Effectiveness of create sensitivity model on glycemic control and quality of life among patients with type 2 diabetes

Dini Rudini*, Yulia Indah Permata Sari, Putri Irwanti Sari, Yosi Oktarina

Program Studi Keperawatan, Fakultas Kedokteran dan Ilmu Kesehatan Universitas Jambi, Jambi, Indonesia

Abstract

Background: Type 2 diabetes can negatively impact one's physical, emotional, and mental health, often leading to a diminished quality of life. Traditional care typically overlooks psychosocial aspects, and there is a gap in evaluating comprehensive psychosocial interventions. The "Create Sensitivity" model combines these aspects, emphasizing both blood sugar management and life quality.
Purpose: This quasi-experimental research sought to evaluate the impact of the "Create Sensitivity" intervention on enhancing glycemic control and quality of life in individuals with type 2 diabetes, in comparison to standard treatment.
Methods: Seventy individuals were divided into two groups through matched group allocation: the intervention group (n=35), which participated in the 12-week "Create Sensitivity" program, and the control group (n=35), which received standard care. The program involved weekly group meetings that concentrated on cognitive-behavioral education, individualized support, self-care techniques, and strategies for preventing relapse. "HbA1c, mean blood glucose, and Diabetes Quality of Life (DQOL) scores were evaluated at baseline and following a 12-week period. The data were examined through repeated-measures analysis of variance (ANOVA).
Results: The intervention group improved significantly more than the control group in all outcomes. HbA1c decreased by 2.82 percentage points ($p < 0.001$, $\eta^2p = 0.87$), blood glucose reduced by 81.13 mg/dL ($p < 0.001$, $\eta^2p = 0.87$), and quality of life scores increased by 26.91 points ($p < 0.001$, $\eta^2p = 0.86$). These findings indicate large effect sizes and clinically meaningful changes.
Conclusion: The "Create Sensitivity" program effectively improved both glycemic control and quality of life. Integrating psychosocial strategies into diabetes management may enhance patient outcomes, with further research needed on long-term impacts.

Keywords: blood sugar; "create sensitivity" treatment model; hba1c; type 2 diabetes mellitus; quality of life

OPEN ACCESS

Jurnal Keperawatan Padjadjaran (JKP)

Volume 13(2), 120-129

http://dx.doi.org/10.24198/jkp.v13i2.2608

Article Info

Received : September 17, 2024
Revised : June 01, 2025
Accepted : June 10, 2025
Published : August 14, 2025

Corresponding author

Dini Rudini*
Program Studi Keperawatan, Fakultas Kedokteran dan Ilmu Kesehatan Universitas Jambi Jambi, Indonesia; Address: Jl. Letjen Suprapto No.33, Telanaipura, Kec. Telanaipura, Kota Jambi, Jambi 36361; Phone:+6819871229; E-mail:dinirudini@unja.ac.id

Citation

Rudini, D., Sari, Y. I. P., Sari, P. I., & Oktarina, Y. (2025). Effectiveness of create sensitivity model on glycemic control and quality of life among patients with type 2 diabetes. *Jurnal Keperawatan Padjadjaran, 13*(2), 120-129. http://dx.doi.org/10.24198/jkp.v13i2.2608

Website

http://jkp.fkep.unpad.ac.id/index.php/jkp

E-ISSN: 2442-7276
P-ISSN: 2338-5324

Introduction

Type 2 diabetes represents a worldwide health emergency, impacting millions of individuals and severely compromising their quality of life and overall health outcomes (Davies et al., 2022). Diabetes mellitus (DM) remains highly prevalent in Indonesia, based on physicians' diagnoses among individuals aged 15 years, rose to 2%, according to the 2018 Riskesdas (Wahidin et al., 2024). This long-term and advancing condition requires ongoing care, frequently placing a significant physical, emotional, and psychological strain on individuals affected (Kroenke et al., 2024).

Managing blood glucose levels, adhering to treatment plans, and addressing potential complications on a daily basis can be burdensome, negatively impacting patients' well-being and overall quality of life (Janssen et al., 2020). Quality of life refers to a person's subjective evaluation of their

physical, emotional, and social well-being. Studies have shown that adults living with diabetes mellitus typically report poorer quality of life compared to the general population (Gálvez Galán et al., 2021).

While the widespread occurrence and impact of type 2 diabetes are well established, traditional care approaches may fail to comprehensively address the multifactorial challenges faced by patients. This realization has led to a shift in healthcare perspective (Asmat et al., 2022). Traditional diabetes management primarily focuses on physiological aspects, such as medication regimens and lifestyle modifications. Nonetheless, there is an increasing awareness in the healthcare field that people with type 2 diabetes encounter significant psychological and emotional difficulties in coping with their illness (Reichert et al., 2025).

These psychological challenges—encompassing feelings of frustration, anxiety, depression, and a perceived loss of control—have been shown to adversely influence patients' overall quality of life and glycemic management outcomes (Jafari et al., 2024). Consequently, addressing the psychological and emotional needs of individuals with Type 2 diabetes mellitus is increasingly recognized as a critical component of comprehensive and holistic patient care (Mangoulia et al., 2024).

