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Evaluation of Type 2 Diabetes Mellitus Chronic Disease Management Policy to Improve Self-Care Management

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ABSTRACT

Type 2 Diabetes Mellitus (T2DM) is a global health problem that requires long-term and collaborative management. Self-care management is the main key in controlling this disease effectively. Chronic disease management policies in various countries have been widely implemented, but their effectiveness in improving self-care management still needs further study. This study aims to further examine the evaluation of chronic disease management policies for type 2 diabetes mellitus to improve self-care management. Literature review was conducted by searching and analyzing journals from the Pubmed and Schimago portals with predetermined inclusion and exclusion criteria. Key search terms were identified using truncated words (in this case *) with Type 2 Diabetes Mellitus" OR "T2DM" AND "chronic disease management" OR "policy evaluation" OR "health policy" AND "self-care management" OR "self-management" OR "patient engagement". Most studies indicate that policy-based interventions such as patient education programs, primary healthcare integration, and digital health support contribute positively to improving self-care management in T2DM patients. However, their effectiveness varies across regions and health systems. Comprehensive and integrated chronic disease management policies have been shown to be effective in improving self-care management in T2DM patients. These findings can serve as a reference in formulating more responsive health policies.

Keywords: Type 2 Diabetes Mellitus, Health policy, Chronic disease, Self-care management

INTRODUCTION

An estimated 1 in 5 people aged 65–99 years, or 136 million people, live with diabetes worldwide. This number is projected to increase to 276 million by 2045 (1). As society ages, the healthcare burden associated with diabetes in older adults will increase significantly. This is due in part to this population managing comorbidities in addition to diabetes, including frailty, cognitive impairment, functional disability, and vascular complications, among others. pose significant challenges and affect millions of people worldwide.6,7 The prevalence of chronic conditions is increasing due to factors such as an aging population, sedentary lifestyles, unhealthy diets, and environmental influences. These conditions not only have a significant impact on affected individuals, but also place a significant burden on healthcare systems, economies, and society as a whole. Addressing the prevention, management, and treatment of chronic conditions is crucial for improving public health, enhancing quality of life, and ensuring sustainable healthcare systems globally.

Studies have shown that patients with good self-care skills tend to have better glycemic control and a lower risk of complications. With increasing awareness of the importance of self-care, various health policies have been

