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Prevalence of prediabetes and its risk factors among adults in selected communities in Accra

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Abstract

Background: Diabetes mellitus is a global health issue, with cases projected to surge from 180,000,000 in 1980 to over 693,000,000 by 2045. Considering that prediabetes precedes type 2 diabetes, early diagnosis and timely intervention are essential to prevent or delay disease progression.

Objective: This study assessed the determinants of prediabetes among adults in selected Accra communities.

Methods: This study investigated prediabetes prevalence in five Accra communities - North Kaneshie, Madina, Teshie, Lapaz, and Legon. A cross-sectional study used multistage sampling to recruit 360 adults (≥ 18 years). Eligibility required Accra residency (≥ 1 year), 10 – 12-hour fasting, and informed consent. Sociodemographic variables, behavioural patterns, dietary intakes, anthropometric measures and clinical indicators were collected. Logistic regression was employed to estimate associations between all variables and prediabetes status.

Results: Prediabetes and diabetes prevalence were 26.7% and 29.4%, respectively. Significant associations were found with prediabetes for female sex (OR: 2.03, 95% CI: 1.02 - 4.59, p = 0.031), age 40 - 59 years (OR: 2.97, 95% CI: 1.10-8.32, p = 0.039), and being single (OR: 2.60, 95% CI: 1.05-6.43, p = 0.038). Behavioral factors linked to prediabetes included salt intake (AOR: 6.25, 95% CI: 1.69-23.02, p=0.006), smoking (AOR: 10.14, 95% CI: 1.21-111.03, p = 0.002), caffeine intake (AOR: 2.51, 95% CI: 1.53 - 11.88, p = 0.012), and low physical activity (AOR: 3.53, 95% CI: 1.83 - 7.89, p < 0.001). Increased consumption of starchy foods (AOR: 3.63, 95% CI: 1.74 - 7.58, p = 0.007), animal-sourced foods (AOR: 2.54, 95% CI: 1.36 - 4.86, p = 0.015), fats and oils (AOR: 5.87, 95% CI: 2.76 - 12.51, p = 0.001), and legumes (AOR: 2.45, 95% CI: 1.23 - 6.11, p = 0.045) were significantly linked to prediabetes. BMI greater than 25kg/m2 (AOR: 4.55, 95% CI: 2.12 - 18.11, p < 0.001), MAP (AOR: 4.21, 95% CI: 1.50 - 11.81, p = 0.006), and stage 1 hypertension (AOR: 6.74, 95% CI: 1.50 - 30.29, p = 0.015) showed associations with prediabetes.

Conclusion: Prediabetes prevalence was high, driven by sociodemographic, dietary, and behavioural factors. Lifestyle and physiological risks underscore the urgent need for targeted interventions in this population.

Keywords: Prediabetes, diabetes mellitus, body mass index (BMI), blood pressure, dietary predictors

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INTRODUCTION

Diabetes mellitus (DM) is a highly prevalent global health disease, with cases soaring across regions and particularly in lower- and middle-income countries. The World Health Organisation (WHO) reported a dramatic increase from 180 million diabetes cases in 1980 to 422 million in 2014, and by 2019, diabetes and related kidney disease contributed to approximately 2 million deaths worldwide [1]. Approximately 693 million people could live with diabetes by 2045, with around half undiagnosed [2]. Diabetes is generally categorised into type 1, type 2, and gestational diabetes. Type 1 diabetes, previously known as "juvenile diabetes," results from insulin deficiency and requires lifelong administration, while type 2 diabetes is associated with insulin resistance and is often linked to obesity, family history, and lifestyle factors. Gestational diabetes, which affects pregnant women, increases the risk of diabetes later in life for both mother and child [3,4]. Recent global criteria define diabetes by a

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fasting plasma glucose threshold of > 7.0 mmol/L, with prediabetes marked by 6.1 - 6.9 mmol/L. Individuals with prediabetes have higher risks for type 2 diabetes, heart disease, and other complications, though lifestyle changes can significantly reduce this risk [5,6].

