Harnessing The Associated Health Risk of Diabetes Among Old Age in Akure Metropolis

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ABSTRACT: The study harness the associated health risk of diabetes among old age in Akure metropolis. It is very important for medical and clinical discipline to examine the quality of life and find opportunity to improve it. Furthermore, it was found that diabetic complications had more impact on the quality of life in patient younger than 70 years (45 – 70 years) and above. Diabetes has become one of the major causes of sudden illness and death in old ages in most places mainly through the increased risk of cardiovascular disease. The sample size of one hundred and fifty (150) respondents was sampled for the study using multi-staged sampling technique fish bowl without replacement. The respondents were drawn from all government owned health institutions in the study area. The instrument for data collection was a self-constructed questionnaire. The split half method of reliability was used to ascertain the reliability of the instrument using Pearson's Product Moment Correlation and Spearman Brown's formula. A coefficient of 0.79 was obtained. Formulated hypotheses were tested using inferential statistics of Analysis of Variance, the hypotheses were tested at 0.05 level of significance. The findings of the study revealed that teeth and gum damage, eye defect and skin damage are effects of diabetes among aged. The researchers recommended that diabetes patients with diagnosed teeth and gum damage should regularly visit dentist for time to time check-up in order to control the effect of the damage of their health. Ministry of health should from time to time make provision for checking of the state of eye of aged mostly the diabetes patients in order to diagnose those with related eye disease and educate them on how to prevent such occurrence. Aged should be careful of the food and drugs they take as this may contribute to diabetes at the old age and contribute to the effects on their skin.

KEYWORDS: Aged, Diabetes, Glucose, Retinopathy

I. INTRODUCTION

Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Insulin is the hormone that controls the amount of glucose (sugar) in the blood. Diabetes mellitus (DM), commonly known as diabetes, is a group of metabolic disorders characterized by a high blood sugar level over a prolonged period of time (World Health Organization {WHO}, 2014). d'Emden, Shaw, Jones and Cheung (2015) defined diabetes as a chronic metabolic disease characterized by hyperglycemia and high glycated hemoglobin with or without glycosuria. Glucose metabolism disorder (GMD) results from a defect in insulin secretion by the pancreas, insulin action on the target tissues (or insulin resistance), or both. Old age refers to ages nearing or surpassing the life expectancy of human beings, and is thus the end of the human life cycle. Old age comprises "the later part of life; the period of life after youth and middle age. The United Nations has agreed that 65+ years may be usually denoted as old age and this is the first attempt at an international definition of old age (WHO, 2016). However, for its study of old age in Africa, the World Health Organization (WHO) set 55 as the beginning of old age. At the same time, the WHO recognized that the developing world often defines old age, not by years, but by new roles, loss of previous roles, or inability to make active contributions to society.

Diabetes Mellitus (DM) is a metabolic disorder characterized by the presence of chronic hyperglycemia accompanied by greater or lesser impairment in the metabolism of carbohydrates, lipids and proteins. Diabetes Mellitus is probably one of the oldest diseases known to man. It was first reported in Egyptian manuscript about 3000 years ago (Baynes, 2015). There are three main types of diabetes mellitus (WHO, 2013):

- Type 1 diabetes results from the pancreas's failure to produce enough insulin due to loss of beta cells. This form was previously referred to as "insulin-dependent diabetes mellitus" (IDDM) or "juvenile diabetes". The loss of beta cells is caused by an autoimmune response. The cause of this autoimmune response is unknown.
- Type 2 diabetes begins with insulin resistance, a condition in which cells fail to respond to insulin properly. As the disease progresses, a lack of insulin may also develop. This form was previously referred to as "non

insulin-dependent diabetes mellitus" (NIDDM) or "adult-onset diabetes". The most common cause is a combination of excessive body weight and insufficient exercise.

- Gestational diabetes is the third main form, and occurs when pregnant women without a previous history of diabetes develop high blood sugar levels.

