MILLET CONSUMPTION PATTERNS AND GLYCEMIC CONTROL IN TYPE 2 DIABETES: A CROSS-SECTIONAL STUDY

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***Abstract* —A study of 200 individuals with type 2 diabetes found that frequent millet consumption was associated with better glycemic control, as measured by lower HbA1c and random blood sugar levels. Psychosocial factors like perceived health benefits, taste preferences, cultural beliefs, and recommendations from others significantly influenced millet consumption. The findings suggest that millets may play a beneficial role in diabetes management and highlight the importance of addressing individual perceptions and accessibility in promoting healthy dietary habits, providing valuable insights for developing targeted nutritional interventions to improve glycemic control in individuals with type 2 diabetes.**

I. Introduction

Type 2 diabetes mellitus (T2DM) is a global health burden, significantly impacted by diet and lifestyle. Millets, which are rich in fiber and have a low glycemic index, have shown promise in improving glycemic control among individuals with T2DM [1]. Studies indicate that regular millet consumption helps reduce fasting and postprandial blood glucose levels due to their slow digestion and high polyphenol content [2]. Despite these benefits, awareness and consumption of millets among diabetic patients remain relatively low.[3]

II. Objectives:

1. To quantify the frequency, types, and preparation methods of millet consumption among individuals with type 2 diabetes.
2. To examine the influence of demographic (e.g., age, education, gender) and psychosocial factors (e.g., health beliefs, accessibility) on millet consumption.
3. To determine the statistical association between millet consumption frequency and glycemic control parameters, specifically HbA1c and random blood sugar levels.

III. Review of literature

Millets are nutrient-rich, gluten-free grains that offer numerous health benefits. They're packed with fiber, protein, and essential vitamins and minerals, making them a great option for those with dietary restrictions. Incorporating millets into our diets could help address global issues like malnutrition and food insecurity. Millets also contain antioxidants and anti-inflammatory compounds that may improve blood sugar control, heart health, and weight management. By adding millets to our diets, we can unlock a range of benefits for our overall well-being.[4]A study by Katkuri et al. (2024) found that despite physicians believing millets can help lower blood sugar, several barriers prevent them from recommending millet-based diets to diabetic patients. These barriers include patient comorbidities, low income, lack of physician training, and limited resources. The study highlights the need for better education, patient resources, and dietitian support to promote millet-based diets in diabetes management. Addressing these barriers can help healthcare professionals support patients in adopting healthier diets.[5]According to Veda Krishnan et al. (2022), pearl millet phenolics have shown potential antidiabetic effects by inhibiting key enzymes involved in carbohydrate digestion and regulating glucose uptake. The study identified specific flavonoids and phenolic acids that contribute to these effects, highlighting the potential role of pearl millet in managing blood sugar levels. These findings suggest that pearl millet could be a valuable dietary component for diabetes management .[6]A study by Vedamanickam et al. (2020) compared the effects of millet and non-millet diets on diabetic patients with hypertension. The results showed that patients on a millet diet had significant reductions in weight, BMI, blood sugar levels, and improved lipid profiles, particularly in the 40-55 age group. The study suggests that a millet diet may be beneficial for regulating glucose levels and overall health in diabetic patients. According to the researchers, incorporating millets into the diet could be a valuable strategy for managing diabetes.[7]According to Swagata Dilip Tavhare (2024), millets offer numerous health benefits, including improved digestion, lower cholesterol, and protection against heart disease, diabetes, and cancer. These nutrient-rich grains are accessible, affordable, and possess anti-inflammatory, antioxidant, and gastro-protective properties. Millets may also help manage chemotherapy side effects,

