INTRODUCTION
Prediabetes, an intermediate stage between normal glucose tolerance (NGT) and overt type 2 diabetes mellitus, is a condition in which individuals have blood glucose levels higher than normal but not high enough to be classified as diabetes mellitus. As such, it represents two groups of individuals, those with impaired glucose tolerance (IGT) and/or those with impaired fasting glucose (IFG). According to the American Diabetes Association, prediabetes is diagnosed as a fasting blood glucose of 100 to 125 mg/dl (5.6 to 6.9 mmol/L) known as IFG; a blood glucose of 140 to 199 mg/dl (7.8 to 11.0 mmol/L) two hours after an oral glucose tolerance test (OGTT) known as IGT or HbA1c level of 5.7% to 6.4%. Prediabetes is largely asymptomatic and it is therefore mostly detected on routine screening in apparently healthy individuals. Three tests are used for the screening of prediabetes; a fasting blood glucose (FBG) level, a two-hour OGTT and measuring of HbA1c levels. Though, the OGTT is a specific indicator of diabetes risk and is considered to be the gold standard for detection of prediabetes.
According to the Centers for Disease Control and Prevention (CDC),1 prediabetes has been noted to have a higher prevalence figures than diabetes mellitus among populations. For instance, prediabetes was called “America’s largest healthcare epidemic” in year 2011 as approximately 79 million adults in the United States had prediabetes.1 This number was more than three times the number of adults (approximately 26 million) with frank diabetes mellitus in the United States that same year.1 Few studies have shown a high prevalence of prediabetes among hospital employees in a similar fashion as noted in the general population. In a study to determine the prevalence of prediabetes in healthcare professionals, Rongies et. al6 found 15.7% of their study participants had prediabetes. In another survey among medical staff of a hospital in Kuwait, AlRandi et. al7 found that out of the 51 participants with high Finnish diabetes risk assessment scores, 26 (51.0%) had prediabetes.

Inadequate moderate-intensity physical activity, amidst other risk factors, is a well-documented risk factor for prediabetes.8–10 The World Health Organization (WHO) had recommended that; adults aged 18–64 years should do at least 150 minutes of moderate-intensity physical activity throughout the week.2 Arguably, hospital administrative staff can be particularly vulnerable to chronic medical conditions like diabetes mellitus because of the greater number of hours spent in a sitting or sedentary position during administrative duties while making out time for exercises might be extremely difficult. Uninterrupted sitting at workplaces for lengthy hours has also been linked with high postprandial glucose and insulin levels which may lead to prediabetes.11

Studies have shown that hospital employees, despite their proximity to healthcare system, have a low level of health seeking behaviour including regular screening for chronic medical conditions like diabetes mellitus.12–15 A huge knowledge gap exists as there is no local study on the prevalence and predictors of prediabetes among hospital administrative staff in Nigeria. The specific objectives of this study were to find the prevalence and predictors of prediabetes and to determine its predictors among administrative staff of a tertiary health centre in southwestern Nigeria. The findings of this study will be important for implementing routine screening for prediabetes among hospital employees and for informing public health policy decisions on lifestyle interventions to prevent the progression of prediabetes to type 2 diabetes mellitus.

MATERIALS AND METHODS

Study setting
The study was carried out at the Metabolic Research Ward of the University College Hospital (UCH), Ibadan, Nigeria. The study population was administrative members of staff of UCH, Ibadan. The hospital has a total staff population of 5,697 persons within the varies departments of the hospital. The administrative members of staff in UCH Ibadan are a total number of 2,065.

Sample size determination
The sample size was estimated using the Leslie Kish formula (N= Z2pq/d2) for prevalence studies.16 Where N = Desired sample size, Z= The standard normal deviate set at 1.96 which correspond to 95% confidence level. An estimated sample size of 300 participants was determined based on a precision of 0.05 and a prevalence of 20.2% from a study of prevalence of prediabetes and its associated risk factors in eastern Uganda.17 A systematic sampling of one in seven staff was used to recruit participants from the sample frame (list of the 2,065 administrative members of staff UCH Ibadan) until estimated sample size of 300 participants was reached.

