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*Research Article*

# Diabetes Screening as a Preventive Strategy: The Role of POCT and Telemedicine.

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**Abstract**

Diabetes is a chronic metabolic disorder of growing global concern. By 2030, it is projected to affect 643 million individuals worldwide. Early identification and management are essential to prevent complications and reduce healthcare costs. This study investigates the effectiveness of a screening strategies using Point- of care testing (POCT) and telemedicine to identify individuals at risk for type 2 diabetes. This study evaluates the effectiveness of screening strategies using Point-of-Care Testing (POCT) and telemedicine in identifying individuals at risk for type 2 diabetes. A sample of 80 individuals aged 45 to 65 was evaluated using capillary blood, to glucose levels testing and risk scoring questionnaires. By reducing the negative consequences of diabetes mismanagement the patient's quality of life will increase in addition to a reduction in the cost of healthcare. In recent years, the advancement of modern technology as a whole has favored a more patient-centric care approach. Our findings support the efficacy of POCT and telemedicine as tools for early detection, patient engagement and disease management.

**Keywords** : Diabetes, Poct, Telemedicine, Screening, Dysglicemia.

## INTRODUCTION

Diabetes is a chronic metabolic disorder characterized by impaired glucose homeostasis. The prevalence of Type 2 diabetes (T2D), the most common form of the disease, comprising over 90% of all cases, is increasing rapidly and it is frequently associated with other conditions such as obesity and cardiovascular disease , kidney failure, nerve damage, and vision problems. It has been estimated that in 2030 there will be approximately 643 million people living with diabetes [1,2]. The American Diabetes Association (ADA) holds a preeminent role in education, research, advocacy, and the creation of diabetes care guidelines, over the world, and since 1989, a report has been published every year on diabetes medical care standards [1,2]. Regular screening programs and early diagnosis are critical to preventing complications, improving quality of life and reducing healthcare expenditures. Type 2 diabetes T2D, often progresses silently, without symptoms, making early detection difficult. Dysglycemia is a condition characterized by alterations in blood glucose levels, which are not yet sufficient to define diabetes, but which can increase the risk of developing it in the future. This is a condition that falls within "pre-diabetes" which is an important warning sign that should not be ignored, as it can lead to the development of type 2 diabetes mellitus and cardiovascular disease. It is important to identify and manage dysglycemia through lifestyle changes, such as a balanced diet, physical activity and weight loss. [3,4]. There are several commonly used screening tests for dysglicemias (pre-diabetes) and diagnostic for diabetes as described below:

- Fasting Plasma Glucose (FPG) Test: This test measures blood sugar levels after an overnight fast.The expected values for normal fasting blood glucose concentration are between 70 mg/dL (3.9 mmol/L) and 100 mg/dL (5.6 mmol/L). If fasting blood glucose value is between 100 to 125 mg/dL (5.6 to 6.9 mmol/L), changes in lifestyle and

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monitoring glycemia are suggested. A level above 126 mg/dL (7 mmol/L) indicates diabetes.

- Oral Glucose Tolerance Test (OGTT): After fasting, the patient consumes 75 g of glucose, and blood sugar levels are measured after 120 minutes. A reading above 200 mg/dL suggests diabetes.
- Hemoglobin A1c Test (HbA1c): This blood test provides an average blood sugar level over the past three months. An HbA1c level above 48 mmol/moL or > 6.5 % suggests a diabetes diagnosis.
- Random measurement of plasma glucose: This test, performed at any time of the day, not on an empty stomach, is useful during screenings. A value above 200 mg/dL (11.1 mmol/L) or higher, in people who have symptoms, may indicate diabetes.

