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Prevalence and Awareness of Type 2 Diabetes among Traders in Hohoe Municipality, Volta Region-Ghana

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Abstract

Background: Type 2 diabetes mellitus (DM2) is a metabolic disease whose prevalence is on the increase in both the developed and developing countries. In Hohoe Municipality, trading is the second highest occupation besides farming. Thus, this study sought to assess the prevalence and awareness of DM2 among traders in Hohoe Municipality, Ghana.

Methods: This was a population-based cross-sectional study carried out in April 2015 involving 387 traders (18–65 years) using a random cluster sampling technique. A pre-tested, semi-structured questionnaire was used to obtain information on background characteristics, knowledge on the causes and risk factors of DM2. Weight, height, waist circumference (WC) and hip circumference (HC) were measured following standard procedures. Capillary blood was used to measure fasting blood sugar (FBS) using a glucometer (ONETOUCH UltraEasy blood glucometer, UK). Body mass index (BMI), WC, HC, Waist-to-Hip ratio (WHR), and FBS were categorized using World Health Organization recommendations and Chi-square was used to determine associations between independent categorical variables and DM2 (dependent variable). Correlation between BMI, WHR and DM2 was determined using correlation coefficient. To determine the mean in quantitative variables, t test was used.

Results: Of a total of 387 traders involved in the study, 88.9% were females and most (58.4%) were within the ages of 41–65 years. Overall prevalence of DM2 including those who were on treatment was 10.3%. The prevalence at the time of the survey was 8.7% and this was significantly higher among static traders (8.2%) compared to mobile traders (0.5%). Prevalence of pre-diabetes was 18.4%. Only 3.2% of the traders were diagnosed and knew about their status. However, half (1.6%) of them were not controlling their sugar levels. Interestingly, 7.1% of the traders had diabetes and were not aware. Diabetes and pre-diabetes was highest among traders aged 41–50 (30%) and 51 years and above (34%). Sedentary traders more likely to develop DM2 or Pre-diabetes than mobile traders ($p = 0.004$). The correlations between DM2, BMI and WHR were significant ($r = 0.24$, $p < 0.001$) and ($r = 0.12$, $p = 0.03$) respectively. Less than half (49%) knew about the causes and symptoms of DM2 and its prevention.

Conclusion: Very high proportions of adult traders were diabetics or pre-diabetics and not aware of their status. Over half of the traders did not know the causes and symptoms of diabetes and its prevention. We recommend that targeted periodic community-based screening and education on DM2 be instituted to capture those with pre-diabetes early enough for prevention of DM2 among traders in Hohoe municipality.

Keywords: Type 2 Diabetes prevalence; Pre-diabetes; Awareness; Traders; Hohoe Municipality; Volta Region; Ghana

Background

Diabetes is a serious public health problem and is one of the four priority non-communicable diseases (NCDs) targeted as part of the 2030 agenda for Sustainable Development. It is a metabolic disease characterized by hyperglycaemia resulting from defects in either insulin secretion or action, or both. It is a condition that occurs when the body cannot utilise glucose. The levels of glucose in the blood are controlled by a hormone called insulin made by the pancreas, and insulin helps glucose to enter the cells. In diabetes, the pancreas does not make sufficient insulin (Diabetes Type 1) or the body cannot act normally in response to the insulin that is made (Diabetes type 2); this causes the glucose levels in the blood to rise, leading to symptoms such as frequent urination, lethargy, excessive thirst and hunger [1]. Normal fasting blood glucose level in humans is below 6.0 mmol/L, pre-diabetes is 6.1–6.9mmol/L and diabetes is defined as more than 7.0 mmol/L [2].

