



Comparative Effectiveness of Sunnah Fasting Variations on Fasting Blood Glucose Monitoring in Type 2 Diabetes Mellitus: A Pragmatic Pilot Study

Abdur Rosyid, Satibi Satibi , Fita Rahmawati, Lutfan Lazuardi

[The author informations are in the declarations section. This article is published by ETFLIN in Sciences of Pharmacy, Volume 5, Issue 2, 2026, Page 238-243. DOI: 10.58920/sciphar0502673]

Received: 26 April 2026

Revised: 18 May 2026

Accepted: 06 June 2026

Published: 28 June 2026

Editor: Pilli Govindaiah



This article is licensed under a Creative Commons Attribution 4.0 International License. © The author(s) (2026).

Keywords: Sunnah fasting, intermittent fasting, Religiosity, fasting blood glucose, T2DM.

Abstract: Intermittent fasting has increasingly been incorporated into complementary and alternative medicine (CAM) strategies for the management of type 2 diabetes mellitus (T2DM). The extent to which weekly fasting frequency dictates glycemic outcomes is well-noted; however, the distinct clinical benefit of increasing Sunnah fasting adherence to two days weekly remains an unresolved question in diabetes management. This study aims to compare the effectiveness of Monday-only Sunnah fasting *versus* combined Monday and Thursday Sunnah fasting on Fasting Blood Glucose (FBG) among patients with Type 2 Diabetes Mellitus (T2DM). This research is a pre-experimental employing a within-subject exploratory pilot comparison with a single-group pre-post design involving 50 participants selected through purposive sampling, with data analyzed using the Wilcoxon Signed Ranks Test ($p < 0.05$). The results demonstrated that most participants (84%) were between 43 and 54 years of age, and the majority were female (56%). practicing Sunnah fasting twice weekly (Monday and Thursday) resulted in significantly lower average FBG (186,67 mg/dL) compared to fasting only once a week on Mondays (202.28 mg/dL), statistically significant reduction in FBG ($Z = -2.660$, $p = 0.008$; $r = 0.37$, Cohen's $d = 0.79$). The study suggests that practicing Sunnah fasting twice weekly offers a more favorable impact on fasting blood glucose control for T2DM patients than fasting only once a week.

Introduction

International Diabetes Federation (IDF) reported in 2021 that the global prevalence of Diabetes Mellitus (DM) had reached 536.6 million cases and is projected to increase to 783.2 million by 2045. Type 2 Diabetes Mellitus (T2DM) represents the most prevalent form of the disease, accounting for more than 90% of all diabetes cases worldwide (1). The increasing burden of this disease is often linked to sedentary lifestyles and obesity, which directly exacerbate insulin resistance and glycemic control in type 2 patients (2, 3). Managing Type 2 Diabetes Mellitus (T2DM) remains complex because patients frequently experience changes in health status, lifestyle, and therapeutic regimens. As a result, achieving optimal glycemic control continues to be a major challenge, even when patients comply with treatment recommendations and clinicians possess substantial professional experience. (4, 5). Given the chronic nature of the disease, sustainable self-management through the monitoring of Fasting Blood

Glucose (FBG) is a crucial factor in preventing fatal long-term complications.

As a complementary solution, intermittent fasting has gained widespread attention due to its effectiveness in improving insulin sensitivity and glucose metabolism (6, 7). In Islamic tradition, the practice of Sunnah fasting on Mondays and Thursdays offers an intermittent fasting model similar to the 5:2 diet pattern, which has been empirically proven to reduce weight and improve metabolic parameters (8–10). While previous research has confirmed the health benefits of fasting for diabetics, most studies have focused on Ramadan fasting, which is mandatory and performed for a full month (11, 12). On the other hand, Sunnah fasting is voluntary; thus, the intensity of its practice among Muslims varies significantly, depending on each individual's spiritual commitment (13, 14).

