Marital Status						
Not currently married++	107	17.38	5.376	1	3.969 *	0.000+
Married	339	15.10	5.117			
Highest level of Education						
NCE	46	15.30	5.769	5	1.290 **	0.260
OND	120	15.73	4.819			
HND	71	14.97	4.922			
BSC	175	15.79	5.043			
PGD	29	17.21	7.428			
Masters	4	14.25	8.057			
Ethnic Group						
Yoruba	386	15.25	5.114	3	16.794**	0.000+
Hausa	26	23.23	3.362			
Igbo	23	14.91	2.644			
South-south	11	13.23	4.105			

*Results are based on t-test analyses ** Results are based on F-test analyses

+ Statistically significant ++ Never married+ Single parents

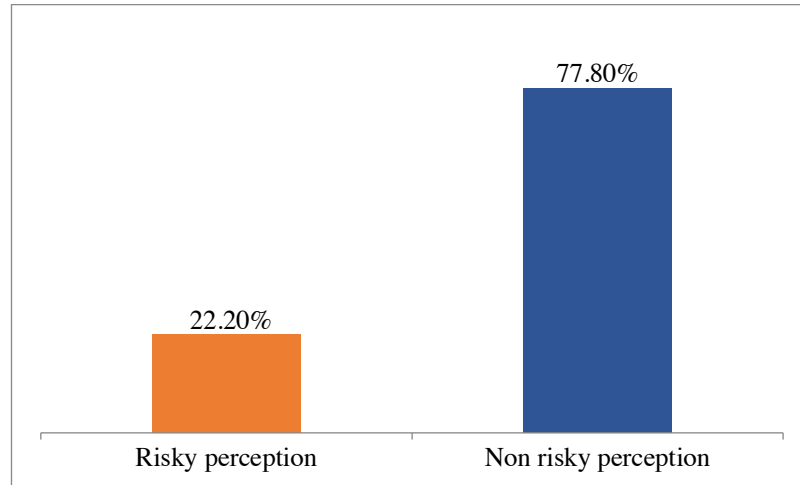


Figure 2 Categorization of respondent's perception

Table 5 Respondents' perception relating to susceptibility and seriousness of diabetes

Perceived susceptibility to diabetes	Responses		
	Agree (%)	Undecided (%)	Disagree (%)
Eating all kinds of food as much as I can cannot make me get DM	93(20.9)	59 (13.2)	294 (65.9) *
Diabetes mellitus is a disease for old people	53 (11.9)	54 (12.1)	339 (76.0) *
Obesity cannot lead to DM	108 (24.2)	151 (33.9)	187 (41.9) *
Taking a lot of alcohol is not anyway related to the occurrence of DM	52 (11.7)	93 (20.9)	301(67.5) *
Perception of seriousness of diabetes			
Diabetes mellitus cannot affect one's social life	95 (21.3)	67 (15.0)	284 (63.7) *
Diabetes mellitus is a disease that can be cured once and for all	56 (12.6)	68 (15.2)	322 (72.2) *
Diabetes mellitus is not a serious health problem	69 (15.5)	93 (20.9)	284 (63.7) *
Diabetes mellitus is not a disease that is expensive to manage	59 (13.2)	58 (13.0)	329 (73.8) *
Diabetes mellitus cannot kill	83 (18.6)	54 (12.1)	309 (69.3) *

* Perception in line with biomedical world view

Table 6 Respondents' perception relating to diabetes prevention through Lifestyle Modification

Perception related to diabetes prevention through Lifestyle Modification	Responses		
	Agree (%)	Undecided (%)	Disagree (%)
Increasing intake of sugar containing foods cannot lead to diabetes mellitus because sugar is needed by the body for energy	111(24.9)	28 (6.3)	307 (68.8)*
Regular physical exercise can be used to make one fit or healthy; it cannot prevent diabetes mellitus	106 (23.8)	54 (12.1)	286 (64.10) *
Reduction of starchy foods only makes one hungry, It cannot prevent Diabetes	130 (29.1)	92 (20.6)	224 (50.2)*
Eating fruits and vegetables regularly can help prevent the occurrence of diabetes	288 (64.6) *	59 (13.20)	99 (22.2)
Reducing alcohol consumption is a means of reducing the possibility of having diabetes mellitus	108 (24.2) *	151 (33.9)	187 (41.9)

* Perception in line with biomedical world view

Table 7 Comparison of Respondents' mean perception score by Socio-demographic Characteristics

