



MALAHAYATI INTERNATIONAL JOURNAL
OF NURSING AND HEALTH SCIENCE
ISSN 2620-9152 (Print)
ISSN 2621-4083 (Online)
DOI: 10.33024



ARTICLE INFORMATION

Received: October, 11, 2025

Revised: February, 15, 2026

Available online: February, 16, 2026

at : <https://e-jurnal.iphorr.com/index.php/minh>

Intervention strategies to improve adherence to the five pillars of diabetes management among patients with type 2 diabetes mellitus: A literature review

Putu Vera Megawati, Ni Luh Putu Inca Buntari Agustini*, Sri Dewi Megayanti, Ni Made Candra Citra Sari

Program Studi Magister Keperawatan, Fakultas Kesehatan, Institut Teknologi dan Kesehatan Bali

Corresponding author: *E-mail: incaagustini@gmail.com

Abstract

Background: Diabetes mellitus is a metabolic disease that is a global problem, with the number of sufferers increasing annually. Adherence to the five pillars of diabetes management is the cornerstone of preventing and reducing morbidity and mortality from diabetes.

Purpose: To analyze how to improve adherence in type 2 diabetes patients in implementing the five pillars of diabetes management.

Method: The research method used a literature review approach to map and identify interventions for implementing the 5 pillars of diabetes management.

Results: The study found 20 articles describing interventions for people with diabetes mellitus through educational and informational delivery mechanisms. The types of interventions included: mobile phone application interventions, physical exercise interventions, audiovisual interventions, flipchart interventions, and peer leader interventions.

Conclusion: Five types of interventions improve adherence in patients with type II diabetes mellitus to implementing the 5 pillars of diabetes management.

Keywords: Five Pillars of Diabetes Management; Intervention; Type II Diabetes Patients.

INTRODUCTION

Type II diabetes mellitus is a global problem, with the number of sufferers continuing to increase significantly. The World Health Organization (WHO) predicts that by 2030, there will be more than 346 million people with type II diabetes worldwide, a number likely to more than double without intervention (Liawati, Arsyah, & Patimah, 2022). As many as 38 million (68%) of the 56 million deaths worldwide are also caused by the degenerative disease diabetes (Sonhaji, Hani, & Rahmani, 2024). With the scale of the problem of type II diabetes mellitus continuing to expand globally and its serious health implications, it is important to identify the main characteristics of this disease.

Diabetes Mellitus (DM) refers to a group of metabolic diseases characterized by elevated blood

glucose levels (hyperglycemia). This condition is caused by a deficiency in insulin secretion, impaired insulin function, or a combination of both (Febriani, Prabowo, Putri, & Setyawan, 2023). Data released by the International Diabetes Federation (2025) shows that by 2024, diabetes will affect approximately 589 million adults worldwide (aged 20-79 years), which equates to more than one in ten (11.1%) individuals in that age group living with diabetes. A worrying finding is that more than 40% of them are unaware they have diabetes. This trend is expected to continue, with a projected number of cases reaching 853 million by 2050, representing an increase of approximately 46% (International Diabetes Federation, 2025). Diabetes mellitus is an incurable condition, but blood glucose levels can be

Intervention strategies to improve adherence to the five pillars of diabetes management among patients with type 2 diabetes mellitus: A literature review

managed. In the long term, adherence to a diabetes management plan is essential to reduce the risk of morbidity and mortality associated with this disease (Rahman 2023).

One intervention approach used to prevent and reduce risks for diabetes sufferers is implementing the five pillars of diabetes management. These five pillars of diabetes management consist of patient education, dietary management, physical activity, pharmacological therapy, and regular blood glucose monitoring (Huda, Biantoro, & Prasetyo, 2022). The main goals of implementing the five pillars of diabetes mellitus management are achieving optimal blood sugar control, preventing or slowing the development of complications, and improving their quality of life. To achieve these goals, this approach prioritizes education, a healthy diet, regular physical activity, appropriate pharmacological interventions, and regular blood glucose monitoring (Pratiwi, Wahyudi, & Sadhana, 2025). If patients adhere to the five pillars of diabetes management, they can achieve a better quality of life.

The Diabetes Control and Complication Trial (DCCT) concluded that optimal adherence to diabetes mellitus can reduce the risk of chronic complications by 20 to 30% (Purwandari, Wirjatmadi, & Mahmudiono, 2022). Research conducted at the Klampis Ngasem Community Health Center in Surabaya City showed that adherence to intensive blood sugar control from an early age reduced the risk of death by 20% and the risk of myocardial infarction by 31% (Adler, Coleman, Leal, Whiteley, Clarke, & Holman, 2024). Consistent with these findings, research at the Haji Makassar Regional General Hospital in South Sulawesi showed that adherence to diabetes management can reduce the risk of readmission, with 53.6% of patients with good adherence avoiding readmission (Saputra, Haskas, & Restika 2022).

Non-compliance in diabetes patients can lead to failure in controlling blood sugar levels, which can lead to serious complications (Damayanti, Hondrizal, Hutaperi, Jelmila, & Ashan, 2024). Implementing adherence to the five pillars of diabetes is a key factor in reducing the burden of the disease, both in preventing life-threatening complications and reducing the frequency of rehospitalizations. This success can improve the health status of people with

diabetes (Prawinda, Ningrum, Mujirahayu, Noviana, Zuliyanti, Permatajaya, & Pranata, 2024).

RESEARCH METHOD

The research method used in this study is a literature review approach. This process involves an in-depth search of various sources and employs various research methods. The stages of implementing the literature review method using the framework proposed by Arkey and O'Malley (Arksey, & O'malley, 2005; Utami, Jahar, & Zulkifli 2021).

This literature review aims to identify and map interventions to improve adherence in type II diabetes patients to the five pillars of diabetes management. Although numerous studies have been conducted on the topic of diabetes interventions, no comprehensive study has mapped diabetes mellitus interventions and adherence to the five pillars of diabetes management. The review question in this study was: What types of interventions have been tested to improve adherence in type II diabetes patients to the five pillars of diabetes management? At this stage, the researcher identified research questions that would be used as references in searching for articles and to prevent the use of low-quality research sources.