In response to these evolving needs, innovative treatment strategies have been developed to offer more holistic and patient-centered care for individuals with Type 2 diabetes mellitus. Existing literature shows that psychological interventions can enhance diabetes management by improving emotional regulation, coping strategies, and Diabetes self-care activities (Ngan et al., 2023). However, empirical evidence regarding the effectiveness of the 'Create Sensitivity' model in managing type 2 diabetes mellitus (T2DM) remains limited. This model integrated cognitive restructuring, structured discharge planning, scientific self-care training, and hope cultivation to build sensitivity among medical teams, patients, and their families. Although the model holds theoretical promise, its influence on quality of life and clinical outcomes remains underexplored, highlighting the need for further empirical investigation.

This gap highlights the need for interventions that not only address the physical aspect of diabetes but also incorporate the psychosocial dimensions into patient care. While psychological and behavioral interventions have shown promise, there remains a scarcity of structured models that comprehensively integrate these elements within a culturally and contextually relevant framework (Versloot et al., 2021). Specifically, there is limited empirical evidence evaluating holistic interventions that simultaneously target emotional regulation, self-efficacy, patient support systems, and structured discharge planning in a single integrated model.

The 'Create Sensitivity' model was developed to address existing gaps in holistic diabetes care. The term 'Create Sensitivity' reflects the model's central philosophy, which emphasizes cultivating awareness, empathy, and responsiveness among healthcare professionals, patients, and families toward the lived experiences of individuals managing diabetes (Hekmatpou et al., 2018). The model is theoretically grounded in cognitive behavioral principles, empowerment theory, and patient-centered care frameworks. It integrates four essential components: cognitive restructuring, structured discharge planning, scientific self-care training, and hope development. These components are designed to strengthen psychological resilience, improve self-management behaviors, and promote sustainable improvements in quality of life.

Significantly, this study advances previous work by Hekmatpou et al. by employing a more rigorous methodology. While Hekmatpou et al.'s original study introduced the "Making Sensitivity" concept without incorporating a control group, thus limiting causal inferences, the present study enhancing internal validity and enhancing the clarity of effectiveness evaluation for the intervention. Thus, the present study contributes novel evidence supporting the utility of the Create Sensitivity model by demonstrating its effectiveness in improving both glycemic control and quality of life outcomes within a controlled research setting.

Accordingly, the present study sought to evaluate the effectiveness of the 'Create Sensitivity' intervention model in improving quality of life among individuals with type 2 diabetes mellitus. This holistic approach—integrating cognitive restructuring, structured discharge planning, evidence-based self-care training, and the cultivation of hope—targets the psychological and emotional challenges faced by individuals with type 2 diabetes mellitus. By comparing the 'Create Sensitivity' model with standard diabetes care, the present study aims to generate critical insights into the potential of this integrated approach to enhance well-being and improve disease management among individuals with type 2 diabetes mellitus.

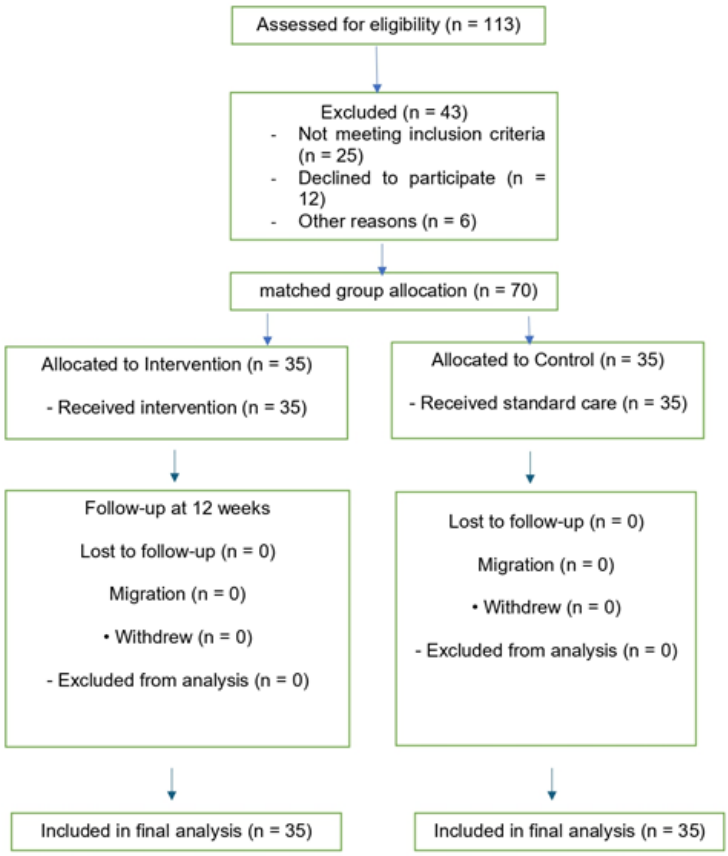
Materials and Methods

Design

To examine the impact of the 'Create Sensitivity' intervention, the study adopted a quasi-experimental pre–post design involving two groups: an intervention group and a control group receiving standard diabetes care. The intervention was delivered over 12 weeks and integrated cognitive restructuring, discharge planning, scientific self-care training, and hope development.