The rising global prevalence of prediabetes necessitates critical early intervention, with data indicating that impaired fasting glucose is common in both Asian and Caucasian populations [7]. US data from the CDC found that between 2009 and 2012, 37% of adults aged over 20 and 51% over 65 were living with prediabetes, equating to approximately 86 million Americans. The global prevalence of prediabetes was around 343 million (7.8%) in 2010, with the International Diabetes Federation estimating a rise to 471 million by 2035 [8]. In Africa, approximately 19.8 million people have diabetes, with approximately 75% of these cases undiagnosed, while type 2 diabetes accounts for about 90% of cases. This increase parallels a rise in obesity and cardiovascular risk factors in sub-Saharan Africa, where the prevalence of diabetes has increased from an estimated 7.1 million in the early 2000s to a projected 18.6 million by 2030 [9]. Ghana reflects similar trends, with prevalence estimates between 6.2% and 13.9%. Policymakers remain inadequately informed about diabetes prevalence and its public health impact, partly due to data gaps and regional variability.

Prediabetes, though often undiagnosed, poses serious public health implications as it often leads to type 2 diabetes, a condition associated with multiple health complications, including cardiovascular disease, neuropathy, and kidney disease [10]. Increasing urbanisation and sedentary lifestyles contribute significantly to prediabetes risk. Screening efforts remain limited in many developing nations, constraining the ability of healthcare systems to implement preventive measures. Research into prediabetes prevalence and associated risk factors in Accra, Ghana, offers valuable insights into the health effects of urbanisation, informing targeted prevention strategies and potentially alleviating future healthcare burdens. Despite the known progression of prediabetes to diabetes, a paucity of data exists on the risk factors for prediabetes in Ghana. The current study assessed prediabetes prevalence in Accra and identified key risk factors.

MATERIALS AND METHODS

Study design and sites

This cross-sectional study was conducted in Accra over six months (January to June 2024), assessing sociodemographic details, behavioural and lifestyle factors, dietary habits, and other prediabetes risk factors using a pre-tested questionnaire. The study involved both household and hospital outreaches. Five communities in Accra, North Kaneshie, Madina, Teshie, Lapaz, and Legon were selected for their demographic diversity, variations in healthcare access, and relevance to the study objectives. North Kaneshie and Lapaz, located in the Okaikoi South Sub-Metropolitan District, represented urban residential settings. Madina, part of the La Nkwantanang-Madina Municipal District, included Pentecost Hospital as a key healthcare centre. Teshie, situated in the Ledzokuku Municipal District, and Legon, home to the University of Ghana Hospital, served as both community and clinical recruitment sites. These diverse locations allowed for a comprehensive assessment of the target population.

Sample size and sampling technique

The study targeted adults (18 years and above) residing in Accra. Using Cochran's formula with a 95% confidence level and a 2% margin of error, a sample size of 360 was calculated based on a 3.9% prevalence rate previously reported by Vuvor et al. [11]. A multistage sampling procedure was employed to ensure a diverse and representative sample while maintaining methodological rigour. The selection process combined a community-based and hospital-based approach to recruit participants from different settings within Accra. In the community-based sampling, study locations were selected using convenience sampling to reflect the city's diverse urban landscape, incorporating both residential and commercial areas. Within each chosen community, systematic sampling was applied to select streets, ensuring a structured and unbiased approach. A random starting point was determined, and every third house was approached for participation. To enhance fairness, data collection alternated between both sides of the street rather than arbitrary exclusion of any given side. At each household, informed consent was obtained, and participants were given a clear explanation of the study's objectives, potential risks, voluntary nature, and confidentiality. This procedure was repeated across multiple communities until the required sample size was obtained.

For the hospital-based sampling, simple random sampling was employed to ensure an unbiased selection of participants due for blood glucose checkups. Hospital records were used to compile a list of eligible patients, each assigned a number. A computer-generated random selection process was then applied to select participants systematically. This method was implemented across multiple hospitals, ensuring a mix of public and private healthcare facilities, thereby capturing a broad socioeconomic representation. By combining these two approaches, the study achieved a balanced and comprehensive sample, allowing for greater validity and generalizability of the findings across Accra's diverse population.

