

## THE EFFECT OF PEER SUPPORT GROUPS ON BLOOD SUGAR LEVELS IN PATIENTS WITH DIABETES MELLITUS AT PRATAMA MEDIKA HUSADA CLINIC, MOJOKERTO CITY

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### ABSTRACT

Diabetes mellitus is a chronic metabolic disease requiring ongoing management to prevent complications. One non-pharmacological approach is the Peer Support Group, which utilizes mutual support among fellow patients to assist in blood sugar management. This study aimed to analyze the effect of a Peer Support Group on fasting blood sugar levels in patients with diabetes mellitus at the Pratama Medika Husada Clinic in Mojokerto City. A quasi-experimental design with a pretest-posttest control group arrangement was employed. The sample consisted of 36 respondents selected via purposive sampling, divided into an intervention group (n=18) and a control group (n=18). Fasting blood sugar levels were measured using a glucometer and analyzed using the Wilcoxon and Mann-Whitney tests. The results showed a significant difference before and after the intervention in the intervention group ( $p=0.000$ ), whereas the change in the control group was not significant ( $p=0.265$ ). The comparison between the two groups at the second measurement was also not significant ( $p=0.728$ ). In conclusion, the Peer Support Group was effective in lowering fasting blood sugar levels in the intervention group.

**Keywords:** *Diabetes Mellitus, Peer Support Group, fasting blood glucose*

### INTRODUCTION

High blood sugar levels remain a major challenge in the management of Diabetes Mellitus (DM), particularly in primary healthcare settings. Blood sugar control is linked to a patient's ability to practice self-care, including dietary management, medication adherence, physical activity, and regular blood sugar monitoring (Yusuf et al., 2023). A preliminary study conducted at the Medika Husada Primary Clinic in Mojokerto City between February and March 2026, involving 60 DM patients, revealed that many still had uncontrolled fasting blood sugar levels. This situation was influenced by dietary non-adherence, a lack of physical activity, treatment fatigue, and insufficient social support from fellow patients.

One non-pharmacological approach with the potential to support DM management is the Peer Support Group a form of support provided by individuals sharing similar health conditions or experiences. Data from the International Diabetes Federation indicates that over 589 million adults were living with DM in 2025, with Indonesia accounting for 20.4 million cases. East Java recorded 929,535 DM cases, with 867,257 patients receiving healthcare services, while Mojokerto City had 7,715 registered DM patients.

Blood sugar control is influenced by biological, behavioral, and psychosocial factors. Through education, emotional support, and motivation, Peer Support Groups can help improve self-care behaviors and glycemic control (Azmiardi et al., 2021). Research by (Qian et al., 2020) demonstrated an increase in the proportion of patients achieving blood sugar control rising from 29.3% to 44.2%, after participating in a Peer Support Group for four months. Other studies have also confirmed the effectiveness of Peer Support Groups in improving blood sugar control (Maina et al., 2025). Knowledge and self-management skills

are associated with blood glucose stability (Faizal & Anggraini, 2025), whereas stress and low motivation can worsen glycemic control (Chandra, 2022).

Diabetes mellitus management relies not only on pharmacological therapy but also requires non-pharmacological interventions, such as physical activity and social support (Prawinda et al., 2024). Peer support groups can provide education, motivation, and emotional support, while also enabling patients to share experiences and coping strategies, thereby fostering sustainable health management (Azmiardi et al., 2021). Given this context, research on the impact of peer support groups on blood glucose levels in patients with diabetes mellitus is crucial for developing nursing interventions within primary healthcare settings.

## METHOD

This study employed a quasi-experimental design using a pretest-posttest control group approach. Blood glucose levels were measured before and after the intervention in both the intervention and control groups (Nor, 2024). The intervention group participated in a Peer Support Group program, while the control group received routine care.

The study was conducted at the Medika Husada Primary Clinic in Mojokerto City. The study population consisted of 60 patients with Diabetes Mellitus (DM) participating in the *Prolanis* program at the clinic. A sample of 36 respondents was selected using purposive sampling, comprising 18 respondents in the intervention group and 18 in the control group.