DM prevalence, in general, is growing worldwide and is becoming an epidemic and endemic problem with the social and economic burden (Kalra, Kumar, Jarhyan & Unnikrishnan, 2015). However, its prevalence and its co-morbidities and mortality are higher in elderly than in young people. With increasing life expectancy, the numbers of elder people are growing in our society. There are many illness that occur in association with age, diabetes is been seen as one of the classical examples of a disease that increases with age (Owoeye, 2017). Changes in lifestyle, including diet and physical activity, and the increasing numbers of elderly people are better key factor for the increasing worldwide epidemic of diabetes. Age is one of the variables influencing the prevalence of diabetes and Impaired Glucose Tolerance (IGT). Globally, the number of people with diabetes has risen from 108 million in 1980 to 422 million in 2014. The global prevalence of diabetes among adults over 18 years of age has risen from 4.7% in 1980 to 8.5% in 2014 (WHO, 2020). But, by 1994, the continent-wise (Africa) prevalence of diabetes mellitus stood at 3 million and was then predicted to double or triple by the year 2010 (Azevedo & Alla, 2008).

Wild, Roglic, Green, Sicree and King (2004) cited by Owoeye, (2017) asserts that approximately, 7.1 million Africans were said to be suffering from diabetes at the end of 2000, a figure that was expected to rise to 18.6 million by 2030. WHO (2006) suggested that Nigeria has the greatest number of people living with diabetes in Africa, with an estimated burden of about 1.7 million which will increase to 4.8 million by 2030. Although, the impact of the burden of diabetes is often described in terms of its work on age adults, diabetes in older adults in linked to higher mortality, reduced functional status and increased risk institutionalization. Older adult with diabetes are at substantial risk for both acute and chronic micro vascular and cardiovascular complications of the disease, aged with diabetes are at high risk for life threatening complications such as kidney failure, eye disorder, cardiovascular disease etc, these diabetic-related complications negatively affect the quality and the length of life of people with diabetes and are some of the main causes of mortality and health care costs (American Diabetes Association, 2010).It is very important for medical and clinical discipline to examine the quality of life and find opportunity to improve it. Furthermore, it was found that diabetic complications had more impact on the quality of life in patient younger than 70 years (45 – 70 years) and above (Owoeye, 2017). A possible explanation is that complications are likely to have a greater impact on health of this group because they have less comorbidity and have not adjusted to the idea of accepting lesser health.

Diabetes has become one of the major causes of sudden illness and death in old ages in most places mainly through the increased risk of cardiovascular disease in Ondo State. There are 2,500 diabetics patients living in Ondo State according to the record and speech given by commissioner of health on the World diabetes day 2015 (Owoeye, 2017). The burden of the sudden and premature death from diabetes is similar to that of HIV/AIDs, yet the problem seems to be not fully recognized. It has also be the leading cause of blindness, amputation and kidney failure in elder adults. These complications or effects account for much of the social and financial burden of diabetes. These has then prompted the researcher to examine the associated health risk associated with diabetes among old age in Akure metropolis.

Objectives of the study : Majorly, the study seeks to examine the associated health risk associated with diabetes among old age in Akure metropolis. Specifically, the study will examine the following:
1. if teeth and gum damage will be an health risk associated with diabetes among old age in Akure metropolis.
2. if eye defects will be an health risk associated with diabetes among old age in Akure metropolis.
3. to examine if skin damage will be an effect by diabetes among aged in Akure metropolis.

Hypotheses
The hypotheses for this study was tested at 0.05 level of significance
1. Teeth and gum damage is not significantly an effect of diabetes among old age in Akure metropolis.
2. Eye defects is not significantly an effect of diabetes among old age in Akure metropolis.
3. Skin damage is not significantly an effect of diabetes among old age in Akure metropolis.

II. METHODOLOGY

The researcher used survey design of the descriptive type of research for the study. The area of the study was Akure Metropolis. The population of the study involved aged from age 50-75 years of age in Akure metropolis of

Ondo State. The sample size of one hundred and fifty (150) aged was used. Multistage sampling which involve purposive and simple random sampling technique was used to select aged from aged in hospitals in each geographical zone in Akure and it cut across both male and female aged. Respondents were selected randomly from each of the selected health centres according to their population in Akure south local government area of Ondo state. The research instrument used for this study was a self-structured closed ended questionnaire designed by the researcher. The questionnaire used for taking the responses of the respondents was items instrument which was designed in line with research questions and hypotheses formulated for testing. With each of the variables generating five optional items, the questionnaire used Yes or No format for responses of the respondent. Reliability of the instrument was ascertained using split half method. One of the health centres that did not form part of the study was used. Twenty (20) aged were randomly selected. The coefficient (r) of 0.79 was obtained. The descriptive statistics of frequency counts and simple percentage were used in anlysing the demographic while inferential statistics of Analysis of Variance was used to test the hypotheses at 0.05 level of significant.