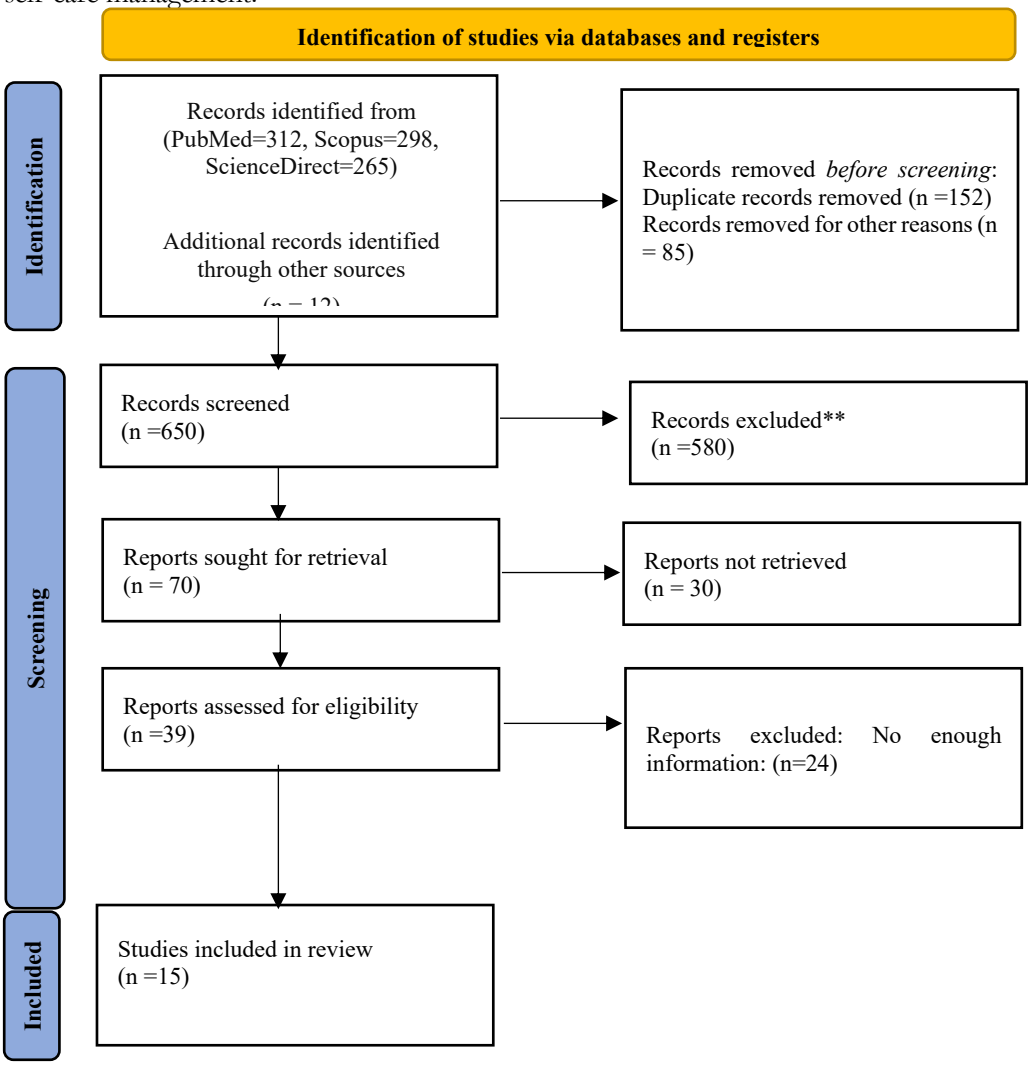
developed to support the management of chronic diseases, including T2DM. These policy-based approaches include the integration of primary healthcare services, patient education programs, the use of digital technology in monitoring patient health, and the provision of psychosocial support. However, the effectiveness of these policies in improving self-care management among T2DM patients varies and requires systematic evaluation. In this context, this literature review was conducted to comprehensively evaluate existing chronic disease management policies and their impact on improving self-care management in patients with T2DM. This review aims to provide robust scientific evidence to support decision-making in developing more effective health policies in the future.

MATERIALS AND METHODS

The method used in writing this article is a literature review, namely research by examining several international articles. The literature sources in this study are primarily from online database journals that provide journal articles in PDF format, such as Pubmed, Scopus, and Science Direct. To maintain the information up-to-date, the literature used primarily comes from literature collected over the past seven years (from 2020 to 2025).

Based on a search through the database 16 articles were obtained that met the inclusion criteria in the form of 1) quantitative and qualitative research types and other relevant research; 2) the target population is type 2 DM sufferers; 3) published between 2020-2025; 4) articles using English; and 5) articles in full text form. The key search terms were identified using truncated words (in this case*) with words in the form of: "Type 2 Diabetes Mellitus" OR "T2DM" AND "chronic disease management" OR "policy evaluation" OR "health policy" AND "self-care management" OR "self-management" OR "patient engagement".

Data were taken from articles that met the inclusion criteria and requirements and then presented in a table with columns in the form of author, year, country, research reference, objectives and, type of study and research results related to the evaluation of chronic disease management policies for type 2 diabetes mellitus to improve self-care management.



RESULTS AND DISCUSSION

A total of 15 articles met the requirements, and as a final result were obtained for review. Characteristics studies in study of 15 article journal Which identified based on 4 (four) main variables including Policy and Regulation (3), Technology and Innovation Factors (4), Demographic Factors (3) and Self-Management (5).

