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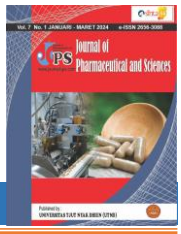

The Effect of Shared Decision Making on Glucose and HbA1c Levels in Diabetes Mellitus Patients: A Literature Review

Pengaruh Pengambilan Keputusan Bersama terhadap Kadar Glukosa dan HbA1c pada Pasien Diabetes Mellitus: Tinjauan Literatur

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Abstract

Background: Diabetes mellitus (DM) is a chronic disease with a high global prevalence, requiring comprehensive and patient-centered care. Shared Decision Making (SDM) is a collaborative approach between patients and healthcare providers that has been associated with improved treatment adherence and clinical outcomes in chronic diseases. **Objective:** This literature review aimed to evaluate the impact of SDM on glycemic control, particularly blood glucose and HbA1c levels, in patients with diabetes mellitus. **Methods:** A systematic search was conducted on PubMed and Scopus databases using specific keywords, limited to randomized controlled trials (RCTs) published in English between 2015 and 2025. Inclusion criteria included adult patients with type 1 or type 2 DM, SDM as the primary intervention, and HbA1c or blood glucose levels as clinical outcomes. **Results:** Five RCTs met the eligibility criteria. Most studies reported a decrease in HbA1c in the intervention group, although only one study showed a statistically significant within-group reduction. No consistent significant differences were observed between the intervention and control groups. However, SDM was positively associated with improved patient engagement, satisfaction, and the quality of communication. **Conclusion:** While evidence regarding the direct impact of SDM on HbA1c remains inconclusive, SDM appears to enhance patient participation and therapeutic communication in diabetes care. Further standardized and long-term studies are needed to confirm its clinical effectiveness.

***Keywords*: Shared decision making, Diabetes mellitus, HbA1c, Glucose level, Patient-centered care**

Abstrak

Latar Belakang: Diabetes melitus (DM) merupakan penyakit kronis dengan prevalensi tinggi secara global, yang memerlukan pendekatan perawatan komprehensif dan berpusat pada pasien. *Shared Decision Making* (SDM) atau pengambilan keputusan bersama merupakan pendekatan kolaboratif antara pasien dan tenaga kesehatan yang telah dikaitkan dengan peningkatan kepatuhan terapi dan luaran klinis pada penyakit kronis. **Tujuan:** Tinjauan literatur ini bertujuan untuk mengevaluasi pengaruh SDM terhadap kendali glikemik, khususnya kadar glukosa darah dan HbA1c pada pasien diabetes melitus. **Metode:** Pencarian literatur dilakukan secara sistematis melalui basis data PubMed dan Scopus menggunakan kata kunci tertentu, dibatasi pada studi uji klinis acak (RCT) berbahasa Inggris yang diterbitkan antara tahun 2015 hingga 2025. Kriteria inklusi meliputi pasien dewasa dengan DM tipe 1 atau tipe 2, intervensi utama berupa SDM, serta luaran klinis berupa kadar HbA1c atau glukosa darah. **Hasil:** Sebanyak lima RCT memenuhi kriteria inklusi. Mayoritas studi melaporkan penurunan kadar HbA1c pada kelompok intervensi, meskipun hanya satu studi yang menunjukkan penurunan bermakna secara statistik dalam kelompok tersebut. Tidak ditemukan perbedaan signifikan yang konsisten antara kelompok intervensi dan kontrol. Namun demikian, SDM dikaitkan secara positif dengan peningkatan keterlibatan pasien, kepuasan, dan kualitas komunikasi klinis. **Kesimpulan:** Meskipun bukti mengenai dampak langsung SDM terhadap kadar HbA1c masih belum

konsisten, pendekatan ini terbukti meningkatkan partisipasi pasien dan komunikasi terapeutik dalam perawatan diabetes. Diperlukan penelitian lebih lanjut yang terstandarisasi dan berdurasi panjang untuk memastikan efektivitas klinisnya.

Kata Kunci: Pengambilan keputusan bersama, Diabetes melitus, HbA1c, Kadar glukosa, Perawatan berpusat pada pasien

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Introduction

Diabetes mellitus (DM) is one of the chronic diseases whose prevalence continues to increase globally and poses a significant burden on the health care system. Data from the International Diabetes Federation (IDF) in 2021 shows that more than 537 million adults worldwide are living with diabetes, and this figure is expected to increase to 643 million by 2030 and 783 million by 2045 [1]. Diabetes not only increases the risk of microvascular and macrovascular complications, but also significantly affects patients' quality of life and life expectancy. [2].