The article search strategy used the PICOTS framework, namely: Population: Patients with Type II Diabetes Mellitus. Intervention: Various interventions aimed at improving adherence in Type II DM patients in implementing the 5 pillars of diabetes management. Comparator: No comparison of outcomes is required. This literature review method focuses on mapping available evidence without directly comparing effectiveness. Outcome: Improved adherence in Type II DM patients in implementing the 5 pillars of diabetes management. Implementation Time: The literature search was conducted between May 8, 2025, and publications were made between January 1, 2020, and May 8, 2025. Study Design: All study designs relevant to adherence interventions to improve adherence in Type II DM patients in implementing the 5 pillars of diabetes management.

Inclusion criteria: Articles discussing interventions in Type II DM patients, articles published within the last 5 years, and written in Indonesian or English. Exclusion criteria: Incomplete articles and articles

Putu Vera Megawati, Ni Luh Putu Inca Buntari Agustini*, Sri Dewi Megayanti, Ni Made Candra Citra Sari

Program Studi Magister Keperawatan, Fakultas Kesehatan, Institut Teknologi dan Kesehatan Bali
Corresponding author: *E-mail: incaagustini@gmail.com

DOI: <https://doi.org/10.33024/minh.v8i12.1690>

Intervention strategies to improve adherence to the five pillars of diabetes management among patients with type 2 diabetes mellitus: A literature review

that are not open access, articles with a scoping review, literature review, or systematic review research design. And using keywords ("Type 2 Diabetes Mellitus" OR "Type 2 Diabetes" OR "Non-insulin Dependent Diabetes") AND ("Adherence" OR "Medication Adherence" OR "Diet Adherence" OR "Exercise Adherence" OR "Blood Glucose Self-Monitoring" OR "Foot Care") AND ("Intervention" OR "Program" OR "Strategy" OR "Education" OR "Counseling" OR "Support" OR "Technology" OR "Mobile App" OR "Telemedicine") AND ("Diabetes Management" OR "Self-Care" OR "Medication Adherence" OR "5 Pillars of Diabetes Management").

The literature search process in this study was comprehensively documented, referring to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Furthermore, a PRISMA flowchart was used to detail the number of literatures at each stage of the selection process, from identification and screening to inclusion of studies in the review. The use of PRISMA, originally designed for reporting Systematic

Reviews and Meta-Analyses, is considered appropriate because it can improve the quality of publication reporting, including in terms of literature source selection (Nurhayati, Astuti, & Fitriahadi 2020).

The literature source databases used in this study were Google Scholar, PubMed, and Springer. These databases were selected to maintain the credibility and quality of the literature used in this study. The data extraction process in this study included; title, objectives, types of adherence interventions for the 5 pillars of diabetes management, and barriers and solutions. The results of the extraction process are depicted in the following diagram and table. An analysis of 20 articles explains that interventions for Type II diabetes mellitus patients, including education, knowledge, and information, improve patient knowledge, which impacts patient adherence to the five pillars of diabetes management. This, in turn, can lower blood sugar levels in Type II diabetes mellitus patients.

Putu Vera Megawati, Ni Luh Putu Inca Buntari Agustini*, Sri Dewi Megayanti, Ni Made Candra Citra Sari

Program Studi Magister Keperawatan, Fakultas Kesehatan, Institut Teknologi dan Kesehatan Bali
Corresponding author: *E-mail: incaagustini@gmail.com

DOI: <https://doi.org/10.33024/minh.v8i12.1690>

RESEARCH RESULTS

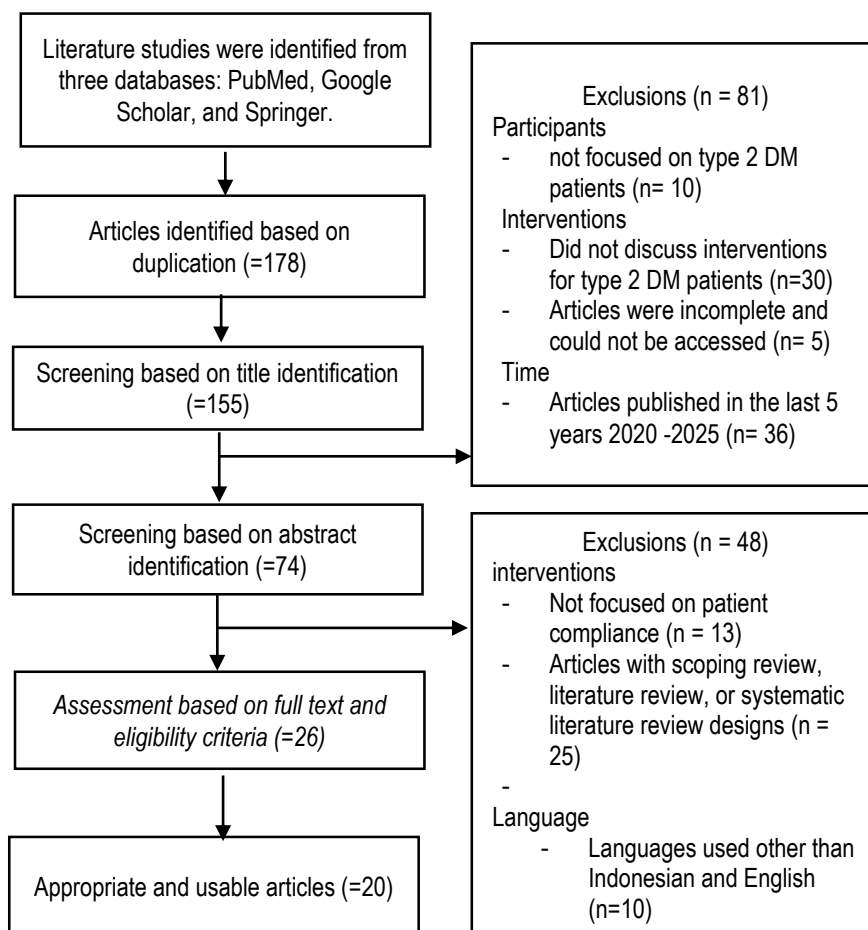


Figure PRISMA Diagram of Literature Search

Putu Vera Megawati, Ni Luh Putu Inca Buntari Agustini*, Sri Dewi Megayanti, Ni Made Candra Citra Sari