To date, there remains an unexplored area regarding how variations in the weekly frequency of Sunnah fasting influence the glycemic stability of patients. There is limited specific evidence comparing whether increasing the

frequency of fasting from one day to two days per week yields a meaningful clinical difference for type 2 diabetes sufferers. Understanding this is vital to provide evidence-based guidance for patients seeking to integrate spiritual practices with their disease management. Therefore, this study aims to determine the comparative effectiveness between the variation of Monday-only Sunnah fasting and Monday-Thursday Sunnah fasting on the monitoring of Fasting Blood Glucose (FBG) levels in Type 2 Diabetes Mellitus (T2DM) patients

Methodology

Study Design and Ethical Approval

This research is a pre-experimental employing a within-subject exploratory pilot comparison with a single-group pre-post design conducted for a one-week period in December 2024. The study protocol received formal approval from the Bioethics Commission of the Faculty of Medicine, Universitas Islam Sultan Agung Semarang, under Ethical Clearance No. 363/VIII/2024/Komisi Bioetika. Prior to participation, all individuals were informed of the study objectives and provided their written consent to participate in the monitoring process.

Participants and Recruitment

The study was conducted at the Puskesmas Kota Semarang in Central Java, Indonesia. The participants consisted of 50 patients with Type 2 Diabetes Mellitus (T2DM) recruited through purposive sampling from the government's chronic disease management program (BPJS Health Prolanis). Inclusion criteria required participants to be Muslim, aged between 18 and 54 years, Patients were administered a combination of oral antidiabetic therapy consisting of metformin and glimepiride, which was taken before meals and during prolonged fasting periods, actively practicing Sunnah fasting on Mondays and Thursdays. Additional exclusion criteria, such as the presence of renal failure or the use of insulin therapy, Non-adherence to medication schedules or recent dose modifications may interfere with the continuity of voluntary sunnah fasting were applied to ensure sample homogeneity.

Procedures and Intervention

The intervention focused on the variation of Sunnah fasting, where participants fasted for approximately 13 hours per day, starting from dawn until sunset. The study compared two specific conditions within the same group:

the performance of fasting only on Mondays and the performance of fasting on both Mondays and Thursdays. During the fasting period, participants abstained from all caloric intake and fluids, consistent with Islamic spiritual practices aimed at spiritual proximity to God. Participants were instructed to maintain their standard medication regimens and consistent dietary patterns during non-fasting hours to minimize confounding variables.

Parameters and Data Collection

The primary dependent variable was the Fasting Blood Glucose (FBG), measured in mg/dL. Blood samples were collected from participants at 18:00 WIB, coinciding with the end of the fasting period. Glucose levels were determined using a calibrated electronic glucometer to ensure measurement accuracy. Sociodemographic data, including age and gender, were also recorded to characterize the study population. Furthermore, researchers monitored participant compliance through daily logs or weekly interviews to verify the consistency of the fasting frequency.

Statistical Analysis

Data were processed using IBM SPSS Statistics version 25. Sociodemographic characteristics were analyzed using descriptive statistics and presented as percentages. To evaluate the comparative effectiveness of the fasting variations, the Wilcoxon Signed Ranks Test was performed with a 95% confidence interval. A p-value of less than 0.05 was established as the threshold for statistical significance. Parametric test assumptions were not satisfied as the data deviated from a normal distribution. This non-parametric test was selected because it is suitable for comparing two related samples to observe the significance of the changes in FBG.

Results

Sociodemographic Characteristics

The comprehensive sociodemographic profile of the 50 enrolled participants is meticulously summarized in **Table 1**. The study population was predominantly in the late adulthood stage, with 84% of participants aged between 43 and 54 years old. The mean age of the entire cohort was 47.04 ± 6.34 years. In terms of the overall gender distribution within this group, female participants constituted the majority (56%), while males accounted for 44% of the total sample.

Table 1. Sociodemographic characteristics of participants.

Sociodemographic Characteristics	Frequency (%)
Age	
18 – 30 Years Old	4%
31 – 42 Years Old	12%
43 – 54 Years Old	84%
Gender	
Male	44%
Female	56%

Descriptive Analysis of Fasting Blood Glucose (FBG)

The comparison of FBG levels between the two Sunnah fasting variations is presented in **Table 2**. The results indicate a notable difference in glycemic control depending on the frequency of fasting. During the period of Monday-only fasting, the mean FBG was recorded at 202.28 mg/dL. However, when participants performed the combined Monday and Thursday Sunnah fasting, the mean FBG decreased to 186.67 mg/dL.