Prevalence of non-communicable diseases (NCDs) particularly diabetes and its associated morbidity and mortality are on the ascendency. Globally, prevalence of diabetes among adults 18 years and above has doubled from 4.7% in 1980 to 8.5% in 2014 and these estimates are rising more rapidly in low- and middle-income countries (LMIC) [3]. In 2010, in sub-Saharan Africa (SSA), it was estimated that 12.1 million people were living with diabetes and this is likely to double in the next 20 years; but only 15% of the people with diabetes have been diagnosed [4,5]. It is projected that by 2030, 23.9 million adults in SSA will have diabetes [5]. It is estimated that Type 2 diabetes mellitus (DM2) accounts for 90–95% of all diabetes cases and more than 183 million people are unaware that they have disease [6,7]. Thus, it is difficult to establish the incidence and actual prevalence of diabetes due to lack of awareness on the signs and symptoms [8]. Available evidence indicates that, the number of people living with diabetes is expected to increase from 366 million in 2011 to 552 million by 2030 if no action is taken [9].

In 2012, diabetes caused 1.5 million deaths, and a further 2.2 million deaths were attributable to diabetes as a result of increased risks of cardiovascular diseases and other NCDs [10]. It is estimated that about half of all deaths attributable to diabetes occur before the age of 70 years and it has been projected to be the 7th leading cause of death by 2030 [11]. Statistics indicate that in every 10 seconds, someone dies from diabetes-related condition and DM2 is the major cause of blindness in adults aged 20–74 years, and also the leading cause of non-traumatic lower-extremity amputation and end-stage renal diseases [12]. Diabetes kills 10,000 people every day which is approximately 4 million adults worldwide or 6.8% of deaths from all causes [13]. Experts predict that the economic impact of diabetes and its consequences will exceed the ravages of HIV/AIDS [14].

In SSA, prevalence and burden of DM2 are on the increase. Rapid uncontrolled urbanisation and major changes in lifestyle

resulting in high overweight/obesity prevalence could be driving this epidemic. This increase presents a substantial public health burden in the face of scarce resources. Also, the rate of undiagnosed diabetes is high in most countries in SSA, and as such diabetes-related morbidity and mortality could grow substantially [15].

In Ghana, diabetes has remained among the top ten causes of morbidity and mortality over the past decade [16]. In Hohoe municipality, trading is the second highest occupation besides farming. Based on authors' general impression, most traders are obese due to their sedentary lifestyle and eating habits, hence are predisposed to diabetes with time. However, there are few or no studies on the prevalence of diabetes among traders in the Hohoe municipality. Unpublished data from the Hohoe Municipal Hospital (HMH) from 2010 to date indicate that there is an increase in the detection of diabetes cases in the municipality. The high prevalence of both out-patient and in-patient diabetes cases led to the establishment of a diabetes clinic in the HMH in June 2011. Statistics from the clinic shows that over the past five years, cases of diabetes have increased exponentially. This increase is probably due to the increased detection plus increased utilization of the facility in 2010. Sixty-seven cases were recorded in 2010, 100 in 2011, 473 in 2012 and 952 in 2013. Eight hundred and eighteen cases were reported between January and September 2014 [17]. This increasing diabetes trend in the municipality informed our study among traders who contribute significantly to the economic development of the informal sector of the municipality. Hence this report presents the prevalence and determinants of DM2 among traders in urban and peri-urban settlements in the Hohoe Municipality in the Volta region of Ghana.

Methods

Study Site

The study was conducted in Hohoe, the capital of the Hohoe Municipality. The municipality is located in the central part of the Volta Region with a population of 176,262 inhabitants, projected from the 2010 Ghana Population and Housing Census [18]. It covers an area of 1,403 sq. km, consisting of 102 communities and is divided into seven sub districts. The municipality is bounded to the North by Jasikan District, North-west by Biakoye District, West by Kpando Municipality, South by Afadjato South District and East by Republic of Togo. The major economic activity is farming and the second is trading. The municipality has 14 health centres, one reproductive and Child Health (RCH) clinic, three Community-based Health Planning and Services (CHPS) compounds, two outreach child health services, and one municipal referral hospital, making a total of 21 health facilities, to manage the health situations of the populace.

Study Design

This was a cross-sectional study carried out in April, 2015 among 387 traders in Hohoe, the capital of the Hohoe Municipality. A pre-tested, semi-structured questionnaire was used to obtain information on the socio-demographic characteristics, dietary pattern, lifestyle, knowledge and perception about diabetes. The questionnaire was pre-tested on a convenience sample of 20 traders who did not take part in the actual study.