Program Studi Magister Keperawatan, Fakultas Kesehatan, Institut Teknologi dan Kesehatan Bali
Corresponding author: *E-mail: incaagustini@gmail.com

DOI: <https://doi.org/10.33024/minh.v8i12.1690>

Table Summary of Article Reviews

(Author, Year) (Country)	Type of Intervention	Method	Results
(Winaningsih et al., 2020) (Indonesia)	Mobile Phone Application	D: Quasi-experimental with a one-group pretest-posttest design S: 20 Type 2 DM patients at the Gamping I Community Health Center without complications. IV: Nutrition counseling using the Nutri Diabetic Care application. DV: Diabetes diet adherence A: Wilcoxon test	The Nutri Diabetic Care application has a 25% impact on adherence. Barriers: Unclear information content and patients' lack of understanding of the technology, Solution: Educational media must be clear, easy, engaging, concise, and beneficial.
(Rosdina et al., 2024) (Indonesia)	Physical exercise/foot exercises	D: Quantitative with a cross-sectional approach. S: 81 respondents with type 2 diabetes mellitus in the Rejosari Community Health Center Work Area, Pekanbaru City. IV: Self-efficacy. DV: Physical exercise adherence. A: Univariate and bivariate.	There is a relationship between physical exercise interventions and self-efficacy in improving adherence in Type 2 DM patients. Barriers: Patients with low self-efficacy have doubts about achieving adherence. Solution: Implementing regular exercise can improve patient adherence and motivation.
(Khairani & Purwanti., 2023) (Indonesia)	Social support with peer leaders	D: Quasi-experimental S: 88 type II diabetes patients IV: Social support and peer leader intervention DV: Diabetic self-management A: Quantitative	There is a significant effect between social support with peer leaders and adherence to diabetes management ($p < 0.05$).
(Amry, 2020) (Indonesia)	Peer-Leader	D: Quasi-Experimental S: 30 Type II Diabetes Patients at Banguntapan 3 Community Health Center, Bantul IV: Peer Education DV: Knowledge of Preventing Diabetic Foot Complications A: Paired t-test.	There was an increase in knowledge and adherence to preventing diabetic foot complications using the peer-based method, with a p-value of $0.006 < 0.05$. Barriers: Lack of understanding of health education regarding preventing diabetic complications. Solution: Implementation of more comprehensive education

Putu Vera Megawati, Ni Luh Putu Inca Buntari Agustini*, Sri Dewi Megayanti, Ni Made Candra Citra Sari

Program Studi Magister Keperawatan, Fakultas Kesehatan, Institut Teknologi dan Kesehatan Bali
Corresponding author: *E-mail: incaagustini@gmail.com

DOI: <https://doi.org/10.33024/minh.v8i12.1690>

Intervention strategies to improve adherence to the five pillars of diabetes management among patients with type 2 diabetes mellitus: A literature review

(Author, Year) (Country)	Type of Intervention	Method	Results
(Wellyanah et al., 2024) (Indonesia)	Foot Exercises	D: Plate Method S: 5 Patients with Diabetes IV: Foot Exercise Demonstration DV: Knowledge of Diabetes Mellitus	The plate method has an impact and changes (80%), improved eating patterns, and 73% of patients experienced increased foot exercise skills. Barriers: Lack of a routine program to provide counseling and education regarding the plate method and foot exercises. Solution: Education is scheduled.
(Sari et al., 2022) (Indonesia)	Audiovisual/Video	D: Quasi-experimental with control group S: 76 respondents IV: Audiovisual-Based Diabetes Self-Management Education (DSME) Intervention DV: Diabetes Self-Care Knowledge and Skills	A significant effect of DSME-based audiovisual intervention on self-care knowledge and skills was found with a P-value of 0.001 < 0.05. Barriers: There were no barriers in the study. Solutions: There were no solutions to the barriers.
(Hasina et al., 2022) (Indonesia)	Foot Exercises	D: Quantitative S: 68 Diabetes Mellitus Patients in the Kebonsari Subdistrict IV: Foot Exercises DV: Increased Knowledge of Diabetes Patients A: Wilcoxon Test	The Buerger Allen Exercise intervention was shown to increase knowledge by 96.1% and had an effect value of 0.001 < 0.05. Barriers: There were no obstacles in the study. Solutions: There were no solutions to the obstacles.
(Syaipuddin et al., 2024) (Indonesia)	Audiovisual/Video	D: Quantitative with Quasi-Experimental S: 54 people with diabetes mellitus at the Tamangapa Antang Community Health Center in Makassar City IV: Audiovisual DV: Diabetes Management A: Paired Sample T-test.	There was a significant effect of the audiovisual intervention on self-management, with an auditory increase of 62.7% and an effect value of 0.001 < 0.05. Barriers: There were no obstacles in the study. Solutions: There were no solutions to the obstacles.
(Aniah et al., 2024) (Indonesia)	Foot Exercises	D: Pre-Experimental S: 20 Respondents IV: Foot Exercises DV: Blood Sugar Levels in Diabetes Mellitus Patients A: Univariate and Bivariate Analysis (Wilcoxon Test)	There was a significant decrease in HbA1c levels by 0.04%. Barriers: Prolonged DM increases blood sugar levels due to decreased organ function. Solution: Recognize the early symptoms of diabetes.