Study Design
This was a descriptive cross-sectional study carried out within a period of three months between February to April, 2015. Inclusion criteria include: (i) age of participant between 40 and 60 years4 (ii) not diagnosed with diabetes mellitus or not currently on medications for diabetes mellitus. Exclusion criteria include; (i) non-consenting staff (ii) pregnant women.

Data collection
The study involved the administration of a semi-structured questionnaire which was adapted and modified from the generic WHO STEPwise approach to chronic disease risk factor surveillance.18 The WHO STEPs instrument was developed by the WHO and it provides an entry point for chronic disease surveillance activities in low and middle income countries making it suitable for this study. It is called STEPwise approach because data are collected in 3 steps; step 1 uses a questionnaire to collect demographic and lifestyle data; step 2 involves measurements of height, weight, blood pressure, waist and hip circumference; and step 3 is laboratory investigations as collection of venous blood sample for FPG and OGTT estimation. The WHO STEPs instrument is validated and had been used in some local studies on chronic disease surveillance in Nigeria.19–22 The questionnaire was in English language and self-administered.
Step 1: Demographic and lifestyle data were obtained using the WHO STEPs instrument. A proxy for social classification of respondents was used by categorizing this study participants into junior and senior staff cadres using the grade level 6 and above as senior staff and grade level 5 and below as junior staff according to the Nigeria Federal Civil Service gazette. Alcohol consumption was categorized into non-drinkers or previous drinkers and current drinkers depending on whether the respondents had never taken alcohol in their lifetime, drank alcohol in the past but had not used alcohol in the previous 12 months preceding this study or currently used alcohol in the previous 30 days preceding this study respectively. Cigarette smoking status was categorized as non-smokers or previous smokers and current smokers depending on whether the subjects had never used cigarette in their lifetime, took cigarette in the past but had not smoked in the last 12 months preceding this study and currently smoked cigarette within the last one year preceding this study respectively. Questions on physical activity sought information on participants’ undertaking of moderate-intensity activities (e.g. brisk walking, carrying light loads, riding a bicycle, light recreational activities etc.). Physical activity was categorized as adequate or inadequate physical activity whether participant met the WHO recommendations of 150 minutes of moderate-intensity activities per week or did not respectively. Food frequency was assessed using recall of foods eaten in the seven days preceding this survey. The responses of participants to the dietary intake pattern were summarized into two broad categories as healthy diet and Western diet. The healthy dietary pattern was characterized by a frequent consumption (1 – 2 times/day) of food items that had a high fibre contents and low fat contents such as fruits, vegetables, legumes, whole grains, fruits, salad, fish and other seafood. In contrast, the Western dietary pattern was characterized by a frequent consumption (1 – 2 times/day) of food items that had low fibre contents and high fat contents such as processed meat, red meat, butter, high-fat dairy products, refined grains and eggs.

Step 2: Height was measured in metres using a stadiometer, with the participant standing upright. Weight was measured in kilograms using a calibrated Seca® weighing scale, with the participant lightly clothed. Body Mass Index (BMI) was then calculated as weight divided by the square of height. Using an inelastic measuring tape, waist circumference was measured in centimeters at the level midway between the lowest rib margin and the iliac crest while the hip circumference was measured in centimeters at the widest level over the greater trochanters. Waist-to-hip ratio (WHR) was calculated as waist circumference divided by hip circumference. Two blood pressure measurements were taken (5 to 30 minutes apart), with the participant seated, using a mercury sphygmomanometer and the mean of these two measurements was calculated as their blood pressure. Participants were classified as high/uncontrolled blood pressure if their systolic BP was ≥140mmHg, or if their diastolic BP was ≥90mmHg or if they were on anti-hypertensive drugs.

