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Research Article

Physical Activity and Blood Sugar Control in Type 2 Diabetes Patients at Mama Lucy Kibaki Hospital, Nairobi, Kenya

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Abstract

Type 2 Diabetes Mellitus (T2DM) is a growing public health burden in Kenya and in the globe. Regular physical activity remains a key non-pharmacological strategy for improving glycemic outcomes in type 2 diabetic patients. This study assessed the relationship between physical activity and blood sugar control among adults with T2DM attending the outpatient diabetes clinic at Mama Lucy Kibaki Hospital, Nairobi, using a cross-sectional analytical design. Physical activity was assessed using the Global Physical Activity Questionnaire (GPAQ) and converted into MET-min/week categories; clinical glycemic indicators were obtained from patient records and validated where necessary, with quantitative analysis conducted in SPSS. Data from 116 participants was analyzed. Most participants were found to be overweight (41.4%) or obese (27.6%). Random blood sugar levels showed that 25.0% were within the normal range (<7.8 mmol/L), 38.8% were elevated (7.8–11.0 mmol/L), and 36.2% were in the diabetes range (≥11.1 mmol/L). Reported physical activity participation was also generally high with Metabolic Equivalent of Task (MET)-based categorization showing that 70.2% of the respondents had above average (≥3000 MET-min/week). A weak inverse association was as well observed between total energy expenditure (MET-min/week) and random blood sugar (r = −0.062). These findings suggest that although many patients report engaging in physical activity, the relationship with glycemic control may be limited or influenced by other factors such as weight status and broader lifestyle or clinical factors. Strengthening structured and monitored activity counselling alongside weight management support may therefore improve diabetes outcomes in this setting.

Keywords

Type 2 Diabetes Mellitus, Physical Activity, Glycaemic Control, Metabolic Equivalent of Task (MET), Random Blood Sugar, Nutritional Status, Body Mass Index, Kenya

1. Introduction

Type 2 Diabetes Mellitus (T2DM) is a major global public health challenge characterized by insulin resistance, impaired insulin secretion, and chronic hyperglycemia [1]. It accounts for over 90% of all diabetes cases globally and continues to increase at an alarming rate, particularly in low- and middle-income countries [2]. The global diabetes prevalence among

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adults aged 20–79 years was estimated at 537 million in 2021 and is projected to reach 783 million by 2045, with sub-Saharan Africa experiencing the fastest growth [2]. In Kenya, the prevalence of diabetes among adults stands at approximately 3.4% with urban regions such as Nairobi bearing the highest burden due to sedentary lifestyle and dietary transitions [3, 4].

Physical activity is widely recognized as a cornerstone of diabetes management, alongside dietary modification, medication adherence, and behavioral interventions [5]. Regular physical activity improves insulin sensitivity, enhances glucose uptake by skeletal muscles, aids in weight management, and reduces cardiovascular risk factors [6]. Moreover, both aerobic and resistance exercises have been shown to significantly lower glycated hemoglobin (HbA1c) levels, independent of weight loss [7]. The American College of Sports Medicine (ACSM) recommends at least 150 minutes of moderate-intensity aerobic exercise per week, supplemented by resistance training two to three times weekly for optimal glycemic control [8].

Despite the established benefits of physical activity, evidence suggests that most individuals with T2DM fail to meet the recommended activity levels, particularly in urban areas where sedentary lifestyles predominate [9]. Factors such as limited access to safe exercise environments, poor health literacy and status, cultural beliefs, and financial constraints contribute to low physical activity participation [10]. In Kenya, rapid urbanization and technological advancement have exacerbated sedentary behaviors, especially among middle-aged and older adults, who form the majority of T2DM patients [3].

Research indicates that integrating physical activity into diabetes care leads to substantial improvements in fasting blood glucose and HbA1c levels [8]. Mechanistically, physical exercise enhances glucose transport by increasing the translocation of glucose transporter type 4 (GLUT-4) in muscle cells, thus promoting glucose utilization independent of insulin [7].

However, in many sub-Saharan African settings, including Kenya, the incorporation of physical activity as part of diabetes care and management remains suboptimal [11]. A study conducted at Kenyatta National Hospital revealed that most T2DM patients relied heavily on pharmacological treatment, with minimal adherence to lifestyle recommendations [12]. Similarly, findings from a previous study conducted at Mama Lucy Kibaki hospital indicated that T2DM patients exhibited limited engagement in physical activity despite acknowledging its importance [13]. This gap highlights a critical need to assess how physical activity influences blood glucose control among T2DM patients receiving diabetes care in this setting.