Putu Vera Megawati, Ni Luh Putu Inca Buntari Agustini*, Sri Dewi Megayanti, Ni Made Candra Citra Sari

Program Studi Magister Keperawatan, Fakultas Kesehatan, Institut Teknologi dan Kesehatan Bali

Corresponding author: *E-mail: incaagustini@gmail.com

DOI: <https://doi.org/10.33024/minh.v8i12.1690>

Intervention strategies to improve adherence to the five pillars of diabetes management among patients with type 2 diabetes mellitus: A literature review

(Author, Year) (Country)	Type of Intervention	Method	Results
(Rusmini et al., 2023) (Indonesia)	Calendar	D: Pre-experimental S: 30 respondents IV: Medical calendar DV: Diabetic management compliance A: Wilcoxon Signed Rank Test	The use of a medication calendar has been shown to influence medication adherence in patients with diabetes mellitus with a p-value of $0.000 < \alpha = 0.05$. Barriers: There were no barriers in the study. Solutions: There were no solutions to the barriers.
(Sundari & Sutrisno, 2023) (Indonesia)	Leaflets/Booklets	D: Case Study S: 30 Respondents IV: Leaflets/Booklets DV: Type II Diabetes Mellitus Compliance A: Wilcoxon Test	Increased patient knowledge and compliance after providing health education related to the four pillars of diabetes mellitus, 70% adhered to diabetes management. Barriers: No barriers were found in the study. Solutions: No solutions to the barriers
(Erlina & Avianti, 2023) (Indonesia)	Mobile Phone Application	D: Colaizzi with a qualitative study S: 10 patients with type II diabetes mellitus IV: e-monitoring application DV: Need to improve compliance with diabetes management. A: Colaizzi test	There was a decrease in blood sugar levels in the intervention group using e-monitoring, with seven themes: diet management, weight loss, exercise, blood sugar control, taking medication as prescribed, reducing stress, and health protocols. Barriers: Unclear information content and patients' lack of understanding of technology, as well as a lack of engaging information presentation. Solution: Educational media must be clear, easy, engaging, concise, and beneficial.
(Gusdiani et al., 2021) (Indonesia)	Reminder App	D: Experimental Design S: 10 Patients with Type II Diabetes Mellitus IV: Reminder App DV: Diet Compliance and Blood Sugar Levels in Type II Diabetes Patients A: Paired t-test.	Using the app improves and facilitates patients' ability to remember the type, amount, and schedule of meals. This indicates that using the reminder app effectively reduces FBG in Type II Diabetes patients. Barriers: Unable to control the food provided by the family daily. Solution: Implementing counseling using app-based media so that families understand the foods that should be provided.

Putu Vera Megawati, Ni Luh Putu Inca Buntari Agustini*, Sri Dewi Megayanti, Ni Made Candra Citra Sari

Program Studi Magister Keperawatan, Fakultas Kesehatan, Institut Teknologi dan Kesehatan Bali
Corresponding author: *E-mail: incaagustini@gmail.com

DOI: <https://doi.org/10.33024/minh.v8i12.1690>

Intervention strategies to improve adherence to the five pillars of diabetes management among patients with type 2 diabetes mellitus: A literature review

(Author, Year) (Country)	Type of Intervention	Method	Results
(Septiani, 2023) (Indonesia)	Flip-Flops/Leaflets/ Booklets	D: Quantitative with a Case-Control Design S: 18 Diabetes Mellitus Patients IV: Flip-Flops/Leaflets/Booklets DV: Knowledge, 3J Skills, and Blood Sugar Levels in Type II Diabetes Patients in the Outpatient Clinic of Pulang Pisau Regional Hospital. A: Univariate and bivariate tests (Shapiro-Wilk test).	The effect of diet counseling using flip-flops and leaflets on 3J skills (0.033). However, there was no effect of diet counseling on blood sugar levels (0.058). Barriers: There were no obstacles in the study. Solutions: There were no solutions to these obstacles.
(Laila et al. 2020) (Indonesia)	Mobile Phone Application	D: Quasi-experimental S: 26 Type II Diabetes Mellitus Patients IV: Disease Knowledge DM, Nutrition Therapy Knowledge, Physical Exercise Knowledge, and Pharmacological Therapy Knowledge, Variables DV: Education Using an Android Application. A: Mann-Whitney Test	Significant changes in patient knowledge related to diabetes (0.034), nutrition therapy (0.008), and physical exercise (0.014). There was also a non-significant increase in pharmacological therapy. Barriers: No barriers were found in the study. Solutions: No solutions to these barriers were found.
(Zhai and Yu 2020) (China)	Mobile phone application	D: Quasi-experimental S: 120 patients with type 2 diabetes mellitus IV: Diabetes management application DV: Improved glycemic control and self-efficacy. A: t-test	The application was shown to help patients improve self-management and prevention experiences. The results also showed better HbA1c (6.71±1.06 vs. 7.22±1.02, P<0.05) and efficacy scores (119.20±9.88 vs. 102.09±10.67, P<0.05). Barriers: There were no barriers to the study. Solutions: There were no solutions to the barriers.
(Wangi, 2025) (Indonesia)	Foot Exercise/ Foot Spa	D: Quasi-Experimental S: 64 respondents with type 2 diabetes mellitus IV: Orem's Theory-Based Diabetic Foot Spa DV: Glycemic Control and Diabetes Management A: Univariate and Bivariate	The foot spa obtained a value of 0.00, <0.05, indicating the effectiveness of the foot spa on glycemic control. A significant decrease occurred in the intervention group, with a value of 21.09 mg/dl. Barriers: There were no obstacles in the study. Solutions: There were no solutions to these obstacles.