Policies and Regulations

Title	Author, Year, Country Reference	Objective	Study Design	Results
War on Diabetes in Singapore: a policy analysis	Yong et al, 2021, Singapore [12]	to assess to explore how these policies have been positioned to bring about change in addressing the rising prevalence of diabetes, and to analyze the policy responses and associated challenges involved.	Qualitative	The findings indicate that the WoD policy has generated a sense of unity and purpose among most policy actors. Policy actors recognize the policy's core message and have begun implementing changes to align their interests with government policy. Directly addressing diabetes sufferers is crucial to understanding their needs. Clarifying the intended target audience and articulating how the policy seeks to support identified groups will be essential. Issues such as fake news, unclear messaging, and a lack of regulation of uncertified healthcare providers are other identified problem areas. High costs of innovation, production, and marketing are key concerns among food and beverage companies.
Policy analysis of self-care programs: a qualitative study protocol	Mohammadzade et al, 2022, Saudi Arabia [13]	Conducting a policy analysis study can be useful in closely examining the content, processes, contexts, and actors of self-care programs.	Qualitative	To comprehensively examine the content, process, context, and actors of self-care programs, a policy analysis study can be helpful. Therefore, this study will analyze the self-care program using a policy analysis approach. By identifying challenges in the program's content, process, context, and actors, corrective solutions to improve the program's current status, as well as policy recommendations tailored to the country's context, will be provided. Furthermore, policymakers at various authorities at the national, regional, and provincial levels will benefit from the results of this study.
Policies for type 2 diabetes and non-communicable disease management during the COVID-19 pandemic in Kenya and Tanzania: a desk review and views of decision-makers	Shukri al, 2024, Africa [14]	to identify gaps, if any, in the management of NCDs, particularly diabetes, during COVID-19 in Kenya and Tanzania to inform recommendations for priority actions for the management of	Desk Review	Kenya and Tanzania have developed and updated several policies/guidelines to address continuity of care in emergencies. However, gaps exist within these documents and between them and practice. Health systems need to establish disaster preparedness plans that integrate attention to NCD care to better manage severe disruptions caused by emergencies such as pandemics. These

		NCDs during similar crises in the future		guidelines should include contingency planning to provide adequate resources for NCD care and should also address the evaluation of implementation effectiveness.

The previous table shows that the Singapore study demonstrated that the policy successfully created a sense of unity among policy actors, despite challenges such as fake news, unclear messaging, and a lack of regulation of uncertified healthcare providers. Furthermore, high innovation, production, and marketing costs are a major concern for food and beverage companies. In conclusion, despite increasing public awareness, ongoing dialogue with various policy actors is needed to address these challenges. [12]

Another study stated that the self-care program is recommended by the WHO as a crucial step towards achieving universal health coverage, improving health, and protecting vulnerable populations. This study was conducted in four phases: a global policy review, a qualitative study of the program's status in Iran, an analysis using the policy triangle framework, and the formulation of initial policy recommendations. The results are expected to provide corrective solutions to improve the current program status as well as policy recommendations tailored to the country's context. This approach also highlights the potential of self-care to make healthcare more affordable, convenient, and equitable, especially for underserved populations. [13] Research related to DM during the COVID-19 era shows that before the pandemic, both countries (Kenya and Tanzania) did not have comprehensive policies to ensure continuity of NCD care. However, during the pandemic, several policy documents were updated, and new policies were developed to support NCD care. Measures such as extended drug supplies and new guidelines for emergency care were implemented, although gaps between policy and practice remain. [15]

The causes of diabetes are diverse. Respondents pointed to a complex interaction between economic, social, cultural, individual, national, and environmental factors, which inform policy formulation. [16] As part of its overall strategy, the government is working with primary care networks (PCNs) to provide more supportive services for people with diabetes. [12] The process of policy formulation and implementation is influenced by many political, economic, social, and cultural factors. As a result, the policy-making process faces many challenges, and in certain cases, the desired policy goals or objectives may not be fully achieved. [17]