Each test has specific advantages, and healthcare providers often recommend a particular test based on an individual's risk factors and medical history. Regular screenings, especially for high-risk individuals, can make a significant difference in the early detection of diabetes. The technological tools that support diabetes care, include devices and software that allow glucose monitoring, insulin administration and patient education. From a historical point of view, diabetes technology has been divided into two main categories: 1) insulin a by syringe administration, pen, patch devices, or pump (also called continuous subcutaneous insulin infusion) and 2) glucose as assessed by blood glucose monitoring (BGM) or continuous glucose monitoring systems (CGM). These devices now include automated insulin delivery (AID) systems that use CGM-informed algorithms to modulate insulin delivery and connected insulin pens and diabetes self-management support software that serve as medical devices. All technological devices, coupled with education, follow-up programs, pharmacotherapy if needed, and support, can improve the lives and health of people with diabetes; however, the complexity and rapid evolution of the technology landscape can also be an obstacle to their use for people with the disease, their care partners, and the healthcare team [1,5,6]. In recent years the use of news technologies in healthcare has evolved significantly to become more patient-centered, thanks to the implementation of Point-of-Care Testing (POCT) devices that are increasingly used in Laboratory Medicine. These devices allow to carry out medical tests performed where the patient receives care, rather than in a central laboratory, allowing for faster results, facilitating clinical decisions. This integrative approach enhances diagnostic accuracy, optimizes patient outcomes, and facilitates timely and early diagnoses with a quicker medical decision-making, thereby reducing both risks and costs. Furthermore, POCT has proven to be highly effective for the ongoing monitoring of diabetic patients, enabling more accurate and prompt glycemic regulation, minimizing disease management, lowering the risk of complications. The accuracy of the results obtained with POCT systems it is therefore essential, as significant errors in the measurement can lead to an incorrect pharmacological dosage, or even to incorrect therapy, and potentially determine, especially in acute cases, very serious consequences for the patient health [5,7]. Repeated analytical errors, even of moderate extent, in patients suffering from the disease diabetic may cause inadequate therapeutic adjustments, negatively influencing the control of illness. It is difficult in clinical practice, to keep up with the very rapid development of technology, and new approaches and tools are available each year, with newer versions of the devices and digital solutions wich are already on the market [8,9,10]. Most important aspect is that, at the heart of this process, must be placed the person with diabetes. Technology selection must be appropriate for the individual, and it is truly effective only if determine an improvement in health outcomes. It is important to underline the need for the health care team to assist diabetic individuals in device and program selection and to support their use through continuous training and education programs. Expectations must be proportionate to the real situation, as it does not exist yet a technology that completely eliminates the self-care tasks necessary for managing diabetes, but the tools described also in this report can help to simplify daily self-management by patients [11,12]. Moreover, in the last years, have been developed in the field of of telemedicine, a set of health services provided remotely, usually by telephone or Internet, that allow communication between a doctor and a patient even when they are not in the same location. This practice uses information and communication technologies (ICT) to innovate traditional methods of medical examination and therapy; it has become an essential tool for diabetes care and monitoring, without the need to go to hospital. In conclusion, the implementation of modern diabetes technology, such as POCT and telemedicine, improve early diagnosis and disease management, which lowers complications related to diabetes and enhances patient outcomes. In light of these evidences, a screening was organized and carried out in September 2024 with the aim of identifying and intercepting subjects at risk of developing diabetic disease, with the aid of a POCT device and the administration of a questionnaire to detect the main risk factors. Diabetes screening is particularly important for individuals at high risk. Risk factors include being overweight, having a family history of diabetes, being over the age of 45, leading a sedentary lifestyle, or belonging to certain ethnic backgrounds with a higher prevalence of diabetes. Additionally, conditions such as hypertension, abnormal cholesterol levels, or a history of gestational diabetes can increase the likelihood of developing type 2 diabetes. In individuals with these risk factors, the screening allows to detect the disease in its early stages before complications arise.

## MATERIALS AND METHODS

### Participant

the subjects were selected through voluntary screening campaigns and provided informed consent. Demographics, family history and lifestyle data were collected. A total of 80 subjects aged 45–64 years were enrolled: Among the participants, 9 individuals were identified as diabetic (11%) and 71 as non diabetic (89%). Among the non-diabetic group, 29 (41%) were male, and 41 (59%) were female. The age range for females was between 25 and 85 years, whereas for males it ranged from 30 to 84 years. Among the diabetic subjects, only one individual (10%) was male.

### Methods

capillary blood glucose was measured using the finger-prick method with the Star Strip Glu/Ket glucometer (multi-well Nova Biomedical). This device incorporates a specific supplementary well, a reaction zone for interference testing, which measures and corrects for electrochemical interferences and variations in hematocrit and pH levels. It provides highly accurate results validated against the reference plasma hexokinase method, which is traceable to the Isotope Dilution Mass Spectrometry (IDMS) method and complies with POCT 12-A3 CLSI guidelines. The blood volume used was 1.2 μL and results were available within 6 seconds. The instrument includes an internal quality control system, which was performed before the screening commenced (control range: 109–136 mg/dL) [7].