Putu Vera Megawati, Ni Luh Putu Inca Buntari Agustini*, Sri Dewi Megayanti, Ni Made Candra Citra Sari

Program Studi Magister Keperawatan, Fakultas Kesehatan, Institut Teknologi dan Kesehatan Bali
Corresponding author: *E-mail: incaagustini@gmail.com

DOI: <https://doi.org/10.33024/minh.v8i12.1690>

Intervention strategies to improve adherence to the five pillars of diabetes management among patients with type 2 diabetes mellitus: A literature review

(Author, Year) (Country)	Type of Intervention	Method	Results
(Wahyuni, 2023) (Indonesia)	Audiovisual/Video	D: Pre-Experimental S: 18 Type II Diabetes Mellitus Patients IV: Educational Video DV: Blood sugar control and diabetes management adherence A: McNemar test	The results of the study, with a value of $0.000 < 0.05$, indicate that educational videos have an effect on control. The study also found that respondents' ability to understand the videos was the most important factor.
(Yang et al., 2020) (South Korea)	Mobile Phone Application	D: Cluster randomized, open-label trial. S: 97 patients with type 2 diabetes mellitus IV: Mobile phone (monitoring and feedback system) DV: Diabetes management adherence A: Wilcoxon test	The results of routine blood sugar tests were sent to the doctor for monitoring and feedback via mobile phone (Hi Care Smart K). Results showed a significant improvement in the adjusted mean difference compared to controls (-0.30% , $95\% \text{ CI } -0.50 \text{ to } -0.11$). $P=.003$) and fasting plasma glucose (-17.29 mg/dL , $95\% \text{ CI } -29.33 \text{ to } -5.26$; $P=.005$) compared with those in the control group.
(Prihantoro & Ain, 2022) (Indonesia)	Foot Exercises	D: Pre-experimental S: 4 Patients with Type II Diabetes Mellitus IV: Foot Exercises DV: Blood Sugar Levels and Diabetes Mellitus Management A: Narrative and Table	Respondents experienced a decrease in blood sugar levels after implementing foot exercises.

Putu Vera Megawati, Ni Luh Putu Inca Buntari Agustini*, Sri Dewi Megayanti, Ni Made Candra Citra Sari

Program Studi Magister Keperawatan, Fakultas Kesehatan, Institut Teknologi dan Kesehatan Bali
Corresponding author: *E-mail: incaagustini@gmail.com

DOI: <https://doi.org/10.33024/minh.v8i12.1690>

DISCUSSION

Diabetes mellitus is a chronic disease characterized by elevated blood sugar levels (Simatupang & Kristina, 2023). Furthermore, diabetes is a global health threat, with the number of sufferers increasing annually (Sesaria, Kusnanto, & Bakar, 2020). Twenty articles categorized the main interventions into seven types: mobile phone application interventions, physical exercise/foot exercises/foot spa interventions, audiovisual/video interventions, calendar interventions, flipchart/leaflet/booklet interventions, peer leader interventions, and pocketbook interventions.

Mobile Phone Application Intervention

Advances in healthcare technology have given rise to various innovations aimed at improving adherence to the five pillars of diabetes management. More effective use of media can be a strategy to improve patient adherence. Patient experiences with diabetes self-management in a 2023 qualitative study demonstrated the need for an e-monitoring application to support self-care and improve patient adherence to diabetes management (Erlina & Avianti 2023). This is consistent with a 30-day study at the Mertoyudan I Community Health Center in Magelang, which found that 79.9% of the intervention group experienced a decrease in blood sugar levels after an educational intervention using an Android-based application, compared to the control group. Interestingly, adherence to the five pillars of diabetes management also significantly increased (81.53%) in the group receiving the educational intervention (Laila, Yuniarti, Noviardi, Muningggar, & Jaelani, 2020).

Utilizing Android applications on mobile phones allows patients to enjoy an interactive learning platform and receive flexible educational support. Easy access is a major added value, as learning can be done anytime and anywhere according to user preferences (Yang, Lee, Kim, Lee, Yoon, & Cho, 2020; Zhai & Yu 2020). The Nutri Diabetic Care application, studied in 2020, is one innovation designed to support diabetes management. The study showed that use of this application correlated with a 25% increase in patient adherence to the five main pillars of diabetes management (Winaningsih, Setyowati, & Lestari, 2020). Study on the effect of

reminder applications showed similar results, with changes in uncontrolled fasting blood sugar levels and a 49% increase in patient adherence to diabetes management (Gusdiani, Sukarni, & Mlta, 2021). These findings illustrate that implementing mobile phone application technology can be an effective strategy in improving diabetes patient care, particularly adherence to the five pillars of diabetes management.

Physical Exercise Intervention/Foot Exercise/Foot Spa

Physical exercise is a crucial pillar in diabetes management and is included in the diabetes management regimen. Exercise, including foot exercises or foot spas, is one of the recommended physical exercises to help the body become more responsive to insulin, facilitate blood sugar absorption, and maintain stable blood pressure. For diabetes patients, foot exercises or spas play a crucial role in preventing wounds, strengthening small muscles, and improving blood flow in the feet (Aniah, Hilda & Arsyawina, 2024; Rosdina, Saputra, & Roslita, 2024).

Research in 2025, providing foot spa with a duration of 20-25 minutes per session, frequency 3 times per week for 4 weeks with a total of 12 meetings showed the effectiveness of the diabetic foot spa given (Wangi, 2025). Furthermore, research in 2024 showed a difference in blood sugar levels before receiving foot exercise treatment, namely 333.60 mg/dl and there was a decrease in blood glucose after treatment, namely 297.20 mg/dl (Wellyanah, Diba, & Ridwan, 2024). Hemoglobin A1c (HbA1c) is a minor fraction of hemoglobin that has clinical significance as an indicator of monitoring blood glucose levels. The results of this examination are influenced by factors such as diet, physical activity, and adherence to pharmacological therapy in managing patient blood glucose levels. Research in 2024 showed a significant average decrease in HbA1c levels between before and after diabetes foot exercise treatment, where the average HbA1c level before foot exercise was 8,830 with a standard deviation of 1.3051 and after foot exercise there was a decrease of 7,870 with a standard deviation of 0.9056 (Aniah et al. 2024). In combination, research

Putu Vera Megawati, Ni Luh Putu Inca Buntari Agustini*, Sri Dewi Megayanti, Ni Made Candra Citra Sari

Program Studi Magister Keperawatan, Fakultas Kesehatan, Institut Teknologi dan Kesehatan Bali
Corresponding author: *E-mail: incaagustini@gmail.com

DOI: <https://doi.org/10.33024/minh.v8i12.1690>

Intervention strategies to improve adherence to the five pillars of diabetes management among patients with type 2 diabetes mellitus: A literature review

in 2022 showed results in the form of changes in feeling relaxed, the foot and toe muscles could be moved slowly and the stiffness that occurred in both stiffness was reduced. Changes in blood circulation in the feet can increase the decrease in blood sugar levels and improve blood circulation (Prihantoro & Ain, 2022).