2. Materials and Methods

2.1. Research Design

This study utilized a cross-sectional analytical research design to evaluate the physical activity practices and blood sugar concentration of outpatients with type 2 diabetes mellitus at Mama Lucy Kibaki Hospital in Nairobi City County, Kenya. It aimed at investigating the relationship between physical activity and blood sugar control among adult patients living with T2DM. Quantitative methods were extensively applied in the collection and analysis of data.

2.2. Study Area

This study was conducted at Mama Lucy Kibaki Hospital, located in Komarock Ward, Embakasi Central Sub-County, Nairobi City County, Kenya. Serving the wider Nairobi Eastlands community, the hospital provided a setting for collecting data that offers valuable insights into the dietary habits and physical activity patterns of patients with Type 2 Diabetes Mellitus, supporting policy assessment, identifying gaps, and guiding recommendations for better management and future research.

2.3. Target Population

This study focused exclusively on adult patients aged 18 years and above who had type 2 diabetes and were attending routine diabetes clinics at Mama Lucy Kibaki Hospital in Nairobi City County, Kenya. Consequently, the results of the study may only be applicable to populations with characteristics similar to those of the participants involved in the study.

2.4. Inclusion and Exclusion Criteria

The study included adult patients aged 18 years and above with type 2 diabetes who had been attending clinics at Mama Lucy Kibaki Hospital, had lived with the T2DM diagnosis for at least four months, and consented to participate in the study. However, pregnant patients and those with psychological or mental health disorders were excluded from participation in the study.

2.5. Sample Size Determination and Sampling Strategy

The sample size was determined using Fisher's formula (Fisher et al., 1998) for estimating proportions, with a 95% confidence interval and a 5% margin of error. Based on an assumption that 50% of patients adhered to recommended physical activity levels ($p = 0.5$), the initial calculated sample size was 323. Since the monthly population of T2DM patients at the clinic was 155, a finite population correction was applied, reducing the sample size to 105 participants. To accommodate potential non-response or incomplete questionnaires, the calculated sample size was raised by 10% which brought the final sample size to 116 respondents.

Participants were selected using a simple random sampling technique to ensure representativeness and minimize selection bias. Eligible patients attending the diabetes clinic were assigned random numbers, and selection was conducted through a balloting method until the desired sample size was achieved.

2.6. Validity and Reliability

The research instruments were pretested at Mbagathi County Referral Hospital, where 12 participants; approximately 10% of the total sample completed the questionnaires. This process helped improve the validity and reliability of the tools by ensuring the questions were clear and that they effectively captured the required information. Acting as a quality control measure, the pretesting allowed the questionnaire to be refined for greater accuracy in data collection. Mbagathi County Referral Hospital was chosen for pretesting because its catchment area and population closely resemble that of Mama Lucy Kibaki Hospital, making it a suitable site to assess the effectiveness of the instruments.

2.7. Data Collection and Analysis Procedures

After signing the consent form, the participants responded to all the questions in the main questionnaire and Global physical activity questionnaire (GPAQ) as expected. The data was then analyzed using SPSS (version 25) and Microsoft Excel to compute mean values and frequencies while. Data were presented in tables.

2.8. Ethical Considerations

Authorization to conduct the study was obtained from the Graduate School of Kenyatta University, the Kenyatta University Ethics Review Committee, and the National Commission for Science, Technology and Innovation (NACOSTI). Additional approval was granted by Nairobi City County and the management of Mama Lucy Kibaki Hospital, while Mbagathi County Referral Hospital permitted the pre-testing of the questionnaires. Participation in the study was voluntary, and informed consent was obtained from all respondents before their involvement. Participants' privacy and confidentiality was strictly upheld, and the data collected was used solely for research purposes. To maintain anonymity, the questionnaires did not contain participants' names; instead, coded identifiers were used, and all completed questionnaires were securely stored at the university.