Comparative Analysis of Fasting Blood Glucose (FBG)

Statistical analysis using the Wilcoxon Signed Ranks Test revealed FBG difference between the two groups to be statistically significant with a p-value of 0.008 ($p < 0.05$) in **Table 3**. These findings demonstrate that the practice of Sunnah fasting twice a week is associated with significantly lower fasting blood glucose compared to fasting once a week among T2DM patients.

Discussion

The findings of this study indicate that patients with Type 2 Diabetes Mellitus (T2DM) in the chronic disease management program are predominantly in the late adulthood stage, with a mean age of 47 years. This demographic trend aligns with the physiological understanding that aging is a significant risk factor for T2DM, often associated with increased abdominal fat accumulation and central obesity, which exacerbate insulin resistance (15). Furthermore, the higher prevalence of T2DM among female participants (56%) in this study may be attributed to hormonal shifts during postmenopause and lifestyle factors that promote lipid accumulation, although gender itself may not directly dictate blood glucose fluctuations (16, 17).

The core finding of this research demonstrates that increasing the frequency of Sunnah fasting from one day to two days a week leads to a significantly greater reduction in Fasting Blood Glucose (FBG). Practicing Sunnah fasting twice weekly, specifically on Mondays and Thursdays, resulted in a mean FBG of 186, 67 mg/dL, which is substantially lower than the 202.28 mg/dL observed during Monday-only fasting. The findings demonstrated a statistically significant reduction in FBG following the intervention period ($Z = -2.660$, $p = 0.008$). This statistical

significance is further reinforced by an effect size of $r = 0.37$, Cohen's $d = 0.79$ represents a moderate-to-strong practical impact, suggests a dose-response relationship where more frequent fasting episodes enhance glycemic stability.

The metabolic benefits of this twice-weekly fasting model can be explained through the mechanism of metabolic switching (18, 19). During the 13-hour fasting period, the body shifts from utilizing glucose to mobilizing fatty acids and ketones as primary energy sources (20). This process is closely linked to the activation of Adenosine Monophosphate-activated Protein Kinase (AMPK), which improves insulin sensitivity and glucose homeostasis (21). By performing this practice twice a week, patients likely experience more frequent "reset" periods for their insulin signaling pathways compared to fasting only once a week.

In addition to physiological mechanisms, the spiritual nature of Sunnah fasting plays a vital role in managing T2DM. As a voluntary spiritual practice, Sunnah fasting is associated with higher levels of religiosity and inner peace, which have been shown to reduce depression and stress—known predictors of T2DM. The combination of calorie restriction and spiritual fulfillment may lower cortisol levels by regulating the hypothalamic-pituitary-adrenal (HPA) axis, further preventing glucose spikes induced by stress (22–24). Therefore, the Monday and Thursday Sunnah fasting practice offers a holistic approach that integrates metabolic regulation with psychological and spiritual well-being for better diabetes management.

As a pragmatic pilot study, this pre-experimental research evaluated the comparative effectiveness of various sunnah fasting regimens, despite being constrained by a limited sample size and a short duration. Confounding variables that may influence fasting blood glucose such as daily dietary patterns on non-fasting days and levels of religiosity or spiritual fulfillment warrant strict control. Consequently, future studies are essential to fully evaluate the benefits of sunnah fasting frequency in managing fasting blood glucose among T2DM patients.

Conclusion

This study concludes that practicing Sunnah fasting twice weekly, specifically on Mondays and Thursdays, is significantly more effective in controlling Fasting Blood Glucose (FBG) in patients with Type 2 Diabetes Mellitus (T2DM) compared to fasting only once a week on

Table 2. Descriptive of FBG based on fasting variation (N=50).