Audiovisual/Video Intervention

Providing educational materials has been proven effective in increasing patient knowledge. Providing educational materials requires the use of effective means to optimize the delivery of information, especially in the implementation of the five pillars of diabetes management. Research in 2024, several means that can be used to increase patient knowledge and compliance include: (1) visual media: visual aids used to stimulate visual receptors during educational sessions, (2) audio media: facilitating auditory stimulation in delivering materials, (3) audio visual media: a combination of audio and visuals (video or film) can provide more comprehensive delivery of materials (Syaipuddin, Suhartatik, Haskas, Nurbaya, & Kasim, 2024).

Nursing interventions using audiovisuals for approximately 7 weeks during the COVID-19 pandemic obtained results in an increase in knowledge and skills regarding the five pillars of diabetes management where in the intervention group 12.90-14.83 in the control group 11.89-12.80 with a p-value of 0.008 (Sari, Sagitarini, & Sanjana, S2022). Research in 2023 of 18 respondents, 4 respondents (22.2%) showed no blood glucose control, either in measurements before or after the provision of educational videos. There were 9 respondents (50%) who initially did not carry out blood glucose control before the educational video intervention, but then carried out control after the intervention. A total of 5 respondents (27.8%) had carried out blood glucose control consistently, both before and after the provision of educational videos. No respondents did not carry out blood glucose control after receiving the educational video intervention (Wahyuni, 2023).

Intervention flip sheet/leaflet/booklet/calendar

Health education interventions utilizing media such as flip-flops, leaflets, booklets, and calendars aim to strengthen understanding and practice of the five pillars of diabetes management. This intervention design integrates supplemental information or large, easy-to-read text on media labels, as an adaptation for patients who have difficulty digesting conventional educational information. Flip-flops, leaflets, booklets, and calendars are designed to provide an in-depth understanding of the four main pillars of diabetes mellitus management (Srikartika, Akbar, & Lingga 2019; Nasrullah, Basri, Hartati, Bahtiar, Masdiana, Sudirman, & Rahman, 2024; Sundari & Sutrisno, 2023). A 2-week study in 2023 using the MMAS-8 questionnaire before and after the intervention showed an increase in medication adherence among diabetes patients, with 73% having moderate compliance and 20% having high compliance (Rusmini, Arip, Emilyani, & Sari, 2023). Furthermore, research in 2023 found that a two-week counseling process resulted in an 88.8% improvement in patient skills. However, the use of flipcharts, leaflets, booklets, and calendars did not significantly reduce blood sugar levels, due to lack of physical activity, sleep disturbances, and stress (Septiani, 2023).

Peer Leader Intervention

Peer educators, through comprehensive training, are prepared to conduct interactive and constructive sessions focused on enhancing student knowledge. These sessions also aim to integrate theoretical understanding with practical applications in everyday life, particularly in clarifying mechanisms that students (patients) may not yet understand, in line with their current health status (Sesaria et al., 2020).

A study at Banguntapan 3 Community Health Center in Bantul found that pretest results indicated that the majority of respondents in the control group (73.3%) and the intervention group (66.7%) had sufficient knowledge. In the posttest, the control group showed a decrease to 66.7% in the sufficient category, while the intervention group experienced

Putu Vera Megawati, Ni Luh Putu Inca Buntari Agustini*, Sri Dewi Megayanti, Ni Made Candra Citra Sari

Program Studi Magister Keperawatan, Fakultas Kesehatan, Institut Teknologi dan Kesehatan Bali
Corresponding author: *E-mail: incaagustini@gmail.com

DOI: <https://doi.org/10.33024/minh.v8i12.1690>

Intervention strategies to improve adherence to the five pillars of diabetes management among patients with type 2 diabetes mellitus: A literature review

an increase to 67.7%. Bivariate analysis showed a significant effect between the control and intervention groups on foot care knowledge in people with diabetes after receiving peer-based health education ($p = 0.006$) (Amry, 2020). A study of fellow type II diabetes sufferers at the Elderly Integrated Health Post found that social support is effective in addressing psychological stress and strengthening the response to chronic disease by improving immune function and reducing physiological responses to stress, especially when it is exercise-based and provided "invisibly" without causing emotional burden. The results of this study imply the important role of social support, especially from peer leaders, in improving diabetes self-management in type II diabetes sufferers. Univariate analysis showed that the majority of respondents were elderly (51-60 years old), had a low level of independence, were female, felt the role of relatives/family was less significant, and had had type II diabetes for more than a year (Khairani & Purwanti, 2023).

CONCLUSION

The implementation of the five pillars of Diabetes Mellitus management aims to achieve optimal blood sugar control, prevent/slow down complications, and improve quality of life through education, a healthy diet, regular physical activity, appropriate pharmacological therapy, and routine blood glucose monitoring. Various interventions that can be carried out include mobile phone applications, physical exercise/foot exercises/foot spas, audiovisuals/videos, flipcharts/leaflets/booklets and peer leaders. Recommendations for further research include conducting more in-depth research on one of these interventions to obtain more comprehensive results and benefits.