The independent variable in this study was the Peer Support Group, while the dependent variable was blood glucose levels.

Data collection involved selecting respondents based on inclusion and exclusion criteria. The 36 respondents were divided into an intervention group and a control group, with 18 respondents in each. Subsequently, fasting blood glucose levels (pretest) were measured in both groups using a glucometer. The intervention group then participated in the Peer Support Group program via the *Prolanis* WhatsApp group over a two-week period, with sessions held 3–4 times weekly; activities included education, discussion, experience sharing, and motivational support regarding Diabetes Mellitus management. The control group continued to receive routine care. Following the intervention, fasting blood glucose levels (posttest) were measured in both groups. The resulting data were recorded and analyzed using appropriate statistical tests.

Data regarding changes in blood glucose levels before and after the intervention within each group were analyzed using the Wilcoxon Signed-Rank Test. Comparisons of blood glucose levels between the intervention and control groups (posttest) were conducted using the Mann-Whitney test.

**FINDING AND DISCUSSION**  
**RESEARCH RESULT**  
**RESPONDENT CHARACTERISTICS**

**Table 1 Characteristics of Respondents in the Intervention and Control Groups**

| Characteristics | Category/Value                   | Group     | Intervention | Kelompok  | Control     |
|-----------------|----------------------------------|-----------|--------------|-----------|-------------|
|                 |                                  | <b>f</b>  | <b>%</b>     | <b>f</b>  | <b>%</b>    |
| Employment      | Unemployed                       | 0         | 0%           | 1         | 5,6%        |
|                 | Housewife                        | 5         | 27,8%        | 5         | 27,8%       |
|                 | Private employees                | 7         | 38,9%        | 3         | 16,7%       |
|                 | Government employees             | 1         | 5,6%         | 1         | 5,6%        |
|                 | Retired                          | 5         | 27,8%        | 8         | 44,4%       |
|                 | <b>Amount</b>                    | <b>18</b> | <b>100%</b>  | <b>18</b> | <b>100%</b> |
| Gender          | Male                             | 5         | 27,8%        | 6         | 33,3%       |
|                 | Female                           | 13        | 72,2%        | 12        | 66,7%       |
|                 | <b>Amount</b>                    | <b>18</b> | <b>100%</b>  | <b>18</b> | <b>100%</b> |
| Education       | Elementary School or Equivalent  | 0         | 0%           | 1         | 5,6%        |
|                 | Junior High School or Equivalent | 2         | 11,1%        | 0         | 0%          |
|                 | High School or Equivalent        | 7         | 38,9%        | 10        | 55,6%       |
|                 | Diploma or Bachelor's Degree     | 9         | 50,0%        | 7         | 38,9%       |
|                 | <b>Amount</b>                    | <b>18</b> | <b>100%</b>  | <b>18</b> | <b>100%</b> |
| Age             | 31                               | 1         | 5,6%         | 0         | 0%          |
|                 | 37                               | 0         | 0%           | 1         | 5,6%        |
|                 | 38                               | 1         | 5,6%         | 0         | 0%          |
|                 | 39                               | 1         | 5,6%         | 0         | 0%          |
|                 | 49                               | 0         | 0%           | 1         | 5,6%        |
|                 | 51                               | 0         | 0%           | 1         | 5,6%        |
|                 | 52                               | 0         | 0%           | 1         | 5,6%        |
|                 | 54                               | 1         | 5,6%         | 1         | 5,6%        |
|                 | 55                               | 0         | 0%           | 2         | 11,1%       |
|                 | 56                               | 1         | 5,6%         | 0         | 0%          |
|                 | 57                               | 1         | 5,6%         | 0         | 0%          |
|                 | 58                               | 2         | 11,1%        | 0         | 0%          |
|                 | 59                               | 1         | 5,6%         | 0         | 0%          |
|                 | 60                               | 1         | 5,6%         | 0         | 0%          |
|                 | 61                               | 2         | 11,1%        | 1         | 5,6%        |
|                 | 63                               | 1         | 5,6%         | 0         | 0%          |
|                 | 64                               | 1         | 5,6%         | 0         | 0%          |
|                 | 66                               | 0         | 0%           | 3         | 16,7%       |