Step 3: The fasting blood glucose was determined after an overnight fast of 8 – 10 hours by collection of 2mls of venous blood sample following which participants were given a glucose drink containing 75g of anhydrous glucose. Another 2mls of venous sample was taken for an OGTT estimation, two hours after the ingestion of a glucose drink. Estimation of blood glucose was done by glucose oxidase method. Prediabetes was defined using the ADA criteria.

Data management
The questionnaires were cross-checked after each interview and coded serially. The SPSS (version 17) was used for data entry and analysis. Categorical variables were summarized using frequency and percentages while mean and standard deviations were computed for quantitative variables. Descriptive analyses were performed to estimate the prevalence of prediabetes while the independent predictors of prediabetes were investigated using multinomial logistic regression model. The level of statistical significance was set at 5% (p < 0.05).

Ethical consideration
Ethical approval for the study was obtained from the UI/UCH Institutional Review Committee and a written informed consent was obtained from each participant.

RESULTS
Demographic and lifestyle data of the participants
The demographic and lifestyle data characteristics of the participants are shown in Table 1. The mean age of participants was 51.2 ± 5.3 years. There were 164 (54.7%) males and 136 (45.3%) females that participated in the study. Majority of the participants in this study were Muslims (180, 60.0%); were married (286, 95.3%); belonged to the Yoruba ethnic group (287, 95.6%) and had tertiary education (255, 85%). More of the study participants (211, 70.3%) belonged to the senior civil servant cadre while 89 (29.7%) respondents belonged to the junior civil servant cadre. The majority of participants (224, 74.7%) had a positive family history of diabetes mellitus. The majority of participants (251, 83.7%) had never smoked cigarettes while less than half of the participants, (130, 43.3%) never consumed alcohol. The majority of participants
(215, 71.7%) had a healthy dietary intake pattern while (85, 28.3%) participants had a Western dietary intake pattern. A little above half (153, 51.0%) of the participants had an inadequate moderate-intensity physical activity while (147, 49.0%) participants had an adequate moderate-intensity physical activity.

Biochemical and anthropometric profile of the participants
The biochemical and anthropometric profile of the participants in this study are shown in Table 2. A greater proportion of the participants, 186 (62.0%), were overweight while 59 (19.7%) participants had normal body mass index and 51 (18.3%) participants had obesity. A total of 127 (42.3%) participants had an increased metabolic risk on waist circumference measurements and 106 (35.3%) participants had a substantial metabolic risk on waist-hip ratio measurements. A high number of participants, 238 (79.3%) had a normal/controlled blood pressure measurement while 62 (20.7%) participants had a high/uncontrolled blood pressure measurement. Following fasting plasma glucose test, the majority of participants in this study, 243 (81.0%), had normoglycemia while

Table 1: Demographic and lifestyle data of participants (N=300)

| Variable                             | Frequency (n) | Percentages (%) |
|--------------------------------------|---------------|-----------------|
| Age (years)                          |               |                 |
| 40-50                                | 102           | 34.0            |
| 51-60                                | 198           | 66.0            |
| Sex                                  |               |                 |
| Male                                 | 164           | 54.7            |
| Female                               | 136           | 45.3            |
| Religion                             |               |                 |
| Christianity                         | 119           | 39.7            |
| Islam                                | 181           | 60.3            |
| Marital Status                       |               |                 |
| Married                              | 286           | 95.5            |
| Separated/Divorced/Widowed           | 14            | 4.7             |
| Tribe                                |               |                 |
| Yoruba                               | 287           | 95.6            |
| Igbo                                 | 13            | 4.4             |
| Education                            |               |                 |
| Secondary                            | 45            | 15.0            |
| Tertiary                             | 255           | 85.0            |
| Cadre                                |               |                 |
| Senior cadre                         | 211           | 70.3            |
| Junior cadre                         | 89            | 29.7            |
| Family History of Diabetes           |               |                 |
| Yes                                  | 224           | 74.7            |
| No                                   | 76            | 25.3            |
| Cigarette Smoking Status             |               |                 |
| Non-smoker                           | 251           | 83.7            |
| Previous/Current smoker              | 49            | 16.3            |
| Alcohol Intake Status                |               |                 |
| Non-drinker                          | 130           | 43.3            |
| Previous/Current drinkers            | 170           | 56.7            |
| Dietary Pattern                      |               |                 |
| Healthy                              | 215           | 71.7            |
| Western                              | 85            | 28.3            |
| Moderate Physical Activity           |               |                 |
| Adequate                             | 147           | 49.0            |
| Inadequate                           | 153           | 51.0            |
Table 2: Biochemical and anthropometric of participants (N=300)

