



The Use of Cinnamon Decoction to Reduce Blood Glucose Levels in Patients with Type 2 Diabetes Mellitus

Nabila Dwinata^{1*}, Rizaldi Nanda Wiguna^{2*}, Rina Karmila^{3*}, Syukriyah^{4*}, Melafilani S^{5*}

¹²³⁴⁵Department of Nursing, Iskandar Muda Regional Military Command Nursing Academy, Banda Aceh, Indonesia.

Received: 2026-07-07

Revised: 2026-07-31

Accepted: 2026-08-07

Published: 2026-08-08

Corresponding Author: Rizaldi

Nanda Wiguna

Author Name*: Nabila Dwinata

Email*: nabiladwinataa@gmail.com

DOI:

<https://doi.org/10.63404/juka.v10i6.309>

© 2023 The Authors. This open access article is distributed under a (CC-BY License)



Phone*: +6285333066839

Abstract: Type 2 diabetes mellitus is a metabolic disorder characterized by elevated blood glucose levels resulting from impaired insulin secretion or insulin resistance. Uncontrolled hyperglycemia may lead to complications such as neuropathy, nephropathy, retinopathy, and cardiovascular disorders. Hyperglycemia can be managed through both pharmacological and non-pharmacological approaches. One non-pharmacological therapy is the use of cinnamon decoction, which contains flavonoids, cinnamaldehyde, and polyphenols. This study aimed to determine the effect of cinnamon decoction on reducing blood glucose levels in patients with type 2 diabetes mellitus. This study employed a descriptive case study approach involving two female participants with fasting blood glucose levels >125 mg/dL. Data were collected through interviews. The research instruments consisted of a glucometer and an observation checklist. The intervention involved administering a cinnamon decoction prepared from 10 g of cinnamon in 100 mL of water for three consecutive days. The results showed a reduction in blood glucose levels in both participants. Participant I experienced a decrease from 344 mg/dL to 278 mg/dL, while Participant II showed a decrease from 205 mg/dL to 176 mg/dL. The findings suggest that cinnamon decoction can reduce blood glucose levels in patients with type 2 diabetes mellitus. Cinnamon decoction may be considered an adjunct therapy for blood glucose control.

Keywords: type 2 diabetes mellitus; blood glucose level; cinnamon decoction.

Introduction

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia resulting from abnormalities in carbohydrate, lipid, and protein metabolism. This condition occurs due to impaired insulin secretion, decreased insulin sensitivity, or a combination of both. Persistent hyperglycemia may lead to various chronic complications, including cardiovascular disease and neuropathy (Setyaji et al., 2023). According to the 2018 Basic Health Research (Riskesdas) conducted by the Indonesian Ministry of Health, the prevalence of diabetes mellitus in Indonesia increased to 10.9%. Furthermore, the 2023 Indonesian Health Survey (Survei Kesehatan Indonesia/SKI) reported that the prevalence of diabetes mellitus based on blood glucose examination among individuals aged

≥15 years reached 11.7%. The International Diabetes Federation (IDF) reported in 2021 that Indonesia ranked fifth worldwide in terms of the number of people living with diabetes mellitus, with approximately 19.5 million cases. At the national level, Aceh Province ranked seventh among Indonesian provinces with a relatively high number of diabetes mellitus cases. Data from 2022 indicated that there were 189,464 individuals with diabetes mellitus in Aceh, of whom 108,684 (57.46%) received standard healthcare services. Meanwhile, according to the Aceh Provincial Health Office Profile, the number of diabetes mellitus cases in Banda Aceh City reached 5,468 (Aceh Provincial Health Office, 2024).