|                     |               |           |             |           |             |
|---------------------|---------------|-----------|-------------|-----------|-------------|
|                     | 67            | 1         | 5,6%        | 1         | 5,6%        |
|                     | 69            | 1         | 5,6%        | 2         | 11,1%       |
|                     | 72            | 1         | 5,6%        | 0         | 0%          |
|                     | 74            | 1         | 5,6%        | 1         | 5,6%        |
|                     | 75            | 0         | 0%          | 2         | 11,1%       |
|                     | 77            | 0         | 0%          | 1         | 5,6%        |
|                     | <b>Amount</b> | <b>18</b> | <b>100%</b> | <b>18</b> | <b>100%</b> |
| Duration of illness | 1             | 3         | 16,7%       | 5         | 27,8%       |
|                     | 2             | 3         | 16,7%       | 1         | 5,6%        |
|                     | 4             | 1         | 5,6%        | 1         | 5,6%        |
|                     | 6             | 3         | 16,7%       | 6         | 33,3%       |
|                     | 7             | 1         | 5,6%        | 2         | 11,1%       |
|                     | 8             | 5         | 27,8%       | 0         | 0%          |
|                     | 12            | 1         | 5,6%        | 3         | 16,7%       |
|                     | 15            | 1         | 5,6%        | 0         | 0%          |
|                     | <b>Amount</b> | <b>18</b> | <b>100%</b> | <b>18</b> | <b>100%</b> |
|                     |               |           |             |           |             |

This study involved 36 respondents, divided into an intervention group (18 participants) and a control group (18 participants). Regarding employment status, nearly half of the intervention group worked in the private sector (7 individuals; 38.9%), while a small minority were civil servants (1 individual; 5.6%); conversely, nearly half of the control group were retirees (8 individuals; 44.4%), with a small minority being unemployed or civil servants (1 individual; 5.6% each). In the intervention group, the majority were female (13 individuals; 72.2%) and nearly half were male (5 individuals; 27.8%), while in the control group, the majority were female (12 individuals; 66.7%) and nearly half were male (6 individuals; 33.3%). Regarding education, half of the intervention group had a higher education background (9 individuals; 50.0%) and a small minority had a junior high school education or equivalent (2 individuals; 11.1%); in contrast, the majority of the control group had a senior high school education or equivalent (10 individuals; 55.6%) and a small minority had an elementary school education or equivalent (1 individual; 5.6%).

In the intervention group, a small minority of respondents were aged 58 and 61 (2 individuals each; 11.1%), while the remaining ages 31, 38, 39, 54, 56, 57, 59, 60, 63, 64, 67, 69, 72, and 74 were represented by one individual each (5.6%). Meanwhile, in the control group, a small proportion of respondents were aged 66 years (n=3; 16.7%), followed by those aged 55, 69, and 75 years (n=2 each; 11.1%), while those aged 37, 49, 51, 52, 54, 61, 67, 74, and 77 years were represented by one person each (5.6%). In the intervention group, nearly half of the respondents had suffered from diabetes mellitus for 8 years (n=5; 27.8%), while a small proportion had suffered for 4, 7, 12, and 15 years (n=1 each; 5.6%). Meanwhile, in the control group, nearly half of the respondents had suffered from diabetes mellitus for 6 years (n=6; 33.3%), while a small proportion had suffered for 2 and 4 years (n=1 each; 5.6%).

