**Journal of Applied Nutrition and Dietetic**
Volume 5, Number 1, June 2025
P-ISSN: 2797-7412
DOI : 10.30867/jand.v5i1.856

# Effect of Pumpkin Cream Soup on Blood Glucose in Type 2 Diabetes Outpatients in North Aceh

**Riski Amelia[1*], Dini Junita[2]**

[1] Bachelor of Applied Nutrition and Dietetics, Department of Nutrition Poltekkes Kementerian Kesehatan, Aceh
[2]Department of Nutrition, Poltekkes Kementerian Kesehatan, Aceh
*Correspondence email : riskiameliaa05@gmail.com

*Submitted : 06/05/2025* *Accepted: 24/06/2025* *Published: 30/06/2025*

## Abstract

Diabetes mellitus is a chronic metabolic disorder characterized by elevated blood glucose levels (hyperglycemia). One innovative dietary approach to help manage hyperglycemia is the consumption of pumpkin cream soup. Pumpkin is rich in beta-carotene, flavonoids, vitamin C, and soluble fiber such as pectin, and also contains various bioactive compounds including proteins, peptides, polysaccharides, sterols, and para-aminobenzoic acid. This study aimed to determine the effect of pumpkin cream soup on blood sugar levels in type II diabetes mellitus outpatients at the UPTD Muara Batu Health Center, North Aceh Regency. A quasi-experimental design with a one-group pretest-posttest approach was employed. The intervention was conducted over seven consecutive days, which participants consumed pumpkin cream soup daily. Blood glucose levels were measured using the Easy Touch glucometer before and after the intervention. Data were analyzed using the paired sample t-test. The results showed that the average fasting blood glucose level decreased from 189.65 mg/dL before the intervention to 167.00 mg/dL after, with an average reduction of 22.65 mg/dL. The findings indicate a significant effect of pumpkin cream soup consumption in lowering blood sugar levels among type II diabetes mellitus patients. Therefore, pumpkin cream soup may be recommended as a dietary alternative to help manage blood glucose levels in individuals with type II diabetes mellitus.
**Keywords:** blood sugar, dietary intervention, hyperglycemia, pumpkin cream soup, type II diabetes mellitus

## Introduction

Diabetes mellitus (DM) is one of the most prevalent chronic diseases worldwide. It is characterized by the pancreas's inability to produce sufficient insulin or the body's ineffective use of insulin (Na'imah & Putriningtyas, 2021). This condition leads to various symptoms, including elevated blood glucose (hyperglycemia), glucose in the urine (glycosuria), frequent urination (polyuria), excessive thirst and hunger, weight loss, fatigue, and metabolic acidosis. DM is a genetically and clinically heterogeneous metabolic disorder, with one key manifestation being the loss of carbohydrate tolerance caused by defects in insulin action (Sya'diyah et al., 2020). In general, DM can be defined as a metabolic disorder with elevated blood glucose levels due to insulin deficiency or resistance, sharing characteristics with other metabolic syndromes (Trisda & Bakri, 2021).

**Journal of Applied Nutrition and Dietetic**
Volume 5, Number 1, June 2025
P-ISSN: 2797-7412
DOI : 10.30867/jand.v5i1.856

According to the International Diabetes Federation (2021), diabetes represents one of the fastest-growing global health emergencies of the 21st century. The number of people with diabetes is projected to reach 643 million by 2030 and 783 million by 2045. In 2021, more than 537 million adults worldwide were living with diabetes, and an estimated 541 million were in the prediabetes stage—characterized by impaired glucose tolerance. Diabetes is also associated with high mortality, accounting for approximately 6.7 million deaths among individuals aged 20–79 years (IDF, 2021). According to the Indonesian Ministry of Health (2019), the national prevalence of diabetes mellitus was 1.5%, affecting approximately 8.3 million people. Seventeen provinces exceeded the national prevalence rate, including Aceh, West Sumatra, Riau, Bangka Belitung, Riau Islands, Jakarta, West Java, Central Java, Yogyakarta, East Java, West Nusa Tenggara, East Nusa Tenggara, North Sulawesi, Central Sulawesi, Gorontalo, and West Papua (Aceh Singkil Health Office, 2021).