Sunnah Fasting Variation	Mean $\pm$ SD (mg/dL)	Median (IQR) (mg/dL)	Range (Min - Max)	95% Confidence Interval (CI)
Monday-only Fasting	202.28 $\pm$ 44.12	205.0 (169.88-231.9)	112.5 -281	189.74 – 214.81
Monday and Thursday Fasting	186.67 $\pm$ 45.29	182.5 (150.98-222)	108.4 – 276.3	173.80 – 199.54

Table 3. Comparison of FBG based on fasting variation (N=50)

FBG (mg/dL)	Z	p-value	Effect Size (r)	Cohen's d
Monday-only Fasting	- 2.66	0.008	0.37	0.79
Monday and Thursday Fasting				

Mondays. The significant reduction in FBG suggests that a higher frequency of intermittent fasting within a spiritual framework provides better metabolic regulation and glycemic stability. These findings recommend the integration of Monday and Thursday Sunnah fasting as a viable complementary lifestyle intervention in the management of T2DM. However, further research with a strict control of confounding factors, including daily dietary intake during non-fasting periods, levels of religiosity or spiritual fulfillment, larger sample size and a longer observation period is needed to evaluate the long-term sustainability of these metabolic benefits.

Abbreviations

T2DM = Type 2 Diabetes Mellitus; FBG = Fasting Blood Glucose; IDF = International Diabetes Federation; AMPK = Adenosine Monophosphate-activated Protein Kinase; Hypothalamic Pituitary Adrenal (HPA).

Declaration

Author Information

Abdur Rosyid

Doctoral Program in Pharmacy, Faculty of Pharmacy, Gadjah Mada University, Yogyakarta, Indonesia; Department of Clinical and Community Pharmacy, Faculty of Pharmacy, Sultan Agung Islamic University, Semarang, Indonesia.

Contribution: Data Curation, Formal Analysis, Conceptualization, Investigation, Writing – Original Draft, Project Administration.

Satibi Satibi

*Corresponding author

Department of Pharmaceutics, Faculty of Pharmacy, Gadjah Mada University, Yogyakarta, Indonesia.

Contribution: Conceptualization, Funding Acquisition, Methodology, Validation, Formal Analysis.

Fita Rahmawati

Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Gadjah Mada University, Yogyakarta, Indonesia.

Contribution: Data Curation, Investigation, Supervision, Visualization, Writing – Original Draft.

Lutfan Lazuardi

Faculty of Medicine, Gadjah Mada University, Yogyakarta, Indonesia.

Contribution: Investigation, Supervision, Validation.

Acknowledgment

We would like to thank all participants (patients and medical personnel) involved in this study. We also express our gratitude to the Faculty of Pharmacy, Sultan Agung Islamic University, and the Faculty of Pharmacy, Gadjah Mada University, for their invaluable research support, which enabled the successful completion of this study.

Conflict of Interest

The authors declare no conflict of interest.

Data Availability

The unpublished data is available upon request to the corresponding author

Ethics Statement

The procedure used in this study has been obtained from the Bioethics Commission, Faculty of Medicine, Sultan Agung Islamic University, Semarang, Ethical Clearance No. 363/VIII/2024/Bioethics Commission.

Funding Information

This work received no external funding.