Inclusion criteria required participants to have lived in Accra for at least one year, be aged 18 or older, and fast overnight (10 - 12 hours) prior to testing. Pregnant or lactating women were excluded from the study to avoid potential confounding effects, as hormonal changes during pregnancy and lactation can significantly alter glucose metabolism and may not reflect typical prediabetes risk factors. Additionally, individuals with severe medical or mental conditions were excluded to ensure participants' safety and the reliability of the data. Participants were recruited from households and hospitals within the selected communities. After explaining the study objectives, verbal or written consent was obtained. Participants from households were advised to fast overnight, while hospital participants were already fasting, aligning with study requirements.

Data collection and instruments

The classification of prediabetes and diabetes was based on the World Health Organisation (WHO) criteria, ensuring consistency with globally recognised diagnostic standards. Blood glucose levels were measured, and individuals were categorised accordingly. A 7-day food frequency questionnaire (FFQ) was used to evaluate participants' habitual food intake for dietary assessment. This validated tool allowed for a comprehensive analysis of dietary patterns, capturing variations in food consumption over a week.

Blood pressure was assessed using an automated Omron digital sphygmomanometer. Measurements were taken twice on the left arm of each participant with a 5-minute rest interval between readings, and the average of the two values was used for analysis. Hypertension was defined according to the American Heart Association (AHA) guidelines. Participants were categorised as having normal blood pressure if systolic blood pressure was less than 120 mmHg and diastolic pressure was less than 80 mmHg. Stage 1 hypertension was defined as systolic blood pressure between 130 – 139 mmHg and diastolic pressure between 80–89 mmHg, while Stage 2 hypertension was defined as systolic pressure equal to or greater than 140 mmHg and diastolic pressure equal to or greater than 90 mmHg.

Physical activity levels were assessed using a modified version of the International Physical Activity Questionnaire (IPAQ) developed by Craig et al. (2003). Participants self-reported their activity levels over the past seven days, providing data on frequency, duration, and intensity. The IPAQ, a widely validated tool, allowed for the estimation of Metabolic Equivalent of Task (MET) scores, which facilitated the classification of participants' activity levels as low, moderate, or high. Anthropometric measurements, including height and weight, were recorded twice per participant for accuracy. Clinical assessments included blood glucose, measured using a glucometer, and blood pressure, measured twice on the left arm with a 5-minute interval using an Omron sphygmomanometer. Each data point was averaged for precision.

Data Analysis

Microsoft Excel was used for data entry and cleaning, and the IBM Statistical Package for Social Sciences (SPSS) version 26.0 software was used for all data analysis. The categorical sociodemographic variables of the participants were summarised into frequencies and percentages using descriptive statistics, and the continuous sociodemographic variables were analysed using mean and standard deviation. Binary logistic regression was used in predicting the risk factors of prediabetes by explaining the relationship between the dependent variable (prediabetes) and the independent variables (physical activity, age, religion, education level, monthly income, length of sleep, salt intake, BMI, dietary factors, marital status, smoking, stress management, blood pressure status and mean arterial pressure). Three confounding variables identified using bivariate analysis for the logistic regression model were marital status, sex and age. They were controlled and adjusted for in the model.

RESULTS

Table 1 presents participant demographics, revealing an average age of 49 years (SD = 15) and a female majority (57.8%, n = 208). The sample was predominantly identified as Christian (82.5%, n = 297) and married (55%, n = 198). Regarding education, most participants had secondary-level education (43.3%), while income distribution indicated that 47.8% earned between 1001 and 2000 Ghana cedis (US $70.07 - $140) monthly. Blood glucose levels among participants, illustrated in Figure 1, show that 43.3% had blood sugar levels within the range of 3.9 - 6mmol/L, 29.4% had levels of 7mmol/L or above, and 26.7% were within the prediabetes range of 6.1-6.9mmol/L. Multivariate logistic regression analysis (Table 2) revealed that females (OR: 2.03, 95% CI: 1.02 - 4.59, p = 0.031), individuals aged 40 - 59 (OR: 2.97, 95% CI: 1.10 - 8.32, p = 0.039), and singles (OR: 2.60, 95% CI: 1.05 - 6.43, p = 0.038) had higher odds of prediabetes.