Optimal diabetes management requires the active involvement of patients in decision-making regarding their treatment. One approach that is developing in modern clinical practice is Shared Decision Making (SDM). SDM is a collaborative process between healthcare workers and patients, where clinical information and patient preferences are considered in a balanced manner in choosing the best intervention [3]. This approach has been shown to strengthen patient engagement, improve adherence to therapy, and improve clinical outcomes in a variety of chronic conditions, including diabetes mellitus [4,5]

A systematic study by Joosten et al. (2008) showed that SDM was significantly associated with increased patient satisfaction, decreased anxiety, and improved glycemic control.[6]. Diabetic patients involved in shared decision-making tended to have better HbA1c control (an average HbA1c decrease of 0.5% in six months) compared to the control group. [7]. These findings are reinforced by a recent meta-analysis, which demonstrates that SDM interventions in diabetes management contribute to improvements in clinical parameters, including HbA1c, blood pressure, and body mass index. [8,9]. In addition, the implementation of SDM also supports the principle of *patient-centered care*, a key pillar in modern clinical practice. DM patients are often faced with a variety of therapy options, ranging from lifestyle changes to the use of insulin and oral antihyperglycemic medication. Without patient involvement in the decision-making process, the interventions chosen often do not reflect the patient's values and preferences, which can ultimately decrease the effectiveness of therapy. [10].

Although the shared decision-making (SDM) approach has been widely studied in the context of chronic diseases, such as diabetes, most studies have focused more on subjective outcomes, including patient satisfaction, adherence, and quality of life. Objective clinical outcomes, such as blood glucose levels and glycated hemoglobin (HbA1c), are primary indicators of the success of diabetes therapy. Unfortunately, there is a lack of literature specifically reviewing the impact of SDM on glycemic control, particularly in developing countries. Therefore, this literature review was compiled to assess the impact of shared decision-making on blood glucose levels and HbA1c in patients with diabetes mellitus.

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Method

This literature review was conducted systematically to identify and analyze studies that evaluated the effect of shared decision making (SDM) on glucose and HbA1c levels in DM patients. The literature search strategy was focused on two highly reputable international scientific databases, namely PubMed and Scopus, using a combination of keywords and Boolean operators, "Shared Decision Making" AND "Diabetes Mellitus" AND "Randomized Controlled Trial" AND "HbA1c" AND "Glucose level". The search was limited to English-language articles published between 2015 and 2025, specifically focusing on open-access and original research articles. The focus of the search was directed to studies with a Randomized Controlled Trial (RCT) design involving adult patients with a diagnosis of diabetes mellitus, as well as evaluating the implementation of SDM as the primary intervention, with clinical outcomes in the form of HbA1c and/or blood glucose levels.

The inclusion criteria used in the selection included: (1) primary studies with RCT design, (2) adult populations with type 1 or type 2 diabetes mellitus, (3) interventions involving the application of SDM, (4) reporting of clinical outcomes in the form of HbA1c or blood glucose levels, and (5) articles available in full text and English. The exclusion criteria include: (1) articles in the form of literature reviews, editorials, comments, and letters to editors; (2) studies that do not explicitly mention the application of SDM; (3) studies with specific populations such as children, pregnant women, or patients with severe cognitive Impairment; (4) articles that do not report relevant clinical outcomes; and (5) articles identified as duplicates.

Results and Discussion

Results

Of the 28 articles obtained through the search engine, one duplicate article was identified and removed using Mendeley. A total of 27 articles were kept for further screening. The full text of the remaining 27 articles was assessed for thorough eligibility, and nine articles were excluded because they reported inappropriate findings or incomplete information. A total of 9 articles were removed because they lacked full-text, and four articles were removed because they were article reviews. Finally, five articles were included in the survey.