References

1. Kumar A, Gangwar R, Ahmad Zargar A, Kumar R, Sharma A. Prevalence of Diabetes in India: A Review of IDF Diabetes Atlas 10th Edition. *Cdr*. 2024;20(1). doi: <https://doi.org/10.2174/1573399819666230413094200>
2. Heald AH, Stedman M, Davies M, Livingston M, Alshames R, Lunt M, *et al*. Estimating life years lost to diabetes: outcomes from analysis of National Diabetes Audit and Office of National Statistics data. *Cardiovascular Endocrinology & Metabolism*. 2020;9(4):183-185. doi: <https://doi.org/10.1097/xce.0000000000000210>
3. Sun H, Saeedi P, Karuranga S, Pinkepank M, Ogurtsova K, Duncan BB, *et al*. IDF Diabetes Atlas: Global, regional and country-level diabetes prevalence estimates for 2021 and projections for 2045. *Diabetes Research and Clinical Practice*. 2022;183:109119. doi: <https://doi.org/10.1016/j.diabres.2021.109119>
4. Pranata S, Hwang HF. The implementation of diabetic self-management in indonesia and taiwan hospital: a case study design. *nhjk*. 2021;10(1):1-17. doi: <https://doi.org/10.36720/nhjk.v10i1.157>
5. Wisnu Sadhana, Jiin-Ru, Rong. Self-Management Behaviors of Diabetes Control Among Diabetic Patients in Indonesia. *ijsn*. 2021;p18. doi: <https://doi.org/10.20849/ijsn.v6i2.863>
6. Furmli S, Elmasry R, Ramos M, Fung J. Therapeutic use of intermittent fasting for people with type 2 diabetes as an alternative to insulin. *BMJ Case Reports*. 2018;2018:bcr-2017-221854. doi: <https://doi.org/10.1136/bcr-2017-221854>
7. Anton SD, Moehl K, Donahoo WT, Marosi K, Lee SA, Mainous AG, *et al*. Flipping the Metabolic Switch: Understanding and Applying the Health Benefits of Fasting. *Obesity*. 2017;26(2):254-268. doi: <https://doi.org/10.1002/oby.22065>
8. Zhang C, Li H, Yan Y, Zhang X, Tu Z. 5:2 intermittent fasting tapers food intake in the refeeding state and ameliorates metabolic disturbances in mice exposed to olanzapine. *Front. Psychiatry*. 2022;13. doi: <https://doi.org/10.3389/fpsy.2022.926251>
9. Zubrzycki A, Cierok-Kmieci K, Wronska A, Kmiec Z. The role of low-calorie diets and intermittent fasting in the treatment of obesity and type-2 diabetes. *Journal of Physiology and Pharmacology*. 2018;69(5):663-683.

doi:10.26402/jpp.2018.5.02

10. Gabel K, Kroeger CM, Trepanowski JF, Hoddy KK, Cienfuegos S, Kalam F, *et al.* Differential Effects of Alternate-Day Fasting Versus Daily Calorie Restriction on Insulin Resistance. *Obesity*. 2019;27(9):1443-1450. doi: <https://doi.org/10.1002/oby.22564>

11. Shete A. Vildagliptin+sulfonylurea in Indian Muslim diabetes patients fasting during Ramadan. *Wjd*. 2013;4(6):358. doi: <https://doi.org/10.4239/wjd.v4.i6.358>

12. Babineaux SM, Toaima D, Boye KS, Zagar A, Tahbaz A, Jabbar A, *et al.* Multi-country retrospective observational study of the management and outcomes of patients with Type 2 diabetes during Ramadan in 2010 (CREED). *Diabet. Med.* 2015;32(6):819-828. doi: <https://doi.org/10.1111/dme.12685>

13. Yazla E, Karadere ME, Küçükler FK, Karşıdağ Ç, İnanc L, Kankoc E, *et al.* The Effect of Religious Belief and Forgiveness on Coping with Diabetes. *J Relig Health*. 2017;57(3):1010-1019. doi: <https://doi.org/10.1007/s10943-017-0504-z>

14. Darvyri P, Christodoulakis S, Galanakis M, Avgoustidis AG, Thanopoulou A, Chrousos GP. On the Role of Spirituality and Religiosity in Type 2 Diabetes Mellitus Management—A Systematic Review. *Psych*. 2018;09(04):728-744. doi: <https://doi.org/10.4236/psych.2018.94046>

15. Noo-in S, Khiewkhern S, Somdee T. Factors influencing preventive self-care behaviors to avert Diabetes Mellitus among Thai Buddhist Monks, Thailand: A Cross-sectional Study. *J Public Hlth Dev*. 2024;22(3):228-242. doi: <https://doi.org/10.55131/jphd/2024/220319>

16. Hafizi A, Hasbie NF, Febriyani A, Kurniati M. Hubungan Antara Usia Jenis Kelamin Dan Indeks Massa Tubuh Dengan Kejadian Diabetes Mellitus Tipe 2 Di Rumah Sakit Pertamina Bintang Amin Husada. *Jur.Alumni*. 2025;8(4):900-907. doi: <https://doi.org/10.33024/jmm.v8i4.17069>

17. Akan M, Unal S, Gonenir Erbay L, Taskapan MC. The effect of Ramadan fasting on mental health and some hormonal levels in healthy males. *Egypt J Neurol Psychiatry Neurosurg*. 2023;59(1). doi: <https://doi.org/10.1186/s41983-023-00623-9>