Sample and setting

Sample size estimation was conducted based on an independent two-group design, utilizing parameters reported in previous literature, including an effect size of d = 1.1, standard deviations of S_1 = 1.74 and S_2 = 1.35, a Type II error rate (β) of 0.2, and a significance level (α) of 0.05. The sample



size calculation indicated a requirement of 64 participants. To accommodate a projected attrition rate of 5–10%, a total of 70 individuals with type 2 diabetes were recruited from a local diabetes clinic, a community health center, and a hospital.

Eligibility criteria included a diagnosis of type 2 diabetes, age range of 30–60 years, a minimum of four months since diagnosis, active engagement in diabetes treatment, and the absence of documented mental health conditions or incurable diseases. Using a computer-generated group allocation sequence, participants were assigned using matched group allocation to either the intervention or control group.

Exclusion criteria during recruitment were terminal illness, cognitive impairment, or refusal to participate. Participants were excluded from analysis if they migrated, missed more than two sessions, or submitted incomplete post-intervention data. Lack of cooperation was operationalized as two or more unexcused absences or voluntary withdrawal from activities. The participant recruitment and flow are illustrated in Figure 1.

Variables

Diabetes-related quality of life (QOL) served as the dependent variable, with the independent variable being the participants' allocation to either the intervention or control group. Secondary outcomes included fasting blood glucose and glycated hemoglobin (HbA1c) levels.

Instruments

Fasting blood glucose was measured using the Gluco Dr. Biosensor, with a range of 30–600 mg/dL. Glycated hemoglobin (HbA1c) was measured using the SD Biosensor Standard F HbA1c test conducted in a certified clinical laboratory. The Diabetes Quality of Life (DQOL) instrument was employed to evaluate diabetes-related quality of life among participants, which demonstrated high validity and reliability in Indonesian populations (Cronbach's $\alpha > 0.70$; test-retest correlations between 0.830–0.975). All outcome measures were collected at two time points: baseline (Week 0) and following the intervention (Week 12). Due to the clinical recommendation

Table 1. Demographic and Baseline Characteristics

Characteristics	Intervention Group (n = 32)	Control Group (n = 33)	p-value
Age (years, mean ± SD)	48.3 ± 7.1	46.9 ± 6.8	0.387
Gender (n, %)			
- Male	14 (43.8%)	15 (45.5%)	0.891
- Female	18 (56.2%)	18 (54.5%)	
Education (n, %)			
- Primary	10 (31.2%)	9 (27.3%)	0.847
- Secondary	14 (43.8%)	16 (48.5%)	
- Higher	8 (25.0%)	8 (24.2%)	
Employment (n, %)			
- Employed	16 (50%)	15 (45.5%)	
- Unemployed/Retired	16 (50%)	18 (54.5%)	0.795
Diabetes Duration (years, mean ± SD)	5.6 ± 2.3	5.4 ± 2.1	0.678
Baseline HbA1c (% mean ± SD)	8.70 ± 1.11	8.03 ± 0.69	0.004
Baseline Fasting Blood Glucose (mg/dL, mean ± SD)	203.25 ± 31.89	184.05 ± 20.04	0.007
Baseline Quality of Life (mean ± SD)	31.63 ± 7.02	37.14 ± 5.88	0.002

that HbA1c be measured at intervals of at least three months, only two measurements (baseline and endline) were conducted for HbA1c. Other assessments (fasting glucose, QOL) followed the same schedule. Data collection was performed by trained research nurses.

Intervention

The intervention group received the 12-week "Create Sensitivity" treatment model in addition to standard diabetes care. The intervention was adapted from the preliminary work proposed by Hekmatpou et al. (2018) and structured into 12 weekly sessions. The program was divided into four phases:

Weeks 1–3: Cognitive restructuring; Weeks 4–5: Discharge planning; Weeks 6–9: Scientific self-care training; Weeks 10–12: Hope development

The intervention consisted of 12 weekly sessions, grouped into four phases: cognitive restructuring (weeks 1–3), discharge planning (weeks 4–5), scientific self-care training (weeks 6–9), and hope development (weeks 10–12). Sessions were conducted by trained nurses certified in diabetes education and counseling

Standard care group:

Standard clinical management, including four-weekly follow-up visits, was administered to control group participants in alignment with routine practice protocols. To reduce performance bias, participants in both groups continued their prescribed medication regimens without alteration. Nurses delivering the intervention were not given access to participants' outcome data, and outcome assessors remained blinded to group allocation.

Data collection

Demographic and clinical data were collected through self-report questionnaires and verified against medical records. All outcome variables (fasting blood glucose, HbA1c, and QOL scores) were assessed at baseline (Week 0) and Week 12 post-intervention.

Data analysis

The effectiveness of the intervention was assessed using repeated-measures ANOVA to detect significant time × group interaction effects. he analysis modeled time (baseline and Week 12) as a within-subjects variable and group assignment as a between-subjects variable to assess differential changes across groups. The main effects of Time and Group, and the Time × Group interaction, were examined. A significant Time × Group interaction would indicate that the pattern of change over time differed between groups(Miller et al., 2020).