III.   RESULTS AND DISCUSSION

Demographic analysis

Table 1: Percentage distribution of respondents by name of hospital

S/N	Level	No of Respondents	Percentage (%)
1	Health Centre Oke-Ijebu, Akure.	20	13.33%
2	Comprehensive Health Centre Isolo	25	16.67%
3	Basic Health Centre Adegbola	20	13.33%
4	State specialist hospital Akure	38	25.33%
5	Arakale comprehensive Health centre	25	16.67%
6	Basic Health Centre Oke-Aro	22	14.67%
	Total number of respondents	**150**	**100**

Source: Field survey

Table 1 above shows the percentage distribution of respondents by name of hospital in which 20 (13.33%) of the respondents were from basic health centre OkeIjebu, 25 (16.67%) of the respondents were from comprehensive health centre Isolo, 20 (13.33%) of the respondents were from basic health centre Adegbola, 38 (25.33%) of the respondents were from State specialist hospital, 25 (16.67%) of the respondents were from Arakale comprehensive health centre and 22 (14.367%) of the respondents were from Basic health centre Oke-aro. This implies that more of state specialist hospital were selected in this study than any other hospital for sampling.

Table 2: Percentage analysis of age distribution

S/N	Age in Years	Frequency	Percentage (%)
1	65-70	83	53.33%
2	71-75	45	30.00%
3	76-80	22	14.67%
Total number of respondents		**150**	**100**

Source: Field survey

Table 2 above shows that 83 (53.33%) of the respondents are within age group of 65-70 years, 45 (30.00%) of the respondents are within age group of 71-75 years and 22 (14.67%) of the respondents are within the age of 76-80 years. This implies that respondents of age group 65-70 years had highest representation in this study than any other age group in years.

Table 3: Percentage analysis of area distribution

S/N	Area	Frequency	Percentage (%)
1	Urban	103	68.67%
2	Rural	47	31.33%
Total number of respondents		**150**	**100**

Source: Field survey

Table 3 above shows that 103 respondents which was (68.67%) of the respondents selected were from urban area while 47 (31.33%) of the respondents selected were from rural area. This implies that urban area respondents were more represented in this study than rural area respondents.

Hypotheses Testing
Hypothesis 1: Teeth and gum damage will not significantly be an effect of diabetes among aged in Akure metropolis.

Table 4: Analysis of Variance on teeth and gum damage as an effect of diabetes among aged

Variables	Sum of Squares	df	Mean Square	F-cal	F-tab	Sig.
Between Groups	5.333	1	5.333	8.958	3.942	.000
Within Groups	31.627	148	3.214			
Total	**36.960**	**149**				

P≤0.05

The result presented in table 4 above revealed that F-calculated (8.958) is greater than F-table (3.942), df = 1, 148 at 0.05 level of significance. This led to the rejection of hypothesis one. Hence, teeth and gum damage is significantly an effect of diabetes among aged in Akure metropolis.
Hypothesis 2: Eye defects will not significantly be an effect of diabetes among the aged in Akure metropolis.

Table 5: Analysis of Variance on eye defect as an effect of diabetes among aged

Variables	Sum of Squares	df	Mean Square	F-cal	F-tab	Sig.
Between Groups	17.974	1	7.974	5.693	3.942	.008
Within Groups	25.319	148	.171			
Total	**26.293**	**149**				

P≤0.05

The result presented in table 4 above revealed that F-calculated (5.693) is greater than F-table (3.942), df = 1, 148 at 0.05 level of significance. This led to the rejection of hypothesis two. Hence, eye defect is significantly an effect of diabetes among aged in Akure metropolis.
Hypothesis 3: Skin damage will not significantly be an effect of diabetes among aged in Akure metropolis.

Table 4.16: Analysis of Variance of skin damage effect of diabetes among aged

Variables	Sum of Squares	df	Mean Square	F-cal	F-tab	Sig.
Between Groups	4.039	1	4.039	4.198	3.942	.657
Within Groups	28.821	148	6.195			
Total	28.860	149				

P≤0.05

The result presented in table 4.16 above revealed that F-calculated (4.198) is greater than F-table (3.942), df = 1, 148 at 0.05 level of significance. This led to the rejection of hypothesis three. Hence, skin damage is significantly an effect of diabetes among aged in Akure South metropolis.