In examining behavioural factors (Table 3), salt and caffeine intake were strongly linked to prediabetes

Table 1. Background characteristics of participants

Characteristic	n (%)
Sex	
Male	152 (42.2)
Female	208 (57.8)
*Age (years)	49 ± 15
Religion	
Christian	297 (82.5)
Muslim	58 (16.1)
Others	5 (1.4)
Level of education	
Primary	140 (38.9)
Secondary	156 (43.3)
Tertiary	64 (17.8)
Marital status	
Married	198 (55.0)
Single	162 (45.0)
Income (GHS)	
≤ 1000	65 (18.1)
1001-2000	172 (47.8)
≥ 2001	123 (34.1)

*Means data is represented in means and standard deviations

Table 2. Sociodemographic predictors associated with prediabetes among participants

Characteristic	OR (CI[1])	p-value[2]
Sex		
Male	1	
Female	2.03 (1.02-4.59)	0.031
Age (years)		
18-39	1	
40-59	2.97 (1.10-8.32)	0.039
60+	1.53 (0.60-3.94)	0.377
Level of education		
Primary	1.85 (0.96-3.55)	0.066
Secondary	1.34 (0.47-1.89)	0.535
Tertiary	1	
Marital status		
Married	1	
Single	2.60 (1.05-6.43)	0.038
Income (GHS)		
≤ 1000	1.34 (0.52-1.99)	0.972
1001-2000	1.08 (0.18-2.28)	0.489
≥ 2001	1	

*OR = Odds ratio; CI = Confidence interval; GHS = Ghana Cedis 1 = Confidence interval at 95% 2 = p-value based on binary logistic regression; significance level $p < 0.05$

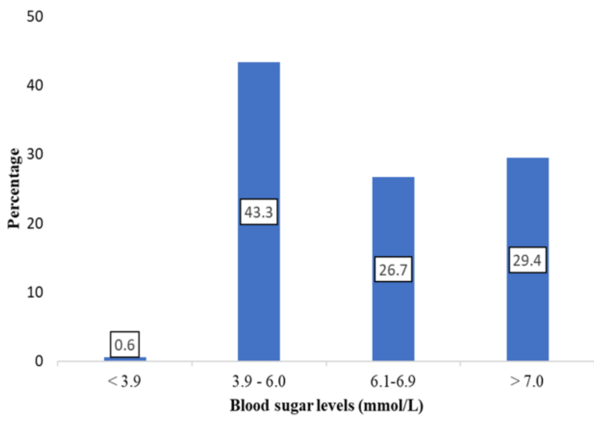

Figure 1. Blood glucose levels of participants

Table 3. Behavioural and lifestyle factors associated with prediabetes among participants

Risk factor	Unadjusted		Adjusted	
	OR (CI[1])	p-value[2]	OR (CI[1])	p-value[2]
Salt intake				
Yes	6.58 (1.87-23.22)	0.003	6.25 (1.69-23.02)	0.006
No	1		1	
Alcohol intake				
Yes	1.50 (0.47-4.91)	0.144	1.54 (0.18-3.52)	0.060
No	1		1	
Caffeine intake				
Yes	1.89 (1.19-6.78)	0.039	2.51 (1.53-11.88)	0.012
No	1		1	
Smoking				
Yes	8.90 (1.29-84.08)	0.004	10.14 (1.21-111.03)	0.002
No	1		1	
Snacking				
Yes	1 (0.53-1.90)	0.992	1.24 (0.65-2.38)	0.520
No	1		1	
Length of sleep				
Healthy	1		1	
Unhealthy	2.53 (1.05-5.24)	0.041	5.11 (1.54-9.43)	0.005
Meals in a day				
≤2	1		1	
≥3	2.00 (1.11-3.04)	0.021	2.54 (1.83-5.56)	0.004