Patients with diabetes mellitus commonly experience symptoms such as nausea, vomiting, fatigue, weakness, blurred vision, and paresthesia of the upper

How to Cite:

Dwinata, RN Wiguna, Karmila, Syukriyah & Melafilani. (2026). The Use of Cinnamon Decoction to Reduce Blood Glucose Levels in Patients with Type 2 Diabetes Mellitus. *Jurnal Keperawatan Akimba*, 10(6), 44-49. <https://doi.org/10.63404/juka.v10i6.309>

and lower extremities. Inadequately managed diabetes mellitus may increase the risk of developing various complications, including diabetic ketoacidosis, retinopathy, nephropathy, neuropathy, stroke, peripheral vascular disease, sexual dysfunction, cardiovascular disease, and gangrene that may ultimately require amputation. Therefore, nurses play a crucial role in providing appropriate nursing care and interventions to prevent the progression of severe complications in patients with diabetes mellitus (Dewi & Suriadi, 2024).

The management of type 2 diabetes mellitus includes both pharmacological and non-pharmacological approaches. Pharmacological treatment generally begins with metformin as the first-line therapy, followed by sulfonylureas, sodium-glucose cotransporter-2 (SGLT2) inhibitors, glucagon-like peptide-1 (GLP-1) receptor agonists, or insulin according to the patient's clinical condition and therapeutic needs. Although pharmacological therapy has been proven effective in controlling blood glucose levels, its use is associated with several limitations, including gastrointestinal adverse effects, hypoglycemia, high treatment costs, and poor patient adherence (American Diabetes Association [ADA], 2024).

In addition to pharmacological treatment, diabetes mellitus management also involves non-pharmacological interventions, including lifestyle modifications such as dietary management, increased physical activity, and weight control. These strategies have been shown to improve glycemic control, although maintaining long-term adherence remains challenging (Colberg et al., 2022). Various non-pharmacological therapies have been utilized to help reduce blood glucose levels, including bay leaf decoction, cherry leaf decoction, yam (jicama) extract, red betel leaf decoction, ginger administration, foot relaxation massage, progressive muscle relaxation therapy, increased water intake, diabetic foot exercises, diabetes exercise programs, and cinnamon decoction (Helmi et al., 2024).

Cinnamon (*Cinnamomum burmannii*) is a medicinal plant that has long been used as a traditional herbal therapy because of its hypoglycemic and hypolipidemic properties. Cinnamon contains various polyphenolic compounds, including quercetin, kaempferol, isorhamnetin, and catechin. One of the polyphenolic compounds that exhibits insulin-mimetic activity is doubly linked procyanidin type-A polymers, a member of the catechin/epicatechin group known as methylhydroxychalcone polymer (MHCP) or cinnamtannin B1. In addition, cinnamon contains several other bioactive compounds, including cinnamaldehyde, cinnamic acid, cinnamate, and essential oils, which contribute to its pharmacological

effects in improving blood glucose control (Nurfritriani & Sari, 2024).

A study conducted by Wanti et al. (2021) demonstrated a significant reduction in blood glucose levels among participants who received a cinnamon decoction prepared by boiling 10 g of cinnamon in 100 mL of water for 5 minutes. The intervention was administered for three consecutive days and produced a statistically significant reduction in blood glucose levels. Similarly, Nurfritriani and Sari (2024) concluded that administering a cinnamon decoction at a dose of 10 g/day prepared in 100 mL of water helped improve blood glucose stability in patients with type 2 diabetes mellitus. Their findings demonstrated a reduction in random blood glucose levels, as indicated by comparisons between pre-test and post-test measurements following three consecutive days of intervention.

This case study aimed to describe nursing care through the implementation of cinnamon decoction as a complementary intervention to reduce blood glucose levels in patients with type 2 diabetes mellitus in the working area of the Ulee Kareng Community Health Center, Banda Aceh, Indonesia.

Method

This study employed a descriptive research design using a case study approach. Descriptive research is a type of research that aims to systematically, objectively, and factually describe a phenomenon, condition, or characteristic of the research subjects based on evidence obtained from the field, without examining relationships between variables or testing hypotheses (Nursyamsi et al., 2022).