3. Results

3.1. Socio-economic and Demographic Characteristics of the Study Population

Table 1 presents the demographic, anthropometric, clinical, and socioeconomic profile of the study respondents (N = 116). Female respondents constituted 56.0% (n = 65) of participants, while the proportion of males' respondents was 44.0% (n = 51), with the age distribution concentrated in the 50–59 years (30.2%) and 60–69 years (22.4%) categories. Anthropometric measures indicated that the modal weight category was 75.0–79.9 kg (14.7). Most (44.0%) respondents had normal blood pressure readings while (23.3%) were hypertensive. With respect to duration lived with diabetes, the largest proportion of the respondents reported living with diabetes for 1–4 years (38.8%), while 11.2% were newly diagnosed. Findings of socioeconomic characteristics indicated that most participants were married (75.0%), had attained secondary education (43.1%), and were primarily self-employed (50.0%), with only, 23.3% being engaged in formal employment.

Table 1. *Socio-Economic and Demographic Characteristics of the Study Population.*

Variable	Category / Range	Frequency (n)	Percent (%)
Sex	Male	51	44.0
	Female	65	56.0
Age range (years)	18–29	3	2.6
	30–39	19	16.4
	40–49	20	17.2
	50–59	35	30.2
	60–69	26	22.4
	70 & above	13	11.2
Weight range (kg)	35.0–39.9	1	0.9
	40.0–44.9	2	1.7
	45.0–49.9	4	3.4
	50.0–54.9	10	8.6

Variable	Category / Range	Frequency (n)	Percent (%)
	55.0–59.9	3	2.6
	60.0–64.9	16	13.8
	65.0–69.9	10	8.6
	70.0–74.9	15	12.9
	75.0–79.9	17	14.7
	80.0–84.9	10	8.6
	85.0–89.9	10	8.6
	90.0–94.9	9	7.8
	95.0–99.9	1	0.9
	100.0–104.9	1	0.9
	105.0–109.9	1	0.9
	≥110.0	6	5.1
Blood pressure range	Hypotension	3	2.6
	Mild Hypotension	12	10.3
	Normal	51	44.0
	High Normal	23	19.8
	Hypertensive	27	23.3
Years living with diabetes	0 years (newly diagnosed)	13	11.2
	1–4 years	45	38.8
	5–9 years	25	21.6
	10–14 years	18	15.5
	15–19 years	10	8.6
	20+ years	5	4.3
Marital status	Single	12	10.3
	Married	87	75.0
	Divorced/Separated	11	9.5
	Widow/Widower	6	5.2
Highest education level attained	None	7	6.0
	Primary	30	25.9
	Secondary	50	43.1
	Tertiary	29	25.0
Employment status	Employed	27	23.3
	Unemployed	17	14.7
	Pensioner	9	7.8
	Housewife/househusband	5	4.3
	Self-employed	58	50.0

3.2. Nutrition Status and Random Blood Sugar

The Table 2 below summarizes the nutritional status and random blood sugar (RBS) profiles for the 116 study participants. The largest proportion of participants were classified as overweight (41.4%, n = 48), while normal and obese categories both accounted for 27.6% (n = 32) each. Random blood sugar measurements showed that 25.0% (n = 29) were within the normal range (<7.8 mmol/L), whereas 38.8% (n = 45) had elevated values (7.8–11.0 mmol/L) warranting follow-up. Slightly more than a third (36.2%, (n = 42) of the respondent were observed to have blood glucose levels within the diabetes range (≥11.1 mmol/L), indicating poorly controlled T2DM. BMI classification revealed a predominance of overweight status (41.4%), with a further 27.6% of the respondents BMI distributed across obesity classes I–III, indicating that a substantial proportion of participants had BMI values above the normal range.

Table 2. Nutrition status and Random Blood Sugar.

Variable	Category / Range	Interpretation	Frequency (n)
Nutrition status	Normal	—	32
	Overweight	—	48
	Obese	—	32
	Underweight	—	3
	Severely underweight	—	1
Random blood sugar (mmol/L)	< 7.8	Normal range	29
	7.8–11.0	Elevated/high (needs follow-up)	45
	≥ 11.1	Diabetes range (clinical confirmation needed)	42
BMI range (kg/m²)	(<18.5)	—	4
	(18.5–24.9)	—	32
	(25.0–29.9)	—	48
	(30.0–34.9)	—	22
	(35.0–39.9)	—	8
	(≥40.0)	—	2