Technology and Innovation Factors

Title	Author, Year, Country Reference	Objective	Study Design	Results
Effectiveness of disease-specific mHealth apps in patients with diabetes mellitus: Scoping review	Eberle et al, 2021, Germany [18]	to evaluate the clinical effectiveness of mHealth applications in DM management by analyzing health-related outcomes in patients diagnosed with type 1 DM (T1DM), type 2 DM (T2DM), and gestational DM.	Systematic Review	A DM-specific mHealth app improved glycemic control by significantly reducing HbA1c levels in both T1DM and T2DM patients. Overall, the mHealth app effectively improved DM management. However, further detailed clinical efficacy research is needed. (JMIR
SFeasibility and Acceptability of the HOME Model to Promote Self-Management among Ethnic Minority Elderly with Type 2 Diabetes Mellitus in Rural Thailand: A Pilot Study	Pitchalard et al, 2022, Thailand [19]	to explore the feasibility, acceptability, and effects of the HOME model (Home intervention; Online monitoring; Multidisciplinary approach; and Equity and education) specifically to improve self-	Quasi Experiment	This study found that stigmatization. Overall, 23 couples of EME with T2DM and their family caregivers completed the 12-week intervention. They reported that the HOME model was helpful and motivating, and they reported satisfaction with the services provided. EME with T2DM showed significant reductions in blood glucose levels, and significant increases in self-management activities, happiness, and satisfaction compared to baseline.

		management activities, glycemic control, and satisfaction of EME patients with T2DM in rural areas of Thailand.		Family caregivers also experienced significant increases in happiness and reported satisfaction with the HOME model.
Effects of a health education technology program on long-term glycemic control and self-management abilities of adults with type 2 diabetes: A randomized controlled trial)	Pai et al, 2021, Taiwan [20]	to explore the effects of a health technology education program on long-term glycemic control and self-management abilities of adults with type 2 diabetes (T2D)	RCT	The mean HbA1c level in the experimental group decreased by 0.692% (7.564 mmol/mol) and 0.671% (7.332 mmol/mol) at 3 and 6 months after the intervention ($p < 0.05$) while the mean increase in PDSMS scores at 3 and 6 months after the intervention was significantly higher than the control group ($p < 0.05$). Conclusion: The health technology education program was more effective than routine concomitant care alone in reducing HbA1c and improving self-management skills in T2D patients.
Efficacy of telemedicine on glycemic control in patients with type 2 diabetes: A meta-analysis	Groot, 2021, Australia [21]	To evaluate the impact of telemedicine intervention on hemoglobin A1c (HbA1c), systolic blood pressure (SBP), diastolic blood pressure (DBP), body mass index (BMI), post-meal glucose (PPG), fasting plasma glucose (FPG), body weight, cholesterol, mental and physical quality of life (QoL) in patients with type 2 diabetes.	Cross Sectional Study	Telemedicine is effective in improving HbA1c and, thus, glycemic control in patients with type 2 diabetes. Furthermore, telemedicine interventions were also found to significantly improve other health outcomes and QoL scores. Subgroup analyses emphasized that telemonitoring interventions, delivered at a frequency of less than weekly and for a duration of 6 months, had the greatest effect on HbA1c reduction.

The table presented above shows that previous research evaluating the effectiveness of a mobile health (mHealth) application specifically designed for diabetes mellitus patients demonstrated that this application was able to improve glycemic control with a significant reduction in HbA1c values in both type 1 and type 2 diabetes patients. Furthermore, this application also improved patients' self-care skills and self-efficacy. However, further research is needed to explore the clinical impact in more depth. [18]

Meanwhile, the HOME model (Home intervention; Online monitoring; Multidisciplinary approach; Equity and education) was designed to improve self-management in ethnic minority older adults with type 2 diabetes in rural Thailand. This study demonstrated that this model is acceptable and feasible to implement, resulting in improved glycemic control, self-management activities, and patient and family satisfaction. This intervention also had a positive impact on the happiness and satisfaction of patients' families. [19] Community resources and local government organizations can also fill critical gaps in services by developing community-based support systems. [22]

An app has been designed and revealed that this health education technology program aims to improve long-term glycemic control and self-management skills in patients with type 2 diabetes. Previous studies have found this technology-based program to be effective in lowering HbA1c and improving patients' ability to manage their diabetes. However, the results suggest that personalizing the program could further enhance its effectiveness. [20]