In Aceh Province, the Health Office reported 184,527 people were diagnosed with diabetes mellitus in 2021, of whom only 53% (97,131 individuals) received appropriate services. In North Aceh Regency, the number of DM cases increased to 12,207 by 2022 (Aceh Provincial Health Profile, 2022). An initial survey in the working area of UPTD Puskesmas Muara Batu identified 340 individuals with diabetes mellitus, averaging 15 patients per village (Puskesmas Muara Batu Profile, 2022). The development of DM is influenced by both non-modifiable factors—such as age, sex, and genetic predisposition—and modifiable risk factors, including diet, obesity, stress, and physical inactivity (Susilawati & Rahmawati, 2021).

Diabetes management includes both pharmacological and non-pharmacological therapies. While pharmacological approaches rely on medication, non-pharmacological treatments encompass dietary and lifestyle modifications, including the use of traditional or herbal remedies. One such functional food with antidiabetic potential is pumpkin (*Cucurbita moschata*) (Wati Rindar et al., 2023). Pumpkin is a low-calorie, high-fiber local food suitable for diabetic individuals. Its high fiber content helps slow intestinal glucose absorption, thereby reducing postprandial blood glucose spikes. Moreover, pumpkin has been found to improve glucose tolerance and exhibit hypoglycemic effects due to its polyphenolic antioxidants—such as flavonoids—which inhibit GLUT2, phosphodiesterase activity, and oxidative stress (Nurrahman et al., 2022).

The benefits of pumpkin are largely attributed to its high beta-carotene content, ranging from 9–19 mg/100g. Beta-carotene, a provitamin A compound, functions as a powerful antioxidant under low-oxygen conditions. Antioxidants neutralize free radicals and reactive oxygen species (ROS), thereby reducing the risk of chronic diseases (Ikhda & Khoiriyah, 2024). Pumpkin also contains soluble fiber (pectin) and several bioactive compounds such as proteins, peptides, polysaccharides, sterols, and para-aminobenzoic acid. Nutritionally, 100 g of pumpkin provides vitamin A (180 IU), vitamin C (52 mg), iron (1.4 mg), beta-carotene (1.18 mg), and fiber (6.6 g) (Nurjanah et al., 2020).

Pumpkin is commonly consumed by steaming, but to increase local food innovation and public appeal, it can be developed into **cream soup**. Pumpkin cream soup is a creamy dish made by pureeing cooked pumpkin and combining it with milk or cream and seasonings. Its soft texture and savory taste make it palatable and appealing, especially when attractively packaged in ready-to-eat plastic cups (Halimah & Rahmawati, 2021).

**Journal of Applied Nutrition and Dietetic**
Volume 5, Number 1, June 2025
P-ISSN: 2797-7412
DOI : 10.30867/jand.v5i1.856

## Methods

This study aimed to examine the effect of pumpkin cream soup on blood glucose levels in patients with type II diabetes mellitus. A quasi-experimental design with a one-group pretest-posttest approach was employed. The intervention consisted of administering pumpkin cream soup to participants for seven consecutive days. The study population comprised all 63 patients diagnosed with type II diabetes mellitus, aged between 17 and 65 years, registered at the UPTD Muara Batu Health Center, North Aceh Regency. The research was conducted from November 28 to December 4, 2024. The total population sampling method was used, from which 20 participants were selected based on predefined inclusion criteria. The research procedure began with measuring participants' fasting blood glucose levels prior to the intervention. Each participant then consumed pumpkin cream soup at 10:00 AM daily for seven consecutive days. On the eighth day, fasting blood glucose levels were measured again to determine any significant changes. The collected data underwent several stages of processing, including editing, coding, data entry, tabulation, and cleaning. Data analysis was conducted using the paired sample t-test (Dependent T-Test) to assess the statistical difference in blood glucose levels before and after the intervention. The results were then presented in both tabular and narrative formats.