3.3. Physical Activity

The Table 3 below summarizes participation in key physical activity domains and the distribution of MET-minute ranges among the respondents. Among the respondents (N = 116), vigorous-intensity activity at work was reported by 14.7% (n = 17), whereas moderate-intensity work activity was common (81.9%, n = 95). Active transport (walking or bicycling for at least 10 minutes continuously) was reported by 89.7% (n = 104) of the respondents. In contrast, participation in vigorous-intensity sports or leisure activities was low at (9.5%, n = 11), further moderate-intensity sports/leisure was reported by 37.9% (n = 44). Among those participants reporting activity, MET-minute distributions were generally concentrated in the lower to mid ranges. Reportedly, 35.3% of the respondents reported vigorous work activity which fell within 1,000–4,999.99 MET-minutes (35.3%) and moderate work activity within the 1,000–4,999.99 MET-minutes range. Further, 61.5%, and transport-related activity predominantly remained within 1–999.99 MET-minutes (61.5%). The MET-minutes for reported leisure activities in form of vigorous-intensity sports were evenly split between 1–999.99 and 1,000–2,999.99 (each 45.5%), while moderate-intensity sports/leisure MET-minutes were largely within 1–999.99 (72.7%), indicating that leisure-based physical activity, when present, was typically of relatively low accumulated intensity.

Table 3. *Physical Activity.*

Physical activity item	Response	Frequency (n)	Percent (%)
Work involves vigorous-intensity activity (≥10 min)	Yes	17	14.7
	No	99	85.3
Work involves moderate-intensity activity (≥10 min)	Yes	95	81.9
	No	21	18.1
Walk or bicycle for transport (≥10 min)	Yes	104	89.7
	No	12	10.3
Do vigorous-intensity sports/leisure (≥10 min)	Yes	11	9.5
	No	105	90.5
Do moderate-intensity sports/leisure (≥10 min)	Yes	44	37.9
	No	72	62.1

Table 4. *Physical Activity in Terms of MET.*

Activity domain	MET-minute range	Frequency (n)	Percent (%)
Vigorous work activity (n = 17)	1,000–4,999.99(low)	6	35.3
	5,000–9,999.99(medium)	2	11.8
	10,000–19,999.99(high)	1	5.9
	20,000–29,999.99(high)	4	23.5
	30,000–39,999.99(high)	2	11.8
	40,000–49,999.99(high)	2	11.8
Moderate work activity (n = 95)	1–999.99(low)	15	15.8
	1,000–4,999.99(low)	36	37.9
	5,000–9,999.99(medium)	15	15.8
	10,000–14,999.99(high)	16	16.8
	15,000–19,999.99(high)	4	4.2
	20,000–24,999.99(high)	9	9.5
Walking/bicycling for transport (n = 104)	1–999.99(low)	64	61.5
	1,000–4,999.99(low)	35	33.7
	5,000–9,999.99(medium)	3	2.9
	10,000–14,999.99(high)	1	1.0
	15,000–19,999.99(high)	1	1.0
Vigorous sports/leisure (n = 11)	1–999.99(low)	5	45.5
	1,000–2,999.99(low)	5	45.5
	10,000–10,999.99(high)	1	9.1
Moderate sports/leisure (n = 44)	1–999.99(low)	32	72.7
	1,000–1,999.99(low)	10	22.7
	2,000–2,999.99(low)	1	2.3

Activity domain	MET-minute range	Frequency (n)	Percent (%)
	9,000–9,999.99(high)	1	2.3

3.4. Relationship Between Nutrition Status and Physical Activity

Collectively, Tables 5 and 6 below provide an overview of the relationship between physical activity and indicators relevant to blood sugar control within the sample (N = 116). The correlation analysis indicated a negligible inverse association between random blood sugar and total energy consumed (Pearson's $r = -0.062$, $p = 0.005$), suggesting that energy intake alone shows minimal linear relationship with random blood sugar levels in this dataset. In parallel, the MET-based activity classification demonstrated that most participants were categorized as having above-average physical activity (≥3000 MET-min/week) (70.2%, n = 80), while 24.6% (n = 28) were in the average range and 5.3% (n = 6) were below average. Taken together, the distribution of MET categories and the Pearson's $r = -0.062$ correlation observed highlighted that; although physical activity is conceptually important for glycemic regulation, the present results do not demonstrate a strong linear pattern in random blood sugar outcomes based on the measures reported, and should therefore be interpreted with caution in relation to blood sugar control.

Table 5. Relationship between Nutrition status and Physical Activity in terms of Pearson correlation.