### Screening procedure

participant completed a risk assessment questionnaire modeled on Findrisc assessing lifestyle, BMI, waist circumference and dietary habits. It is based on 10 key questions with a differentiated score depending on the answers: the higher the result, the greater the risk of developing disease over the next ten years. If the result is less than 7, risk is low (1 in 100 chance of developing diabetes). Glucose measurements were performed postprandially and results interpreted for ADA criteria.

### Statistical analysis

associations between diabetes status and clinical variables were assessed using T-test and Fisher's exact test with significance set at $p < 0.05$.

The waist circumference measurement is useful for the risk assessment and correlates with fat accumulation both in the abdominal area and the rest of the body. Waist circumference was measured using a standard measuring tape, positioned exactly halfway between the lower border of the ribcage and the iliac crest, approximately at the level of the navel. According to the World Health Organization (WHO), the risk of metabolic complications associated with increased waist circumference differs between the two sexes (**Table 2**). All parameters considered are summarized on **table 3**. A score of 20 points must be considered very high, and between 12 and 14 should be considered an alarm signal: the individual should start paying attention to their daily behavior and try to combat negative and detrimental factors such as overweight, abdominal obesity, sedentary lifestyle, poor diet, smoking habit. If the score is between 15 and 20, it is recommended to undergo a blood sugar test.

**Table 1.** indicates the diabetes risk score at 10 years.

| ***POINTS*** | **RISK %** |
|---|---|
| *0* | 0 |
| *1* | 0.1 |
| *2* | 0.5 |
| *3* | 1.1 |
| *4* | 2 |
| *5* | 3.3 |
| *6* | 5 |
| *7* | 7.1 |
| *8* | 9.7 |
| *9* | 12.7 |
| *10* | 16.3 |
| *11* | 20.4 |
| *12* | 25.1 |
| *13* | 30.4 |
| *14* | 36.4 |
| *15* | 43.1 |
| *16* | 50.5 |
| *17* | 58.7 |
| *18* | 67.7 |
| *19* | 77.5 |
| *20* | 88.2 |
| *>20* | >90 |

Among the parameters considered there is the Body Mass Index (BMI), categorized into the following ranges:

| **BMI Ranges:** | **CATEGORY** |
|---|---|
| 18.5 – 24.9 | Normal weight |
| 25.0 – 29.9 | Overweight |
| 30.0 -34,9 | Obesity 1 |
| 35-39,9 | Obesity 2 |
| 40-49,9 | Obesity 3 |
| < 18.5 | Underweight |

**Table 2.**

| RISK OF METABOLIC COMPLICATIONS | WAIST CIRCUMFERENCE (CM) | |
|---|---|---|
| | Men | Women |
| Increased | >= 94 | >= 80 |
| Substantially increased | >= 102 | >= 88 |

**Table 3.** Data and parameters related to clinical history of the subjects.

| | DIABETIC | | NON DIABETIC | |
|---|---|---|---|---|
| | VALUE | PERCENTAGE | VALUE | PERCENTAGE |
| Males | 1 | 11% | 29 | 41% |
| Females | 8 | 89% | 42 | 59% |
| Family History | 7 | 70% | 28 | 40% |
| No Family History | 3 | 30% | 42 | 60% |
| Normal Weight | 4 | 40% | 38 | 54% |
| Underweight | 0 | 0% | 4 | 6% |
| Overweight | 5 | 50% | 25 | 36% |
| Obese | 1 | 10% | 3 | 4% |
| with therapy | 9 | 90% | 25 | 36% |
| without therapy | 1 | 10% | 45 | 64% |
| Physical Activity | 4 | 40% | 47 | 67% |
| No Physical Activity | 6 | 60% | 23 | 33% |
| > 3 Fruits/day | 8 | 80% | 26 | 37% |
| < 3 Fruits/day | 2 | 20% | 44 | 63% |
| Waist Circumference <94 | 5 | 50% | 44 | 63% |
| Waist Circumference 94-102 | 3 | 30% | 15 | 21% |
| Waist Circumference >102 | 2 | 20% | 11 | 16% |

## RESULTS AND STATISTICAL ANALYSIS

The following key associations were identified as reported on **table 4**:

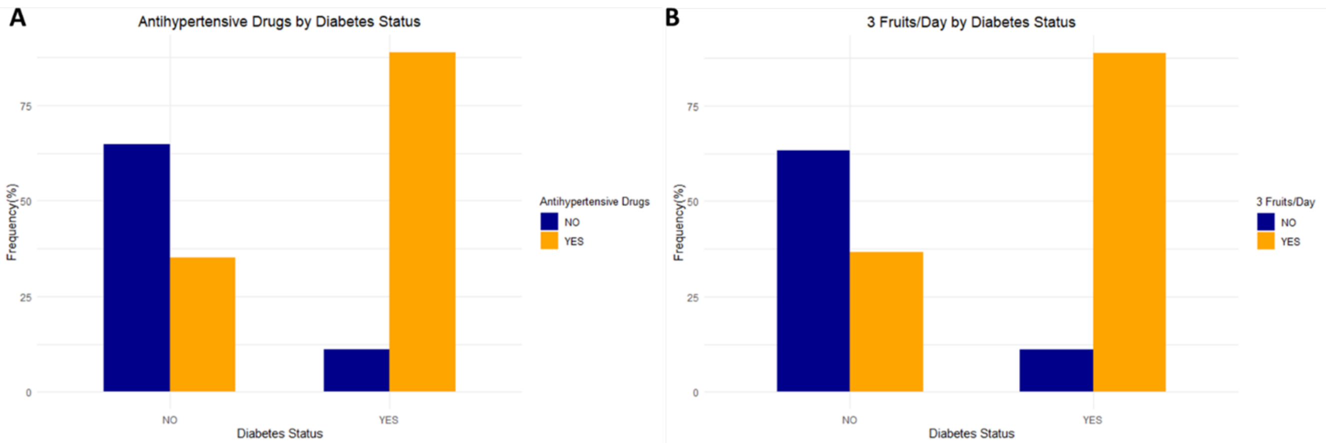
- Blood glucose: mean levels were significantly higher in diabetic vs non diabetic individuals (129vs 104 mg/dL respectively, p=0.03).
- Fruit intake: a significant association was observed between high fruit consumption (≥3/day) and diabetes (p<0.01).
- Antihypertensive therapy: 88.9% of diabetic individuals used antihypertensive drugs compared to 35.2% of non diabetic (p<0.01).

BMI, age and waist circumference were not significantly associated with diabetes in this cohort. Four non diabetic participants had glucose levels > 140 mg/dL, suggesting a possible impaired glucodse tolerance (IGT). The results of the association tests between the presence of diabetes and various clinical variables are reported in **Table 4**. Specifically, for numerical variables, the p-values were obtained using a T-test, while for categorical variables, the p-values were derived from Fisher's exact test. A significance threshold of p-value was considered as < 0.05. As shown, significant associations were found for key discriminant variables, including blood glucose (p = 0.03), the consumption of three or more fruits per day (p < 0.01), and the use of antihypertensive drugs (p < 0.01). The bar plots in **Figure 1** illustrate these associations: Panel A shows the percentage frequency of antihypertensive medication use among diabetic and non-diabetic individuals, while Panel B presents the percentage frequency of consuming four or more fruits daily across both groups.

**Table 4.** Summary table of the main collected variables. For numerical variables, the mean, median, minimum-maximum range, and the p-value from the T-test are reported. For categorical variables, counts, percentage frequencies, and the p-value from Fisher's exact test are provided.