Study Population

The study population consisted of traders who were aged 18 to 65 years, resident in the municipality for at least six months and consented to participate. Traders who reported being ill at the time of the study and were not able to give consent, were excluded from the study.

Sampling

A multi-stage sampling technique was used to select the communities and the participants. This included stratified sampling, thus the names of all the communities within Hohoe were listed to form a sampling frame of clusters stratified into urban and peri-urban, based on the population density. The corresponding total population was noted per stratum to enable proportionate calculation of the population. The names of the communities were written on pieces of paper and folded, then grouped into corresponding strata and shaken to ensure they mixed well. Using lottery method, three persons each were blinded and they randomly selected one community from each stratum. Individual units were interviewed in the selected communities.

Systematic sampling technique was used to select every k^{th} unit starting with a unit which corresponds to the number r chosen at random from 1 to k, where "k" is an integer such that k = N/n. A list of traders including market women and shop owners was obtained from the Hohoe Municipal Assembly. The sampling procedure was denoted as follows; r, r+k, r+2k, ... r+(n-1)k. Thus, this procedure was repeated until the sample size required was obtained.

Sample Size Determination

The required sample size was determined using the sample size calculation formula [19]. Z score of 1.96 at 95% confidence level, margin of error of 5% and proportion of 40% were entered in to the formula to determine a minimum sample size of 361. However, a non-response rate of 5% was added to the minimum sample size, which then increased the required sample size to 387 traders.

Data Collection

A pre-tested, semi-structured questionnaire was used to obtain information on the socio-demographic characteristics, dietary pattern, lifestyle, knowledge and perception about diabetes. Data were collected through one-on-one interview. Arterial blood pressure and anthropometric measurements of height, weight, hip and waist circumference were also measured. Finger-prick blood was used for assessment of fasting blood sugar level. Qualified health personnel were trained to assist in the data collection. Data quality control was ensured by calibrating all data collection tools for measurements before use.

Anthropometric measurements: Weight measurements were taken with an electronic bathroom weighing scale (Seca Personenwage Clara 803 Medical Scales and Measuring Systems, Hamburg, Germany), were taken with participants wearing light clothing without shoes, and values obtained were recorded to the nearest 0.5 kg. Heights of the traders were measured with a stadiometer while standing upright to the nearest 0.1 cm. Waist circumference (WC) and hip circumference (HC) were measured to the nearest 0.1 cm using an inextensible tape measure and the measurements were done at the naval region for WC and at the level of the greater trochanter for HC.

Blood Pressure measurement: Arterial blood pressure was measured at rest using a digital sphygmomanometer MOTECH™® TrueScan™ (Digital/Automatic Blood Pressure Monitor, Germany). Measurements were taken in triplicate at five minutes interval, and the average of the two nearest measurements was recorded to the nearest 1 mmHg.

Blood glucose level measurement: Capillary blood (10 µl) of the traders was obtained after pricking the ethanol-cleaned fingertip with a sterile lancet and the blood obtained was used to determine their blood glucose level using a glucometer (ONETOUCH Ultra Easy blood glucometer, UK). Fasting Blood Sugar

(FBS) was obtained from the traders who observed an overnight fast and those who had already eaten before the interview were visited the following day early in the morning after fasting, where FBS was obtained. All measurements were recorded to the nearest 0.1 mmol/L. Aseptic techniques were ensured during and after the procedure to prevent infection.

