

## Knowledge and Perception of Cardiovascular Risk Factors among Patients with Type II Diabetes Mellitus, 2017

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### ABSTRACT

Individuals with diabetes are more likely to develop cardiovascular disease (CVD) compared to those without diabetes and when they do, it tends to be more extensive. This study investigated the knowledge and perception of cardiovascular disease risk factors in patients with type II diabetes mellitus (DM).

This cross-sectional survey involved 125 patients with type II diabetic Mellitus aged 34-85 years. The heart disease fact questionnaire (HDFQ) and the Perception of Risk of Heart Disease Scale (PRHDS) were used for data collection. Data were analyzed using SPSS version 22.0.

The mean score of the knowledge and perception of cardiovascular risk factors among the participants was  $11.68 \pm 6.71$  and  $57.47 \pm 8.37$  respectively. There was a significant difference in the knowledge ( $p=0.011$ ) and perception ( $p=0.009$ ) of risk factors of cardiovascular disease between male and female participants.

This study shows a fair knowledge and perception of cardiovascular risk factors among patients with type II DM and there was a distinction in the perception and knowledge of cardiovascular risk factors between male and female participants.

**Keywords:** Diabetes Mellitus, Knowledge, Perception, Risk Factors, Cardiovascular Diseases

### INTRODUCTION

Diabetes mellitus (DM) is a metabolic disorder majorly characterized by hyperglycemia or raised blood glucose levels. The prevalence of type II DM in middle and low-income countries has been rising more rapidly [1]. This prevalence is expected to increase in the next ten years with a substantial increase experienced in low-income countries.

According to the World Health Organization (WHO), diabetes will be the seventh leading cause of death in 2030 [2]. The majority of morbidity and mortality in diabetes is due to cardiovascular disease (CVD) [1]. Fifty-five percent of deaths and 75% of hospitalizations in people with diabetes are caused by vascular disease [3]. Studies have continually shown that people with diabetes are more likely to develop coronary heart disease (CHD) when compared with non-diabetic individuals and when they do, their CHD tends to be more extensive [4,5]. Thus, prevention and management of cardiovascular disease (CVD) are crucial in the management of diabetes. Hence, modifiable risk factors of CVD such as dyslipidemia, hypertension, smoking, obesity, sedentary lifestyle, and poor eating habits should be well known and fully understood by patients with diabetes which may help to prevent or reduce the occurrence of diabetes. While knowledge of the risk factor of CVD is not sufficient for risk modification in diabetes, it is a necessary precondition [6].

Following the clinical practice recommendations of the American Diabetes Association, it was stated that the cardiovascular burden of diabetes has not been effectively communicated to people with diabetes [7] as this may affect their knowledge of CVD and ultimately predispose them to the risk factors. Hence, it is necessary to evaluate the knowledge and perception of cardiovascular risk factors among patients with type II diabetes mellitus (DM).

### MATERIALS AND METHODS

This cross-sectional survey involved 125 patients with type II DM who were recruited from Lagos University Teaching Hospital (LUTH) Idi-Araba and Nigerian Air force Hospital Shogunle, Lagos State between June and October 2017. The sample size was calculated using the formula developed by Cochran [8], i.e.  $Z^2 \times P(1-p)/d^2$ , where  $Z$  = standard normal variate (at 5%), type 1 error ( $p < 0.050$ ) is 1.96, and  $P$  is the prevalence of Type II Diabetes Mellitus (10.5%) [9]

Included in the study were participants diagnosed with type II DM who are fully conscious and gave consent while participants were excluded if they had any associated neurological disorder such as stroke.

Prior to the commencement of the study, ethical approval was sought and obtained from the Health Research and Ethics Committee of the College of Medicine University of Lagos, Idi-Araba, Lagos (Approval number: CMUL/HREC/05/17/138). The

objective of the study was explained to the participants and they were assured of the confidentiality of their responses. Written informed consent was obtained from each participant before the commencement of the study.