| | ***NON DIABETIC*** **(N=71)** | ***DIABETIC*** **(N=9)** | ***P-value*** |
|---|---|---|---|
| *Blood Glucose (mg/dL)* | | | |
| *Mean (SD)* | 104 (15.6) | 129 (28.1) | 0.0302 |
| *Median [Min, Max]* | 102 [76.0, 148] | 119 [99.0, 190] | |
| *Age* | | | |
| *Mean (SD)* | 61.1 (13.6) | 68.6 (11.9) | 0.112 |
| *Median [Min, Max]* | 61.0 [25.0, 85.0] | 69.0 [48.0, 86.0] | |
| *Sex* | | | |
| *F* | 42 (59.2%) | 8 (88.9%) | 0.143 |
| *M* | 29 (40.8%) | 1 (11.1%) | |
| *Family History* | | | |
| *No* | 42 (59.2%) | 3 (33.3%) | 0.169 |
| *Yes* | 29 (40.8%) | 6 (66.7%) | |
| *Body Mass index (BMI)* | | | |
| *Normal Weight* | 39 (54.9%) | 3 (33.3%) | 0.324 |
| *Obese* | 3 (4.2%) | 1 (11.1%) | |
| *Underweight* | 4 (5.6%) | 0 (0%) | |
| *Overweight* | 25 (35.2%) | 5 (55.6%) | |
| *Waist Circumference (cm)* | | | |
| *<94* | 44 (62.0%) | 4 (44.4%) | 0.534 |
| *>102* | 11 (15.5%) | 2 (22.2%) | |
| *94-102* | 16 (22.5%) | 3 (33.3%) | |
| *Physical Activity 30 min/day* | | | |
| *No* | 23 (32.4%) | 4 (44.4%) | 0.477 |
| *Yes* | 48 (67.6%) | 5 (55.6%) | |
| *3 Fruits/Day* | | | |
| *No* | 45 (63.4%) | 1 (11.1%) | 0.00383 |
| *Yes* | 26 (36.6%) | 8 (88.9%) | |
| *Antihypertensive Drugs Therapy* | | | |
| *No* | 46 (64.8%) | 1 (11.1%) | 0.00298 |
| *Yes* | 25 (35.2%) | 8 (88.9%) | |

**Figure 1.** Bar plot showing the percentage frequencies of the significant variables. Orange represents individuals who do take the respective treatment/food, while blue represents those who do not. On the right side of each panel are diabetic individuals, while non-diabetic individuals are on the left. Panel A displays the percentage frequency of antihypertensive medication use, while Panel B shows the consumption of three fruits per day.



## DISCUSSION

The International diabetes federation (IDF) has indicated that by 2045 the number of subjects with diabetes will exceed 780 million [13]. The management of the diabetes risk factors and the organization of screening campaigns, to identify mainly subjects at risk of developing diabetes is mandatory. This study confirm the value of community-based screening using POCT in identifying individuals at risk of type 2 diabetes Blood glucose levels remain a strong predictor of diabetes and integration of POCT device allows for immediate result interpretation. Blood sugar concentration is an essential marker for diagnosis and treatment of diabetes. In fact, as is known, high blood glucose levels are already well known to be related to disease. The presence of a statistically significant relationship that we observed between glucose levels and diabetes ($p < 0.05$) is indicative of a real and concrete relationship, and strengthens the importance of glycemic control in the management and prevention of diabetes and its complications. All the subjects that we found with elevated blood glucose levels and other risk factors, were advised to undergo further laboratory tests to confirm or exclude the presence of metabolic disease. By the 9 subjects with a previous diagnosis of diabetes who were screened, only 3 (33.3%) had glucose levels above the 126 mg/dL threshold. The remaining 6 individuals, with normal glycemic values, likely had an optimal control of the disease. Blood glucose measurement was done on average, two hours after lunch. In the management of diabetes, post-prandial hyperglycaemia (PPG) is usually targeted two hours (2h) after the start of meal, and, according to the guidelines of the main diabetes associations, this value should be <140 mg/dL. Any value above 140 mg/dL may indicate impaired glucose tolerance (IGT) [14]. Four subjects (approximately 5% of the screened group) who were deemed non-diabetic had values >140 mg/dL of glucose implicating a need for further investigation of diabetes to confirm or deny diabetes.

Unexpectedely higher fruit intake was significantly associated with diabetes ($p < 0.01$). While fruits are generally recommended for health, certain fruits and derived product may contribute to glycemic load. Further studies should distinguish between whole fruit and fruit juice intake. It is generally known that fruit is a source of fiber, vitamins, minerals, antioxidants, and phytochemicals that contributes to multiple health outcomes, however, the sugar content in fruit may be a negative contributor to the metabolism of lipids, glucose, and uric acid [15, 16]. The relationships between specific fruits and the risk of type 2 diabetes vary significantly, as reported by the group of Isao Muraki. A reduction in the risk of type 2 diabetes is linked to the intake of certain types of fruit, while an increase in the risk comes from the consumption of fruit juices, which have a higher glycemic index (GI) than whole fruit. This means that the sugar in the juice is absorbed much more quickly into the bloodstream, causing a rapid rise in blood sugar. [17]. In fact, it is important not to forget that fruit is rich in fructose, which, is a natural sugar, monosaccharide, present in many fruits, honey and some tubers. It is an isomer of glucose, but has a higher sweetening power than table sugar (sucrose) and can contributes to raising blood sugar levels. Therefore, individuals who have diabetes (or even just high blood sugar levels) should limit the consumption of certain types of fruit, preferring those with a low glycemic index. the consumption of excessive amounts of fruit can result in excess of sugar and calories, which finally promotes insulin resistance and increased risk, particularly when done in the presence of an incorrect or unbalanced diet. It should be emphasized that each of these factors (natural sugars and fruit alone) are not the cause of the disease, which is instead the expression of complex interactions of genetic predisposition and lifestyle choices that need to be analyzed and corrected if necessary [18].