A total of 5 randomized controlled trials (RCTs) have been included in this literature review to evaluate the effect of Shared Decision Making (SDM) on glycemic output, especially HbA1c levels, in patients with diabetes mellitus (Table 1). The majority of studies were conducted in patients with type 2 diabetes mellitus (T2DM) [11–14], while one study involved patients with type 1 and type 2 diabetes mellitus [15]. While one study involved patients with type 1 and type 2 diabetes mellitus, the number of participants varied, ranging from 50 [29] to 1,400 [13]. The interventions used include various SDM models, including patient-centered communication (DEBATE model) [16], model SDM-OPTIMAL [12], negotiation over the phone [13], Computer-based digital toolkit [17][18], and health system-based interventions (POWER2DM) [15]. The duration of the intervention ranged from 37 weeks. [15] up to 24 months [16,18].

All studies evaluated HbA1c as a primary clinical outcome, and some studies also assessed additional parameters such as lipid profile, body mass index (BMI), safety, and quality of life (QoL) [15]. Despite variations in the design and methods of SDM interventions, most studies reported a decrease in HbA1c levels in the intervention group. However, only one study showed a statistically significant decrease in the intervention group, with no significant difference compared to the control group. [15]. Three studies found no statistically significant difference between the intervention and control groups [12,16,18], while one study showed results that varied depending on the analysis approach used (intention-to-treat vs. per-protocol) [13].

Most interventions were conducted in outpatient settings, focusing on structured communication and the use of decision-making tools between healthcare workers and patients. These interventions generally aim to empower patients to make informed treatment decisions and improve adherence to therapy or lifestyle changes [19]. Although the Influence of SDM on lowering HbA1c levels remain statistically inconsistent, some studies emphasize the positive benefits on patient-health worker communication, patient satisfaction, and confidence in decision-making [20]. Overall, SDM interventions in diabetic populations show potential benefits in improving glycemic control and patient engagement. However, the evidence on the effectiveness of SDM in significantly lowering HbA1c remains inconsistent, requiring further studies with longer durations and more standardized intervention approaches in various clinical settings.

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Shared Decision Making

Shared Decision Making (SDM) is a process in which patients and healthcare providers share information, values, and preferences to make shared decisions regarding patient treatment [21]. SDM is considered to be able to overcome the communication gap between health workers and patients. A study developed a Three Talk Model framework for SDM practices in healthcare. This model divides the decision-making process into three stages. The first stage is Team Talk, which emphasizes the importance of building trust between patients and healthcare workers as a basis for collaborative decision-making. In the Option Talk stage, healthcare professionals explain the various treatment options available, based on scientific evidence, and discuss the associated benefits and risks. The final stage, Decision Talk, involves an in-depth discussion of the patient's preferences, so that the final decision made reflects the individual's values and expectations [22].

SDM is considered effective in increasing patient engagement and supporting decision-making that is appropriate to individual needs in chronic disease management [23,24]. SDM skills training for physicians has been shown to improve patient outcomes and satisfaction, underscoring the importance of personalized care [21]. The implementation of SDM can improve patient satisfaction and improve clinical communication processes, although it does not always result in significant changes [25].

Clinical Outcomes in Patients with Diabetes Mellitus

Clinical outcomes refer to a variety of indicators that reflect the effectiveness of therapy and the patient's overall health condition. In DM patients, one of the most frequently used key parameters is hemoglobin A1c (HbA1c), which reflects the average blood glucose level over the past 90 months and is an important benchmark in assessing the success of glycemic control [26,27]. Blood pressure and lipid profiles, including LDL and HDL cholesterol levels, should be monitored regularly to ensure optimal health. This is because DM patients are at high risk of developing cardiovascular complications [28,29]. Weight status or Body Mass Index (BMI) also needs to be monitored because obesity is a risk factor as well as a therapeutic target in type 2 diabetes [30,31].

Adherence to medication and lifestyle changes is a non-biomedical indicator that can affect long-term outcomes [32,33]. Non-compliant patients have a higher risk of developing complications, both microangiopathy (such as nephropathy and retinopathy) and macroangiopathy (such as coronary heart disease) [34–36]. The patient's quality of life (which includes physical, psychological, and social aspects) is also an important outcome in the management of DM, since the success of therapy is measured not only by clinical parameters alone, but also by how much improvement in the patient's functional condition and subjective well-being [37]. A study states that the application of a shared decision-making approach can have a positive impact on satisfaction and increase patient participation. This model is considered effective in encouraging active patient participation and improving two-way communication between patients and healthcare workers. A systematic review reported that respondents preferred and valued SDM and wanted to make decisions together with health facilities. Healthcare providers have a favorable view of SDM and prefer to involve patients in decision-making [38]. However, several studies have also demonstrated that significant changes in biomedical parameters such as HbA1c or blood pressure are not consistently achieved [39,40]. SDMs are believed to enhance patient understanding and motivation, thereby positively influencing clinical outcomes.