Previous meta-analyses have shown that telemedicine, which utilizes remote communication technology, has been shown to be effective in improving glycemic control in patients with type 2 diabetes. This meta-analysis demonstrated significant reductions in HbA1c, blood pressure, and body weight. Furthermore, telemedicine also positively impacted patients' mental and physical quality of life, making it a cost-effective and convenient intervention. [21]

Overall, these studies demonstrate that technological innovations, such as mHealth apps, telemedicine, and technology-based health education programs, have significant potential to support diabetes mellitus management. Furthermore, community-based approaches like the HOME model have demonstrated effectiveness in providing additional support to vulnerable groups, such as older ethnic minority populations. These technology-based interventions not only improve glycemic control but also enhance patients' self-care skills, self-efficacy, and quality of life. These findings emphasize the need for further research to strengthen implementation and adaptation across diverse social and cultural contexts to ensure broader benefits for diabetes patients.

Demographic Factors

Title	Author, Year, Country Reference	Objective	Study Design	Results
	Abu et al, 2025, UK [23]	describe five to evaluate factors influencing the acceptance of a culturally adapted Diabetes Self-Management Education and Support (DSMES) program among ethnic minority patients diagnosed with type 2 diabetes mellitus (T2DM).	Systematic Review	Nine studies met inclusion criteria, demonstrating that culturally tailored DSMES programs significantly increased uptake among ethnic minority groups. Key factors influencing participation included demographic characteristics, diabetes knowledge, emotional support, and cultural beliefs. Barriers such as language proficiency, cost, and diabetes fatalism were identified, while enabling factors included the use of local champions and culturally specific strategies.
The Self-Care Behaviors of Adults With Type 2 Diabetes Within 10 Years After Diagnosis: Relationship Between Self-Care Behaviors, Knowledge and Education	Horiguchi et al 2021, Japan [24]	to investigate self-care behaviors among people with type 2 diabetes in the 10 years following diagnosis and examine the relationship between their self-care behaviors and diabetes knowledge and education.	Cross Sectional Study	Data from 125 participants were analyzed. Treatment adherence was high at all times; however, relatively few patients engaged in diet and exercise therapy. High levels of self-care behaviors were associated with high levels of knowledge, initial diabetes education less than three months after diagnosis, and re-education more than two years after diagnosis.
Diabetes self-management and its influencing factors among adults with type 2 diabetes mellitus in rural Sri Lanka: A cross-sectional study	Premadasa et al, 2024, Sri Lanka [25]	to describe DSM among adults with Type 2 Diabetes Mellitus (T2DM) in rural Sri Lanka and to examine whether perceived stress, health literacy, self-efficacy, and family support can predict DSM among adults with T2DM in rural Sri Lanka.	Cross Sectional Study	Approximately half of the participants had uncontrolled T2DM (Fasting Plasma Glucose (FPG) >126) and suboptimal DSM. Analysis revealed that all variables could explain 39.3% of the variance in DSM among rural Sri Lankan adults with T2DM. However, DSM was significantly predicted by self-efficacy ($\beta = 0.530$, $p = 0.001$), adverse family involvement ($\beta = -0.169$, $p = 0.038$), and health literacy ($\beta = -0.162$, $p = 0.020$).

The previous table presents how sociodemographic factors influence the acceptance of culturally tailored diabetes management education and support programs among ethnic minority patients with type 2 diabetes. The results indicate that culturally tailored programs can increase patient participation, particularly considering

demographic characteristics, diabetes knowledge, emotional support, and cultural beliefs. Barriers such as language barriers, cost, and diabetes fatalism were also identified. [23]

Previous research explored the relationship between self-care behaviors, knowledge, and education in patients with type 2 diabetes 10 years after diagnosis. Results showed that high levels of self-care behaviors were associated with good diabetes knowledge, initial education within three months of diagnosis, and re-education after two years. These factors contribute to successful diabetes management. [24]

Research in Sri Lanka identified factors such as stress experienced by adults with diabetes, with health literacy, self-efficacy, and family support as key predictors. Self-efficacy was found to be the most significant factor in improving diabetes management, while unsupportive family involvement can be a barrier. [25]

Patients' cultural identity, including language and beliefs, influences their acceptance of culturally tailored diabetes education programs. Patients' initial education and knowledge levels are directly related to their self-care behaviors. In rural areas, such as Sri Lanka, perceived stress, health literacy, and family support are key predictors of diabetes management. By understanding these demographic factors, healthcare providers can develop more inclusive and effective approaches to diabetes management.

