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(REVIEW ARTICLE)

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Insulin treatment adherence in type 2 diabetes mellitus patients: Literature review

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Abstract

One of the hallmarks of diabetes, a metabolic disease caused by a lack of secretion, work, or both insulins, is hyperglycemia. Although insulin is the most effective treatment for diabetes mellitus, most patients are reluctant to inject insulin. A problem that can arise from not taking insulin as prescribed at the initial dose is cardiovascular disease, which is a leading cause of morbidity and death in diabetics. The goal is to analyze the administration of insulin therapy in diabetic individuals who receive it. The PICO Strategy method is applied to research topics using populations/problems, interventions, comparisons, outcomes, and keywords relevant to Sciencedirect, PubMed, Nelitik, and Google Scholar (in Indonesian and English). The results of the review obtained were the compliance of Diabetes Mellitus (DM) patients in undergoing therapy, some participants were obedient to undergo insulin therapy regularly. Conclusion factors of non-compliance with insulin therapy often arise fear of hypoglycemia, discomfort and fear in using insulin injections

Keyword: Compliance; Diabetes mellitus; Insulin therapy; Literature Review; Treatment adherence

1. Introduction

Elevated blood sugar levels are a hallmark of diabetes, a chronic metabolic disease that gradually damages the heart, blood vessels, eyes, kidneys, nerves, and other organs. Hyperglycemia is a hallmark of diabetes, a metabolic disease caused by lack of insulin secretion, lack of insulin action, or both [1]. The World Health Organization (WHO) estimates that 422 million people worldwide have diabetes, and most sufferers live in low- and middle-income countries. Every year, an additional 1.5 million people are diagnosed with this disease. Over the past few decades, there has been an increase in the number and prevalence of diabetic patients. According to projections made by the International Diabetes Federation (IDF), 537 million people worldwide, aged 20 to 79 years, will suffer from diabetes mellitus (DM) by 2021 [2]. High blood sugar is the main reason

Proper diabetes treatment can be used to prevent chronic complications. Treatment of diabetes often focuses on maintaining stable blood sugar levels and preventing complications due to high blood sugar levels. Insulin is currently a useful therapy for people with diabetes mellitus (DM), but insulin injections are usually rejected by patients Insulin administration is still a major problem because many type II diabetes patients do not adhere to insulin administration in daily life [3]. Adherence is an important component of successful treatment for patients, including people with type 2 diabetes. If not compliant, the patient may lose the benefits of treatment and the condition may worsen further. The extent to which a person adheres to agreed advice from healthcare experts to undergo insulin therapy on time, adhere to diet, or make lifestyle changes is known as adherence to insulin therapy treatment [4]. The success of treatment depends on the person himself, including knowledge of the disease and adherence to treatment. Adherence is determined by whether or not the patient's blood sugar levels are controlled [5].

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Insulin therapy is a treatment that has a rapid onset of action, as indicated by the action of insulin, and converts glucose into glycogen and stores it in the liver, thereby lowering blood sugar levels. However, some patients choose to discontinue insulin use because they are not interested in insulin injections, which causes discomfort, fear of injections, or finds injections stressful. On the other hand, diabetic patients who are not adherent to insulin therapy may lose control of blood sugar levels more often than patients who are adherent [6]. To provide efficient treatment, minimize complications from other diseases, and improve the quality of life of diabetic patients to maintain a stable condition, it is important to identify patients who do not adhere to the prescribed regimen [7]. Improving adherence to optimize treatment outcomes can help individuals with diabetes mellitus avoid problems [8].