18. Carter S, Clifton PM, Keogh JB. Effect of Intermittent Compared With Continuous Energy Restricted Diet on Glycemic Control in Patients With Type 2 Diabetes. *JAMA Netw Open*. 2018;1(3):e180756. doi: <https://doi.org/10.1001/jamanetworkopen.2018.0756>

19. Albosta M, Bakke J. Intermittent fasting: is there a role in the treatment of diabetes? A review of the literature and guide for primary care physicians. *Clin Diabetes Endocrinol*. 2021;7(1). doi: <https://doi.org/10.1186/s40842-020-00116-1>

20. Corley BT, Carroll RW, Hall RM, Weatherall M, Parry-Strong A, Krebs JD. Intermittent fasting in Type 2 diabetes mellitus and the risk of hypoglycaemia: a randomized controlled trial. *Diabet. Med.* 2018;35(5):588-594. doi: <https://doi.org/10.1111/dme.13595>

21. Shamshoum H, Vlavcheski F, MacPherson RE, Tsiani E. Rosemary extract activates AMPK, inhibits mTOR and attenuates the high glucose and high insulin-induced muscle cell insulin resistance. *Appl. Physiol. Nutr. Metab*. 2021;46(7):819-827. doi: <https://doi.org/10.1139/apnm-2020-0592>

22. Azmiardi A, Tri Atmojo J, Widiyanto A, Rejo R, Widyaningrum NR, Setyorini C, *et al.* Predictors of depressive symptoms among people with type 2 diabetes mellitus in Indonesia: a cross-sectional study. *J Public Hlth Dev*. 2023;21(3):43-54. doi: <https://doi.org/10.55131/jphd/2023/210304>

23. Lynch CP, Hernandez-Tejada MA, Strom JL, Egede LE. Association Between Spirituality and Depression in Adults With Type 2 Diabetes. *Diabetes Educ*. 2012;38(3):427-435. doi: <https://doi.org/10.1177/0145721712440335>

24. Febrinasari N, Nurul Fatiha C, Fatin Fitria R. Association Between Religiosity, Spirituality, and Depression-Anxiety Among Pharmacist Students in Indonesia. *BIO Web Conf*. 2023;75:05005. doi: <https://doi.org/10.1051/bioconf/20237505005>

Additional Information

How to Cite

APA 7th Edition: Rosyid, A., Satibi, S., Rahmawati, F. & Lazuardi, L. (2026). Comparative Effectiveness of Sunnah Fasting Variations on Fasting Blood Glucose Monitoring in Type 2 Diabetes Mellitus: A Pragmatic Pilot Study. *Sciences of Pharmacy*, 5(2), 238-243. doi: <https://doi.org/10.58920/sciphar0502673>

Vancouver: Rosyid A, Satibi S, Rahmawati F, Lazuardi L. Comparative Effectiveness of Sunnah Fasting Variations on Fasting Blood Glucose Monitoring in Type 2 Diabetes Mellitus: A Pragmatic Pilot Study. *Sciences of Pharmacy*. 2026;5(2):238-243. doi: <https://doi.org/10.58920/sciphar0502673>

Harvard: Rosyid, A., Satibi, S., Rahmawati, F. & Lazuardi, L. (2026) 'Comparative Effectiveness of Sunnah Fasting Variations on Fasting Blood Glucose Monitoring in Type 2 Diabetes Mellitus: A Pragmatic Pilot Study', *Sciences of Pharmacy*, 5(2), pp. 238-243. doi: [10.58920/sciphar0502673](https://doi.org/10.58920/sciphar0502673)

Publisher Note

All claims expressed in this article are solely those of the authors and do not necessarily reflect the views of the publisher, the editors, or the reviewers. Any product that may be evaluated in this article, or claim made by its manufacturer, is not guaranteed or endorsed by the publisher. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Open Access

This article is licensed under a Creative Commons Attribution 4.0 International License. You may share and adapt the material with proper credit to the original

author(s) and source, include a link to the license, and indicate if changes were made.