Post-hoc tests were conducted after a significant time × group interaction to determine specific group differences at each point. Assumptions for repeated measures ANOVA (normality, sphericity, and equality of covariance matrices) were tested before analysis. To assess the nature of missing data, Little's MCAR test was performed. Data identified as missing completely at random were subsequently handled using suitable multiple imputation techniques (P. Zhang & Xie, 2025). All analyses were conducted using statisty.app, with an alpha level set at $p < .05$ (two-tailed). By employing a detailed data analysis strategy, the study ensures a methodologically sound examination of the intervention's effectiveness in improving glycemic control and quality of life.

Table 2 Result for pre- and post-intervention and Group (intervention vs. control) on the combined dependent variables blood sugar, HBA1C and Quality of life

Variable	Intervention group (N = 35)	Control group (N = 35)	Results of repeated measures ANOVAb					
	Mean ± Std	Mean ± Std	Sum of squares	df	Mean Squares	F	p	η2	η2p
Blood sugar			765027.6	2	382513.8	455.6	<.001	0.33	0.87
pre intervention	203.25 ± 31.89	184.05 ± 20.04							
post intervention	122.12 ± 25.61	175.02 ± 22.18							
Hba1c			86.37	1	86.37	458.94	<.001	0.33	0.87
pre intervention	8.7 ± 1.11	8.03 ± 0.69							
post intervention	5.88 ± 0.89	7.71 ± 0.77							
Quality of life			7651.61	.1	7651.61	420.18	<.001	0.23	0.86
pre intervention	31.63 ± 10.63	37.14 ± 13.24							
post intervention	58,54± 10.06	39.8 ± 12.24							

Ethical consideration

Ethical approval for this study was granted by the Faculty of Medicine and Health Sciences, University of Jambi (Ref. No. 2510/UN21.8/PT.01.04/2024), with all research activities conducted in compliance with the Declaration of Helsinki. All participants provided written informed consent after receiving detailed information about the study's procedures, associated risks, and potential benefits. Data privacy and confidentiality were ensured through de-identification and secure storage on locked cabinets and password-protected computers. Participants were assured that their participation was voluntary and that they could withdraw at any point without consequence; they were also offered supplementary resources to support diabetes self-management.

Results

Participant Characteristics

Seventy participants (35 intervention, 35 control) were comparable regarding age, sex, education, occupation, and diabetes duration. However, the intervention group exhibited higher baseline levels of HbA1c and blood glucose compared to the control group. Pre-intervention glycated hemoglobin (HbA1c) levels averaged 8.70% (95% Confidence Interval [CI]: 8.32–9.08; Standard Deviation [SD]: 1.11) in the intervention group, versus 8.03% (95% CI: 7.80–8.27; SD: 0.69) in the control group. Similarly, the baseline mean blood glucose level was 203.25 mg/dL (95% CI: 192.29–214.21; SD: 31.89) in the intervention group and 184.05 mg/dL (95% CI: 177.16–190.94; SD: 20.04) in the control group. These differences were statistically significant (p = 0.004) (see Table 1)

Effect of Intervention on Outcomes

After 12 weeks, the intervention group demonstrated significantly greater improvements across all primary outcome measures compared to the control group (see Table 2)

Blood glucose levels in the intervention group decreased markedly by 81.13 mg/dL, from 203.25 mg/dL at baseline to 122.12 mg/dL post-intervention. In contrast, the control group experienced a modest reduction of 9.03 mg/dL, from 184.05 mg/dL to 175.02 mg/dL. This between-group difference was statistically significant ($p < 0.001$) and associated with a large effect size, as indicated by a partial eta squared (η^2_p) value of 0.87.

Glycated hemoglobin levels decreased by 2.82 percentage points in the intervention group (from 8.70% to 5.88%), versus 0.32 percentage points in the control group (from 8.03% to 7.71%) ($p < 0.001$, $\eta^2p = 0.87$), indicating a large effect size.

Diabetes-related quality of life scores increased by 26.91 points in the intervention group, rising from 31.63 at baseline to 58.54 post-intervention. In contrast, the control group demonstrated only a modest improvement of 2.66 points, from 37.14 to 39.80. This difference was statistically significant

($p < 0.001$), with a large effect size indicated by a partial eta squared (η^2_p) of 0.86

Partial eta squared (η^2_p) was employed to assess the magnitude of the intervention's effects. In accordance with Cohen's conventions, η^2 values around 0.01 represent small effects, 0.06 medium effects, and values equal to or greater than 0.14 indicate large effects. All outcome measures in this study demonstrated large effect sizes, suggesting that the intervention had a substantial impact on both glycemic control and diabetes-related quality of life.

Discussion

This study demonstrated that the 'Create Sensitivity' intervention led to significant improvements in both glycemic control and diabetes-related quality of life among individuals with type 2 diabetes. The intervention group exhibited greater reductions in both blood glucose and glycated hemoglobin (HbA1c) levels, as well as significantly greater improvements in quality of life scores, compared to participants who received standard care. These findings highlight the critical role of incorporating psychosocial and behavioral components into the comprehensive management of chronic diseases. The "Create Sensitivity" model is a multifaceted approach that includes cognitive restructuring, structured discharge planning, scientific self-care training, and hope development (Hekmatpou et al., 2018). Each component appears to play a distinct role in achieving the intervention's effectiveness.