The association between antihypertensive therapy and disease aligns with established clinical correlations. Hypertension and diabetes often coexist, sharing pathophysiological mechanisms including insulin resistance [14]. Of the 9 people with diabetes 8 (89%) were treated with antihypertensive drugs. All 8 people had a diagnosis of diabetes and 6 showed a body mass index (BMI) value that classifies them in an overweight or clinically obese status (BMI >24.9 and BMI >30 respectively). The presence of various type of risk factors both cardiac and renal, such as hypertension overweight/obesity, dyslipidemia, insulin resistance/hyperinsulinemia, microalbuminuria and/or alteration of renal function, represent risk factors for cardio-renal metabolic syndrome. A strict and rigorous control and potential intervention needed to manage these risks. Furthermore, the chance of developing new-onset diabetes is elevated when hypertension is present. As a result, 35% of patients without diabetes who take antihypertensive medications may be more susceptible to diabetes. The limitations of this study depend on the intrinsic typology of screening itself with a limited, small number of people with a history of diabetes compared to non-diabetics evaluated during the screening [22]. It can be concluded that the control of all risk factors and the adoption of important changes in lifestyle remain an essential aspect to reduce the risk of developing diabetes in the general population. In this perspective, the periodic organization of screening represents one of the useful and effective tools that allow effective education of the population and support in the control and monitoring of diabetic disease [23,24].

Diabetes screening is definitely helpful for early diagnosis and timely intervention. One of the main advantages of this approach is the identification of individuals unaware of their risk for developing diabetes or metabolic syndrome, even in the presence of lifestyle-related risk factors. There are also some psychological benefits with early diagnosis, as it allows individuals to take an active role in disease management and in compartecipate for their therapeutic plan; working closely with healthcare professionals, patients can develop a personalized "plan of care" tailored to their specific needs, allowing them to take informed decisions regarding their health and lifestyle. Type 2 diabetes may initially manifest with few symptoms but usually it is non symptomatic. Long-term effects lead to a several different problems late in the course of the disease, leading to debilitating consequences. Considering the initial silent progression, diabetes often remains undiagnosed until significant symptoms appear. The screening for the disease aims at prevention and early treatment with the resulting long-term benefits. Several reports suggest the advantages that screening tests and subsequent specific treatment have a positive impact on health and outcomes.

The national Institute for health (NIH) and care excellence (NICE) have determined that diabetes screening services fall well under recommended cost thresholds, confirming that this tool has been proven to be cost- effective. Delays in diagnosis directly contribute to increased risk of cardiovascular disease. The use of modelling has shown the impact that early diagnosis has on reducing mortality, indicating that screening (and subsequent actions) can save human lives. Furthermore, these models shows that the identification of the 850,000 undiagnosed diabetics could prevent nearly 7,000 major cardiac events (such as heart attacks and strokes) each year [25, 26, 27]. Screening must be done through a series of tests that include non-fasting blood sugar measurement, hemoglobin (A1C), glucose tolerance testing, and random plasma sugar.

Urine glucose assessment may be useful, but not at the time of screening. The POCT glucometers are not recommended in the diagnostic phase but are useful in the treatment of diabetic pathology since they offer monitoring for therapy control in all types of diabetes mellitus. The usefulness of glucometers is unequivocally recognized both as tools for self-determination and for performing analyses at the patient's bedside. The performance of the portable instruments available today seems potentially consistent with clinical requests but all the problems related to the training and operational capabilities of the users remain open. The new non-invasive sampling strategies designed for glucose have produced methods that in the short term have had interesting repercussions. The inaccuracy of glucometers and modest reproducibility prevents their use in the diagnosis of diabetes mellitus [26, 27, 28]. However, also though tool- and operator-dependent [29], glycemic self-monitoring is considered a true therapeutic tool, particularly in patients treated with insulin.