REFERENCES

- Adler, A. I., Coleman, R. L., Leal, J., Whiteley, W. N., Clarke, P., & Holman, R. R. (2024). Post-trial monitoring of a randomised controlled trial of intensive glycaemic control in type 2 diabetes extended from 10 years to 24 years (UKPDS 91). *The Lancet*, 404(10448), 145-155.
- Aniah, S. N., Hilda, H., & Arsyawina, A. (2024). Pengaruh senam kaki terhadap kadar gula darah pada penderita diabetes mellitus type II di Rumah Sakit Islam Bontang. *Jurnal Cakrawala Ilmiah*, 3(5), 1473-1482.
- Arksey, H., & O'malley, L. (2005). Scoping studies: towards a methodological framework. *International journal of social research methodology*, 8(1), 19-32.
- Amry, R. Y. (2020). Efektivitas Penggunaan Metode Pendidik Teman Sebaya Dalam Meningkatkan Pengetahuan Pencegahan Komplikasi Kaki Diabetes Di Puskesmas Banguntapan 3 Bantul. *Nursing Science Journal (NSJ)*, 1(2), 20-27.
- Damayanti, F., Hondrizal, H., Hutaperi, B., Jelmila, S. N., & Ashan, H. (2024). Hubungan Diabetes Melitus Terhadap Penderita Katarak. *Scientific Journal*, 3(4), 209-220.
- Erlina, L., & Avianti, N. (2023). Pengalaman Pasien Dalam Self-Management Diabetes Sebagai Indikator Instrumen Aplikasi E-Monitoring Diabetes: Studi Kualitatif. *Jurnal Riset Kesehatan Poltekkes Depkes Bandung*, 15(1), 87-92.
- Febriani, R. P., Prabowo, N. A., Putri, D. P., & Setyawan, S. (2023). Panduan diabetes bagi pasien dan keluarga. *Penerbit Tahta Media*.
- Gusdiani, I., Sukarni, S., & Mita, M. (2021). Pengaruh penggunaan aplikasi reminder terhadap kepatuhan diet dan kadar gula darah pasien diabetes melitus tipe II. *ProNers*, 6(1).
- Hasina, S. N., Shodiq, M., Ikwan, M., Putri, R. A., Noventi, I., & Masithah, D. (2022). Pengaruh Edukasi Kesehatan Terapi Buerger Allen Exercise Terhadap Pengetahuan Penderita Diabetes Mellitus Dalam Upaya Menurunkan Resiko Gangguan Perfusi Jaringan Perifer. *Jurnal Ilmiah Permas: Jurnal Ilmiah STIKES Kendal*, 12(4), 871-876.

Putu Vera Megawati, Ni Luh Putu Inca Buntari Agustini*, Sri Dewi Megayanti, Ni Made Candra Citra Sari

Program Studi Magister Keperawatan, Fakultas Kesehatan, Institut Teknologi dan Kesehatan Bali
Corresponding author: *E-mail: incaagustini@gmail.com

DOI: <https://doi.org/10.33024/minh.v8i12.1690>

Intervention strategies to improve adherence to the five pillars of diabetes management among patients with type 2 diabetes mellitus: A literature review

- Huda, M. M., Biantoro, S., & Prasetyo, M. D. (2022). Potensi Telenursing Sebagai Inovasi Untuk Meningkatkan Kualitas Hidup Pasien Diabetes Melitus Tipe 2: Literature Review. In *Proceedings of the National Health Scientific Publication Seminar* (Vol. 1, No. 2, pp. 289-298).
- International Diabetes Federation. (2025). "IDF Diabetes Atlas." *International Diabetes Federation. IDF Diabetes Atlas*. Retrieved from: <https://idf.org/about-diabetes/diabetes-facts-figures/>.
- Khairani, W., & Purwanti, N. S. (2023). Pengaruh social support dengan peer leader untuk meningkatkan self management diabetic pada sesama penderita DM tipe II di Posyandu Lansia. *Jurnal Kesehatan Masyarakat*, 11(5), 464-470.
- Laila, M. N., Yuniarti, Y., Noviardi, A., Muningsar, D. L. P., & Jaelani, M. (2020). Edukasi gizi berbasis aplikasi android meningkatkan pengetahuan empat pilar penatalaksanaan diabetes melitus pada peserta prolanis. *Jurnal Riset Gizi*, 8(1), 18-24.
- Liawati, N., Arsyah, S. N., & Patimah, I. (2022). Hubungan kepatuhan diet dengan kualitas hidup diabetes mellitus tipe 2. *Jurnal Medika Cendekia*, 9(02), 163-173.
- Nasrullah, N., Basri, M., Hartati, H., Bahtiar, B., Masdiana, M., Sudirman, S., & Rahman, R. (2024). *Media Dan Metode Promosi Kesehatan Dalam Perubahan Perilaku Kesehatan*. Nas Media Pustaka.
- Nurhayati, E., Astuti, A. W., & Fitriahadi, E. (2020). Scoping Review tentang Partisipasi Suami pada Masa Perinatal. *Midwifery Journal: Jurnal Kebidanan UM. Mataram*, 5(2), 97-106.
- Pratiwi, N. H., Wahyudi, D. A., & Sadhana, W. (2025). Hubungan Lima Pilar Pengelolaan Diabetes Melitus dengan Kadar Glukosa Darah pada Pasien DM Tipe II di Puskesmas Bernung. *Health Research Journal of Indonesia*, 3(3), 120-126.
- Prawinda, Y. D., Ningrum, D. E. S., Mujirahayu, V., Noviana, D. W., Zulyanti, E., Permataya, 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.
- Prihantoro, W., & Aini, D. N. (2023). Penerapan senam kaki diabetes terhadap nilai kadar gula darah pada penderita diabetes mellitus di kel. Krapyak kec. Semarang barat kota Semarang. In *Proceeding Widya Husada Nursing Conference* (Vol. 3, No. 1).
- Purwandari, C. A. A., Wirjatmadi, R. B., & Mahmudiono, T. (2022). Faktor Risiko Terjadinya Komplikasi Kronis Diabetes Melitus Tipe 2 pada Pra Lansia. *Amerta Nutrition*, 5(3).
- Rahman, Z. (2023). Pengaruh Edukasi Kesehatan Terhadap Self Care Pasien Diabetes Melitus Tipe 2: The Effect of Health Education on Self Care Type 2 Diabetes Mellitus Patients. *Jurnal Ilmiah Keperawatan (Scientific Journal of Nursing)*, 9(3), 576-581.
- Rosdina, S., Saputra, B., & Roslita, R. (2024). Hubungan self efficacy terhadap kepatuhan latihan fisik pada penderita diabetes mellitus tipe 2. *Health Care: Jurnal Kesehatan*, 13(1), 47-58.
- Rusmini, R., Arip, M., Emilyani, D., & Sari, L. A. (2023). The Influence of Using Medication Calendar on Driving Compliance In Patients with Diabetes Mellitus in Meninting Village. *Jurnal Keperawatan Terpadu (Integrated Nursing Journal)*, 5(2), 75-81.
- Saputra, A., Haskas, Y., & Restika, I. (2022). Hubungan kontrol glikemik dan kepatuhan pengobatan dengan kejadian hospital readmission pada pasien diabetes mellitus type 2 di RSUD Haji. *JIMP: Jurnal Ilmiah Mahasiswa & Penelitian Keperawatan*, 2(1), 95-102.