Cognitive restructuring helped patients develop more adaptive beliefs and coping strategies, enhancing emotional regulation and commitment to self-care. Evidence suggests that cognitive behavioral interventions play a vital role in promoting psychological adaptability and self-management confidence in individuals with chronic conditions, including diabetes (Abbas et al., 2023; Jenkinson et al., 2022; Li et al., 2023). By empowering patients to reinterpret their illness experiences, cognitive restructuring reduces psychological distress and diabetes-related burnout, factors that are strongly associated with poor treatment adherence. Moreover, addressing maladaptive beliefs about disease management has been linked to improved glycemic control through enhanced behavioral engagement and problem-solving skills (Wu et al., 2021) . Thus, in this study, the cognitive restructuring component likely played a central role in facilitating clinical and psychosocial improvements.

Structured discharge planning was crucial in facilitating a smooth transition from clinical settings to home care, ensuring continuity of care and minimizing fragmentation. Involving trained nurses in systematic follow-up and home visits provided patients consistent support during the vulnerable post-discharge period. Research has demonstrated that structured transitional care interventions improve clinical outcomes, enhance self-management behaviors, and significantly reduce hospital readmission rates among patients with chronic illnesses, including diabetes In particular, coordinated discharge planning has been shown to strengthen treatment adherence, enable early identification of self-care challenges, and support sustained glycemic control by maintaining patient engagement after hospitalization(Magny-Normilus et al., 2021). The results highlight the essential role of transitional support in enhancing the effectiveness of integrated diabetes care strategies.

Scientific self-care training provided participants with practical, evidence-based skills for managing their condition, including dietary planning, medication adherence, and physical activity. These behavioral competencies are critical for maintaining glycemic control and preventing diabetes-related complications. A substantial body of research consistently demonstrates that diabetes self-management education improves glycemic control, promotes medication adherence, and empowers patients to maintain long-term lifestyle modifications (Ranjbar et al., 2024). Regular feedback and structured problem-solving sessions reinforce behavior change, reduce relapse rates, and build self-efficacy in managing daily diabetes care. In this study, the scientific self-care training component likely played a direct role in the significant improvements observed in both clinical and psychosocial outcomes.

Finally, the hope development component provided essential emotional and social support by promoting a positive outlook and fostering psychological resilience. Through structured activities such as peer role modeling, goal-setting exercises, and motivational coaching, participants built greater confidence in their ability to manage diabetes and maintain healthy behaviors. Research has demonstrated that cultivating hope and optimism is strongly linked to improved self-care practices, reduced emotional distress, greater adherence to medication regimens, and enhanced quality of life among individuals with chronic illnesses, including type 2 diabetes (Zhang et al., 2022). Interventions that address emotional well-being have been shown to reduce diabetes-related distress and facilitate sustained engagement in long-term disease management (Javanmardifard et al., 2020). Therefore, the hope development component likely contributed substantially to the observed psychosocial and clinical improvements in this study

Unlike standard care—which often focuses narrowly on medication adherence, lifestyle counseling, and general disease education—the Create Sensitivity model adopts a holistic, patient-centered approach that integrates emotional, cognitive, and behavioral support. Evidence indicates that interventions integrating self-management education with psychological support are more effective in enhancing glycemic outcomes and quality of life than educational strategies alone

(Powers et al., 2020). By addressing psychological barriers, enhancing self-efficacy, and providing structured skill-building opportunities, the model empowers patients to engage in their care actively. The significant improvements in blood glucose levels and quality of life align with prior evidence that multifaceted interventions can produce substantial clinical and psychosocial benefits . These findings are particularly relevant in resource-constrained settings, where integrated behavioral strategies offer a feasible, scalable solution to improving chronic disease management.

This integrated approach aligns with the nursing discipline's foundational commitment to whole-person care, positioning nurses as essential facilitators of behavioral change in chronic disease management. By integrating emotional, educational, behavioral, and social support strategies, the Create Sensitivity model provided a comprehensive, patient-centered intervention that directly addressed the complex and multifaceted challenges experienced by individuals with type 2 diabetes. Unlike traditional diabetes care, which often focuses on physiological outcomes such as glycemic control, this model equally attaches to psychological well-being, self-management competencies, and social resilience. Previous research supports the value of holistic interventions in chronic disease care, highlighting their impact on both clinical and psychosocial outcomes (Al-Dwaikat et al., 2023; Litchfield et al., 2023; Ranjbar et al., 2024).

The substantial effect sizes observed in this study further confirm that addressing the whole person can lead to significant and lasting health improvements. hese findings are consistent with prior research demonstrating that integrated care models—combining psychosocial, educational, and clinical support—significantly enhance self-management behaviors and lead to improved clinical outcomes among individuals with chronic diseases. In line with previous studies highlighting the benefits of incorporating psychosocial elements into diabetes care, the significant improvements in glycemic control and quality of life observed in this study suggest that integrating psychosocial support into routine diabetes management may yield transformative outcomes—enhancing both metabolic regulation and emotional well-being. Integrating such holistic approaches into standard diabetes care pathways may be crucial for achieving long-term disease control and enhancing patient quality of life.