2. Method

This research uses a literature study design, by selecting and analyzing articles that are relevant and consistent with the research objectives. The literature study selection process was adapted from Preferred Reporting Items for Systematic Review (PRISMA) to search for and identify selected articles in the literature review. The study's inclusion criteria included the use of Indonesian and English with adherence keywords, insulin therapy, and diabetes mellitus. The article search process includes data used in four databases, literature search used in searching the database, including Pubmed data (33 articles), Google Scholar (58 articles), ScienceDirect (16 articles), and Neliti (13 articles). A detailed explanation of the article I received contains about adherence to the use of insulin to control blood sugar levels. To search for articles in any database by entering keywords, follow these steps: PubMed Database ((Adherence) AND (Insulin Therapy) AND (Diabetes. mellitus)), Google Scholar "Adherence of Insulin Therapy in Diabetic Patients", sciencedirect "Adherence, Insulin Therapy, Diabetes", Neliti "Keywords "Insulin Therapy, Diabetes". A total of 22 duplicate articles were issued, 29 full-text articles with responses were issued, and finally there were 5 articles with relevant content and in accordance with the research topic.
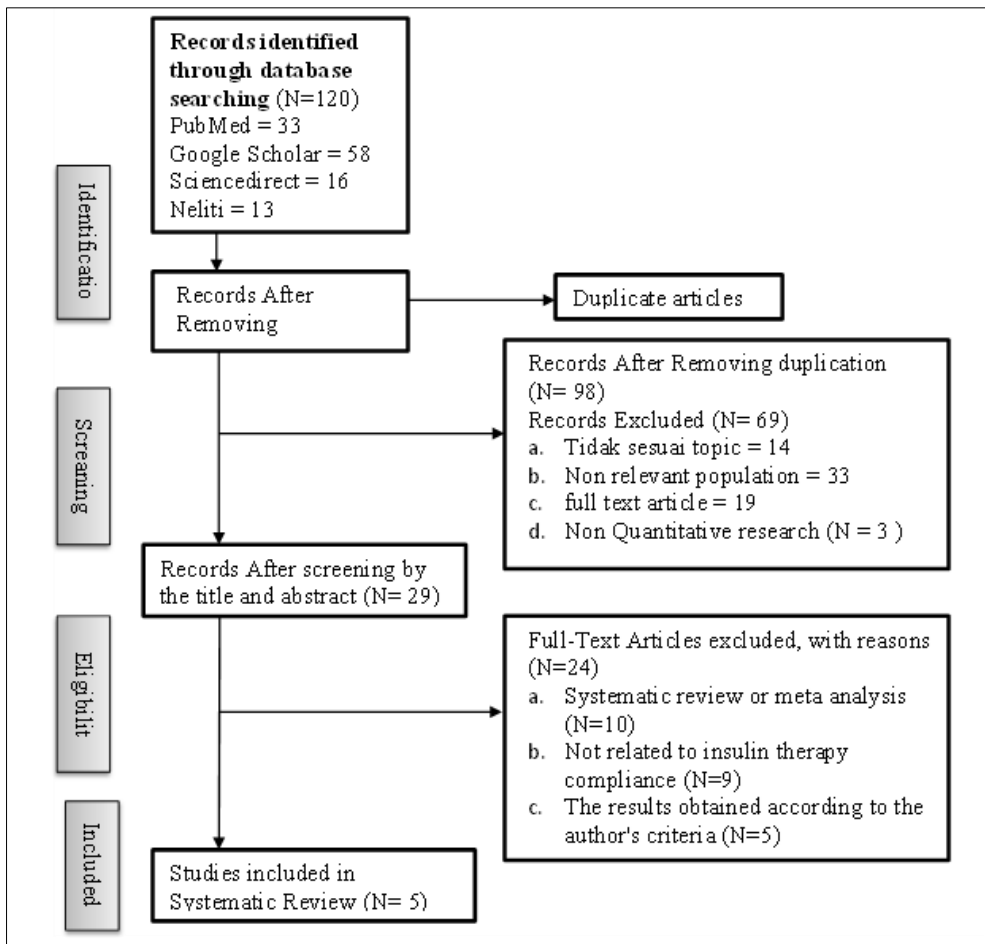
3. Result

Figure 1 Article Selection Process Flowchart Based on PRISMA-ScR

Based on a study of several research journals, it can be displayed in a summary table of research results as follows:

Table 1. Journal Analysis Results

Author	Title and purpose	Method	Result
Rizki Romadhon, Yardi Saibi, dan Narila Mutia Nasir, 2020	Adherence to Treatment of Type 2 Diabetes Mellitus Patients at Puskesmas East Jakarta. The purpose of this study was to determine the characteristics of treatment adherence in type 2 diabetes patients at the Puskesmas Kabupaten Makasar, East Jakarta, as well as factors affecting treatment adherence.	Data for this study were collected using a structured interview approach and MMAS-8 compliance questionnaire. This study used a cross-sectional design.	Based on these findings, 71 respondents (40.6%) were moderately adherent to their antidiabetic treatment. The main causes of non-compliance of respondents were laziness resulting in late payment of drugs when the drugs ran out, and boredom experienced by 48 respondents (43.6%). Twenty-seven respondents (24.5%) returned to receive outpatient treatment. Twenty-six (23.6%) respondents said there was no reason to force them to take medication. Adherence levels and blood sugar levels correlated significantly. More prospective research is needed to learn more about the relationship between blood glucose levels and adherence rates in order to better understand the relationship between the two.
Shadi Farsaei, Mania Radfar, Zahra Heydari, Farzaneh Abbasi dan Mostafa Qorbani, 2014	Insulin adherence in patients with diabetes: Risk factors for injection omission This study aimed to assess the adherence of diabetic patients to insulin therapy	This study was a cross-sectional study. The Morisky Treatment Adherence Scale (MMAS) and automated adherence methods were used for data collection.	Based on the Morisky Green trial, 14.3% and 28.8% of type 1 and 2 diabetes patients had low adherence to insulin therapy, respectively. However, almost all patients adhere to the autocompliance method. In both groups, several characteristics showed noteworthy correlations. Our findings regarding barriers that have a significant impact on insulin adherence may be useful for identifying patients at risk for low adherence, and for guiding the design of appropriate strategies to improve adherence and the consequences of clinical outcomes
Feleke Hailu Chefik,Tesfaye Assefa Tadesse, Bruce John Edward Quisido , Adem Esmael Roba, 2022	Adherence to insulin therapy and associated factors among type 1 and type 2 diabetic patients on follow up in Madda Walabu University Goba Referral Hospital, South East Ethiopia. This study aimed to assess adherence to insulin therapy and related factors among	The 8-item Morisky treatment adherence scale (MMAS) was used to collect data for this institution-based cross-sectional investigation.	The results showed that 121 (38.9%) compliant respondents and 190 (61.1%) non-compliant respondents. Reasons for respondents' non-compliance were having a glucometer (AOR = 3.88; 95% CI [1.46, 10.35]), regular hospital follow-up (AOR = 3.13; 95% CI [1.12, 8.70]), knowledgeable (AOR = 3.36; 95% CI [1.53, 7.37]), and positive attitude (AOR = 4.55; 95%CI [1.68, 12.34]) were factors

	type 1 and type 2 diabetes patients at follow-up at Madda Walabu University—Goba Referral Hospital, Southeast Ethiopia		associated with adherence to insulin therapy. The study concluded that adherence to insulin therapy was low in the study area. Having a glucometer, regular follow-up to the hospital, extensive knowledge, and good attitude are factors associated with adherence to insulin therapy
Janneth Bermeo-Cabrera, Paloma Almeda-Valdes, Josefa Riofrios-Palacios, Carlos A. Aguilar-Salinas, and Roopa Mehta, 2018	Insulin Adherence in Type 2 Diabetes in Mexico: Behaviors and Barriers This study aimed to investigate the factors associated with insulin adherence in subjects with type 2 diabetes mellitus (T2D) who visited a tertiary care center in Mexico City	The Morisky-Green questionnaire (MMAS) was used to collect data for the cross-sectional investigation of the study	Based on the results of the study, we classified 117 (58.5%) patients as non-adherent and 83 (41.5%) patients as adherent. Only 22% of patients, or 22 people, showed high adherence to insulin therapy. The following variables were associated with non-compliance: fear of hypoglycemia (41%) and absence of a plan of daily activities (46.1%), and insulin consumption (2.31 vs 1.76 per day). The main factors associated with stopping insulin use are low socioeconomic status, fear of hypoglycemia, and greater amounts of insulin use each day.
Zahra Davoudi, Arezoo Chouhdari, Mahshid Mir dan Fatemeh Akbarian, 2020	Attitude and Compliance with the Onset of Insulin Therapy in Patients with Type 2 Diabetes. This study aimed to evaluate the attitude and compliance of type 2 diabetes patients in initiating insulin therapy.	The study was cross-sectional and used a questionnaire created by the researchers themselves to assess attitudes toward the onset of insulin therapy and reliability trials were conducted with an estimated Cronbach alpha value of 0.80	In this study, 62% of type 2 diabetes patients were likely to start insulin therapy. There was a statistical difference between the total items of positive and negative attitudes towards insulin therapy (agree/disagree) and acceptance of insulin therapy (P <0.05). Since 38% of type 2 diabetes patients refuse to start insulin therapy, it seems that effective communication between doctor and patient as well as ongoing follow-up by health care providers can increase positive attitudes toward insulin injections.