Variables	Pearson correlation (r)	Sig. (2-tailed)	N
Random Blood Sugar vs Total Energy Consumed	-0.062	0.005	116

Table 6. Relationship between Nutrition status and Physical Activity in terms of MET.

MET category	Normal (n)	Overweight (n)	Obese (n)
Above average (≥3000 MET-min/week)	18	38	23
Average (600–2999 MET-min/week)	10	9	8
Below average (<600 MET-min/week)	4	1	1
Total	32	48	32

4. Discussion

4.1. Social Economic and Demographic Characteristics of the Respondents

Across the 116 respondents, the socio-demographic profile pointed to a predominantly middle-to-older adult diabetes cohort with modest female predominance whereby female respondents constituted 56.0% (n = 65) and males 44.0% (n = 51). With regard to respondents' ages, those in the age category between 50 and 59 years formed the majority (30.2%, n = 35), followed by those in the age category between 60 to 69 years at (22.4%, n = 26) and ≥70 years (11.2%, n = 13), indicating that most participants were aged 50 years and above. This pattern aligns with clinic-based evidence from Kenya, where ambulatory type 2 diabetes samples similarly skew toward older ages and often show higher female representation (e.g., 66.5% female; mean age ~58 years) [14].

Pertaining socio-economic status, most (75.0%, n = 87) of the respondents were married, had secondary education (43.1%, n = 50), and showed substantial engagement in self-employment (50.0%, n = 58), suggesting a population embedded in household and informal-economy contexts that can shape health access, diet, and continuity of care. Comparatively, Kenyan facility-based studies have also highlighted education level as a key and recurring contextual factor in diabetes management and health literacy [14]. Regionally, these socio-demographic patterns are compatible with sub-Saharan African evidence indicating that type 2 diabetes is increasingly established in older adults, with wide variation in sex distributions across settings and strong linkage to urbanization and changing lifestyles [15]. Notably, while global estimates often show slightly higher overall diabetes prevalence in men than women, the current study sample of type 2 diabetes patient was majorly composed of women (56%). This could be a re-flection of the fact that health-service utilization and care-seeking dynamics can produce more female-represented clinic samples, especially in routine follow-up populations [16].

4.2. Nutrition Status of the Respondents

The nutrition status profile of the current study respondents indicated a substantial burden of excess weight among the respondents with 41.4% being overweight and 27.6% being obese (n = 32). This pattern is consistent with Kenyan evidence demonstrating that overweight and obesity are common comorbidities among patients with type 2 diabetes and related cardiometabolic conditions, particularly in clinical populations [17]. At the population level, national Kenyan data also demonstrates a significant prevalence of overweight and obesity among adults especially women [18]. Taken together, the current findings reinforce that nutritional status among Kenyan adults living with diabetes frequently reflects the broader nutrition transition, where rising overweight/obesity coexists with a smaller but important undernutrition subgroup that may require different clinical and nutrition support.

In the wider African context, the observed predominance of overweight/obesity aligns with a growing body of evidence showing that excess weight is highly prevalent among people living with type 2 diabetes across the continent, with consistent associations reported between overweight/obesity and sociodemographic factors such as sex and urban residence [19]. Regionally focused syntheses further reveal that sub-Saharan Africa is experiencing a dual challenge of increasing diabetes burden alongside rapid shifts in diet and physical activity patterns, which are strongly linked to rising adiposity and related complications [15]. Globally, these findings are congruent with international reporting that highlights the expanding impact of diabetes and the central role of overweight/obesity as a major modifiable driver of poor metabolic outcomes and long-term risk [4]. Thus, the nutrition status distribution observed in this sample is not just localized in an urban Kenyan clinic setting but also reflects continental and global trends linking excess adiposity with diabetes risk and management complexity.

4.3. Physical Activity of the Respondents

Overall, the study population reported relatively high engagement in routine physical activity, particularly through work and active transport. Most participants indicated involvement in moderate-intensity work activity and walking or bicycling for transport, whereas participation in vigorous-intensity sports/leisure was low and moderate-intensity sports/leisure was reported.

Consistent with this pattern, MET-based categorization showed that the majority of respondents were classified as above-average physical activity, with fewer in the average and below-average categories as well.