Existing knowledge underscores the importance of psychosocial and behavioral components in managing chronic diseases. However, few interventions have integrated these elements as thoroughly as the "Create Sensitivity" model (Hekmatpou et al., 2018). These findings align with earlier research on the 'Create Sensitivity' Caring Model, which has demonstrated beneficial effects on glycemic control and quality of life in individuals with type 2 diabetes. Hekmatpou et al. demonstrated that application of the 'Create Sensitivity' model among patients with type 2 diabetes was associated with significant reductions in fasting blood glucose and glycated hemoglobin levels, as well as improvements in overall quality of life. Following the intervention, the test group exhibited significantly lower fasting blood glucose levels (mean = 146.4 ± 51.3 mg/dL) compared to the control group (mean = 175.6 ± 59.8 mg/dL; p = 0.032). Similarly, glycated hemoglobin levels were significantly lower in the test group (mean = 67.89 ± 13.34 mmol/mol) than in the control group (mean = 80.03 ± 17.23 mmol/mol; p = 0.002). Quality of life scores also differed significantly between groups, with the test group reporting a higher mean score (58.25 ± 5.3) than the control group (47.02 ± 4.5; p = 0.0001)(Hekmatpou et al., 2018).

Enhancing glycemic control and quality of life in patients with type 2 diabetes is essential, as both factors are closely associated with long-term health outcomes and overall patient well-being. Unlike standard care, the "Create Sensitivity" intervention provided a multifaceted approach that resulted in superior glycemic control and enhanced quality of life. Contrary to some existing studies that emphasize medication adherence alone, our findings highlight the value of incorporating cognitive and emotional strategies into diabetes management. Statistical analyses demonstrated significant differences in both glycemic control and quality of life between the intervention and control groups, thereby supporting the effectiveness of the 'Create Sensitivity' model. This study highlights the potential of comprehensive interventions to address both the physiological and psychological dimensions of chronic disease management, thereby promoting a more holistic approach to patient care.

While the results are promising, caution is warranted in generalizing these findings to diverse patient populations without further research. The "Create Sensitivity" intervention is novel in its integration of cognitive restructuring, structured discharge planning, scientific self-care training, and hope development, offering a unique and holistic strategy for diabetes management. A notable limitation of this study is the relatively short follow-up period, which may not adequately reflect the long-term sustainability of the intervention's effects on glycemic control and quality of life.

Nursing Implications

By integrating holistic care, empowerment, and long-term behavioral guidance, the 'Create Sensitivity' model embodies the essential values of nursing practice. Nurses are ideally positioned to implement this model, as it integrates educational, emotional, and transitional care within their scope of practice. Incorporating this model into nursing education and practice can expand nurses' contributions to chronic disease care, foster better clinical and psychosocial outcomes, and promote integrated care delivery in both institutional and community-based settings.

Conclusion

Applying the 'Create Sensitivity' model led to notable enhancements in both blood glucose regulation and diabetes-related quality of life in individuals with type 2 diabetes. Compared to the standard care group, participants who received the intervention demonstrated more pronounced decreases in fasting blood glucose and HbA1c, as well as substantial enhancements in quality of life. The large effect sizes observed suggest that the benefits of this model are not only clinically meaningful but also potentially sustainable over time. These findings reinforce previous research demonstrating that integrated psychosocial and behavioral interventions enhance outcomes in chronic disease management. By simultaneously addressing cognitive, emotional, behavioral, and transitional care needs, the "Create Sensitivity" model offers a comprehensive and patient-centered approach to diabetes management. To confirm the broader relevance of the 'Create Sensitivity' model, future research should evaluate its long-term efficacy, cost-effectiveness, and scalability across different healthcare systems.

The "Create Sensitivity" model should be considered for integration into routine nursing practice and chronic disease management practices. Its structured yet flexible approach can enhance holistic patient care, improve clinical outcomes, and empower patients toward greater self-management. Implementation training for nurses and interdisciplinary teams is recommended to ensure effective adoption.

Additional studies are needed to evaluate whether the benefits of this model are sustained over time, to analyze its economic viability, and to explore its effectiveness across varying demographic groups and care environments. Multi-center studies with longer follow-up periods would help determine its broader utility and scalability.

Declaration of Interest

The authors declare no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

Acknowledgment

This research was supported by a grant from the Directorate General of Higher Education, Ministry of Education and Culture (Kementerian Pendidikan dan Kebudayaan, Direktorat Jenderal Pendidikan Tinggi), Indonesia, grant number Dikti:052/E5/PG.02.00.PL/2024 Tanggal 11 Juni 2024. We also extend our gratitude to the research assistants at Jambi University for their help with data collection. Finally, we extend our sincere gratitude to the individuals with type 2 diabetes who generously contributed their time and participation to this study.

Funding

This research was supported by a grant from the Directorate General of Higher Education (Direktorat Jenderal Pendidikan Tinggi – DIKTI), Ministry of Education and Culture (Kementerian Pendidikan dan Kebudayaan), Indonesia, grant number Dikti:052/E5/PG.02.00.PL/2024 Tanggal 11 Juni 2024.