*OR = Odds ratio; CI = Confidence interval
Adjusted for age, sex and marital status.
1 = Confidence interval at 95%
2 = p-value based on binary logistic regression; significance level $p < 0.05$

OR for salt: 6.25, 95% CI: 1.69 - 23.02, p = 0.006; for caffeine: 2.51, 95% CI: 1.53 - 11.88, p = 0.012). Smoking and poor sleep were also significant risk factors, with adjusted ORs of 10.14 (95% CI: 1.21 - 111.03, p = 0.002) and 5.11 (95% CI: 1.54 - 9.43, p = 0.005), respectively. High stress levels increased prediabetes risk eightfold (adjusted OR: 8.29, 95% CI: 3.30 - 20.80, p < 0.001) (Table 4). Dietary patterns (Table 4), particularly high starchy food and low fruit and vegetable intake, were associated with elevated odds of prediabetes (adjusted ORs for starch: 3.63,

Table 4. Physical activity levels, dietary choices and stress levels associated with prediabetes among study participants

Risk factor	Unadjusted OR (CI[1])	p-value[2]	Adjusted OR (CI[1])	p-value[2]
Physical activity				
Low	3.20 (1.45-7.03)	<0.001	3.53 (1.83-7.89)	<0.001
Moderate	2.22 (1.03-4.76)	0.005	1.53 (1.21-5.33)	0.003
High	1		1	
Stress levels				
Moderate	1		1	
High	6.36 (2.79-14.47)	0.004	8.29 (3.30-20.80)	<0.001
Starchy foods				
≤ 4	1		1	
≥ 5	2.60 (1.43-6.82)	0.004	3.63 (1.74-7.58)	0.007
Vegetables				
≤ 4	2.43 (1.03-5.72)	0.043	2.22 (1.02-5.07)	0.049
≥ 5	1		1	
Fruits				
≤ 4	1.23 (0.27-3.21)	0.059	4.90 (2.57-9.37)	0.031
≥ 5	1		1	
Animal sourced foods				
≤ 4	1		1	
≥ 5	1.24 (1.01-2.93)	0.032	2.54 (1.36-4.86)	0.015
Fats and oils				
≤ 4	1		1	
≥ 5	3.43 (2.12-9.56)	0.012	5.87 (2.76-12.51)	0.001
Legumes and nuts				
≤ 4	1		1	
≥ 5	1.55 (0.62-3.88)	0.241	2.45 (1.23-6.11)	0.045
Confectionaries				
≤ 4	1		1	
≥ 5	2.10 (1.09-5.21)	0.021	2.25 (1.19-5.23)	0.019

*OR = Odds ratio; CI = Confidence interval
Adjusted for age, sex and marital status
1 = Confidence interval at 95%
2 = p-value based on binary logistic regression; significance level p < 0.05

Table 5. Association between BMI and blood pressure with prediabetes among participants

Risk factor	Unadjusted OR (CI[1])	p-value[2]	Adjusted OR (CI[1])	p-value[2]
BMI (kg/m^2)				
≤ 25	1		1	
>25	3.45 (1.54-12.11)	0.003	4.55 (2.12 - 18.11)	<0.001
Blood Pressure				
Normal	1		1	
Elevated	3.21 (0.43-18.83)	0.132	4.51 (1.14 - 22.12)	0.032
Stage 1 hypertension	4.55 (0.84-25.91)	0.244	6.74 (1.50-30.29)	0.015
Stage 2 hypertension	3.70 (1.33-10.31)	0.045	2.77 (1.04-7.39)	0.038
Mean Arterial Pressure				
Normal	1		1	
High	3.66 (1.26-10.64)	0.017	4.21 (1.50-11.81)	0.006

Adjusted for age, sex and marital status.
1 = Confidence interval at 95%
2 = p-value based on binary logistic regression; significance level p < 0.05

95% CI: 1.74 - 7.58, p = 0.007, fruit: 4.90, 95% CI: 2.57 - 9.37, p = 0.031). Elevated BMI (adjusted OR: 4.55, 95% CI: 2.12 - 18.11, p < 0.001) and hypertension stages 1 and 2, along with high mean arterial pressure, were strongly associated with prediabetes, even after adjustments (Table 5).