	No	$\bar{x}$ perception score	Std. deviation	Df	F/t –test	P value
Age						
<30	41	11.29	1.834	3	2.814 **	0.039+
30-39	145	11.19	2.328			
40-49	187	10.53	2.597			
50-59	73	11.16	2.285			
Sex						
Male	233	10.76	2.332	1	1.433*	0.152
Female	233	11.09	2.489			
Religion						
Christianity	307	10.90	2.506	2	0.416 **	0.660
Islam	135	10.94	2.212			
Traditional	4	12.00	2.000			
Marital Status						
Not currently Married++	107	10.75	2.376	1	0.854 *	0.394
Married	339	10.98	2.428			
Highest level of Education						
NCE	46	11.09	2.085	5	3.183**	0.005
OND	120	10.83	2.643			
HND	71	10.46	2.431			
BSC	175	10.86	2.167			
PGD	29	12.59	2.885			
Masters	4	11.50	2.887			
Ethnic Group						
Yoruba	386	10.74	2.368	3	5.479 **	0.000+
Hausa	26	11.77	3.063			
Igbo	23	12.78	1.278			
South-south	11	11.32	2.208			

*Results are based on t-test analyses ** Results are based on F-test analyses

+statistically significant

++ Never married+ Single parents

Table 8 Comparison of Respondents' knowledge by perception

Typologies of Perception	No	$\bar{x}$ knowledge Score	Std. deviation	Df	t-test	P value
Risky Perception	241	14.99	5.260	1	2.888	0.004 *
Non-Risky Perception	205	16.42	5.177			

**Statistically significant*

DISCUSSION

This study revealed that there are several gaps in respondents' knowledge relating to diabetes mellitus. Far less than half of the respondents knew that blindness, kidney failure, hypertension and stroke, were as a result of untreated diabetes mellitus. This is a gap in knowledge which needs to be bridged because untreated diabetes mellitus can lead to severe complications which can eventually lead to death. Less than half believed that excessive thirst (wanting to drink water all the time) was a symptom of diabetes while slightly above half of the respondents knew that delay in healing of wound could be a symptom of diabetes. This is different from what was found among outpatients at the endocrinology Clinic of the Federal Medical Centre, Owerri, Imo State, Nigeria.⁹ The observation of this study that many respondents had fair knowledge of the symptoms of diabetes mellitus is different from the pattern noted in a previous study where majority of the respondents in their study had a good knowledge of symptoms of diabetes.⁹ The difference between the findings of these two studies may not be unconnected with the difference in the study settings. Clinic based health talks could have a great influence on the knowledge of the respondents. The finding of this study underscores the need to create awareness

about diabetes across various settings including work place.

The media with special reference to television and radio were the most common sources of assessing information about diabetes mellitus among the respondents. Therefore, health promotion and education intervention involving various strategies can help in promoting behaviors relating to the early detection and management of diabetes mellitus. Public enlightenment for instance is a useful health education strategy which has the potential for reaching a large number of people, it can be used to create awareness relating to diabetes and influence knowledge and perceptions as well as foster political will for action.³

Majority of the respondents in the study were conversant with the causes or factors that can lead to diabetes mellitus. Many respondents were of the opinion for instance that diabetes mellitus could be caused by too much consumption of sugary substances or drinks and excessive consumption of carbohydrate foods. The result of this study supported the results of previous studies conducted in Nigeria which showed that most of the respondents had the knowledge that diabetes is a sugar related disease.²¹⁻²³

Some studies have reported increasing age as a predictor of lower knowledge of diabetes.²⁴⁻²⁵ Other researchers on the other hand have reported no relationship.^{22,26} Interestingly, in this

study, more of the older respondents were found to be more knowledgeable than the younger ones. The reason for this may be due to the fact that the prevalence of diabetes increases with age, with the result that elderly persons are more likely to interact with their peers who have diabetes complications than the younger persons would.

The findings of this study revealed that there are several risky perceptions relating to seriousness of diabetes mellitus among the civil servants. For instance, almost one-quarter of the respondents were of the view that diabetes mellitus is not an issue one should worry about and that diabetes cannot affect one's social life. This reflects a gap in knowledge which needs to be bridged because inappropriate perception of the seriousness of diabetes will hinder adoption of healthy lifestyle which can help prevent diabetes. The results suggest the need for sensitization and creation of awareness regarding the seriousness of diabetes so as to reach out to people who indulge in lifestyle that predispose them to diabetes without knowing the adverse effect of their actions.

More than half of the civil servants did not share the view that diabetes is a disease for old people. This is similar to what was reported in a study carried out among persons with type 2 diabetes in Saudi Arabia which showed that most of the respondents reported a high perceived susceptibility to diabetes.²⁷ This implies that perception of vulnerability to diabetes will encourage people to live a healthy lifestyle thereby reducing their risk of diabetes.