Statistical Analysis

Body mass index (BMI) was calculated based on WHO criteria as weight (kg) divided by height squared (m^2). Waist-to-Hip Ratio (WHR) was calculated by dividing WC by HC. BMI and WHR were classified based on WHO (1995) recommendations. FBS was classified based on recommended cut-offs [20]. Data were analyzed using SPSS version 20.0 (Chicago, USA). Frequencies and percentages were used to summarize categorical variables (sex, educational background, ethnicity, religion), whilst means and standard deviations were used for continuous variables (BMI, blood pressure and blood sugar level). Correlation between BMI, WHR and DM2 was determined using correlation coefficient. Chi-square analysis was used to test for the association between diabetes and background characteristics. The dependent variable was diabetes with two levels: high blood sugar and low blood sugar. Independent variables used in the model included background characteristics such as age, sex, educational level, marital status, and residential and business location. Other independent variables included ever been diagnosed DM2, static/sedentary business location (requiring sitting on one place or selling in shops with little activity) or mobile (walk approximately 3 km or more per day to sell goods), time for supper, fruits and vegetables consumption and physical activity defined as any bodily movement produced by skeletal muscles that requires energy expenditure – including exercise, activities undertaken while working, playing, carrying out household chores, active transportation, travelling, and engaging in recreational activities [20].The statistical significance was set at p-value < 0.05.

Ethical Considerations

Ethical approval for the study was sought from the Ghana Health Service Ethical Review Committee with an ID number GHS-ERC: 09/04/15. Permission was also sought from the Hohoe Municipal Health Directorate of the Ghana Health Service. Each respondent was informed prior to the interview that they were under no obligation to take part, that they could withdraw from the study at any time, and that all responses would be treated with paramount confidentiality. All the traders who agreed to be part of the study signed an informed consent form before being interviewed and blood samples taken.

Results

Background Characteristics of Respondents

A total of three hundred and eighty-seven (387) traders in the Hohoe Municipality were surveyed in April 2015. Majority (88.9%) were females, 58.4% had formal education up to Junior High School (JHS)/ Middle school level and 62.5% were married/co-habiting. Majority were Ewes (83.7%) and the least were Ga/Dangbe (0.8%). About 94% of the traders were Christians. Approximately, 14.5% of the traders were mobile (walk about 3 kms or more per day to sell goods), whilst the remaining 85.5% were static/sedentary (Table 1).

Characteristics	Frequency n (%)
Sex	
Female	344 (88.9)
Male	43 (11.1)
Age (years)	
20–30	60 (15.5)
31–40	101 (26.1)
41–50	118 (30.5)
≥ 51	108 (27.9)
Educational level	
None	117 (30.2)
Junior High/ Middle School	226 (58.4)
Senior High	37 (9.6)
Tertiary	7 (1.8)
Marital Status	
Single	35 (9.0)
Married/co-habiting	242 (62.5)
Divorced/ Widowed	110 (28.5)
Number of Children	
0	42 (10.9)
1–4	248 (64.1)
≥ 5	97 (25.1)
Residential Location	
Urban	312 (80.6)
Peri-Urban	75 (19.4)
Ethnicity	
Ewe	324 (83.7)
Guan	23 (5.9)
Northerner	23 (5.9)
Akan	15 (3.9)
Ga/ Dangbe	3 (0.8)
Religion	
Christian	365 (94.3)
Muslim	19 (4.9)
Traditional	3 (0.8)
Business location	
Static/Sedentary	331 (85.5)
Mobile	56 (14.5)

Table 1: Background characteristics of the traders (N = 387)

Knowledge about Type 2 Diabetes Mellitus (DM2)

Almost all the traders (96.9%) had never been tested for diabetes, however, more than half (59.7%) had knowledge about diabetes as a disease associated with too much sugar in the blood (Table 2). Taking too much sugar was the most common cause of diabetes reported by the traders. About 11% of the traders were of the view that late supper also causes diabetes, 8% said over eating, 1.6% attributed diabetes to obesity and 3.6% said lack of physical activity could cause DM2. The main complication of DM2 as reported by the traders is stroke (27.4%), hypertension (15.8%), foot amputation (14.0%) and heart attack (13.7%). About 44% reported eating healthy foods, physical activity (19.1%) and weight loss (4.9%) as well-known preventive measures against DM2. On lifestyle practices, physical activity level among the traders was low as 61.5% were not undertaking any form of physical activity. Almost half of the traders, 47.5% ate supper after 7pm. Each trader ate fruits and vegetables at least once a week. Specifically, 51.9% ate fruits more than twice in a week and 65.4% ate vegetables every 2–4 days per week.