DISCUSSION

The diagnostic thresholds for prediabetes in this study followed the World Health Organisation (WHO) criteria, defining impaired fasting glucose as 6.1 - 6.9 mmol/L, while hyperglycemia (diabetes) was defined as ≥ 7.0 mmol/L. The American Diabetes Association (ADA), in contrast, classifies prediabetes more broadly from 5.6 - 6.9 mmol/L [1]. Although this study employed WHO criteria for consistency with national practice, the broader ADA cut-off range could imply a higher estimate of prediabetes prevalence in similar populations. The prevalence of prediabetes in this study sample was 26.7%, surpassing previous rates reported in Ghana's Ho municipality (17.3%) and global estimates of 15.8% [7,11]. These findings highlight an emerging public health challenge, as individuals with prediabetes face a significantly increased risk of progressing to type 2 diabetes mellitus. The differences in prediabetes prevalence across regions likely reflect a complex interplay of sociodemographic, lifestyle, and environmental factors. Urbanisation in Accra contributes to risk factors such as processed diets, reduced physical activity, and higher exposure to environmental toxins, including air pollution and chemicals, which have been associated with metabolic disorders, including prediabetes [12]. Rural diets, such as those seen in Ho municipality, often feature complex carbohydrates and fibre, which may provide protective effects against prediabetes compared to Accra's urban diets, which are high in refined sugars and unhealthy fats.

Diabetes prevalence was also notably high in this sample at 29.4%, exceeding previous rates documented in Ghanaian studies, which reported rates of 3.9%, 5.4%, and 8.2%, respectively [13,14,15]. Many people living with diabetes remain unaware of their condition, with over 25% of cases going undiagnosed, according to these studies. The higher prevalence observed in this study could be attributed to the adoption of Westernised dietary habits, sedentary lifestyles, and reduced focus on preventive healthcare measures [16]. These results align with global trends projecting significant increases in diabetes and prediabetes cases, underscoring the urgent need for targeted interventions and public health education [3]. Comparative analysis with other African and international settings reveals regional variations in prediabetes prevalence. In Nigeria, estimates ranged from 10.4% (WHO criteria) to 13.2% (ADA criteria), while South Africa reported a notably higher prevalence of 67% [17]. In Ethiopia, prediabetes affected 15.7% of adults, and Egypt reported a prevalence of 21.7% [18,19]. The comparatively high prevalence of prediabetes in Accra suggests unique contextual factors, such as urbanisation, dietary patterns, and lifestyle changes, which require further investigation and tailored interventions [20].

Several key risk factors reported in previous investigations were similarly identified in this present study. Females were nearly twice as likely to develop prediabetes as males, consistent with evidence indicating that hormonal fluctuations and differential fat distribution contribute to increased susceptibility to prediabetes [21,22]. Middle-aged adults (40 - 59 years) demonstrated a significantly higher likelihood of prediabetes than younger adults, suggesting that metabolic changes and reduced physical activity during middle adulthood increase risk [23,24]. Marital status emerged as a significant factor, with single participants facing nearly triple the risk of prediabetes compared to married individuals, potentially due to the absence of social support networks associated with healthier behaviours [25].