The socio-demographic characteristics (age, sex, height, weight, body mass index (BMI) and level of education) and duration of diabetes from diagnosis were obtained and recorded for each participant. The questionnaires were self-administered and personally distributed to the participants and collected after completion.

The Heart Disease Fact Questionnaire (HDFQ) [10] was used to obtain information on the knowledge of the major risk factors for the development of cardiovascular disease. Each item on this scale has responses of true, false, or I do not know. Total scale scores were calculated by summing the total number of correct answers ranging from 0–25. Higher scores indicate a higher level of knowledge.

Perception of Risk of Heart Disease Scale (PRHDS) (11) was used to obtain information on the participant's perception of the probability of developing heart diseases. Each item on the scale has a 4-point Likert scale response option ranging from 1 (strongly agree) to 4 (strongly disagree). Item scores may be summed for subscales and a total scale score. The scores ranged from 20-80. Higher scores on the overall scale indicate an increased perception of risk. Data were analyzed using the statistical package for social sciences (SPSS) version 22.0. Mann-Whitney U and Spearman rank correlation was used to determine the difference and relationship in the knowledge and perception of CVD between male and female participants and socio-demographic characteristics respectively. The level of significance was at  $p < 0.05$ .

## RESULTS

Out of the one hundred and thirty five (135) copies of the questionnaires that were administered, one hundred and twenty five (125) were returned and valid for analysis giving a response rate of 92.59%.

The study population comprised 55 (44%) males and 70 (56%) females. Their ages ranged between 34 years and 85 years with a mean age of  $59.46 \pm 11.68$  years. The mean height, weight and BMI of the participants were  $1.67 \pm 0.09$ m,  $73.36 \pm 9.79$ kg and  $26.3 \pm 3.74$ kg/m<sup>2</sup>. The mean duration of diabetes from the onset was  $6.6 \pm 3.15$  years (Table 1).

### *Comparison of Knowledge and Perception of Cardiovascular Risk Factors between male and female participants*

The knowledge scores of the respondents in this study ranged from 0 to 21 with a general mean score of  $11.68 \pm 6.71$ . There was a significant difference ( $p=0.011$ ) in

knowledge scores when compared between both sexes (Table 2).

The perception of cardiovascular risk factor scores of the respondents in this study ranged from 44 to 80 with a mean score of  $57.47 \pm 8.37$ . There was a significant difference ( $p= 0.009$ ) in the perception scores when compared between both sexes (Table 2).

**Table 1:** Socio-demographic/Clinical Characteristics of the Respondents

Variable	Frequency (n)	Percentage (%)
<b>Age (years)</b>		
30 to 39	6	
40 to 49	23	4.8
50 to 59	30	18.4
60 to 69	38	24.0
70 to 79	27	30.4
80 to 89	1	21.6
<b>Total</b>		0.8
Mean age = $59.5 \pm 11.68$ (years)	<b>125</b>	<b>100</b>
<b>Marital Status</b>		
Single	0	0.0
Married	106	84.8
Divorced	19	15.2
<b>Total</b>	<b>125</b>	<b>100</b>
<b>BMI(Kgm<sup>-2</sup>)</b>		
<18.5kgm <sup>-2</sup>	0	0.0
18.5-24.9kgm <sup>-2</sup>	49	39.8
25-29.9kgm <sup>-2</sup>	52	42.3
>30kgm <sup>-2</sup>	22	17.9
<b>Total</b>	<b>125</b>	<b>100</b>
Mean BMI= $26.3 \pm 3.74$ kg/m <sup>2</sup>		
<b>Level of Education</b>		
Not educated	4	3.2
Primary	29	23.2
Secondary	46	36.8
Post Secondary	34	27.2
University	12	9.6
<b>Total</b>	<b>125</b>	<b>100</b>
<b>Duration of Diabetes from Diagnosis</b>		
1-5 years		
6-10 years	55	44.0
11-15 years	59	47.2
16-20 years	8	6.4
<b>Total</b>	3	2.4
Mean = $6.6 \pm 3.15$ years	<b>125</b>	<b>100</b>

### *Relationship between Selected Socio-Demographic Characteristics and Duration of Diabetes from Diagnosis and Knowledge and Perception of Cardiovascular Risk Factors*

It was observed that there was a significant correlation ( $p = 0.004$ ) between age and knowledge of cardiovascular risk factors but no significant correlation ( $p=0.477$ ) between age and perception of cardiovascular risk factors among respondents with type II DM (Table 3).