Data Availability

Data supporting the findings of this study are available from the corresponding author on reasonable request.

References

Abbas, Q., Latif, S., Ayaz habib, H., Shahzad, S., Sarwar, U., Shahzadi, M., Ramzan, Z., & Washdev, W. (2023). Cognitive behavior therapy for diabetes distress, depression, health anxiety, quality of life and treatment adherence among patients with type-II diabetes mellitus: A randomized control trial. *BMC Psychiatry, 23*(1), 86. https://doi.org/10.1186/s12888-023-04546-w

Al-dwaikat, T. N., Ali, A. M., & Khatatbeh, H. (2023). Self-management social support in type 2 diabetes mellitus: A concept analysis. *Nursing Forum, 2023*(1), 1753982. https://doi.org/10.1155/2023/1753982

Asmat, K., Dhamani, K., Gul, R., & Froelicher, E. S. (2022). The effectiveness of patient-centered care vs. usual care in type 2 diabetes self-management: A systematic review and meta-analysis. *Frontiers in Public Health, 10,* 994766. https://doi.org/10.3389/FPUBH.2022.994766/BIBTEX

Davies, M. J., Aroda, V. R., Collins, B. S., Gabbay, R. A., Green, J., Maruthur, N. M., Rosas, S. E., Del Prato, S., Mathieu, C., Mingrone, G., Rossing, P., Tankova, T., Tsapas, A., & Buse, J. B. (2022). Management of Hyperglycemia in Type 2 Diabetes, 2022. A consensus report by the american diabetes association (ADA) and the european association for the study of diabetes (EASD). *Diabetes care, 45*(11), 2753–2786. https://doi.org/10.2337/dci22-0034

Fisher, E. B., Earp, J. A., Maman, S., & Zolotor, A. (2010). Cross-cultural and international adaptation of peer support for diabetes management. *Family Practice, 27*(suppl_1), i6–i16. https://doi.org/10.1093/fampra/cmp013

Gálvez Galán, I., Cáceres León, M. C., Guerrero-Martín, J., López Jurado, C. F., & Durán-Gómez, N. (2021). Health-related quality of life in diabetes mellitus patients in primary health care. *Enfermería Clínica (English Edition), 31*(5), 313–322. https://doi.org/https://doi.org/10.1016/j.enfcle.2021.03.003

Hekmatpou, D., Poorgharahkhan, A., Sajjadi, M., & Javaheri, A. (2018). Effectiveness of the "create sensitivity" caring model on blood glucose/ glycosylated hemoglobin and quality of life in patients with type 2 diabetes. *The*

Open Nursing Journal, 12(1), 195. https://doi.org/10.2174/1874434601812010195

Jafari, A., Naddafi^, F., Gholian Aval, M., & Tehrani, H. (2024). Relationship between diabetes health literacy, distress, burnout, social support, complications, self-care behaviors, and quality of life among patients with type 2 diabetes: A path analysis study. *Diabetology and Metabolic Syndrome , 16*(1), 1–14. https://doi.org/10.1186/S13098-024-01391-Z/TABLES/5

Janssen, L. M. M., Hiligsmann, M., Elissen, A. M. J., Joore, M. A., Schaper, N. C., Bosma, J. H. A., Stehouwer, C. D. A., Sep, S. J. S., Koster, A., Schram, M. T., & Evers, S. M. A. A. (2020). Burden of disease of type 2 diabetes mellitus: Cost of illness and quality of life estimated using the maastricht study. *Diabetic Medicine, 37*(10), 1759–1765. https://doi.org/10.1111/dme.14285

Javanmardifard, S., Heidari, S., Sanjari, M., Yazdanmehr, M., & Shirazi, F. (2020). The relationship between spiritual well-being and hope, and adherence to treatment regimen in patients with diabetes. *Journal of Diabetes & Metabolic Disorders, 19*(2), 941–950. https://doi.org/10.1007/s40200-020-00586-1

Jenkinson, E., Knoop, I., Hudson, J. L., Moss-Morris, R., & Hackett, R. A. (2022). The effectiveness of cognitive behavioural therapy and third-wave cognitive behavioural interventions on diabetes-related distress: A systematic review and meta-analysis. In diabetic medicine (vol. 39, issue 11). John wiley and sons inc. https://doi.org/10.1111/dme.14948

Kroenke, K., Corrigan, J. D., Ralston, R. K., Zafonte, R., Brunner, R. C., Giacino, J. T., Hoffman, J. M., Esterov, D., Cifu, D. X., Mellick, D. C., Bell, K., Scott, S. G., Sander, A. M., & Hammond, F. M. (2024). Effectiveness of care models for chronic disease management: A scoping review of systematic reviews. In PM and R (Vol. 16, Issue 2, pp. 174–189). John wiley and sons inc. https://doi.org/10.1002/pmrj.13027

Li, Y., Buys, N., Ferguson, S., Li, Z., Shi, Y. C., Li, L., & Sun, J. (2023). The evaluation of cognitive-behavioral therapy-based intervention on type 2 diabetes patients with comorbid metabolic syndrome: A randomized controlled trial. *Diabetology and Metabolic Syndrome, 15*(1). https://doi.org/10.1186/s13098-023-01100-2