## DATA ANALYSIS RESULTS

**Table 2. Test of differences in blood glucose levels among DM patients in the intervention group before and after the Peer Support Group program**

| Variable                                  |                | N               | Mean Rank | Sum of Ranks | P-Value |
|-------------------------------------------|----------------|-----------------|-----------|--------------|---------|
| Fasting Blood Glucose Posttest - Prettest | Negative Ranks | 17 <sup>a</sup> | 10.00     | 170.00       | .000    |
|                                           | Positive Ranks | 1 <sup>b</sup>  | 1.00      | 1.00         |         |
|                                           | Ties           | 0 <sup>c</sup>  |           |              |         |
|                                           | Z              |                 |           |              | -3.686  |
|                                           | <b>Amount</b>  | 18              |           |              |         |

The results of the Wilcoxon Signed-Rank Test indicate that among the 18 respondents in the intervention group, 17 showed a decrease in fasting blood glucose (FBG) levels (negative ranks) following the Peer Support Group program, while 1 respondent showed an increase (positive ranks). No respondents had identical FBG levels before and after the intervention (ties = 0). The analysis yielded a Z-value of -3.686 with an Asymp. Sig. (2-tailed) value of 0.000. The statistical test result showed a p-value of 0.000 (< 0.05).

**Table 3. Test of differences in blood glucose levels among DM patients in the control group before and after the period without the Peer Support Group program.**

| Variable                                  |                | N               | Mean Rank | Sum of Ranks | P-Value |
|-------------------------------------------|----------------|-----------------|-----------|--------------|---------|
| Fasting Blood Glucose Posttest - Prettest | Negative Ranks | 12 <sup>a</sup> | 8.33      | 100.00       | .265    |
|                                           | Positive Ranks | 5 <sup>b</sup>  | 10.60     | 53.00        |         |
|                                           | Ties           | 1 <sup>c</sup>  |           |              |         |
|                                           | Z              |                 |           |              | -1.115  |
|                                           | <b>Amount</b>  | 18              |           |              |         |

Based on the Wilcoxon Signed-Rank Test results for the 18 respondents in the control group regarding fasting blood glucose (FBG) levels before (pretest) and after (posttest) the study period, 12 respondents (negative ranks) showed a decrease in FBG values at the posttest measurement, with a mean rank of 8.33 and a sum of ranks of 100.00. Meanwhile, 5 respondents (positive ranks) showed an increase in FBG values at the posttest, with a mean rank of 10.60 and a sum of ranks of 53.00. Additionally, there was 1 respondent (tie) whose FBG value remained the same between the pretest and posttest. The analysis yielded a Z-value of -1.115 with an Asymp. Sig. (2-tailed) of 0.265.

**Table 4. Test for significant differences in blood sugar levels at the second measurement between the treatment group receiving the Peer Support Group and the control group not receiving the Peer Support Group.**

| Variable                                 |                    | N  | Mean Rank | Sum of Ranks | P-Value |
|------------------------------------------|--------------------|----|-----------|--------------|---------|
| Fasting Blood Glucose Posttest -Posttest | Intervention Group | 18 | 17.89     | 322.00       | .743    |
|                                          | Control Group      | 18 | 19.11     | 344.00       |         |
|                                          | Z                  |    |           |              | -.348   |
|                                          | Amount             | 36 |           |              |         |
|                                          |                    |    |           |              |         |

Based on Table 4, the Mann–Whitney test results show that the intervention group receiving the Peer Support Group had a Mean Rank of 17.89 and a Sum of Ranks of 322.00 (n=18). Meanwhile, the control group not receiving the Peer Support Group had a Mean Rank of 19.11 and a Sum of Ranks of 344.00 (n=18). Statistical analysis yielded a Z-value of -0.348. Additionally, the Exact Sig. (2(1-tailed Sig.)) value was 0.743.

## DISCUSSION

The study results indicate a significant difference in fasting blood sugar levels before and after the Peer Support Group intervention in the intervention group. Seventeen respondents experienced a decrease in glucose levels, while one respondent experienced an increase. The Wilcoxon test yielded a Z-value of -3.686 and a p-value of 0.000 (<0.05), demonstrating a significant change in blood glucose levels following the intervention. Peer Support Groups can enhance emotional support, motivation, self-efficacy, and self-management skills through the sharing of experiences and information regarding diabetes management (Powers et al., 2020). These findings are consistent with research (Chen et al., 2024), indicating that peer support can help improve glycemic control in patients with diabetes mellitus. Education level is also thought to support the intervention's effectiveness by enabling patients to understand health information and adopt self-management behaviors (Powers et al., 2020).