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Table 1. Summary of the results of the study on the effect of Shared Decision Making on HbA1c levels

Author (Year)	Study Design	Population	Country	Intervention	Clinical Outcome	Duration	Result
Wollny et al. (2019) [16]	RCT	Type 2 DM I (n=435), C (n=398)	Germany	Patient-centred and SDM-centric communication: the DEBATE model	HbA1c	24 months	The decrease in HbA1c levels from T0 to T4 was statistically significant in both groups ($p < 0.0001$). However, there was no statistically significant difference between the two groups.
Ouden et al. (2017)[13]	RCT	Type 2 DM I (n=72), C (n=81)	Netherland	SDM model OPTIMAL	HbA1C and Total cholesterol	24 months	There was no significant difference in HbA1C levels and total cholesterol in both groups ($p> 0.05$)
Lauffenburger et al. (2019)[12]	RCT	Type 2 DM I (n=700), C (n=700)	New Jersey	SDM intervention over the phone for interviews and negotiations	HbA1c, Adherence	12 months	The change in HbA1c from baseline was -0.79 (SD:2.01) in the control group and -0.75 (SD:1.76) in the intervention group There was no significant difference in adherence. In treatment-based analysis, the intervention significantly improved diabetes control (-0.48, 95%CI: -0.91, -0.05).
Huang et al (2017)[18]	RCT	Type 2 DM I (n=75), C (n=25)	Chicago	SDM training and computer-based toolkit SDM model	HbA1c	NM	There were no significant differences in the proportions of patients with changes in goals (49% vs. 28%, $p = 0.08$). Most intervention patients reported that the tool was easy to use (91%) and helped them to communicate (84%).
Ruissen et al. (2023)[15]	RCT	Type 1 DM I (n= 54), C (n=54) Type 2 DM I (n= 57), C (n= 61)	The Netherlands and Spain	Development of the POWER2DM integrated e-health system model	HbA1C, BMI, Lipid, Safety, and QoL	37 weeks	In the POWER2DM group, HbA1c decreased from 7.7±1.3% to 7.3±1.1% ($p<0.001$). No significant change in HbA1c was observed in the control group 7.8±1.3% to 7.7±1.1%; $p=0.19$

Abbreviation: I= Intervention, C= Control, RCT= Randomized Control Trial, DM= Diabetes Mellitus, HbA1c= Haemoglobin A1C, QoL= Quality of Life, NM= Not Mentioned.

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Review limitations

Some limitations of this review include: (1) The limited number of studies (only 5 RCTs) and the majority were from high-income countries, which may limit generalizations to other populations, (2) The variation in the model and duration of SDM interventions used in each study made direct comparisons difficult, (3) Some studies did not explicitly describe SDM implementation strategies and implementation compliance levels in participants, and the last (4) Clinical outcomes such as HbA1c may be influenced by other factors outside of SDM, including lifestyle changes, family support, and pharmacological therapies.

Conclusion and Future Direction

This review shows that Shared Decision Making interventions have the potential to increase patient engagement and improve communication between patients and healthcare providers. Although most studies show a decrease in HbA1c levels, the evidence regarding the effectiveness of SDM in significantly lowering HbA1c levels is still inconsistent. The variability of the intervention model, the analysis approach, and the duration of implementation may affect the results of the study. Nevertheless, SDM still plays an important role in supporting patient-centered, long-term care for diabetes patients.

SDM practices can be integrated into diabetes services as a strategy to enhance patient participation, increase medication adherence, and facilitate more personalized therapy decisions. There is a need for the development of a more standardized SDM model and objective effectiveness measurement tools, including biomedical and non-biomedical parameters. Future research should use designs with longer intervention durations, larger sample sizes, and longitudinal measurements to assess the long-term effect of SDM on glycemic control and quality of life.

Conflict of Interest

The author states that there is no conflict of interest.

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Supplementary Materials

No supplementary materials are available.

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