such as appetite loss and nausea, making them a beneficial dietary addition for cancer patients. The Indian government's promotion of millets globally, following the 2023 International Year of Millets, highlights their potential in improving health outcomes.[8]According to Salnamchi J. Sangma et al. (2023), pearl millet shows promise in diabetes management due to its low glycemic index, which helps regulate blood sugar levels. Its high fiber and nutrient content make it a beneficial component of a balanced diet for individuals with diabetes. However, it's essential to consume pearl millet in moderation and as part of a personalized diet plan, with regular blood sugar monitoring and guidance from healthcare professionals. By incorporating pearl millet into a healthy lifestyle, individuals with diabetes may better manage their condition.[9]According to Vanisha S. Nambiar et al. (2011), pearl millet (Bajra) is a nutrient-dense grain that offers several potential health benefits due to its high energy content, low starch, and richness in insoluble fiber and α-amylase activity. With a low glycemic index of 55, pearl millet may be beneficial for managing diabetes. Its gluten-free nature also makes it suitable for individuals with celiac disease. While its protein content is good, it is low in certain amino acids. The study suggests that pearl millet may help manage constipation and other non-communicable diseases, and recommends further research to fully explore its health benefits.[10]

IV. METHODOLOGY

This mixed-methods study investigates millet consumption patterns and preferences among 200 individuals aged 30-50 with type 2 diabetes in Hyderabad, Telangana, exploring their relationship with diabetes management. The study aims to gather insights into dietary habits, perceptions, and experiences related to millet consumption and its potential benefits for glycemic control.

V. Findings

Correlation:

Correlation between	Correlation Coefficient	p-value
Frequency of Millet Consumption & HbA1c Levels	-0.259	<0.001
Frequency of Millet Consumption & RBS Levels	-0.290	<0.001
HbA1c Levels & RBS Levels	0.497	<0.001

- Millet consumption and blood sugar control : People who eat millets more often tend to have better blood sugar control, both in the short term (RBS levels) and long term (HbA1c levels). This connection is pretty strong and reliable.
- Connection between short-term and long-term blood sugar control: Not surprisingly, people with high blood sugar levels in the short term (RBS) also tend to have high levels in the long term (HbA1c). This just shows that these two measures of blood sugar control are related.

Chi square:

Predictor Variable	Estimate (B)	Std. Error	Wald χ^2	p-value	95% CI (Lower–Upper)	Interpretation
Positive Impact Perceived	−0.620	0.175	12.469	<.001	−0.964 to −0.276	Greater benefit →more frequent use
Health (No vs. Yes)	-2.238	0.448	24.948	<.001	−3.117 to −1.360	Belief in health benefits increases frequency
Taste (No vs. Yes)	-1.209	0.434	7.758	0.005	−2.060 to −0.358	Taste preference associated with frequency
Culture (No vs. Yes)	-1.176	0.388	9.204	0.002	−1.937 to −0.416	Cultural familiarity increases usage

Availability (No vs. Yes)	-1.119	0.441	6.426	0.011	−1.984 to −0.254	Perceived access boosts consumption
Recommendation (No vs. Yes)	-1.266	0.490	6.687	0.010	−2.226 to −0.306	Doctor/family advice encourages use

- What influences millet consumption: People's beliefs about millets, like thinking they're good for their health, liking their taste, and seeing them as part of their culture, make them more likely to eat millets regularly.
- External factors matter too: If people think millets are easily available and others recommend them, they're also more likely to eat them often.
- The importance of mindset and environment: It seems that both what people think about millets themselves and external factors like availability and social influence play a big role in whether they eat millets frequently.

VI. Conclusion

This study looked at how people with type 2 diabetes eat millets, what influences their choices, and how it affects their blood sugar control. What they found is that people who believe millets are good for their health, like the taste, see them as part of their culture, think they're easily available, and get recommendations from others are more likely to eat millets regularly. Most importantly, eating millets often connects to better blood sugar control – both in the short and long term. This suggests millets could be a helpful part of managing diabetes. The study's findings have important implications for dietary recommendations and public health interventions. Future research could look at how millets affect people over time and test ways to encourage sustainable millet consumption habits in people with diabetes.

VII. References

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