Limitations of the study include the small sample size, in particular the number of diabetic individuals compared to non-diabetics, and lack of follow-up data on participants referred for confirmatory testing [15, 16, 21]. Moreover, the distribution of certain covariates, such as fruit consumption and antihypertensive drug use, was unbalanced between the two groups. These factors may have introduced residual confounding and could potentially lead to an overestimation of the observed associations. Finally these findings support the utility of periodic screening campaigns to educate and engage the population in diabetes prevention, enabling timely identification of at risk individuals. Public health initiatives incorporating POCT devices can contribute significantly to reduce the global burden of diabetes.

## REFERENCES

1. Introduction and Methodology: Standards of Care in Diabetes—2024. Diabetes Care 2024;47(Suppl. 1): S1–S4, https://doi.org/10.2337/dc24-SINT.

2. Improving Care and Promoting Health in Populations: Standards of Care in Diabetes—2025. Diabetes Care 2025;48(Suppl. 1): S14–S26 | https://doi.org/10.2337/dc25-S001.

3. American Diabetes Association. Medical Management of Type 1 Diabetes. 7th ed. Wang CC, Shah AC, Eds. Arlington, VA, American Diabetes Association, 2017 (3).

4. American Diabetes Association. Medical Management of Type 2 Diabetes. 8th ed. Meneghini L, Ed. Arlington, VA, American Diabetes Association, 2020. (4)

5. Diabetes Technology: Standards of Care in Diabetes—2025, Diabetes Care 2025;48(Suppl. 1): S146–S166 | https://doi.org/10.2337/dc25-S007.

6. Access to https://www.salute.gov.it/portale/nutrizione/dettaglioIMCNutrizione.jsp.area,nutrizione.

7. Council of Medical Specialty Societies. CMSS code for interactions with companies. Accessed 16 August 2023. Available from https://cmss.org/ code-for-interactions-with-companies/

8. Council for Medical Specialty Societies. CMSS principles for the development of specialty society clinical guidelines. Accessed 16 August 2023. Available from https://cmss.org/ wp content/uploads/2017/11/Revised-CMSSPrinciples-for-Clinical-Practice-Guideline-Development.pdf.

9. Comparison of four models for assessing insuling dosing error when a blood glucose monitoring system is used in various patient populations Dubois J.et al. Sessione poster presentata al Convegno AACC Critical and Point of Care Testing division, Sand Diego, CA.

10. Broos B, Charleer S, Bolsens N, et al. Diabetes knowledge and metabolic control in type 1 diabetes starting with continuous glucose monitoring: FUTURE-PEAK. J Clin Endocrinol Metab 2021;106: e3037–e3048.

11. Grace T, Salyer J. Use of real-time continuous glucose monitoring improves glycemic control and other clinical outcomes in type 2 diabetes patients treated with less intensive therapy. Diabetes Technol Ther 2022; 24:26–31.

12. Patil SP, Albanese-O'Neill A, Yehl K, Seley JJ,Hughes AS. Professional competencies for diabetes technology use in the care setting. Sci Diabetes Self Manag Care 2022; 48:437–445.

13. Magliano DJ, Boyko EJ; IDF Diabetes Atlas 10th edition scientific committee. IDF DIABETES ATLAS [Internet]. 10th ed. Brussels: International Diabetes Federation; 2021. PMID: 35914061.

14. Lillioja S, Mott DM, Howard BV, Bennett PH, Yki-Järvinen H, Freymond D, Nyomba BL, Zurlo F, Swinburn B, Bogardus C. Impaired glucose tolerance as a disorder of insulin action. Longitudinal and cross-sectional studies in Pima Indians. N Engl J Med. 1988 May 12;318(19):1217-25. doi: 10.1056/NEJM198805123181901. PMID: 3283552.

15. Sacks DB, Bruns DE, Goldstein DE, Maclaren NK, McDonald JM, Parrott M. Guidelines and recommendations for laboratory analysis in the diagnosis and management of diabetes mellitus. Clin Chem 2002; 48: 436-72.

16. Benjamin Page. Diabetes Spotlight: Lisa Chow, MD, MS: Quantifiable Lifestyle Changes to Improve Diabetes Outcomes. Diabetes 2025;74:251 | https://doi.org/10.2337/dbi24-0056.