Behavioural factors, including high salt intake, caffeine consumption, and physical inactivity, were strongly linked to prediabetes. High salt intake increased the odds sixfold, corroborating studies demonstrating its adverse effects on pancreatic beta-cell function and glucose intolerance [26,27]. Similarly, caffeine consumption was associated with elevated risk due to its stimulatory effects on stress hormones, which raise blood glucose levels [28]. Physical inactivity further increased risk, with low-activity participants nearly 3.5 times more likely to develop prediabetes, reinforcing established evidence linking reduced activity levels to poorly controlled blood glucose levels [29,30]. Sleep duration exhibited a U-shaped relationship with prediabetes risk, where both insufficient and excessive sleep negatively impacted glucose metabolism [31].

Dietary patterns significantly influenced prediabetes risk, as frequent consumption of starchy foods elevated risk nearly fourfold, consistent with evidence linking high-glycemic foods to impaired glucose tolerance [32]. Low intake of vegetables and fruits also doubled and quintupled risk, respectively, highlighting their protective role in regulating blood sugar levels [33,34]. High consumption of animal-sourced foods, fats, and oils further exacerbated risk, aligning with findings that diets high in saturated fats promote insulin resistance and chronic inflammation [35,36]. Confectionery intake similarly elevated risk due to high sugar content, while legume consumption showed unexpected associations, possibly influenced by preparation methods and sedentary behaviour.

Physiological factors, such as high BMI and elevated blood pressure, were strong predictors of prediabetes. Participants with a BMI over 25 kg/m² faced nearly fivefold higher risk, consistent with findings linking obesity to insulin resistance [37]. Elevated blood pressure and hypertension stages 1 and 2 significantly increased risk, with mean arterial pressure (MAP) further compounding susceptibility, thus supporting the bidirectional relationship between elevated blood pressure and impaired glucose metabolism [10,38]. These observances may stem from shared pathophysiological pathways such as endothelial dysfunction, arterial stiffness, and oxidative stress. The interplay between metabolic factors, systemic inflammation, and endothelial dysfunction highlights the critical need to address hypertension in prediabetes prevention.

Study limitation

The inclusion of hospital participants may introduce selection bias, as these individuals could have underlying health concerns or be more health-conscious than the general population. This bias may overestimate the prevalence of prediabetes and diabetes in Accra. Additionally, reliance on self-reported dietary intake and physical activity data introduces the potential for bias, as participants might under-report unhealthy behaviours or over-report healthier ones. Future research should incorporate objective measures, such as dietary records or accelerometer data, to enhance data accuracy and reliability.

Conclusion

This study identified a prediabetes prevalence of 26.7%, exceeding previous estimates in Ghana and highlighting an urgent public health challenge. Prediabetes and diabetes prevalence in this sample underscore the need for early detection and management to prevent progression to type 2 diabetes. Key risk factors included high BMI, elevated blood pressure, physical inactivity, high salt and caffeine intake, and a diet high in animal-sourced foods and fats. To address these findings, we suggest several policy actions: implementation of community-based screening programs for prediabetes to facilitate early detection, public health educational campaigns focused on promoting lifestyle modifications such as increased physical activity and dietary changes, and the integration of prediabetes screening and management into primary healthcare services to ensure accessibility and continuity of care.

The findings of this study have significant implications for health policy in Ghana. They strongly support the goals of Ghana's National Diabetes Strategy by providing evidence for the need to prioritise prediabetes prevention and management. Furthermore, the study contributes to the achievement of Sustainable Development Goal 3 (Good Health and Well-being), particularly target 3.4, which aims to reduce premature mortality from non-communicable diseases, including diabetes, by one-third by 2030.

DECLARATIONS

Ethical consideration

The study was approved by the Ethical Committee of the College of Basic and Applied Science, University of Ghana and the Ghana Health Service Ethical Review Board with identification numbers (ECBAS 021/23-24) and (GHS-ERC 031-12-23), respectively. Written informed consent was obtained from all study participants.

Consent to publish

All authors agreed on the content of the final paper.

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None

Competing Interest

The authors declare no conflict of interest

Author contribution

All authors contributed significantly to the study's conceptualisation, design, data collection, analysis, drafting and finalisation of the manuscript.

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Availability of data

Data is available upon request to the corresponding author

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