| Parameter                        | Description            | Frequency (%) |
|----------------------------------|------------------------|---------------|
| **Body Mass Index (kg/m²)**      | Normal                 | 59 (19.7)     |
| 18.5 – 24.99                     | Normal                 | 186 (62.0)    |
| 25.0 – 29.99                     | Overweight             | 51 (17.0)     |
| 30.0 – 34.99                     | Obesity (Grade I)      | 1 (0.3)       |
| 35.0 – 39.99                     | Obesity (Grade II)     | 3 (1.0)       |
| > 40.0                           | Obesity (Grade III)    |               |
| **Waist Circumference**          | Normal                 | 173 (57.7)    |
|                                 | Increased metabolic risk | 127 (42.3)   |
| **Waist-Hip ratio**              | Normal                 | 194 (64.7)    |
|                                 | Substantial metabolic risk | 106 (35.3) |
| **Blood Pressure (mmHg)**        | Normal/Controlled      | 238 (79.3)    |
|                                 | High/Uncontrolled      | 62 (20.7)     |
| **Fasting Blood Sugar (mg/dl)**  | < 100                  | 243 (81.0)    |
|                                 | 100 - 125              | 46 (15.3)     |
|                                 | > 126                  | 11 (3.7)      |
| **Oral Glucose Tolerance Test**  | < 140                  | 248 (82.7)    |
| (mg/dl)**                        | 140 - 199              | 41 (13.6)     |
|                                 | > 200                  | 11 (3.7)      |

*A: American Diabetes Association (ADA) criteria
*Increased metabolic risk (waist circumference ≥94cm for males or ≥80mm for females)
*Substantial metabolic risk (waist hip ratio ≥0.90 for males or ≥0.85 for females)
1Normal/Controlled (Systolic Blood Pressure <140mmHg / Diastolic Blood Pressure <90mmHg)
2High/Uncontrolled (Systolic Blood Pressure ≥140mmHg / Diastolic Blood Pressure ≥90mmHg)

Association between varying factors and prediabetes among participants
Table 3 shows a bivariate analysis of the association between various characteristics of the participants in this study and the presence of prediabetes. It was noted...
that a significantly higher proportion of male participants ($\chi^2 = 36.97$, $p=0.001$); participants within the junior civil service cadre ($\chi^2 = 2.094$, $p=0.001$); participants with a positive family history of diabetes ($\chi^2 = 32.84$, $p=0.003$); participants that consumed alcoholic beverages ($\chi^2 = 32.99$, $p=0.000$); participants with Western dietary intake pattern ($\chi^2 = 55.99$, $p=0.000$) and participants that did not engage in moderate-intensity physical activities ($\chi^2 = 8.161$, $p=0.017$) had prediabetes as compared to their respective counterparts with prediabetes within the aforementioned categories.