4. Discussion

One of the most important components of successful patient therapy is adherence, along with other elements including an appropriate treatment regimen, accuracy in medication selection, and patient support to lead a healthy lifestyle. In a study by Saibi et al., (2020) A total of 65 respondents (37.1%) reported taking antidiabetic drugs with a high adherence rate, while 71 respondents (40.6%) reported a moderate adherence rate. Of the total, 39 respondents (22.3%) achieved a high level of compliance. The 110 respondents fall into the moderate and poor compliance categories can be used to find out the reasons behind their non-compliance. One of the most important elements in a patient's therapeutic success is adherence, along with other elements including appropriate treatment regimen, accuracy in medication selection, and patient support [9]. Namely the boredom of taking anti-diabetic drugs regularly for a long time, sometimes for life, late payment of drugs, and drugs run out because respondents are too lazy to return to treatment as usual, low attention so no one reminds to take medicine. Respondents did not understand the use of drugs such as insulin injections with their families. Injectable insulin requires daily injections, which can cause discomfort and fear in using insulin injections. In addition, working hours are very busy and falling asleep at night before taking medicine, so it makes you feel scared. Based on the results of the study, individuals with low medication adherence may experience uncontrolled blood sugar levels, while individuals with good adherence are able to maintain stable blood sugar levels. The boredom factor is the most common cause of non-compliance in respondents [10]

In addition to the importance of insulin adherence to achieving treatment goals, there are other risk factors. A study by Farsaei et al., (2014) Morisky Green test results showed 99.4% of patients were adherent in insulin injections and only 2 patients were non-compliant. Factors that showed a significant association with insulin adherence in the type 1 and type 2 diabetes groups were: long-term intake, embarrassment, exacerbations after injections, and forgetting and neglecting insulin on sick days, hypoglycemia, medication costs, overweight, insulin deficiency, difficulty in preparing insulin [11]. Simple insulin injections or administration do not affect insulin therapy. The study showed that dissatisfaction with the time it took for injections, embarrassment, and difficulty in preparing for injections were associated with decreased adherence in both type 1 and type 2 diabetes patients [12].

A study by Chefik et al., (2022) found that respondents who had a more positive attitude towards insulin therapy had up to 4.55 times greater adherence to insulin therapy than respondents who had a less positive attitude [7]. The study also found that the adherence rate to insulin therapy was 121 (38.9%), mainly due to a diabetes diagnosis period of more than 15 years, poor attitude towards insulin therapy, and suffering from type 2 diabetes, in addition, the absence of a home blood glucose measuring device and poor physical condition, knowledge of insulin therapy, adherence to regular visits to the hospital, and taking two types of drugs.

A study by Bermeo-Cabrera et al., (2018) 83 (41.5%) patients were classed as adherent, and 117 (58.5%) as non-compliant. Only 22 patients (11%) received insulin therapy with excellent adherence [13]. The following elements were associated with non-compliance: lack of a daily activity plan (46.1%), fear of hypoglycemia (41%), economic factors (15.4%), and insulin consumption (2.31 vs. 1.76 per year). The main factors associated with discontinuation of insulin use are lower socioeconomic status, fear of hypoglycemia, and increased daily insulin doses. The results of this study may help determine interventions to address and correct insulin treatment non-adherence in type 2 diabetes patients [14].

A study by Davoudi et al., (2020) in this study found some degree of adherence to insulin treatment in 62% of patients receiving insulin therapy and adherence and in 38% of patients not adhering to insulin therapy [2]. The main factors that prevent patients from adhering to the use of insulin are fear of injections, fear of obesity, and how to handle insulin injections. Non-compliant patients also believe that insulin therapy may worsen their symptoms. These include fear of incorrect injection methods and discomfort with insulin injections. Fear of hypoglycemia after injections and insulin injections. Since 38% of type 2 diabetes patients are not adherent to insulin therapy, we believe that effective communication between physician and patient as well as ongoing follow-up by healthcare professionals will increase positive attitudes towards insulin injections [15].

5. Conclusion

Diabetes mellitus (DM) patients who receive insulin therapy generally report a degree of adherence to the treatment. Factors of non-compliance with insulin therapy often arise fear of hypoglycemia, discomfort and fear in using insulin injections

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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