## Result

Carbohydrate Intake of Respondents

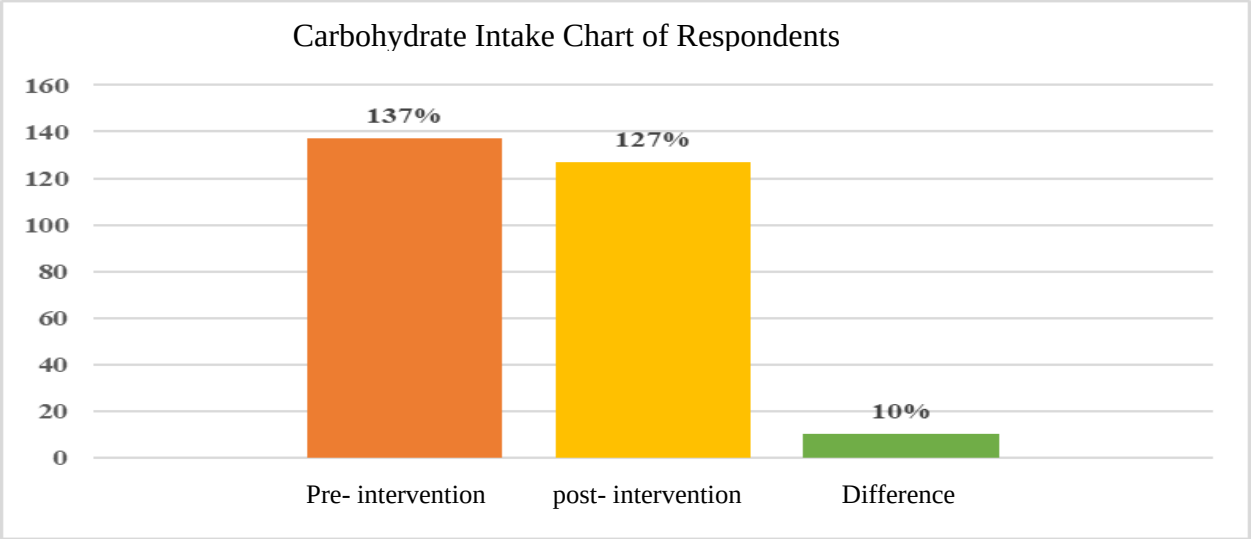


Figure 1. Average Carbohydrate Intake Before and After the Intervention

The graph above illustrates the average carbohydrate intake of respondents before and after the intervention. Prior to the administration of pumpkin cream soup, the average carbohydrate intake was 137% of the recommended daily allowance, while after the intervention it decreased to 127%. Although the intake remained above the recommended level, the data indicate a reduction in carbohydrate consumption following the intervention. The average decrease in carbohydrate intake was approximately 10%.

**Journal of Applied Nutrition and Dietetic**
Volume 5, Number 1, June 2025
P-ISSN: 2797-7412
DOI : 10.30867/jand.v5i1.856

*Blood Sugar Levels and Carbohydrate Intake Before and After Intervention*

Table 1. Blood Sugar Levels and Carbohydrate Intake Before and After Consumption of Pumpkin Cream Soup

| | Mean | Min | Max | SD |
|---|---|---|---|---|
| Blood Sugar Levels (mg/dL) | | | | |
| Before | 189.6500 | 160.00 | 201.00 | 10.84957 |
| After | 167.000 | 120.00 | 218.00 | 24.27344 |
| Carbohydrate intake (g) | | | | |
| Before | 300.775 | 270.20 | 351.80 | 18.48695 |
| After | 279.485 | 225.10 | 380.90 | 38.86182 |

The results in Table 1 show that the mean blood sugar level after consuming pumpkin cream soup was 167.00 mg/dL, which is lower than the pre-intervention level of 189.65 mg/dL. Similarly, the average carbohydrate intake also decreased, from 300.78 g before the intervention to 279.49 g after the intervention. These findings suggest a potential positive effect of pumpkin cream soup on both blood glucose regulation and carbohydrate consumption in patients with type II diabetes mellitus.