IV. DISCUSSION

Hypotheses 1 which sated that teeth and gum will not significantly be an effect of diabetes among aged in Akure metropolis is rejected. Thence, teeth and gum disease are effects of diabetes among aged in Akure metropolis. The findings is in line with the assertion of Taylor et al. (2012) who asserted that the prevalence and incidence of periodontitis were greater among those who had type 2 diabetes mellitus compared with those who did not, with an approximately threefold increased risk for periodontitis. Although diabetes and gum disease may seem like very different diseases, dentists have known for a long time that people with diabetes are more likely to get gum disease. Gingivitis is less serious, but can develop into periodontitis if left untreated. The findings also supports the statement of Chavarry et al (2009) who stated that diabetes has been unequivocally confirmed as a major risk factor for periodontitis. Gum disease is a very common infection that develops when dental plaque builds in the

mouth and sits of the surface of the tooth. People with poor blood sugar control get gum disease more often and more severely, and they lose more teeth than do persons with good control. Mealey and Ocampo (2016) also reported that the risk of periodontitis is increased by approximately threefold in diabetic individuals compared with non-diabetic individuals.Moreover, hypothesis 2 which stated that eye defect will not significantly be an effect of diabetes among aged in Akure metropolis is rejected. Tis implies that eye defect is an effect of diabetes among aged in Akure metropolis. The findings supports the report of WHO (2017) who reported that the prevalence of visual impairment and blindness due to diabetic retinopathy and diabetic eye complications is on the rise. Vision loss compromises people's quality of life because it reduces their capacity to read, drive a car, watch television, or keep personal accounts. Often, it isolates older people and keeps them from friends and family. But as they age, they are at higher risk of developing age-related eye diseases and conditions. Diabetes can affect the eyes in a number of ways. The most serious eye condition related to diabetes is diabetic retinopathy. The findings further compliment the report from the study of *Kertes and Johnson (2007)* whom both reported that eye disease affects up to 80 percent of people who have had diabetes for 20 years or more. Over time, diabetes damages the blood vessels in the retina. Diabetic retinopathy occurs when these tiny blood vessels leak blood and other fluids. Moreover, the finding support the assertion of MacEwen (2011) who asserted that the longer a person has diabetes, the higher his or her chances of developing diabetic retinopathy. Retinopathy can affect all diabetics and becomes particularly dangerous, increasing the risk of blindness, if it is left untreated. Vision loss in diabetic retinopathy occurs mainly due to macular oedema and proliferative diabetic retinopathy.

Finally, hypothesis 3 which stated that skin damage will not significantly be an effect of diabetes among aged in Akure metropolis is rejected. Tis implies that skin damage is an effect of diabetes among aged in Akure metropolis. The findings concurred with the assertion of Frank, Sajadi and Goldman (2017) which stated that in some cases, skin problems can be the first sign that a person has diabetes. Besides the severe renal, vascular and ophthalmic complications, the skin may be compromised by various diseases directly related to diabetes or with associations not yet fully proven. Diabetes can affect every part of the body, including the skin. The findings further agreed with assertion of American Diabetes Association (2017) that diabetes can affect every part of the body, including the skin. As many as one third of people with diabetes are likely to have a skin disorders caused or affected by diabetes at sometimes in their lives. In fact, such problems are sometimes the first sign that a person has diabetes. Luckily, most skin conditions can be prevented or easily treated if caught early. Behm et al (2012) also asserted that reaching pathological high levels of glycaemia strongly affects skin homeostasis by inhibiting keratinocyte proliferation and migration, protein biosynthesis, inducing endothelial cell apoptosis, decreasing nitric oxide synthesis and impairing phagocytosis and chemotaxis from several cells. Staphylococcus skin infections are more common and more serious in people with poorly controlled diabetes. When hair follicles are irritated, these bacteria can cause boils or an inflamed bump.

V.   CONCLUSIONS

The conclusions for this study was derived from the result of findings. The researchers concluded that teeth and gum damage was an effect caused by diabetes among aged, eye defect was an effect of diabetes among the aged, and finally, skin damage was as an effect of diabetes among aged. The researchers further recommend that diabetes patients with diagnosed teeth and gum damage should regularly visit dentist for time to time check-up in order to control the effect of the damage of their health. Also, aged with teeth and gum damage should always practice good oral hygiene and having professional deep cleanings done by their dentist can help to lower their Hemoglobin A1c (HbA1c). The state ministry of health should from time to time make provision for checking of the state of eye of aged mostly the diabetes patients in order to diagnose those with related eye disease and educate them on how to prevent such occurrence. Aged should be careful of the food and drugs they take as this may contribute to diabetes at the old age and contribute to the effects on their skin.

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