Anthropometric and Biochemical Indices of the Traders

The mean body mass index (BMI), Waist-to-hip ratio (WHR) and fasting blood sugar (FBS) level were 29.15 ± 6.63 kg/m^2, 0.89 ±

Knowledge and lifestyle practices	Frequency n (%)
Tested for type 2 diabetes mellitus (DM2)	
Yes	12 (3.1)
No	375 (96.9)
Understanding of DM2	
Too much sugar in blood	231 (59.7)
Don't know	156 (40.3)
Causes of DM2	
Obesity	6 (1.6)
Lack of physical activity	14 (3.6)
Over eating	31 (8.0)
Taking too much sugar	157 (40.6)
Late supper	42 (10.9)
Don't know	137 (35.4)
Complications of DM2	
Heart attack	53 (13.7)
Stroke	106 (27.4)
Hypertension	61 (15.8)
Eye damage	19 (4.9)
Foot amputation	54 (14.0)
Don't know	94 (24.3)
Prevention of DM2	
Exercise	74 (19.1)
Weight loss	19 (4.9)
Eat healthy foods	169 (43.7)
Don't know	125 (32.4)
Physical activity per week	
Less than one hour	33 (8.5)
1-2 hours	55 (14.2)
3-5 hours	61 (15.8)
No physical activity	238 (61.5)
Time for supper	
Before 5pm	30 (7.8)
5-6pm	67 (17.3)
6-7pm	106 (27.4)
After 7pm	184 (47.5)
Fruit consumption per week	
Once	65 (16.8)
2 times	83 (21.4)
More than 2 times	201 (51.9)
Rarely	38 (9.8)
Vegetable consumption per week	
Everyday	74 (19.1)
Every 2-4 days	253 (65.4)
Weekly	48 (12.4)
Rarely	12 (3.1)

Table 2: Knowledge about DM2 and lifestyle practices (N = 387)

0.07 and 6.78 ± 2.34 mmol/L respectively. Only 26.9% were normal for their BMI and 71.9% were overweight/ obese. Waist-to-Hip Ratio was very high for 71.1% of the traders and low for only 8.2% (Table 3). About three quarters of the traders were non-diabetic, 18.4% were pre-diabetic and 8.5% were diabetic as shown in table 3 and figure 1.

The correlation between blood sugar and BMI was weak

Variable	Frequency n (%)
Body Mass Index (kg/m^2)	29.15 ± 6.63
Underweight	5 (1.3)
Normal	104 (26.9)
Overweight	126 (32.6)
Obese	152 (39.3)
Waist-to-Hip Ratio	0.89 ± 0.07
Low	32 (8.2)
High	80 (20.7)
Very high	275 (71.1)
Mean FBS (mmol/l)	6.78 ± 2.34
Non-diabetic (FBS ≤ 6.0 mmol/l)	283 (73.1)
Pre-diabetic (FBS = 6.1-6.9mmol/l)	71 (18.3)
Diabetic (FBS ≥ 7.0 mmol/l)	33 (8.5)

Table 3: Body mass index, Waist-to-hip ratio and blood sugar level (N = 387)

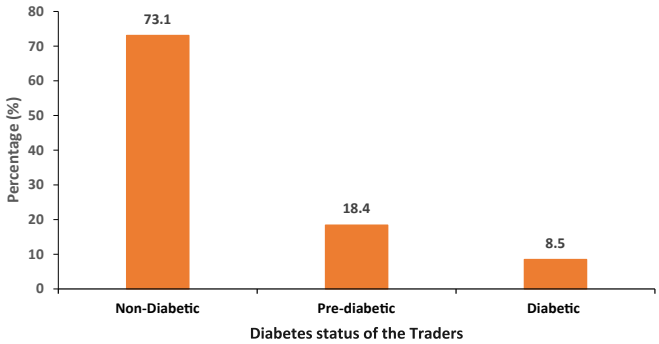

Figure 1: Diabetes prevalence among Traders in Hohoe.