The purpose of this study was to describe the implementation of nursing care through the administration of cinnamon decoction as an intervention to reduce blood glucose levels in patients with type 2 diabetes mellitus. Two participants, referred to as Subject I and Subject II, were selected after meeting the predetermined inclusion criteria. The inclusion criteria were willingness to participate and cooperate throughout the study, age between 44 and 59 years (middle adulthood), fasting blood glucose (FBG) level >125 mg/dL, female sex, not currently receiving either pharmacological or non-pharmacological therapy, having no contraindications to cinnamon decoction, having no comorbid conditions such as gastritis (dyspepsia), and having no previous history of cinnamon decoction therapy. The study was conducted from December 30, 2025, to January 2, 2026, in the working area of the Ulee Kareng Community Health Center, Banda Aceh, Indonesia.

Fasting blood glucose levels were measured before the intervention by instructing the participants to fast for at least 8 hours before blood glucose assessment. The intervention consisted of a cinnamon decoction

prepared by boiling 10 g of cinnamon in 100 mL of water for 5 minutes. The decoction was consumed warm immediately after breakfast and dinner for three consecutive days. Follow-up evaluation was conducted by measuring fasting blood glucose levels every morning between 06:30 and 08:30 Western Indonesian Time (WIB), after confirming that the participants had fasted for at least 8 hours overnight.

The research instruments consisted of a glucometer and an observation sheet for data collection. Data were collected through interviews to obtain the information required during the study. The collected data included participants' demographic characteristics, duration of diabetes mellitus, type of oral antidiabetic medication previously used, and fasting blood glucose measurements obtained before the intervention and after the intervention over three consecutive days.

Result and Discussion

The findings of this study demonstrated that the administration of cinnamon decoction reduced blood glucose levels in two patients with type 2 diabetes mellitus in the working area of the Ulee Kareng Community Health Center, Banda Aceh, Indonesia.

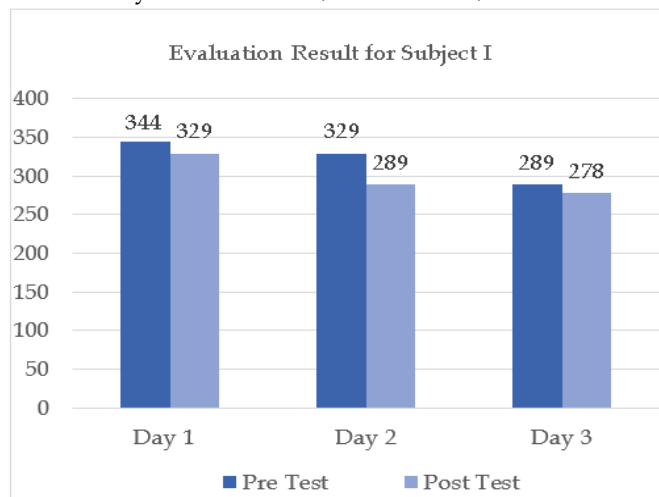


Figure 1. Fasting blood glucose levels before and after the administration of cinnamon decoction in Subject I.

In Subject I, fasting blood glucose levels decreased progressively throughout the three-day intervention period. On the first day, fasting blood glucose decreased from 344 mg/dL to 329 mg/dL following the administration of cinnamon decoction. On the second day, fasting blood glucose further decreased from 329 mg/dL to 289 mg/dL. Subsequently, on the third day, it declined from 289 mg/dL to 278 mg/dL. These findings suggest that the regular administration of cinnamon decoction has the potential to reduce blood glucose levels in patients with type 2 diabetes mellitus.