In the control group, 12 respondents experienced a decrease, 5 experienced an increase, and 1 respondent showed no change. The Wilcoxon test results showed  $p = 0.265$  ( $>0.05$ ), indicating no significant change in blood sugar levels. This outcome is likely attributable to the fact that the control group received only routine care consisting of pharmacological therapy, health monitoring, and standard education without additional peer support. These findings are consistent with previous research. (Höld et al., 2022) which indicates that standard care without peer support yields more limited changes in glycemic control. Job characteristics specifically the predominance of retirees may also influence physical activity and insulin sensitivity (Jati et al., 2023).

A comparison of post-test blood sugar levels between the intervention and control groups showed no significant difference. The Mann-Whitney test yielded  $Z = -0.348$  and  $p =$

0.743, with a mean rank of 17.89 for the intervention group and 19.11 for the control group. Although the intervention group experienced a decrease in blood sugar levels, the change was not substantial enough to produce a significant difference compared to the control group. These results may have been influenced by medication adherence and dietary patterns. (Gow et al., 2024), as well as characteristics regarding age, gender, and duration of diabetes mellitus (Torus et al., 2026). These findings differ from the research. (Luo et al., 2025) which reported the benefits of Peer Support Groups for glycemic control. Thus, Peer Support Groups demonstrated significant changes within the intervention group in the pretest-posttest comparison, but have not yet been proven to yield a significant difference compared to the control group.

## CONCLUSION

There was a significant difference in fasting blood sugar levels before and after the Peer Support Group intervention in the intervention group ( $p=0.000$ ). In the control group, there was no significant difference in fasting blood sugar levels before and after the study ( $p=0.265$ ). Meanwhile, the comparison of post-test results between the intervention and control groups showed no significant difference ( $p=0.728$ ).

Thus, the Peer Support Group demonstrated a reduction in fasting blood sugar levels in the intervention group; however, this study did not prove a significant difference in effectiveness between the group receiving the Peer Support Group intervention and the control group.

## REFERENCES

- Azmiardi, A., Murti, B., Febrinasari, R. P., & Tamtomo, D. G. (2021). The Effect Of Peer Support In Diabetes Self-Management Education On Glycemic Control In Patients With Type 2 Diabetes: A Systematic Review And Meta-Analysis. *Epidemiology And Health*, 43, E2021090. <https://doi.org/10.4178/Epih.E2021090>
- Chandra, A. C. (2022). Diabetes Support Groups Sebagai Upaya Peningkatan Kepatuhan Terapi Dan Pengendalian Gula Darah Penderita Diabetes Melitus. *Jurnal Abdimas Unaya*, 3(2), 213–218.
- Chen, C., Zhou, Y., Xu, J.-Y., Song, H.-Y., Yin, X.-W., & Gu, Z.-J. (2024). Effect Of Peer Support Interventions In Patients With Type 2 Diabetes: A Systematic Review. *Patient Education And Counseling*, 122, 108172. <https://doi.org/10.1016/j.pec.2024.108172>
- Faizal, M., & Anggraini, R. B. (2025). Hubungan Pengetahuan Dan Dukungan Keluarga Dengan Perilaku Mengontrol Kadar Gula Darah Pada Pasien Diabetes Militus Tipe Ii Pada Rawat Jalan Di Rsud Drs. H. Abu Hanifah Bangka Tengah Tahun 2025. *Journal Of Sciencetech Research And Development*, 7(2), 86–99.
- Gow, K., Rashidi, A., & Whithead, L. (2024). Factors Influencing Medication Adherence Among Adults Living With Diabetes And Comorbidities: A Qualitative Systematic Review. *Current Diabetes Reports*, 24(2), 19–25. <https://doi.org/10.1007/S11892-023-01532-0>