Variable	Blood sugar	
	r	*p*-value
Body mass index	0.12	0.03*
Waist-to-hip ratio	0.24	< 0.001**

Table 4: Correlation between blood sugar level and body mass index and waist-to-hip ratio (*significant at *p*-value < 0.05; ** significant at *p*-value < 0.01)

(r = 0.12, *p*-value = 0.03). Also there was a weak but significant correlation between blood sugar and WHR (r = 0.24, *p*-value = < 0.0001) (Table 4).

Associations between DM2 and Background and Lifestyle Characteristics

There was a significant association between non-diabetic and pre-diabetic/diabetic traders in terms of their static/sedentary or mobile business location and marital status. As can be seen in table 5, married traders were more likely to develop diabetes as compared to single and divorced/widowed traders (x^2 = 9.57, *p*-value = 0.04). Static/sedentary traders were more likely to develop diabetes as compared to mobile traders (x^2 = 7.88, *p*-value = 0.04). Also traders who had never been diagnosed of diabetes or pre-diabetes were more likely to have diabetes as compared to those who had ever been tested (x^2 = 9.98, *p*-value = 0.004). There was no significant association between sex, age group, educational level and diabetes status. Also, there was no association between lifestyle characteristics such as physical activity, time for supper, fruit and vegetable consumption and DM2.

Characteristics	Diabetes status		x^2	*p*-value
	Non-diabetic	Pre-diabetic/ Diabetic		
Sex				
Female	255 (90.1)	89 (85.6)	1.58	0.27
Male	28 (9.9)	15 (14.4)		
Age (years)				
20-30	48 (17.0)	12 (11.6)	4.52	0.33
31-40	77 (27.2)	24 (23.1)		
41-50	86 (30.4)	32 (30.8)		
≥51	72 (25.4)	36 (34.6)		
Educational level				
None	82 (29.0)	35 (33.7)	1.65	0.64
Junior High/ Middle School	166 (58.7)	60 (57.7)		
Senior High	29 (10.2)	8 (7.7)		
Tertiary	6 (2.1)	1 (1.0)		
Marital Status				
Single	33 (11.7)	2 (1.9)	9.57	0.04*
Married/co-habiting	171 (60.4)	71 (68.3)		
Divorced/ Widowed	79 (27.9)	31 (29.8)		
Business location				
Static/Sedentary	235 (83.0)	95 (91.3)	7.88	0.04*
Mobile	48 (17.0)	8 (7.7)		
Ever been diagnosed of DM2				
Yes	4 (1.4)	8 (7.7)	9.98	0.004*
No	279 (98.6)	96 (92.3)		
Physical activity per week				
Less than one hour	22 (7.8)	11 (10.6)	2.37	0.51
1-2 hours	41 (14.5)	14 (13.5)		
3-5 hours	41 (14.5)	20 (19.2)		
No physical activity	179 (63.3)	59 (56.7)		
Time for supper				
Before 5pm	18 (6.4)	12 (11.5)	4.46	0.22
5-6pm	52 (18.4)	15 (14.4)		
6-7pm	74 (26.1)	32 (30.8)		
After 7pm	139 (49.1)	45 (43.3)		
Fruit consumption per week				
Once	47 (16.6)	18 (17.3)	2.67	0.45
2 times	59 (20.8)	24 (23.1)		
More than 2 times	145 (51.2)	56 (53.8)		
Rarely	32 (11.3)	6 (5.8)		
Vegetable consumption per week				
Everyday	49 (17.3)	25 (24.0)	2.76	0.44
Every 2-4 days	189 (66.8)	64 (61.5)		
Weekly	37 (13.1)	11 (10.6)		
Rarely	8 (2.8)	4 (3.8)		

Table 5: Associations between diabetes and background characteristics and fruits and vegetable consumption (N = 387)

Discussion

Prevalence of DM2

The study has shown that the prevalence of DM2 among traders in the Hohoe municipality was 8.5%. This prevalence is slightly higher than the 6.3% prevalence reported for Accra [16]. It is possible that the prevalence of diabetes in Accra has change since the study was done 14 years ago. Our finding is slightly higher than what was reported from Uganda (7.4%) [21]. Also our study found very high pre-diabetes prevalence (18.4%). This in contrary to what was reported in Uganda 8.6% [21]. This may be due to the fact that our study determined diabetes prevalence among traders whilst the Accra and Uganda studies determined diabetes in the general population. This presupposes that by the nature of their work, traders in the Hohoe municipality are a higher risk group as compared to the general population. The prevalence of DM2 was higher among static than the mobile traders. Even though age was not a statistically significant contributing factor to DM2, this study clearly showed that the prevalence of DM2 increases with age.