*Differences in Blood Sugar Levels and Carbohydrate Intake Before and After Intervention*

Table 2. Differences in Blood Sugar Levels and Carbohydrate Intake Before and After Consumption of Pumpkin Cream Soup

| | Mean | SD | Mean difference | T value | p value |
|---|---|---|---|---|---|
| Blood Sugar Level (mg/dL) | | | | | |
| Before | 189.65 | 10.85 | 22.05 | 4.387 | .000 |
| After | 167.60 | 24.27 | | | |
| Carbohydrate Intake (g) | | | | | |
| Before | 300.77 | 18.49 | 21.29 | 3.354 | .003 |
| After | 279.48 | 38.86 | | | |

The results of the dependent t-test showed that the p-value for blood sugar levels before and after the intervention was 0.000, which is less than the significance threshold of 0.05. Therefore, $H_0$ is rejected and $H_1$ is accepted, indicating a significant decrease in blood sugar levels after the consumption of pumpkin cream soup. The mean blood sugar level decreased from 189.65 mg/dL to 167.60 mg/dL, with a mean reduction of 22.05 mg/dL. Similarly, the p-value for carbohydrate intake was $0.003 < 0.05$, also indicating a statistically significant difference. The mean carbohydrate intake decreased from 300.78 g to 279.49 g, with a mean reduction of 21.29 g. These findings suggest that the consumption of pumpkin cream soup may contribute to lowering blood glucose levels and reducing carbohydrate intake among patients with type II diabetes mellitus.

**Journal of Applied Nutrition and Dietetic**
Volume 5, Number 1, June 2025
P-ISSN: 2797-7412
DOI : 10.30867/jand.v5i1.856

**Discussion**

The results of this study showed that most respondents were aged 46 years. Generally, after the age of 40, individuals begin to experience significant physiological changes, such as decreased insulin sensitivity, which reduces the body's efficiency in controlling blood glucose levels. In addition, pancreatic function declines, leading to reduced insulin production. This condition can be exacerbated by comorbidities such as obesity and a family history of diabetes. Diabetes mellitus tends to occur more frequently in individuals within this vulnerable age group compared to younger populations. In older adults with normal body mass index, metabolic disorders are commonly caused by diminished beta-cell function, leading to slower insulin secretion in response to rising blood glucose levels (Susanti et al., 2024).

Most respondents in this study had attained a senior high school education level. Educational attainment influences individuals' knowledge about diabetes mellitus (DM), with lower education often linked to limited understanding. Education is considered a key factor in improving comprehension regarding the importance of blood sugar control, proper symptom management, and complication prevention. Generally, the higher a person's education level, the better their knowledge and attitude towards diabetes, leading to more effective self-management. Individuals with higher education levels are statistically less likely to develop DM than those with lower education (Ullya et al., 2024).

Regarding occupational status, the majority of respondents were housewives. Occupational activity is associated with the risk of diabetes, particularly for those in sedentary roles. Lack of physical activity contributes to inadequate energy expenditure, resulting in fat accumulation. This in turn can lead to obesity and insulin resistance—two well-known risk factors for type II diabetes mellitus (Arania et al., 2021).

Obesity was observed in 60% of respondents, or 12 individuals. Obesity is characterized by excessive fat accumulation, typically defined as having a BMI over 25 kg/m² or weight exceeding 20% of the ideal. In diabetics, obesity contributes to metabolic dysfunction and insulin resistance, preventing effective glucose uptake by the cells despite sufficient insulin production. Thus, insulin resistance makes it difficult to regulate blood glucose levels even when insulin is present (Ardiani et al., 2021).

Another contributing factor to DM is excessive carbohydrate intake. Carbohydrates directly impact blood glucose levels, as they are broken down into simple sugars upon digestion. In individuals with insulin resistance, the body's ability to store or use glucose becomes impaired. Overconsumption of carbohydrates can worsen glycemic control, increasing the risk of DM by up to 12 times compared to individuals with balanced carbohydrate intake (Dewi & Sugiani, 2024).

Carbohydrates serve as the body's primary energy source. Once consumed, they are converted into glucose and either used immediately or stored. Insulin facilitates this process. Blood glucose levels can vary throughout the day depending on carbohydrate intake, including fasting and postprandial states. Factors contributing to increased carbohydrate consumption include frequent intake of sweetened beverages and lack of dietary diversity (Murwindra et al., 2024).