Self – Management and Stakeholders

Title	Author, Year, Country Reference	Objective	Study Design	Results
Implementation of Chronic Care Model for Diabetes Self-Management: A Quantitative Analysis	Rashid et al, 2022, Australia [26]	to implement the Chronic Care Model (CCM) for self-management of type 2 diabetes in primary health care settings in rural Pakistan	Quantitative	Quantitative analysis showed that diabetes self-management has a gender dimension in rural Pakistan as the mean difference in HbA1c after a 6-month intervention of the two components of the chronic care model between male and female diabetes patients was 0.83 ($p = 0.039$) with a 95% CI (−0.05; −1.61). The mean difference in BMI after the 6-month intervention between men and women was significant ($p < 0.05$). The mean difference was 4.97 kg/m2, $p = 0.040$ with a 95% CI (−0.24; −9.69). The results showed that the two components of the CCM were effective and improved clinical outcomes for diabetes patients in rural Pakistan.
Barriers to and facilitators of diabetes self-management practices in Rupandehi, Nepal- multiple stakeholders' perspective	Adhikari et al, 2021, Nepal [27]	to explore barriers and enabling factors to type 2 diabetes self-management practices by taking the perspectives of various stakeholders in Nepal.	Qualitative	Five key themes emerged that influenced diabetes self-management practices: individual factors, socio-cultural and economic factors, health system and policy factors, resource availability and accessibility, and environmental factors. Key barriers were: lack of knowledge about diabetes self-management practices, cultural practices, inadequate counseling, lack of guidelines and protocols for counseling, and financial concerns. Key facilitators were: motivation; support from family, peers, and physicians; and availability of community resources. Conclusions:
Chronic disease management program applied to type 2 diabetes patients and	Hyun et al, 2023, Korea [28]	examined the effects of the Chronic Disease Management	Cohort	Among the 11,915 patients with T2DM in the cohort, 4,617 patients were assigned to the CDMP and non-CDMP groups,

prevention of diabetic complications: a retrospective cohort study using nationwide data		Program (CDMP), a health insurance fee-for-service benefit, on the incidence of diabetic complications in patients newly diagnosed with T2DM using the National Health Insurance data.		respectively. CDMP helped reduce the risk of overall and microvascular complications compared with the non-CDMP group; however, the protective effect against macrovascular complications was only observed in those aged ≥ 40 years. Subgroup analysis of the group aged ≥ 40 years with high adherence (MPR ≥ 80) showed that CDMP effectively reduced the incidence of microvascular and macrovascular complications.
Self-Management Education to Control Blood Sugar Levels and Hba1c Value for Type 2 Diabetes Patients	Bakara et al, 2022, Indonesia [29]	to determine the effect of DSME on reducing blood sugar levels and HbA1c values in type 2 diabetes patients.	Experimental	The results of the study showed a significant change in blood sugar levels before and after DSME. Before DSME, blood sugar levels with Mean±SD 341.60±157.589, while after the intervention, blood sugar levels became 107.97±9.984 with p: 0.001. While the HbA1c value before the intervention was Mean±SD 8.4313±2.2610, and after the intervention, the HbA1c value became 6.4553±1.2426 with p = 0.001. Conclusion: DSME can be used as an alternative intervention that can reduce blood sugar levels and HbA1c values in people with type 2 diabetes.
The effects of diabetes self-management programs on clinical and patient reported outcomes in older adults: a systematic review and meta-analysis	Alliston, et al, 2023 Nepal [30]	becomes more complex for older adults, self-management programs have been shown to support this population in meeting their diverse medical needs.	Systematic review and meta-analysis	Evidence for diabetes self-management programs for older adults shows small but clinically meaningful reductions in A1C, improvements in patient-reported outcomes (behavior, self-efficacy, knowledge), and other clinical outcomes (BMI, weight, and lipids). The specific strategies used in diabetes self-management programs for older adults should be considered to achieve optimal outcomes.