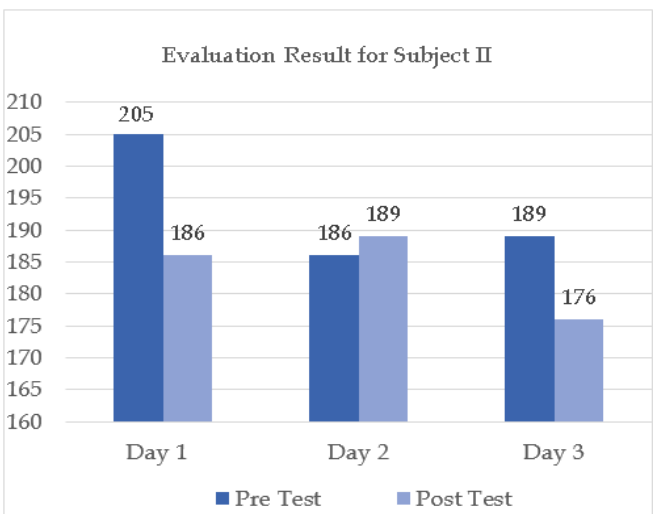


Figure 2. Fasting blood glucose levels before and after the administration of cinnamon decoction in Subject II.

Subject II also demonstrated an overall reduction in fasting blood glucose levels throughout the intervention period. On the first day, fasting blood glucose decreased from 205 mg/dL to 186 mg/dL following the administration of cinnamon decoction. On the second day, a slight increase in fasting blood glucose was observed, from 186 mg/dL to 189 mg/dL. Based on the interview findings, this increase was influenced by the consumption of high-sugar foods and beverages, including sticky rice with durian and packaged beverages. Nevertheless, on the third day, fasting blood glucose levels decreased again to 176 mg/dL. These findings indicate that cinnamon decoction remained beneficial in reducing blood glucose levels, although dietary intake may influence the intervention outcomes.

The results of this study demonstrated that the administration of cinnamon decoction reduced fasting blood glucose levels in both subjects with type 2 diabetes mellitus. Following the intervention, fasting blood glucose levels decreased from 344 mg/dL to 278 mg/dL in Subject I and from 205 mg/dL to 176 mg/dL in Subject II. According to the researchers' assumption, the bioactive compounds contained in cinnamon, particularly flavonoids and cinnamaldehyde, possess antioxidant and anti-inflammatory properties that help neutralize free radicals resulting from impaired insulin production, thereby contributing to the reduction of blood glucose levels in patients with type 2 diabetes mellitus. This assumption is supported by Hayani et al. (2024), who reported that cinnamon contains several active compounds, including cinnamaldehyde, cinnamic acid, and cinnamate, which exert beneficial effects on glucose metabolism. The hypoglycemic mechanism of cinnamon involves enhancing insulin activity, thereby improving insulin responsiveness and contributing to lower blood glucose levels. In addition, cinnamate delays carbohydrate absorption in the

gastrointestinal tract, thereby reducing postprandial increases in blood glucose levels. The polyphenolic compounds present in cinnamon also contribute to lowering hepatic glucose production, one of the primary sources of endogenous glucose.

The findings further identified several factors that contributed to the successful implementation of cinnamon decoction in reducing blood glucose levels in this case study, namely the frequency of administration and family support. One of the primary contributing factors was the frequency of the intervention. In this study, cinnamon decoction was administered to both Subject I and Subject II twice daily, after breakfast and after dinner, for three consecutive days. According to the researchers' assumption, regular and scheduled consumption of cinnamon decoction contributed to the reduction of blood glucose levels in patients with diabetes mellitus. This assumption is supported by the study conducted by Febrianti and Chaniago (2026), which reported that the regular administration of cinnamon decoction with consistent consumption timing significantly reduced blood glucose levels in patients with type 2 diabetes mellitus. Consistent consumption enables active compounds, such as cinnamaldehyde and polyphenols, to function optimally by improving insulin sensitivity and facilitating glucose metabolism.