17. Muraki I, Imamura F, Manson JE, Hu FB, Willett WC, van Dam RM, Sun Q. Fruit consumption and risk of type 2 diabetes: results from three prospective longitudinal cohort studies. BMJ. 2013 Aug 28;347:f5001. doi: 10.1136/bmj.f5001. Erratum in: BMJ. 2013;347:f6935. PMID: 23990623; PMCID: PMC3978819.

18. ElSayed NA, Aleppo G, Bannuru RR, et al. 9. Pharmacologic approaches to glycemic treatment: standards of care in diabetes-2024. Diabetes Care 2024; 47 (suppl 1): S158–78.

19. Lonati C, Morganti A, Comarella L, Mancia G, Zanchetti A; IPERDIA Study Group. Prevalence of type 2 diabetes among patients with hypertension under the care of 30 Italian clinics of hypertension: results of the (Iper)tensione and (dia)bete study. J Hypertens. 2008 Sep;26(9):1801-8. doi: 10.1097/HJH.0b013e328307a07f. PMID: 18698215.

20. Park HA. Fruit Intake to Prevent and Control Hypertension and Diabetes. Korean J Fam Med. 2021 Jan;42(1):9-16. doi: 10.4082/kjfm.20.0225. Epub 2021 Jan 20. PMID: 33524250; PMCID: PMC7884895.

21. Davila-Batista V, Viallon V, Fontvieille E, Jansana A, Kohls M, Bondonno NP, Tjønneland A, Dahm CC, Antoniussen CS, Katzke V, Bajrachaya R, Schulze MB, Agnoli C, Ricceri F, Panico S, Zamora-Ros R, Rodriguez-Barranco M, Amiano P, Chirlaque MD, Moreno-Iribas C, Papier K, Tsilidis KK, Aune D, Gunter MJ, Weiderpass E, Jenab M, Ferrari P, Freisling H. Associations between cardiometabolic comorbidities and mortality in adults with cancer: multinational cohort study. BMJ Med. 2025 Mar 21;4(1):e000909. doi: 10.1136/bmjmed-2024-000909. PMID: 40151205; PMCID: PMC11948348.

22. Gillies CL, Lambert PC, Abrams KR, Sutton AJ, Cooper NJ, Hsu RT, Davies MJ, Khunti K. Different strategies for screening and prevention of type 2 diabetes in adults: cost effectiveness analysis. BMJ. 2008 May 24;336(7654):1180-5. doi: 10.1136/bmj.39545.585289.25. Epub 2008 Apr 21. PMID: 18426840; PMCID: PMC2394709.

23. Gillies CL, Lambert PC, Abrams KR, Sutton AJ, Cooper NJ, Hsu RT, Davies MJ, Khunti K. Different strategies for screening and prevention of type 2 diabetes in adults: cost effectiveness analysis. BMJ. 2008 May 24;336(7654):1180-5. doi: 10.1136/bmj.39545.585289.25. Epub 2008 Apr 21. PMID: 18426840; PMCID: PMC2394709.

24. Gilmer TP, O'Connor PJ. The growing importance of diabetes screening. Diabetes Care. 2010 Jul;33(7):1695-7. doi: 10.2337/dc10-0855. PMID: 20587733; PMCID: PMC2890385.

25. Tuomilehto J. Prevention of type 2 diabetes - where is the evidence? East Mediterr Health J. 2014 Dec 17; 20(11):677-8.

26. Simmons RK, Echouffo-Tcheugui JB, Sharp SJ, Sargeant

LA, Williams KM, Prevost AT, Kinmonth AL, Wareham NJ, Griffin SJ. Screening for type 2 diabetes and population mortality over 10 years (ADDITION-Cambridge): a cluster-randomised controlled trial. Lancet. 2012 Nov 17; 380 (9855):1741-8.

27. Nichols JH, Christenson RH, Clarke W, Gronowski A, Hammett-Stabler CA, Jacobs E et al. National Academy of Clinical Biochemistry. Executive summary. The National Academy of Clinical Biochemistry Laboratory Medicine Practice Guideline: evidence-based practice for point-of-care testing. Clin Chim Acta 2007; 379: 14-28.

28. American Diabetes Association. Standards of medical care in diabetes - 2008. Diab Care 2008; 31: S12-S54. https://doi.org/10.2337/dc08-S012.

29. Makkar BM, Kumar CV, Saboo B, Agarwal S. RSSDI clinical practice recommendations for the management of type 2 diabetes mellitus 2022. Int J Diabetes Dev Ctries 2022; 42: 1–143.