The result of the study which showed that risky perception was associated with lower knowledge of diabetes is not surprising. This implies that for knowledge about diabetes to be improved upon among the civil servants the issue of risky perception needs to be addressed. Studies

on specific health education interventions that can increase the civil servants' knowledge and the correct perception of diabetes should be considered.

IMPLICATIONS FOR INTERVENTION

This study reveals the need for health promotion and education programmes aimed at addressing respondents gaps in knowledge, misconceptions and risky practices relating to diabetes mellitus. Knowing the knowledge and perception of the respondents on diabetes mellitus are important to deliver appropriate diabetes information at work place so that the public service workers can be empowered to manage their health and take measures to prevent and control diabetes mellitus.

Intersectoral collaborations can be used to improve knowledge and perception thereby preventing diabetes among civil servants. For instance, the State Ministry of health can collaborate with the staff clinic at the State Secretariat to create awareness in the work place through health education. This will help in controlling diabetes through promotion of early screening, diagnosis, and initiating of effective treatment which will result in preventing diabetes associated complication and disabilities. The various for a for discussions and meetings among the civil servants should incorporate health talks which involve educating civil servants on diabetes and other Non communicable diseases. This could be used to address the gaps in knowledge and perception of the civil servants relating to diabetes. Since the media was the prominent source of information on diabetes among majority of the respondents, great emphasis on diabetes causes, symptoms, and associated complications has to be given to it. Awareness campaigns have to be done both

at the work place and to the general population. Also behavioral change communication materials can be used and this should carry messages specially designed to take into consideration the socio-demographic characteristics of the study population. It is important that Health Promotion platforms mentioned above should be used to increase the level of education/awareness of the populace.

LIMITATION OF THE STUDY

First, the study was carried out among government workers who were always occupied at work. Participants were very busy at their various offices during the period of the study and data collection. In-order to address this challenge, the data collection process was made flexible. An arrangement was made to administer the questionnaire to each participant when he/she was less busy. The findings of this study can be a representative of the general population.

CONCLUSION

The results indicated that the respondents had a fair knowledge of the symptoms of diabetes. There are gaps in respondents' knowledge relating to complications of untreated diabetes. More than half of the respondents had risky perception of diabetes and there were major misconceptions relating to the perception of susceptibility and seriousness of diabetes among respondents. Health promotion and education play important roles to increase public's awareness of diabetes mellitus. An inter-sectoral collaboration among various institutions is also necessary to reduce the wide spread premature mortality due to diabetes mellitus.

CONFLICT OF INTEREST STATEMENT

The authors declare no competing interests exist.

FUNDING

The authors received no financial support for this study, authorship, and/or publication.

ACKNOWLEDGMENT

The authors would like to acknowledge all the authors whose works were used as reference materials for the design of this study. We particularly appreciate Dr. M. Adebayo and Dr. J Balogun for their valuable contributions to the design of the research instrument used for data collection. We appreciate Mr. J. Akintunde for assisting in supervising the data collectors. We also appreciate Mr. S. Lamidi for assisting in data analysis.

REFERENCES

1. World Health Organization. Global Status Report on Non-Communicable Diseases. Geneva: meeting of the general assembly on the prevention and control of Non- communicable diseases. 2018
2. Shittu RO, Kasali FO, Biliaminu SA. Prevalence of Diabetes and Pre-Diabetes in Oke- Ogun Region of Oyo State, Nigeria. J Med Res Health Educ 2017;(1): 1.
3. Whiting DR, Guariguata L, Weil C, Shaw J. IDF Diabetes Atlas: global estimates of the prevalence of diabetes for 2011 and 2030. Diabetes Res Clin Pract 2011; (94):311–321.