- Höld, E., Grüblbauer, J., Wiesholzer, M., Wewerka-Kreimel, D., Stieger, S., Kuschei, W., Kisser, P., Gützer, E., Hemetek, U., Ebner-Zarl, A., & Pripfl, J. (2022). Improving Glycemic Control In Patients With Type 2 Diabetes Mellitus Through A Peer Support Instant Messaging Service Intervention (Diabpeers): Study Protocol For A Randomized Controlled Trial. *Trials*, 23(1), 308. <https://doi.org/10.1186/S13063-022-06202-2>
- Jati, R. A., Muchtar, F., & Salsabila, S. (2023). Faktor Risiko Aktivitas Fisik Pada Kejadian Diabetes Melitus Tipe 2 Di Wilayah Kerja Puskesmas Kemaraya Kota Kendari Tahun 2023. *Koloni*, 2(2), 328–334.
- Luo, J., Shu, J., Pan, W., Guan, D., Liang, C., Zheng, D., Huang, K., Lai, Y., Meng, B., Lu, R., Cai, Z., Xing, L., Chen, J., & Zhang, H. (2025). The Effect Of Peer Support On Hb1c Levels In Middle-Aged And Elderly Patients With Type 2 Diabetes: A Systematic Review And Meta-Analysis. *Peerj*, 13, E19803. <https://doi.org/10.7717/Peerj.19803>
- Maina, E. W., Kimani, S., & Mwaura, J. (2025). Peer-Led Diabetes Self-Management Education And Support Enhances Cardiometabolic Markers In Adults With Type 2 Diabetes: A Quasi-Experimental Study. *Inquiry : A Journal Of Medical Care Organization, Provision And Financing*, 62, 469580251390775. <https://doi.org/10.1177/00469580251390775>
- Nor, L. (2024). *Pengaruh Peer Group Support Terhadap Kualitas Hidup Pasien Kanker Payudara Yang Menjalani Kemoterapi Di Rumah Sakit Tk Ii Dr. Soedjono Magelang*. Poltekkes Kemenkes Yogyakarta.
- Powers, M. A., Bardsley, J. K., Cypress, M., Funnell, M. M., Harms, D., Hess-Fischl, A., Hooks, B., Isaacs, D., Mandel, E. D., & Maryniuk, M. D. (2020). Diabetes Self-Management Education And Support In Adults With Type 2 Diabetes: A Consensus Report Of The American Diabetes Association, The Association Of Diabetes Care & Education Specialists, The Academy Of Nutrition And Dietetics, The American Academy Of Family Physicians, The American Academy Of Pas, The American Association Of Nurse Practitioners, And The American Pharmacists Association. *Journal Of The American Pharmacists Association*, 60(6), E1–E18.
- Prawinda, Y. D., Ningrum, D. E. S., Mujirahayu, V., Noviana, D. W., Zuliyanti, E., Permatajaya, K. K. D., & Pranata, S. (2024). Penatalaksanaan Lima Pilar Diabetes Melitus Oleh Diabetisi: Studi Fenomenologi: Management Of The Five Pillars Of Diabetes Mellitus By Diabetes: A Phenomenological Study. *Journal Nursing Research Publication Media (NURSEPEDIA)*, 3(1), 12–25.
- Qian, Y., Wang, L., Chen, H., Dong, Y. Q., & Liu, J. (2020). [Effectiveness Of Peer-Supported Self-Management Group Intervention In Patients With Type 2 Diabetes]. *Zhonghua Yu Fang Yi Xue Za Zhi [Chinese Journal Of Preventive Medicine]*, 54(4), 406–410. <https://doi.org/10.3760/Cma.J.Cn112150-20190329-00229>

- Torus, S. M. B., Halim, R., Butar, M. B., & Syukri, M. (2026). Faktor Risiko Diabetes Melitus Tipe II Pada Wanita Kelompok Umur  $\geq 15$  Tahun Di Indonesia Analisis Data Survei Kesehatan Indonesia 2023. *Jurnal Kesehatan Amanah*, 10(1), 252–265.
- Yusuf, B., Nafisah, S., & Inayah, N. N. (2023). Literatur Review: Gula Darah Puasa Pada Penyakit Diabetes Melitus. *Jurnal Farmasi Medica/Pharmacy Medical Journal (PMJ)*, 6(1), 28–33.