Putu Vera Megawati, Ni Luh Putu Inca Buntari Agustini*, Sri Dewi Megayanti, Ni Made Candra Citra Sari

Program Studi Magister Keperawatan, Fakultas Kesehatan, Institut Teknologi dan Kesehatan Bali
Corresponding author: *E-mail: incaagustini@gmail.com

DOI: <https://doi.org/10.33024/minh.v8i12.1690>

Intervention strategies to improve adherence to the five pillars of diabetes management among patients with type 2 diabetes mellitus: A literature review

- Sari, N. M. C. C., Sagitarini, P. N., & Sanjana, I. W. E. (2022). Efektifitas Pemberian Intervensi Diabetes Self-Management Education (DSME) Berbasis Audiovisual Terhadap Pengetahuan dan Keterampilan Perawatan Diri Diabetes. *Jurnal Kesehatan* 11(2):2721–8007.
- Septiani, D. (2023). *Pengaruh konseling diet dengan media lembar balik terhadap pengetahuan, keterampilan 3J dan kadar gula darah pada pasien DM Tipe II di poli rawat jalan RSUD Pulang Pisau* (Doctoral dissertation, Poltekkes Kemenkes Palangka Raya).
- Sesaria, T. G., Kusnanto, K., & Bakar, A. (2020). Efektivitas Tatalaksana Aplikasi Smartphone dan Non Smartphone terhadap Regulasi Glikemik (Kadar Gula Darah dan HbA1c) pada pasien Diabetes: A Systematic Review. *Jurnal Penelitian Kesehatan "SUARA FORIKES" (Journal of Health Research "Forikes Voice")*, 12(1), 93-98.
- Simatupang, R., & Kristina, M. (2023). Penyuluhan tentang diabetes melitus pada lansia penderita DM. *Jurnal Pengabdian Mandiri*, 2(3), 849-858.
- Sonhaji, S., Hani, U., & Rahmani, R. (2024). Pengaruh pendidikan kesehatan tentang manajemen diri terhadap tingkat kepatuhan pasien diabetes mellitus di Kabupaten Semarang. *Jurnal Manajemen Asuhan Keperawatan*, 8(1), 25-31.
- Srikartika, V. M., Akbar, M. R., & Lingga, H. N. (2019). Evaluasi intervensi media booklet terhadap tingkat pengetahuan dan kepatuhan pasien diabetes melitus tipe 2 di puskesmas banjarbaru selatan. *Jurnal Publikasi Kesehatan Masyarakat Indonesia*, 6(1), 27-35.
- Sundari, S. N. S., & Sutrisno, R. Y. (2023). Studi Kasus: Pengaruh Edukasi Penerapan Diet Diabetes Mellitus Terhadap Pengetahuan dan Kepatuhan Pada Pasien Diabetes Mellitus Tipe II. *Jurnal Sains Dan Kesehatan*, 7(1), 61-69.
- Syaipuddin, S., Suhartatik, S., Haskas, Y., Nurbaya, S., & Kasim, J. (2024). Efektivitas Program Metode Edukasi Audiovisual Tentang Penatalaksanaan Diri Pada Pasien Diabetes Mellitus Tipe 2 Di Puskesmas Perumnas Antang Makassar. *Innovative: Journal Of Social Science Research*, 4(1), 1342-1351.
- Utami, M. C., Jahar, A. S., & Zulkifli, Z. (2021). Tinjauan scoping review dan studi kasus. *Radial*, 9(2), 152-172.
- Wahyuni, E. D. (2023). *Pengaruh Video Edukasi Tentang Pengelolaan Diabetes Melitus Terhadap Kontrol Glukosa Darah Pada Pasien Diabetes Melitus Tipe 2* (Doctoral dissertation, Universitas Islam Sultan Agung Semarang).
- Wangi, N. L. P. A. P. (2025). *Efektivitas spa kaki diabetik berbasis orem's theory terhadap kontrol glikemik dan gejala neuropati perifer pada DM tipe 2 di Puskesmas Denpasar Timur 1*. Institut Teknologi dan Kesehatan (ITEKES) Bali.
- Wellyanah, C., Diba, F., & Ridwan, A. (2024). Intervensi plate method dan demonstrasi senam kaki diabetik pada penderita diabetes melitus: Sebuah studi kasus. *Jurnal Ilmiah Mahasiswa Fakultas Keperawatan*, 8(3).
- Winaningsih, W., Setyowati, S., & Lestari, N. T. (2020). Aplikasi nutri diabetic care sebagai media konseling untuk meningkatkan kepatuhan diet diabetes mellitus. *Ilmu Gizi Indonesia*, 3(2), 103-112.
- Yang, Y., Lee, E. Y., Kim, H. S., Lee, S. H., Yoon, K. H., & Cho, J. H. (2020). Effect of a mobile phone-based glucose-monitoring and feedback system for type 2 diabetes management in multiple primary care clinic settings: cluster randomized controlled trial. *JMIR mHealth and uHealth*, 8(2), e16266.
- Zhai, Y., & Yu, W. (2020). A mobile app for diabetes management: impact on self-efficacy among patients with type 2 diabetes at a community hospital. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research*, 26, e926719-1.

Putu Vera Megawati, Ni Luh Putu Inca Buntari Agustini*, Sri Dewi Megayanti, Ni Made Candra Citra Sari

Program Studi Magister Keperawatan, Fakultas Kesehatan, Institut Teknologi dan Kesehatan Bali
Corresponding author: *E-mail: incaagustini@gmail.com

DOI: <https://doi.org/10.33024/minh.v8i12.1690>