**Multivariate logistic regression model for predictors of prediabetes among participants**

Table 4 shows a multivariate logistic regression model of the independent predictors of prediabetes among the participants. Male respondents were 1.24 times more likely to have prediabetes as compared to female respondents (OR = 1.24; 95% CI = 1.082 - 2.460; $p=0.07$). Participants with a positive family history of diabetes were 1.57 times more likely to have prediabetes as compared to participants without a family history of diabetes (OR = 1.57; 95% CI = 1.088 – 2.611; $p=0.023$). Participants who consumed alcohol were 1.13

Table 3: Association between varying factors and prediabetes among participants (N=300)

| Variable                        | Normoglycemia n (%); n= 222 | Prediabetes n (%); n= 67 | Diabetes n (%); n=11 | $\chi^2$ | p-value |
|---------------------------------|-----------------------------|--------------------------|----------------------|----------|---------|
| **Sex**                         |                             |                          |                      |          |         |
| Male                            | 103 (62.8)                  | 58 (35.4)                | 3 (1.8)              | 36.97    | 0.001*  |
| Female                          | 119 (87.5)                  | 9 (6.6)                  | 8 (5.9)              |          |         |
| **Cadre**                       |                             |                          |                      |          |         |
| Senior                          | 159 (75.4)                  | 43 (20.4)                | 9 (4.2)              | 2.094    | 0.001*  |
| Junior                          | 63 (70.8)                   | 24 (27.0)                | 2 (2.2)              |          |         |
| **Family History of Diabetes**  |                             |                          |                      |          |         |
| Yes                             | 156 (69.6)                  | 65 (29.1)                | 3 (1.3)              | 32.84#   | 0.003*  |
| No                              | 66 (86.9)                   | 2 (2.6)                  | 8 (10.5)             |          |         |
| **Smoking Status**              |                             |                          |                      |          |         |
| Never smoked cigarette          | 186 (74.1)                  | 55 (21.9)                | 10 (4.0)             | 0.546#   | 0.761   |
| Smokes cigarette                | 36 (73.5)                   | 12 (24.5)                | 1 (2.0)              |          |         |
| **Alcohol Intake**              |                             |                          |                      |          |         |
| Never took alcohol              | 109 (83.8)                  | 11 (8.5)                 | 10 (7.7)             | 32.99#   | 0.000*  |
| Takes alcohol                   | 113 (66.5)                  | 56 (33.0)                | 1 (0.5)              |          |         |
| **Blood Pressure**              |                             |                          |                      |          |         |
| Normal/Controlled               | 204 (85.7)                  | 25 (10.5)                | 9 (3.8)              | 2.025    | 0.363   |
| High/Uncontrolled               | 18 (29.0)                   | 42 (67.7)                | 2 (3.3)              |          |         |
| **Dietary Pattern**             |                             |                          |                      |          |         |
| Healthy                         | 183 (85.1)                  | 24 (11.2)                | 8 (3.7)              | 55.99    | 0.000*  |
| Western                         | 54 (63.5)                   | 28 (33.0)                | 3 (3.5)              |          |         |
| **Moderate Activity**           |                             |                          |                      |          |         |
| Adequate                        | 110 (74.8)                  | 33 (22.5)                | 4 (2.7)              | 8.161    | 0.017*  |
| Inadequate                      | 112 (73.2)                  | 34 (22.2)                | 7 (4.6)              |          |         |
| **Body Mass Index**             |                             |                          |                      |          |         |
| Normal                          | 56 (94.9)                   | 3 (5.1)                  | 0 (0)                | 62.96#   | 0.039*  |
| Overweight                      | 137 (73.7)                  | 49 (26.3)                | 0 (0)                |          |         |
| Obesity                         | 29 (52.7)                   | 15 (27.3)                | 11 (20.0)            |          |         |
| **Waist-Hip Ratio**             |                             |                          |                      |          |         |
| Normal                          | 124 (71.7)                  | 41 (23.7)                | 8 (4.6)              | 21.47    | 0.104   |
| Metabolic risk                  | 98 (77.2)                   | 26 (20.5)                | 3 (2.3)              |          |         |

* Statistical significance ($p <0.05$); # Fisher's exact test quoted.
times more likely to have prediabetes as compared to participants who never consumed alcohol (OR = 1.13; 95% CI = 0.688 – 1.543; p = 0.039). Participants who do not engage in moderate-intensity physical activities were 1.49 times more likely to have prediabetes as compared to participants who engage in moderate-intensity physical activities (OR = 1.49; 95% CI = 1.027 – 2.936; p = 0.001).