4. Unwin N, Whiting D, Guariguata L, Ghyoot G, Gan D. An overview of management issues in adult patients with type 2 diabetes mellitus. *J Diabetes Sci Technol* 2011; 5(2):245–250.
5. World Health Organization/International Diabetes Federation. Diabetes Action Now. An initiative of the WHO library cataloguing – in – publication data. Geneva 2011;(49): 1-49.
6. Moodley L, Rambiritch V. An assessment of the level of knowledge about diabetes mellitus among diabetic patients in a primary healthcare setting. *South Africa Family Practice*. 2007; 49(10): 16a-16d.
7. Larsson SC, Wolk A. Diabetes mellitus and incidence of kidney cancer: a meta-analysis of cohort studies. *Diabetologia* 2011; (54): 1013–1018.
8. Nwaokoro JC, Oputa RN, Ede AO. Community participation in the prevention of diabetes complications in the South-East, Nigeria. *Am J Sc and Tech* 2014; (1): 69–76.
9. Achigbu EO, Oputa RN, Achebe KI, Ahuche IU. Knowledge and impact of diabetes in patients in a tertiary clinic in Southeast Nigeria. *African journal of diabetes medicine* 2015;(23)1.
10. Uloma-Maurice C, Godswill AN, Dennis OU. Socio-demographic determinants of the knowledge of diabetes mellitus in Onitsha-North Local Government Area, Anambra State, Nigeria. *Orient Journal of Medicine*. 2014; 26:1-2
11. Chinenye S, Uloko AE, Ogbera AO, Ofoegbu EN, Fasanmade OA. Profile of Nigerians with Diabetes Mellitus-Diabcare Nigeria Study Group- Results of a Multicenter Study. *Indian J EndocrinolMetab* 2012; (16): 558-564.
12. Wild S, Roglic G, Green A. Global prevalence of diabetes: estimate for the year 2000 and projections for 2030. *Diabetes Care*. 2004; 127(5): pp1047–1053.
13. Walker EA, Caban A, Schechter CB, Basch CE, Blanco E, DeWitt T. Measuring comparative risk perceptions in an urban minority population: the risk perception survey for diabetes. *Diabetes Educ*. 2007; 33(1):103-10.
14. Weiland TJ, Nguyen M, Jelinek GA. Illness perception and knowledge with regard to prediabetes and type 2 diabetes: a pilot study of emergency department patients and staff. *Eur J Emerg Med*. 2012;19(6):353-8.
15. Pinelli NR, Berlie HD, Slaughter RL, Jaber LA. Risk perception for developing diabetes among pharmacists. *J Epidemiolo Community Health*. 2009; 43(6):1050-6.
16. Oyerinde OO, Owajaiye SO. Dietary, exercise lack and obesity: health consequences of civil-servants in Nigeria in “optimizing performance excellence and wellness through the changing phase of sport, recreation, medicine and exercise science” Proceedings of Fourth International Council for Health, Physical Education, Recreation, Sport and Dance (ICHPER-SD) Africa, RegionalCongress [Internet]. 2008. Available from: <http://www.unilorin.edu.ng/publications/oyerindeoo/dietary.pdf>
17. Oyegbade OO, Abioye-Kuteyi EA, Kolawole BA, Ezeoma IT, Bello IS. Screening for diabetes mellitus in a Nigerian family practice population. *SA Fam Pract* 2007; 49:15-19
18. Afolalu TD, Wada OZ, OlawadeDB, and Suntai AD. Prevalence of Diabetes Mellitus among Adult Residents of Tinda Rural Community, Nigeria. *Journal of Biosciences and Medicines* 2020; 8:107-116.

19. National Population Commission of Nigeria. Nigeria population and Housing Census [Internet]. [cited 2006]. Available from: <http://ghdx.healthdata.org/record/nigeria-population-and-housing-census-2006>
20. Oyo State of Nigeria Book of Estimates. 2017.
21. Okolie UV, Ijeoma EO, Peace IN, Ngozi KI. Knowledge of diabetes management and control by diabetic patient at the federal medical centre Umuahia Abia state, Nigeria. *Int J Med Med sci* 2009;1:353-358.
22. Odili VU, Isibogr PD, Eregie A. Patient's knowledge of diabetes mellitus in a Nigerian city. *Trop J pharmaceutical Res* 2011;(10):637-642.
23. Arugu G, Maduka O. Risk Factors for Diabetes Mellitus among adult Residents of a rural district in Southern Nigeria: Implications for Prevention and Control. *Nigerian Journal of Clinical Practice* 2018;3-4.
24. Rafique G, Azam SI, White F. Diabetes knowledge, beliefs and practices among people attending a university hospital in Karachi, Pakistan. *East Med Health Journal* 2006;(12):590-598
25. West JD, Goldberg KL. Diabetes self care knowledge among outpatients at a Veterans Affairs Medical Center. *Am J Health-Syst Pharm* 2012; (59):849-852.
26. Khan N, Gomathi KG, Shehnaz SI. Diabetes-related knowledge among university students in Ajman, United Arab Emirates. *Sultan Qaboos Univ Med J* 2012; (12):306-314.
27. Albargawi M, Snethen J, Gannass AAL. Perception of persons with type 2 diabetes mellitus in Saudi Arabia. *International journal of Nursing sciences* 2016;3(1):39-44.