Based on the table presented for the study entitled "Implementation of the Chronic Care Model for Diabetes Self-Management: A Quantitative Analysis," the study explores the application of the Chronic Care Model (CCM) in diabetes self-management. CCM is a structured approach aimed at improving patient engagement and health outcomes. This study will likely analyze quantitative data to measure the impact of CCM on blood sugar control, patient adherence, and the effectiveness of the healthcare system. [26]

The second title, "Barriers to and facilitators of diabetes self-management practices in Rupandehi, Nepal - multiple stakeholders' perspective," highlights the challenges and enabling factors in diabetes self-management practices in the Rupandehi area of Nepal. The perspectives of various stakeholders, such as patients, healthcare providers, and the local community, are focused on understanding the social, economic, and cultural dynamics that influence disease management. [27]

In the study, "Chronic disease management program applied to type 2 diabetes patients and prevention of diabetic complications: a retrospective cohort study using nationwide data," researchers evaluated the effectiveness of chronic disease management programs. The study used nationwide data to identify how these programs contribute to preventing type 2 diabetes complications and provide evidence-based insights into long-term management patterns. [28]

"Self-Management Education to Control Blood Sugar Levels and HbA1c Value for Type 2 Diabetes Patients" discusses the importance of self-education in controlling blood sugar levels and HbA1c values in type 2 diabetes

patients. This study potentially illustrates how an educational approach can improve patients' understanding and ability to effectively manage their health. [29]

The fifth study, titled "The effects of diabetes self-management programs on clinical and patient-reported outcomes in older adults: a systematic review and meta-analysis," aimed to analyze the impact of diabetes self-management programs on clinical outcomes and patient satisfaction in older adults. A systematic review of the results from multiple studies provides strong evidence of improvements in quality of life, blood sugar control, and patient self-efficacy. [30]

Diabetes self-management programs for older adults continue to evolve, particularly for older adults living with multimorbidity. Our recent review continues to demonstrate the value of self-management programs on clinical and patient-reported outcomes by synthesizing available evidence and identifying the most effective self-management approaches to use based on outcome type. Overall, a diabetes self-management program intervention for older adults was found to reduce HbA1C by -0.32%, a statistically significant and clinically meaningful improvement, particularly when the self-management program was offered in conjunction with pharmacotherapy. [31–38]

Research over the past five years has shown that *self-management* is a crucial component of any diabetes management program. Self-education encourages patients to take an active role in managing their disease through lifestyle changes, dietary adjustments, physical activity, and regular monitoring of blood sugar and HbA1c levels. The success of a *self-management program* depends heavily on effective interactions between patients and stakeholders, such as healthcare professionals, families, and communities. Stakeholders play a key role as facilitators, providing education, emotional support, and access to resources necessary for optimal diabetes management.

Furthermore, the involvement of various stakeholders can reduce the barriers patients face in implementing *self-management* . The perspectives of stakeholders, such as healthcare providers, can provide insights into programs that better suit individual needs. Local communities also play a crucial role in creating an environment that supports patient lifestyle changes, such as accessibility to healthy foods and exercise facilities. Therefore, a collaborative approach between patients and stakeholders not only improves clinical outcomes but also the overall quality of life of diabetes patients.

CONCLUSION

The involvement of stakeholders such as healthcare workers, families, and communities is also a key factor in the success of diabetes management programs. Studies show that collaboration between patients and stakeholders can overcome common barriers to *self-management* , such as lack of access to resources, economic constraints, and limited understanding of the disease. With appropriate stakeholder support, these programs not only improve clinical outcomes but also provide long-term benefits such as preventing diabetes complications, reducing the burden of chronic disease, and improving the quality of life for patients across various social and cultural contexts. These findings emphasize the importance of a holistic approach and collaboration in optimal diabetes management.

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