**DISCUSSION**

Before developing overt diabetes, most individuals spend years in an intermediate condition called prediabetes. The efficacy of diabetes prevention in people with prediabetes is well known, and there is strong evidence that progression to type 2 diabetes can be delayed or prevented.¹,²,⁴ This had made screening for prediabetes to identify individuals that are at risk of type 2 diabetes mellitus highly imperative.

The result from this study showed that there was a high prevalence of prediabetes among the participants and the independent predictors were male sex, positive family history of diabetes mellitus, alcohol intake and inadequate moderate-intensity physical activity.

**Prevalence of prediabetes among the study participants**

The prevalence of prediabetes among respondents in this study was higher than the 15.7% prevalence of prediabetes recorded by Rongies et al⁶ among their study participants. This difference in prevalence might be due to the racial difference in the prevalence of prediabetes in the general population between Poland and Nigeria.²⁴,²⁵ In the study conducted in eastern Uganda by Mayega et al,¹⁷ the 20.2% prevalence figure for prediabetes reported in that study was similar to the prevalence of prediabetes in this study.

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**Table 4: Multivariate logistic regression model for predictors of prediabetes among all participants (N=300)**

| Variable                        | Odd’s Ratio (OR) | 95% CI for OR          | p-value     |
|---------------------------------|------------------|------------------------|-------------|
| Sex                             |                  |                        |             |
| Male                            | 1.24             | 1.082 - 2.460          | 0.007*      |
| Female                          | 1.00             | Referent               |             |
| Cadre                           |                  |                        |             |
| Senior                          | 1.39             | 1.013 – 2.433          | 0.156       |
| Junior                          | 1.00             | Referent               |             |
| Family History of Diabetes      |                  |                        |             |
| Yes                             | 1.57             | 1.088 – 2.611          | 0.112       |
| No                              | 1.00             | Referent               |             |
| Smoking status                  |                  |                        |             |
| Never smoked cigarette          | 2.01             | 1.235 – 4.372          | 0.039*      |
| Smokes cigarette                | 1.00             | Referent               |             |
| Alcohol intake                  |                  |                        |             |
| Never took alcohol              | 1.00             | Referent               |             |
| Takes alcohol                   | 1.13             | 1.038 – 1.543          |             |
| Blood Pressure                  |                  |                        |             |
| Normal/Controlled               | 1.00             | Referent               |             |
| High/Uncontrolled               | 1.62             | 1.038 – 3.173          |             |
| Dietary pattern                 |                  |                        |             |
| Western                         | 1.26             | 0.925 – 4.103          | 0.204       |
| Healthy                         | 1.00             | Referent               |             |
| Moderate activity               |                  |                        |             |
| Yes                             | 1.00             | Referent               | 0.001*      |
| No                              | 1.49             | 1.027 – 2.936          |             |
| Body Mass Index                 |                  |                        |             |
| Normal                          | 1.00             | Referent               | 0.416       |
| Overweight                      | 1.29             | 1.141 – 3.188          |             |
| Obesity                         | 1.43             | 1.213 – 2.071          |             |
| Waist-Hip ratio                 |                  |                        |             |
| Normal                          | 1.00             | Referent               | 0.131       |
| Metabolic risk                  | 1.26             | 1.107 – 2.413          |             |

*95% CI for OR: 95% Confidence Interval for Odd’s ratio
*Statistically significant (p < 0.05)
study that recorded a similar prevalence to our study was that conducted by Mustapha et al in Malaysia which found a 22.1% prevalence of prediabetes among their study population. In Nigeria, Ogbu et al. and Uche et al. in their respective studies reported slightly higher prevalence figures of prediabetes among hypertensive patients as 25% and 33.1% respectively. These higher prevalence figures might be because the study participants in the two aforementioned studies had hypertension which is a significant risk factor for prediabetes among them.