Another factor supporting the successful implementation of cinnamon decoction in this study was family support. Based on data obtained from both subjects, family members were highly involved in accompanying and supporting the treatment process. The support provided included attention, motivation, encouragement, and reminders for the subjects to consume cinnamon decoction as an alternative non-pharmacological therapy. According to the researchers' assumption, family support plays a crucial role in the successful implementation of cinnamon decoction for reducing blood glucose levels. Such support improves participants' adherence to consuming cinnamon decoction according to the recommended schedule, thereby contributing to improved blood glucose control. This finding is consistent with the study by Suryatno et al. (2025), which reported that family support is an important factor in diabetes mellitus management because it influences not only patient behavior but also clinical outcomes, including blood glucose control. Their study demonstrated a significant association between family support and patient adherence to diabetes management, which subsequently contributed to achieving optimal glycemic control. Greater family support was associated with better adherence to treatment, blood glucose monitoring, and follow-up visits, all of which are essential components of effective blood glucose management.

In addition to the factors supporting the successful implementation of cinnamon decoction, several factors contribute to the development of type 2 diabetes mellitus, including age, dietary patterns, sleep quality, and obesity. One of the factors influencing the occurrence of diabetes mellitus is age. Based on the assessment findings, both Subject I and Subject II were over 45 years of age. According to the researchers' assumption, age above 45 years is one of the factors that can increase the risk of developing type 2 diabetes mellitus because it is associated with declining pancreatic function and increased insulin resistance. The aging process reduces the pancreas' ability to produce insulin and decreases cellular sensitivity to insulin, resulting in impaired glucose metabolism and a tendency toward elevated blood glucose levels.

This finding is consistent with the theory proposed by Rohmatulloh et al. (2024), which states that blood glucose regulation is influenced by various components, including tissues, neurons, and hormones. Age-related changes occur gradually, beginning at the cellular level, progressing to the tissue level, and ultimately affecting organ function. Under these conditions, pancreatic beta cells experience a decline in their ability to produce insulin, accompanied by reduced cellular sensitivity to insulin. Consequently, in older adults, physiological function declines due to both reduced insulin production and increased insulin resistance, thereby diminishing the body's ability to regulate elevated blood glucose levels effectively.

In addition to age, dietary patterns are also one of the factors affecting blood glucose levels. Based on the study findings, Subject II experienced an increase in blood glucose levels before the intervention on the third day, rising from 186 mg/dL to 189 mg/dL. This increase occurred because Subject II consumed foods and beverages with high sugar content, such as ketan durian (glutinous rice with durian) and packaged beverages. According to the researchers' assumption, uncontrolled dietary habits and inadequate attention to the nutritional content of consumed foods can increase an individual's risk of developing type 2 diabetes mellitus. Dietary patterns that increase the risk of diabetes mellitus include frequent consumption of foods high in saturated fat and sugar, as well as diets low in fiber and micronutrients.

These findings are supported by Widiastuti et al. (2024), who reported that consumption of foods high in sugar and refined carbohydrates can cause rapid and significant increases in blood glucose levels. This condition increases the workload of the pancreas in producing insulin, which, if sustained over a prolonged period, may lead to pancreatic fatigue and even pancreatic damage. In addition, the use of cooking oil and coconut milk in food preparation is one of the indicators of high dietary fat content. Excessive

consumption of saturated and trans fats can also impair insulin function by reducing cellular sensitivity to this hormone. As a result, the body requires greater amounts of insulin to regulate blood glucose levels, thereby increasing the risk of insulin resistance.

Another factor contributing to elevated blood glucose levels is poor sleep quality. Based on the assessment findings, both Subject I and Subject II reported poor sleep quality. In Subject I, sleep disturbances were caused by the habit of waking up at night to urinate approximately 3–4 times each night. Meanwhile, Subject II habitually went to bed late, frequently woke up to urinate, and experienced itchy skin that caused discomfort during the night, resulting in frequent awakenings and difficulty returning to sleep. According to the researchers' assumption, impaired sleep quality physiologically affects the patient's ability to perform daily activities, influences mood, causes fatigue, and leads to daytime sleepiness, all of which may ultimately affect blood glucose levels.