**Table 2:** Comparison between Knowledge and Perception of Cardiovascular Risk Factors between male and female participants

Variable	Male (n=55) Mean ± SD	Female (n=70) Mean ± SD	U-value	p-value
Knowledge	13.55 ± 5.86	10.21 ± 7.00	-2.55	0.011*
Perception	59.18 ± 7.14	56.13 ± 9.03	-2.61	0.009*

\*Significance at  $p \leq 0.05$ , Key: U-Mann Whitney U, SD- Standard Deviation

Similarly, the level of education was significantly correlated ( $p=0.001$ ) with knowledge of cardiovascular risk factors but was not significantly correlated ( $p=0.684$ ) with the perception of cardiovascular risk factors among the respondents with type II DM (Table 3).

It was also observed that there was no significant correlation between the duration of diabetes from diagnosis and knowledge ( $p=0.362$ ) and perception (0.340) of cardiovascular risk factors among the respondents (Table 3).

**Table 3:** Relationship between Knowledge, Perception of Cardiovascular Risk factors and other variables

Variable		$r_s$	p-value
Age(years)	Knowledge	-0.26	0.004*
	Perception	0.64	0.477
Level of education	Knowledge	0.49	0.001*
	Perception	-0.04	0.684
Duration of diabetes from diagnosis (years)	Knowledge	-0.08	0.362
	Perception	-0.09	0.340

\* Significance at  $p < 0.05$ , Key:  $r_s$ - Spearman's rank correlation coefficient

## DISCUSSION

This study demonstrated that type II DM is more common among the female sex and highly prevalent in older adults. It was also detected that a greater number of the respondents were either overweight or obese. These observations are consistent with literature as increasing age and being overweight or obese have been identified as major risk factors to Type II DM (12).

It was revealed in this study that the knowledge of cardiovascular risk factors among patients with type II DM was only fair with a mean score of  $11.68 \pm 6.71$  out of a maximum score of 25. This implies that the respondents have about an average level of awareness of cardiovascular risk factors. This result did not agree with the report of the study by Cioe *et al* [13] which revealed a mean knowledge score of 19 which was reported to be fairly good. This difference in scores may be accounted for by the variations in the population and ages of the respondents as their study were relatively younger (mean age of 47 years) than those in this study (mean age of 59.46 years). It has been shown that the young have more quests for knowledge than the elderly. In addition to that Cioe *et al* [13] also reported a higher percentage of respondents with university education compared to the result of this study with a lower percentage of respondents. The mean knowledge score (20.4) was higher in a study conducted by Wagner *et al.* [10] among Spanish speakers with diabetes.

Despite the fact that Wagner *et al* [10] and this present study reported a higher percentage of females and similarities in mean age, the difference in the mean knowledge score may be due to differences in geographical zones as the study done by Wagner *et al* [10] was carried out in a developed country.

The study by Homko *et al* [14], reported that females had more knowledge of cardiovascular risk factors compared to males with type II DM. However, in this study, the mean knowledge score for male participants with type II DM was significantly higher than the female participants. This implies that male participants with type II DM had more knowledge of the risk factors of cardiovascular diseases compared to female participants. This may be due to men being more educated in most instances than women in this clime. This finding supports the result of the study by Potvin *et al* [15] who studied the knowledge of cardiovascular risk factors among the Canadian population and reported that men had good knowledge of cardiovascular complications than their female counterparts.