However, the prevalence of prediabetes in this study was higher than the prevalence figures of some studies such as; 3.3% prevalence figure reported by Ojewale et al. in Ibadan, 3.5% prevalence figure reported in the DIASCAN study 28 and 4.9% prevalence figure reported by Shuqian et al. 29 in China. After taking a closer look at these aforementioned studies, it was noted that the WHO diagnostic criteria were used for blood glucose reference in those studies rather than the ADA diagnostic criteria that was used in this study. The WHO diagnostic criteria for prediabetes and diabetes mellitus differs from the ADA diagnostic criteria because the upper limit of the range of a normal fasting blood glucose is defined differently by each. 30-33 The WHO opted to keep the upper limit of the range of a normal fasting blood glucose at 110 mg/dl for fear of causing too many people to be diagnosed as having impaired fasting glucose, whereas the ADA put the upper limit of the range of a normal fasting blood glucose at 100 mg/dl to allow for an early diagnosis and prompt management of prediabetes. It is noteworthy to mention that, the ADA criteria was adopted for our study because studies have shown that a fasting plasma glucose level of 100 mg/dl and higher is correlated to higher occurrence of complications from diabetes mellitus in at-risk individuals. 31-34 During this research, respondents that were incidentally discovered to have diabetes mellitus were promptly referred to the Staff Clinic of the University College Hospital, Ibadan for further evaluation and management.

Limitations of the study
1. The likely presence of other chronic medical conditions and comorbidities like hypertension, dyslipidemia, obesity etc. among participants in this study was not an exclusion criterion and this could be a confounder which might have had an influence on the findings of this study.
2. This study was a cross-sectional survey carried out among hospital administrative staff of UCH, Ibadan and so its findings might not be representative of hospital administrative staff in other healthcare facilities in Nigeria.

Predictors of prediabetes among the study participants
Several studies had documented various non-modifiable and modifiable risk factors associated with prediabetes and these include ageing, gender, race/ethnicity, genetics and family history of diabetes mellitus, obesity, physical inactivity, excessive alcohol ingestion and tobacco use among others. 35-38 It was therefore not surprising that these risk factors were also associated with prediabetes in this study. Male sex was an independent predictor of prediabetes in this study in a similar way as reported by Ogbu et al. in their study where they found that a significantly higher proportion of males had prediabetes. Conversely, Ejike et al. 24 and Ekpenyong et al. 23 in their respective studies found a higher female population with prediabetes in their surveys. The high family history of diabetes mellitus and its significant association with prediabetes among the participants in this study may be a reflection of the rising prevalence of diabetes mellitus in Nigeria that had been documented in some local literatures. 27,40-42

Inadequate moderate-intensity physical activity is a known risk factor for prediabetes and was significantly associated with prediabetes in this study. A greater proportion of participants of this study might spend below the recommended level of moderate-intensity physical activity as stipulated by the WHO because of the greater number of hours spent in a sitting or sedentary position during their administrative duties with little leisure times for exercises. Since hospital administrative staff spend most of their workday at their workplace, offering physical activity programs at work may be an efficient strategy to increase physical activity among them. Workplace physical activity programs had been widely advocated for workers to improve physical activities especially during work hours. This is specifically important because the imbalance between physical activity and energy intake at work contribute promote a sedentary lifestyle that leads to insulin resistance and prediabetes.

CONCLUSION
The screening exercise conducted in this concluded study revealed a high prevalence of prediabetes among the administrative staff of University College Hospital, Ibadan. Regular screening of hospital employees for prediabetes and advocacy for work-place gymnasia to improve physical activities among healthcare workers are highly recommended. Employers of labour should be continuously encouraged to develop plans or policy for workplace physical activity by setting up work-place indoor gyms or consider joining a
corporate membership scheme with a gymnasium at discounted fees for employees to help employees become more physically active.

AUTHORS’ CONTRIBUTIONS
The conceptualization and study design were done by all authors. The data analysis and writing of the manuscript was done by SOM.

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