Litchfield, I., Barrett, T., Hamilton-Shield, J., Moore, T., Narendran, P., Redwood, S., Searle, A., Uday, S., Wheeler, J., & Greenfield, S. (2023). Current evidence for designing self-management support for underserved populations: An integrative review using the example of diabetes. *International Journal for Equity in Health 2023 22:1, 22*(1), 1–16. https://doi.org/10.1186/S12939-023-01976-6

Magny-Normilus, C., Nolido, N. V, Borges, J. C., Brady, M., Labonville, S., Williams, D., Soukup, J., Lipsitz, S., Hudson, M., & Schnipper, J. L. (2021). Effects of an intensive discharge intervention on medication adherence, glycemic control, and readmission rates in patients with type 2 diabetes. *Journal of Patient Safety, 17*(2). https://journals.lww.com/journalpatientsafety/fulltext/2021/03000/effects_of_an_intensive_discharge_intervention_on.1.aspx

Mangoulia, P., Milionis, C., Vlachou, E., & Ilias, I. (2024). The interrelationship between diabetes mellitus and emotional well-being: Current concepts and future prospects. *Healthcare, 12*(14), 1457. https://doi.org/10.3390/HEALTHCARE12141457

Miller, C. J., Smith, S. N., & Pugatch, M. (2020). Experimental and quasi-experimental designs in implementation research. *Psychiatry Research, 283,* 112452. https://doi.org/10.1016/J.PSYCHRES.2019.06.027

Ngan, H. Y., Chong, Y. Y., Loo, K. M., & Chien, W. T. (2023). Preliminary efficacy of an acceptance-based diabetes education (ACT-DE) programme for people with type 2 diabetes on diabetes distress and self-care behaviours: A pilot randomised controlled trial. *Journal of Contextual Behavioral Science, 30,* 50–60. https://doi.org/10.1016/J.JCBS.2023.09.002

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., Norton, A., Rinker, J., Siminerio, L. M., & Uelmen, S. (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. *Diabetes Care, 43*(7), 1636–1649. https://doi.org/10.2337/dci20-0023

Ranjbar, F., Karimi, M., Zare, E., & Ghahremani, L. (2024). The effect of educational intervention based on the behavioral reasoning theory on self-management behaviors in type 2 diabetes patients: A randomized controlled trial. *BMC Public Health, 24*(1), 1–12. https://doi.org/10.1186/S12889-024-19207-0/TABLES/2

Reichert, M., De La Cruz, B. A., Gardiner, P., & Mitchell, S. (2025). Diabetes medical group visits and type 2 diabetes outcomes: Mediation analysis of diabetes distress. *JMIR Diabetes, 10*(1), e57526. https://doi.org/10.2196/57526

Van allen, J., Steele, R. G., Nelson, M. B., Peugh, J., Egan, A., Clements, M., & Patton, S. R. (2016). A longitudinal examination of hope and optimism and their role in type 1 diabetes in youths. *Journal of Pediatric Psychology, 41*(7), 741–749. https://doi.org/10.1093/jpepsy/

jsv113

Versloot, J., Ali, A., Minotti, S. C., Ma, J., Sandercock, J., Marcinow, M., Lok, D., Sur, D., de Wit, M., Mansfield, E., Parks, S., & Zenlea, I. (2021). All together: Integrated care for youth with type 1 diabetes. *Pediatric Diabetes, 22*(6), 889–899. https://doi.org/10.1111/pedi.13242

Wahidin, M., Achadi, A., Besral, B., Kosen, S., Nadjib, M., Nurwahyuni, A., Ronoatmodjo, S., Rahajeng, E., Pane, M., & Kusuma, D. (2024). Projection of diabetes morbidity and mortality till 2045 in Indonesia based on risk factors and NCD prevention and control programs. *Scientific Reports, 14*(1). https://doi.org/10.1038/s41598-024-54563-2

Walker, R. J., Lynch, C. P., Strom Williams, J., Voronca, D., & Egede, L. E. (2015). Meaning of illness and quality of life in patients with type 2 diabetes. *Journal of Diabetes and Its Complications, 29*(5), 665–669. https://doi.org/https://doi.org/10.1016/j.jdiacomp.2015.04.006

Wu, F. L., Lin, C. H., Lin, C. L., & Juang, J. H. (2021). Effectiveness of a problem-solving program in improving problem-solving ability and glycemic control for diabetics with hypoglycemia. *International Journal of Environmental Research and Public Health 2021, 18*(18), 9559. https://doi.org/10.3390/IJERPH18189559

Zhang, P., & Xie, S. X. (2025). Bias and efficiency comparison between multiple imputation and available-case analysis for missing data in longitudinal models. *Statistics in Biosciences,* 1–34. https://doi.org/10.1007/S12561-025-09493-6/TABLES/7

Zhang, S., Li, J., & Hu, X. (2022). Peer support interventions on quality of life, depression, anxiety, and self-efficacy among patients with cancer: A systematic review and meta-analysis. *Patient Education and Counseling, 105*(11), 3213–3224. https://doi.org/https://doi.org/10.1016/j.pec.2022.07.008