From the 20 samples analyzed in this study, the dependent t-test revealed a p-value of 0.000, which is less than 0.05, indicating a significant difference in carbohydrate intake before

**Journal of Applied Nutrition and Dietetic**
Volume 5, Number 1, June 2025
P-ISSN: 2797-7412
DOI : 10.30867/jand.v5i1.856
and after the intervention. The mean carbohydrate intake decreased from 300 g to 279 g—a difference of 21 grams.

The dependent t-test also showed a significant difference in blood sugar levels before and after the administration of pumpkin cream soup ($p = 0.000$). The mean blood sugar level decreased from 189.65 mg/dL to 167 mg/dL, reflecting a reduction of 22 mg/dL. This indicates that pumpkin is beneficial for people with type II diabetes mellitus. As a herbal, non-pharmacological treatment, pumpkin cream soup offers a natural alternative to support glycemic control. The bioactive compounds in pumpkin contribute to this effect, making it a safe, complementary dietary strategy for managing blood sugar levels.

Pumpkin contains beneficial compounds that help maintain blood glucose stability in diabetic patients. Its antioxidant components—including beta-carotene, flavonoids, and vitamins C and E—play a role in combating oxidative stress, which is common in hyperglycemic conditions. Oxidative stress can lead to insulin resistance by damaging pancreatic beta cells. Flavonoids in pumpkin have been shown to reduce insulin resistance and enhance insulin sensitivity. They also inhibit alpha-amylase and glucosidase enzymes, which are responsible for carbohydrate digestion, thereby reducing postprandial glucose spikes. Beta-carotene supports immune function and helps neutralize free radicals, while vitamins C and E preserve cellular integrity and overall metabolic health (Nurrahman et al., 2022; Anasthasia et al., 2022).

This study also provides new insights into the medicinal potential of pumpkin, which is often overlooked despite its widespread availability. Research by Husna (2010) reported that administering 250 g of pumpkin reduced blood sugar levels from 300 mg/dL to 205 mg/dL—a 95 mg/dL drop. Fajri (2015) observed a 103 mg/dL reduction from 408 mg/dL to 305 mg/dL after administering 200 g of pumpkin. Similarly, Farach (2023) found that giving 100 ml of pumpkin formula reduced blood glucose from 210.5 mg/dL to 172.9 mg/dL—a decrease of 37.6 mg/dL. These findings reinforce the potential of pumpkin as a functional food in diabetes management.

## Conclusion

These findings affirm that pumpkin, as a local and affordable food source, contains nutritional and functional components—such as beta-carotene, flavonoids, and soluble fiber—that contribute to improved glucose metabolism and reduced insulin resistance.The relevance of this study lies in its demonstration of a simple, natural, and culturally appropriate dietary intervention that can support diabetes management in outpatient settings. Given the high and increasing prevalence of diabetes in Indonesia and the limitations of pharmacological therapies, integrating locally sourced, nutrient-dense foods such as pumpkin into daily diets can serve as an effective complementary approach in community-based care. Health programs should consider promoting pumpkin-based food products like cream soup in diabetes education and dietary interventions, particularly at the primary health care level. Future research is recommended to explore the long-term effects of regular pumpkin consumption on glycemic control and to compare different forms of preparation (e.g., puree, porridge, juice) across diverse populations.

## References

**Journal of Applied Nutrition and Dietetic**
Volume 5, Number 1, June 2025
P-ISSN: 2797-7412
DOI : 10.30867/jand.v5i1.856
Anasthasia. (2022). Comparison of total flavonoid content and antioxidant activity of yellow pumpkin extracts with various solvents. *Journal of Holistics and Health Science, 4*(2), 324–339.

Arania, R., Triwahyuni, T., Prasetya, T., & Cahyani, S. D. (2021). The relationship between occupation and physical activity with the incidence of diabetes mellitus at the Mardi Waluyo Clinic, Central Lampung Regency. *Jurnal Medika Malahayati, 5*(3), 163–169.

Ardiani. (2021). Obesity, dietary patterns, and physical activity in the management of diabetes mellitus during the COVID-19 pandemic. *Muhammadiyah Journal of Nutrition and Food Science (MJNF), 2*(1), 1–10.