However, despite this apparently high activity profile, random blood sugar results suggest suboptimal glycemic status in a substantial proportion of respondents: only 25.0% (n = 29) were within the normal range (<7.8 mmol/L), while 38.8% (n = 45) had elevated levels (7.8–11.0 mmol/L) and 36.2% (n = 42) were in the diabetes range (≥11.1 mmol/L).

A similar Kenyan facility-based study reported that, although many adults with type 2 diabetes report some degree of habitual physical activity, glycemic outcomes remain mixed and are strongly shaped by concurrent factors such as diet, duration of disease, and treatment adherence [15].

When compared with regional and global evidence, these findings highlight a common phenomenon: physical activity is strongly protective and therapeutically beneficial for glycemic control. Consequently, measured blood glucose outcomes may remain poor when physical activity is insufficient in intensity/structure, is inconsistently maintained, or is offset by other determinants of hyperglycemia. A systematic review of glycemic control in sub-Saharan Africa shows that a large proportion of patients have inadequate glycemic control, with multiple contributors beyond activity alone, including healthcare access, self-care practices, and comorbid risk profiles [6]. In contrast, controlled trials and meta-analyses consistently demonstrate that structured exercise (aerobic, resistance, combined training, and higher-intensity protocols) produces clinically meaningful reductions in longer-term glycemic markers such as HbA1c [7]. This aligns with global recommendations advocating for 150–300 minutes of moderate-intensity activity weekly (or equivalent) for substantial health benefits, alongside regular physical activity in older adults [20]. Accordingly, the apparent mismatch between high self-reported routine activity (especially transport and work-related) and elevated random blood sugar among the current study respondents may reflect the limitations of single-point random glucose measurement (versus HbA1c), potential overestimation inherent in self-reported physical activity tools, and/or the influence of diet, medication use, and disease duration on day-to-day glycemic variability [20].

4.4. Relationship Between Nutrition Status and Physical Activity

In this study, physical activity (PA) levels were generally high across nutritional status categories with 70.2% of participants being classified as engaging in above average physical activity levels.

Notably, a large share of participants who were overweight (79.2%) and obese (71.9%) still fell within the "above average" PA category, suggesting that high reported MET expenditure did not necessarily translate into normal weight status among the respondents.

This pattern both aligns with and complicates prior evidence from Kenya and other regions. Previous Kenyan data among adults showed that total physical activity can be an important predictor of BMI, but its effects are often intertwined with diet patterns, socio-economic factors, and urban lifestyle transitions [21]. Similarly, a large Africa-wide synthesis among people living with type 2 diabetes reported a consistently high burden of overweight/obesity and highlighted behavioral and contextual drivers; (including diet quality and physical activity patterns) alongside broader structural influences [19].

A plausible interpretation is that the composition and measurement of physical activity matter: MET totals in this sample may be dominated by work- and transport-related activity. These may not provide sufficient intensity, regularity, or muscle-strengthening stimulus to counter energy imbalance, particularly where dietary intake is energy-dense or where sedentary time remains high. Global physical activity guidelines recommend that adults should engage in at least 150–300 minutes of moderate-intensity activity weekly (or equivalent) and reduce sedentary behavior as part of cardiometabolic risk reduction [22]. In addition, clinical guidance for diabetes consistently shows that while physical activity is critical for glycemic management and cardiometabolic health, meaningful improvements in body composition typically require structured aerobic and resistance training combined with dietary strategies, rather than relying on incidental activity alone [8]. Therefore, the present study findings support the interpretation that, even in a relatively active sample, targeted lifestyle support (structured exercise prescriptions plus nutrition counselling) remains essential to address overweight/obesity among adults living with type 2 diabetes.

4.5. Conclusions

Overall, the findings of the current study suggest that while respondents reported relatively high levels of physical activity, glycemic control remained suboptimal for many participants, underscoring the multifactorial nature of blood sugar regulation. Additionally, the correlation analysis indicated a negligible inverse association between random blood sugar and total energy consumed, implying that energy intake alone showed minimal linear association with random blood sugar in the current study respondents.

Taken together, these results indicate that high self-reported activity; particularly when accumulated through routine work and transport may be insufficient on its own to produce optimal glycemic outcomes without complementary factors such as consistent medication adherence, improved diet quality, and structured physical activity that includes adequate intensity and muscle-strengthening components [8, 23]. This conclusion aligns with global evidence that highlights decreasing physical activity and increasing overweight/obesity as key drivers of type 2 diabetes and reinforces the need for integrated lifestyle and clinical management approaches [4].