This assumption is supported by Bingga (2021), who reported that insufficient sleep, particularly due to frequent nocturnal awakenings, can disrupt energy balance through increased appetite, irregular eating patterns, and reduced energy expenditure. Sleep deprivation also results in a significant decrease in leptin levels and an increase in ghrelin levels, hormones that regulate appetite. Increased appetite may subsequently lead to an increase in body mass index, which may eventually contribute to the development of insulin resistance.

Another factor influencing blood glucose levels is obesity. Based on the study findings, Subject I was classified as overweight, with a body mass index (BMI) of 27. Meanwhile, Subject II was classified as obese, with a BMI of 45.8, which falls within the obesity category (BMI >27). According to the researchers' assumption, increased adipose tissue accumulation, particularly abdominal fat (central obesity), can increase the occurrence of insulin resistance. This condition impairs insulin action, preventing glucose from entering cells efficiently and resulting in glucose accumulation within the bloodstream. This statement is consistent with the findings of Khair et al. (2023), who reported that central obesity is associated with impaired glucose tolerance, disturbances in glucose-insulin homeostasis, and reduced glucose-stimulated insulin secretion. In individuals with obesity, there is an increase in circulating non-esterified free fatty acids, glycerol, hormones, cytokines, pro-inflammatory markers, and various other substances that contribute to insulin resistance and pancreatic beta-cell dysfunction. These conditions reduce the body's ability to regulate blood glucose levels, thereby increasing the risk of developing type 2 diabetes mellitus.

Conclusion

Based on the focus of this case study and the discussion of subjects with type 2 diabetes mellitus regarding the reduction of blood glucose levels, it can be concluded that the administration of cinnamon decoction resulted in a decrease in blood glucose levels in both study subjects. Blood glucose levels in Subject I decreased from 344 mg/dL to 278 mg/dL, while those in Subject II decreased from 205 mg/dL to 176 mg/dL following the administration of cinnamon decoction. Several factors contributed to the successful implementation of cinnamon decoction in reducing blood glucose levels among patients with type 2 diabetes mellitus, namely the frequency of administration and family support. Meanwhile, the factors influencing the development of diabetes mellitus included age, dietary patterns, sleep quality, and obesity.

Acknowledgments

The authors would like to express their sincere gratitude to drg. Wahyu Fajar Dwinanto, M.M., Director of the Academy of Nursing Kesdam Iskandar Muda, for his support of this study. The authors also sincerely thank Rizaldi Nanda Wiguna, S.Kep., Ns., M.Kep. for his guidance as the research supervisor, as well as Ns. Fakruddin, S.Kep., SKM., MKM. and Ns. Rudi Alfiandi, S.Kep., M.Kep. for their valuable suggestions and constructive feedback as examiners. Finally, the authors extend their appreciation to their classmates for their encouragement, cooperation, and continuous support throughout the completion of this research.

References

- American Diabetes Association (ADA). (2024). *Standards of medical care in diabetes—2024*. *Diabetes Care*, 46(Supplement 1), S1-S290.
- Bingga, I. A. (2021). Kaitan kualitas tidur dengan diabetes melitus tipe 2. *jurnal medika hutama*, 2(4).
- Colberg, S. R., Sigal, R. J., Yardley, J. E., Riddell, M. C., Dunstan, D. W., Dempsey, P. C., Horton, E. S., Castorino, K., & Tate, D. F. (2022). *Physical activity/exercise and diabetes: A position statement of the American Diabetes Association*. *Diabetes Care*, 45(1), 190–207.
- Dewi, E. R., & Suriadi. (2024). Asuhan keperawatan pasien diabetes melitus: Literatur. *Jurnal Keperawatan : Asuhan Keperawatan Pasien Diabetes Mellitus*, 7(4), 18644–18648.
- Dinas Kesehatan Kota Banda Aceh. (2024). *Profil Kesehatan Kota Banda Aceh Tahun 2024*. Dinas Kesehatan Kota Banda Aceh.
- Dinas Kesehatan Provinsi Aceh, Kementerian Kesehatan Provinsi Aceh. (2022). *Profil Kesehatan Provinsi Aceh Tahun 2022*. Dinas Kesehatan Provinsi Aceh.