It was found that only 3.2% of the traders were aware that they were diabetic; however, half of them had their sugar levels under control at the time of the study. Since their glucose levels were

under control, they tested negative. This may be due to the fact that they were having regular check-ups and were receiving treatments regularly. Also, majority of the traders who were diagnosed as having diabetes had never been tested for diabetes and were going about their normal duties and not aware of their diabetic status.

Knowledge Level about DM2

Generally, the traders were knowledgeable about diabetes, its causes, complications and prevention strategies. These findings conform to a similar study in Rwanda that assessed participants' knowledge about diabetes [22]. It was found out that, more than half of the respondents knew the meaning of diabetes. In this study, the main cause of diabetes reported was taking too much sugar. Nonetheless about one quarter of the participants did not know the causes of diabetes. In previous studies elsewhere, it was reported that only a few respondents were able to give a rudimentary definition of diabetes as well as its causes, signs and consequences [22,23]. This shows that there is a considerable level of knowledge of the respondents on diabetes since this is one of the commonest non-communicable diseases and people are particularly showing great level of interest in knowing about the disease in order to avoid getting it. About 44% of the participants in this study mentioned healthy eating as the commonest preventative strategy against diabetes. The level of knowledge on diabetes prevention was low in this study population and this is in agreement with a previous study among health workers [24].

Factors Contributing to DM2 among Traders

There was a significant correlation between DM2 and WHR and BMI. Thus the diabetic traders were more overweight and obese than the non-diabetic traders. This finding confirms a previous study that reported states the risk of DM2 increases significantly with an increase in BMI and this continues in a monotonic fashion across a spectrum of BMI [25].

Our findings show that DM2 is associated with modifiable risk factors including overweight, obesity, WHR, static/sedentary business location which involve lower physical exertion, marital status, ever been tested and diagnosed of diabetes or pre-diabetes. These priority groups need to be targeted for more intense lifestyle education that emphasizes increased physical activity, self-monitoring of body weight and periodic fasting blood sugar checks. These activities may be integrated into outpatient departments at primary health care levels. The observation that DM2 and pre-diabetes prevalence are highest among traders 41 years and above, further supports the need for periodic screening of all persons older than 40 years for pre-diabetes.

It was reported in this study that mobile traders had a lower likelihood of DM2 or Pre-diabetes than static traders. A key question arising from this finding is whether participating in static/sedentary trading activities implies lower physical exertion. This finding therefore highlights the need for further studies that explore work patterns and ambulatory physical activity of different occupational groups in the Hohoe Municipality.

Limitations

This was a cross-sectional study and hence could not establish causal relationship between diabetes and risk factors among the traders. Other limitations of this study include: determining DM2/pre-diabetes on the basis of a single rapid FBS test, possible recall bias in the assessment of fruits and vegetable consumption and not assessing actual quantities eaten. However, FBS is recommended by the WHO as the first line screening test for diabetes and pre-diabetes [2]. Multiple simultaneous tests are of limited value in screening because of their cost implication. The knowledge reported in this study reflects the views of traders in Hohoe municipality and may not be generalizable to other populations and study groups.

Conclusion

The prevalence of DM2 and Pre-diabetes was high among traders aged 41–65 years and most were not aware of their status. More importantly, knowledge on diabetes among the traders was below average. There is therefore a strong justification for intensified education and targeted periodic screening of individuals aged 41–65 years when they interface with the health services. Likewise, diabetes prevention programs could identify high risk groups on the basis of other risk factors which this study identified as: overweight, obesity and sedentary employment. Also, community-based screening could be instituted since traders are busy and come into contact with health workers only when sick.

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Conflict of Interest

The authors declare that they have no competing interests.

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