4.6. Recommendations

Diabetes care at Mama Lucy Kibaki Hospital should integrate structured physical activity counselling with weight management, dietary guidance, medication adherence support, and psychosocial care. The high prevalence of overweight (41.4%) and obesity (27.6%), combined with only 25.0% of participants achieving normal blood glucose levels, underscores the need for a comprehensive, multi-component approach rather than physical activity counselling alone.

Clinic-based education should promote adherence to evidence-based targets of ⩾150 minutes/week of moderate-intensity aerobic activity and regular resistance training, with individualized progression plans for older adults and those with comorbid hypertension. Given that leisure-time vigorous activity was uncommon and MET accumulation concentrated in lower-to-mid ranges, deliberate exercise prescription is essential for meaningful metabolic improvement.

Beyond the clinic, health system and community-level strategies; including public health campaigns and structured community exercise programs, should be explored to create enabling environments that sustain long-term behavior change among patients with type 2 diabetes.

Abbreviations

ACSM	American College of Sports Medicine
BMI	Body Mass Index
GPAQ	Global Physical Activity Questionnaire
HbA1c	Glycated Haemoglobin
IDF	International Diabetes Federation
MET	Metabolic Equivalent of Task
MET-min/week	Metabolic Equivalent Minutes per Week
RBS	Random Blood Sugar
PA	Physical Activity
SPSS	Statistical Package for the Social Sciences
T2DM	Type 2 Diabetes Mellitus
WHO	World Health Organization

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Author Contributions

Patrick Malusi Martin: Conceptualization, Formal Analysis, Investigation, Methodology, Project administration, Software, Writing – original draft

Ann Wambui Munyaka: Writing – review & editing
Judith Kimiywe: Writing – review & editing
Maureen Kipkoech: Writing – review & editing

Data Availability Statement

The data is available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest.

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Biography

Patrick Malusi Martin is a highly experienced clinical Nutrition and Dietetics Officer at Mama Lucy Kibaki Hospital, Nairobi City County. He is also a master's student in Food Nutrition and Dietetics at Kenyatta university and holds a Bachelor's degree in Food Nutrition and Dietetics from Kisii University, 2018. Patrick is highly passionate in clinical nutrition and dietetics research with the intention of advancing knowledge and boosting evidence-based practice.

Ann Wambui Munyaka is a dedicated lecturer at Kenyatta University with a strong academic background in food science and bioscience engineering. She holds a Ph.D. in Bioscience Engineering from Katholieke Universiteit Leuven, Belgium (2005-2010), a Master's in Food Technology from Universiteit Ghent and Katholieke Universiteit Leuven, Belgium (2003-2005), and a Bachelor's in Food Science and Postharvest Technology from Jomo Kenyatta University of Agriculture and Technology. With extensive expertise in food technology and bioscience research, Dr. Munyaka is committed to advancing knowledge in her field and mentoring the next generation of scientists.

Judith Kimiywe is a distinguished professor at Kenyatta University with extensive expertise in nutrition and community health. She holds a Ph.D. in Nutrition, Food, and Movement Sciences from Florida State University, USA (1993-1999), a Master of Science in Community Health and Nutrition from the University of Queensland, Australia (1981-1982), and a Bachelor of Education in Home Economics from Nairobi University, Kenya (1974-1977). Prof. Kimiywe is dedicated to research, teaching, and improving public health nutrition.

Maureen Kipkoech is a doctoral researcher at the German Cancer Research Center (DKFZ) in Germany, with a strong academic and research background in public health nutrition, epidemiology, and cancer epidemiology. She holds a Master of Science in Epidemiology and Disease Control from Mount Kenya University, Kenya (2022), and a Bachelor's degree in Food, Nutrition, and Dietetics from Kisii University (2018). Her research experience focuses on community-led nutrition interventions, cancer prevention and control, and evidence-based public health strategies, with a commitment to improving health outcomes through applied population-based research. She is dedicated to advancing her skills in cancer epidemiology and contributing to impactful, population-centered cancer prevention and control solutions.

Research Field

Patrick Malusi Martin: Medical Nutrition therapy in disease management and critical care nutrition and dietetics
Ann Wambui Munyaka: Biochemistry of food processing
Judith Kimiywe: Public Health, Nutritional Biochemistry, Nutrition and Dietetics
Maureen Kipkoech: Cancer Epidemiology