- Febrianti, D., & Chaniago, R. (2026). Pemberian seduhan kayu manis (*Cinnamomum Burmanii*) efektif terhadap penurunan kadar glukosa darah puasa pada pasien diabetes melitus tipe 2. *Jurnal Ilmiah Kesehatan Indonesia*, 11(1), 45–52.
- Hayani, N., Suryati, Zulkarnaini, Azwarni, & Yuni Ramadhani. (2024). Efektivitas seduhan kayu manis terhadap kadar gula darah pada diabetes melitus tipe 2 di Puskesmas Langsa Barat Effectiveness. *SAGO: Gizi dan Kesehatan*, 6(1) 10-18.
- Helmi, A., Veri, N., & Lina, L. (2024). Literature review: Penanganan nonfarmakologi untuk penurunan kadar gula darah pada pasien diabetes mellitus. *Jurnal SAGO Gizi dan Kesehatan*, 5(2), 547.
- International Diabetes Federation (IDF). (2021). *IDF Diabetes Atlas (10th ed.). Brussels: International Diabetes Federation*.
- Kementerian Kesehatan Republik Indonesia. (2018). Laporan Nasional Riset Kesehatan Dasar (Riskesdas) 2018. Badan Penelitian dan Pengembangan Kesehatan, Kementerian Kesehatan RI.
- Kementerian Kesehatan Republik Indonesia. (2023). Laporan Hasil Survei Kesehatan Indonesia (SKI) 2023. Badan Kebijakan Pembangunan Kesehatan, Kementerian Kesehatan RI.
- Khair, Y., Safitri, A., Kanang, indah lestari daeng, Latief, S., & Rasfayanah. (2023). *Fakumi medical journal*. *fakumi medical journal*, 3(6), 437–443.
- Nurfitriani, & Sari, A. S. (2024). Studi kasus efektivitas pemberian rebusan kayu manis terhadap penurunan kadar gula darah pada penderita diabetes mellitus tipe II. *Jurnal Ilmiah Kesehatan dan Keperawatan Indonesia* 19, 20–24.
- Nursyamsi, N. L., Kusumawaty, I., Achmad, V. S., Ginting, D. S., Yunike, Liana, Y., Indriyani, D., Martiningsih, W., & Solehudin. (2022). Metodologi penelitian keperawatan. PT Global Eksekutif Teknologi.
- Rohmatulloh, V. R., Pardjianto, B., & Kinasih, L. S. (2024). Hubungan usia dan jenis kelamin terhadap angka kejadian diabetes melitus tipe 2 berdasarkan 4 kriteria diagnosis di poliklinik penyakit. 8, 2528–2543.
- Setyaji, Y., Duri, I. D., Kuniasiwi, P., & Putri, N. A. (2023). Pengendalian diabetes melitus melalui edukasi dan pemeriksaan kadar gula darah sewaktu di perumahan Roto Kenongo Sewon. *Borneo Community Health Service Journal*, 3(2), 128–132.
- Suryatno, H., Yusrianti, L., Wijaya, A., Adhi, i gusti ayu mirah, Cahyono, W., & In. (2025). Hubungan dukungan keluarga dengan tingkat kepatuhan pada penderita diabetes melitus tipe II di wilayah kerja Puskesmas Monta Kabupaten Bima. 11(2), 169–175.
- Wanti, R. M., Hasneli, Y., & Deli, H. (2021). Pengaruh rebusan kayu manis (*Cinnamomum Burmanii*) terhadap kadar gula darah puasa penderita diabetes mellitus tipe 2. *JOM FKp*, 6(1), 28–35.
- Widiastuti, W., Zulkarnaini, A., & Mahatma, G. (2024). *Review artikel*: pengaruh pola asupan makanan terhadap risiko penyakit diabetes. 1(2), 108–124.