In this study, it was observed that the respondents had a fairly good perception of the risk of heart disease with a mean score of 57.47 out of a minimum score of 20 and a maximum score of 80. This finding corroborates the results of the study by Cioe *et al* [13] where it was reported that there was a fairly good perception of cardiovascular risk factors among people living with HIV.

The findings of this study revealed that the perception of risk of heart disease score for males was significantly higher than the female respondents. This implies that male respondents had more perceptions of cardiovascular risk factors compared to their female counterparts. This is supported by the study done by Azimi-Nezhad *et al.* [16] which stated that limited literacy among women is associated with reduced perception of most medical conditions.

In this study, there was a negative correlation between age and knowledge of cardiovascular risk factors. This implies that the higher the age, the lower the knowledge of cardiovascular risk factors. This result is in line with the findings of Potvin *et al* [15], who reported that older people, such as those aged 65 years or more are less able to recall important cardiovascular disease risk factors. In the same vein, the younger population may be more enthusiastic about learning than the older population, which may account for better knowledge. But this report did not agree with the findings of the study by Mosca *et al* (17), who reported that there was an increase in the knowledge of cardiovascular risk factors in older patients who were well informed about the cardiovascular disease than younger patients whose perception of cardiovascular risk factor were poor. On the other hand, age was not correlated with the perception of cardiovascular risk factors. This point to the fact that the age of patients with type II DM may not influence how they feel about the cardiovascular risk factors of the disease [7]. In addition, this study reveals that the majority of respondents did not feel susceptible to risk factors such as hypertension or dyslipidemia with only a few respondents able to name important methods to reduce the risk for heart attack or stroke in diabetes mellitus.

The findings from this study revealed that there was a significant positive correlation between the level of education and knowledge of cardiovascular risk factors among the respondents. This implies that the higher the educational status, the more knowledge of cardiovascular risk factors. This supports the result of the study by Azim-Nezhad *et al* [16], who reported that illiteracy has an association with the knowledge of cardiovascular risk factors. This means that the level of education influences the knowledge of cardiovascular risk factors among the respondents. However, it was observed that there was no correlation between the level of education and perception of cardiovascular risk factors; this means that level of education does not influence the perception of the respondents on cardiovascular risk factors

From the result of this study, it was observed that there was no significant correlation between the duration of diabetes from diagnosis and knowledge and perception of the cardiovascular risk factor of the

respondents. This implies that the number of years an individual has been diagnosed with type II DM may not influence the knowledge and the perception of cardiovascular risk factors of DM.

## CONCLUSION

Patients with type II diabetes mellitus had fair knowledge and perception of cardiovascular risk factors. Higher knowledge of cardiovascular risk factors was observed among the male participants with a higher perception of cardiovascular risk factors than females. There is a relationship between age, level of educational attainment and knowledge of cardiovascular risk factors among patients with type II diabetes mellitus but no relationship with the perception of cardiovascular risk. It is hence recommended that emphasis should be placed on educating patients with type II DM about their susceptibility to cardiovascular disease, the risk factors and preventive measures necessary to be taken to avoid its occurrence. This is the first cross-sectional survey in this environment on knowledge and perception of cardiovascular risk factors among patients with type II diabetes mellitus.

## ETHICAL ISSUES

Ethical approval was sought and obtained from the Health Research and Ethics Committee of the College of Medicine University of Lagos, Idi-Araba, Lagos (Approval number: CMUL/HREC/05/17/138).

## CONFLICT OF INTERESTS

None to be declared

## AUTHORS' CONTRIBUTIONS

TO was involved with study concept and design, analysing the data and preparation of the manuscript. AK was involved with the interpretation of data and reviewing the article. OA was involved in data acquisition. All authors were involved with critical revision of the manuscript for important intellectual content discuss the results and commented on the manuscript. All authors approved the final version of the manuscript.

## ACKNOWLEDGEMENT

The authors appreciate the individuals with type II diabetes who voluntarily participated in this research.

## FUNDING/SUPPORTS

None

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