Dewi, N. L. P. C., Sugiani, P. P. S., & Wiardani, N. K. (2024). The relationship of carbohydrate counting knowledge and carbohydrate intake with blood sugar level control in patients with diabetes mellitus at Puskesmas II East Denpasar. *Journal of Nutrition Science, 13*(2), 118–127.

Dinas Kesehatan Aceh Singkil. (2021). *Profil Kesehatan Aceh Singkil Tahun 2021* (pp. 1–193). Dinas Kesehatan Aceh Singkil.

Fajri, Y. (2015). *The effect of giving yellow pumpkin to blood sugar levels of patients with type II diabetes mellitus outpatient at BLUD Meuraxa Regional General Hospital Banda Aceh* [Undergraduate thesis, Universitas Syiah Kuala].

Halimah, R. N., & Rahmawati, F. (2021). Pumpkin puree substitution for donuts to increase pumpkin consumption. *Proceedings of Boga Busana Technical Education, 16*(1), 1–7.

Husna. (2010). *Differences in blood sugar levels of hospitalized diabetes mellitus patients before and after giving yellow pumpkin at BLUD Meuraxa Regional General Hospital Banda Aceh* [Undergraduate thesis, Universitas Syiah Kuala].

Ikhda, C., & Khoiriyah, M. (2024). Antidiabetic activity of combination of pumpkin and brotowali extracts in vivo. *Journal of Medical Laboratory, 3*(1), 1–8.

Murwindra, R. (2024). Effect of carbohydrate intake on patients with diabetes mellitus (DM). *Jurnal Kesehatan Medika, 6*(2), 52–56.

Na'imah, F., & Putriningtyas, N. D. (2021). Levels of β-carotene, fiber, protein, and organoleptic properties of pumpkin and red bean snack bars as a snack food for type 2 diabetes mellitus patients. *Indonesian Journal of Public Health and Nutrition, 1*(1), 472–478.

Nadira, F. (2023). *The effect of giving pumpkin formula to blood sugar levels of patients with type II diabetes mellitus at the Rezeki Meurasi Mandiri Main Clinic, Sukamakmur District, Aceh Besar Regency* [Undergraduate thesis, Universitas Abulyatama].

Nurjanah, H., Setiawan, B., & Roosita, K. (2020). Potential of yellow pumpkin (*Cucurbita moschata*) as high fiber food in liquid form. *Indonesian Journal of Human Nutrition, 7*(1), 54–68.

Nurrahman. (2022). Analysis of nutrient composition and antioxidants of several yellow pumpkin varieties (*Cucurbita moschata Durch*). *Agrointek, 16*(4), 544–552.

Susanti, N., Syahpira, D. D., Aulia, S. T., & Syahmala, A. R. (2024). The relationship of age to the incidence of type-2 diabetes mellitus with a stepwise approach. *Tambusai Health Journal, 5*(2), 4283–4288.

Susilawati, & Rahmawati, R. (2021). The relationship between age, gender and hypertension with the incidence of type 2 diabetes mellitus at the Tugu Health Center, Cimanggis District, Depok City in 2019. *ARKESMAS (Public Health Archives), 6*(1), 15–22.

**Journal of Applied Nutrition and Dietetic**
Volume 5, Number 1, June 2025
P-ISSN: 2797-7412
DOI : 10.30867/jand.v5i1.856
Sya'diyah, H. (2020). Health counseling for diabetes mellitus management and application of foot gymnastics for the elderly in the Surabaya coastal area. *Journal of Health Services, 3*(1), 9–27.

Trisda, R., & Bakri, S. (2021). The effect of counseling using booklet media on knowledge and attitudes in diabetes mellitus patients. *Journal of SAGO Nutrition and Health, 2*(1), 1–7.

Ullya. (2024). Risk factors for the incidence of diabetes mellitus in early elderly (age 46–55 years) in the working area of the Ingin Jaya Health Center, Aceh Besar Regency. *MAHESA: Malahayati Health Student Journal, 4*(2), 612–622.

Wati, R. (2023). The effect of non-pharmacological therapy education on diabetes mellitus patients. *Delima Health Scientific Journal, 5*(2), 112–116.