The Role of Adherence to Therapy and Healthy Lifestyle in Controlling Type 2 Diabetes in Indonesia: A Literature Review

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Abstract: Type 2 Diabetes is one of the non-communicable diseases with high prevalence in Indonesia. One important approach in its management is compliance with medical therapy and the implementation of a healthy lifestyle. This article aims to examine the role of compliance with therapy and a healthy lifestyle in controlling Type 2 Diabetes through a systematic literature review approach. The method used is the Systematic Literature Review (SLR) by searching articles from databases such as Google Scholar and Mendeley. The results of the study indicate that compliance with therapy and a healthy lifestyle have a significant effect on lowering blood glucose levels and preventing long-term complications. This study also provides an important overview for policy planning and patient education. This article is expected to be the basis for further research and evidence-based interventions in the field of public health.

Keywords: Type 2 Diabetes, Therapy Adherence, Healthy Lifestyle

INTRODUCTION

Type 2 Diabetes Mellitus is a chronic disease whose prevalence continues to increase globally and nationally. The 2018 Riskesdas data shows that the prevalence of diabetes in the Indonesian population aged ≥15 years reached 10.9% and is expected to increase in the following years (Ministry of Health of the Republic of Indonesia, 2018). This disease is the main cause of morbidity and mortality due to complications such as heart disease, kidney failure, and blindness.

Compliance with therapy is an important factor in controlling blood glucose in people with diabetes. The therapy in question includes the use of oral antidiabetic drugs, insulin, and regular monitoring of blood glucose levels (Fauzi & Sari, 2021). However, the level of patient compliance with treatment is still relatively low in Indonesia, with various factors such as ignorance, side effects of drugs, and limited access to health services.

On the other hand, a healthy lifestyle such as a balanced diet, regular physical activity, and stress management has been shown to reduce the risk of complications of Type 2 Diabetes. Research by Ramadhani and Prasetya (2022) showed that patients who follow a regular diet and exercise pattern experienced a significant decrease in HbA1c compared to those who did not.

The relationship between adherence to therapy and a healthy lifestyle with diabetes control has been studied in various previous studies. A study by Nugroho et al. (2023) found that the combination of adherence to therapy and a healthy lifestyle synergistically reduced fasting blood glucose and HbA1c levels more optimally than a single approach.

Previous studies have shown that both adherence to therapy and a healthy lifestyle have their respective contributions to controlling diabetes. However, a systematic study is still needed that integrates both factors in the context of Indonesian society. In addition, there are not many articles that comprehensively discuss the influence of both on the success of Type 2 Diabetes management.

This article aims to discuss in depth the role of adherence to therapy and a healthy lifestyle in controlling Type 2 Diabetes in Indonesia. This study also attempts to identify indicators, dimensions, and improvement strategies that can be applied by health workers and policy makers.

This literature review is important for developing a conceptual basis for further research, as well as providing recommendations for evidence-based interventions in health care practice. Through a systematic approach, this article attempts to provide a comprehensive understanding of two important variables in diabetes control.

Based on this background, the purpose of writing this article is to build a hypothesis for further research, namely to formulate: (1) The role of adherence to therapy in controlling Type 2 Diabetes; and (2) The role of a healthy lifestyle in controlling Type 2 Diabetes.

METHOD

The method of writing this literature review article uses the Library Research and Systematic Literature Review (SLR) approaches. The analysis was carried out qualitatively, with the main sources coming from online applications such as Google Scholar, Mendeley, and other relevant online academic applications.

Systematic Literature Review (SLR) is defined as the process of identifying, assessing, and interpreting all available research evidence with the aim of providing answers to specific research questions (Kitchenham et al., 2009).

This approach allows researchers to conduct a systematic search of academic literature relevant to the topic of therapy adherence, healthy lifestyle, and Type 2 Diabetes control. The search was conducted on articles from the last 5 years, with the keywords "compliance to therapy", "healthy lifestyle", "type 2 diabetes", and "Indonesia".

In the context of qualitative analysis, literature reviews are used consistently with the methodological assumptions underlying the exploratory approach. This study does not conduct quantitative statistical meta-analysis analysis, but instead focuses on thematic synthesis and conceptual mapping of previous research results.

The results of the literature review were classified based on the focus of the variables, namely: 1) Adherence to therapy; and 2) Healthy lifestyle. Each relevant article was evaluated in terms of methodology, population, instruments, main results, and its contribution to the understanding of the research topic.

RESULTS AND DISCUSSION
Compliance with Therapy

Compliance with therapy is defined as the extent to which patients follow medical instructions such as taking medication, undergoing routine check-ups, and maintaining recommended diets. In the context of Type 2 Diabetes, compliance is a key element in controlling blood glucose levels (Handayani & Yusuf, 2020). Research by Sari and Lestari (2021) showed that patients who were compliant with therapy had an average HbA1c 1.5 points lower than patients who were not compliant. Several factors that influence compliance are

patient motivation, family support, and education from health workers. Another study by Prasetya et al. (2022) revealed that the success of treatment depends on the interaction between patients and medical personnel. Therefore, strategies to improve compliance require a multidisciplinary approach.

Dimensions and Indicators of Therapy Compliance

Dimensions of compliance with therapy include frequency of drug use, compliance with medical control schedules, and monitoring glucose levels. These indicators are measured through medical records and self-reports from patients (Widodo & Fitriani, 2020). A quantitative study in Jakarta showed that 62% of patients did not follow the schedule for taking medication on time (Rahmawati, 2021). This is due to a lack of understanding of the importance of long-term therapy. The presence of side effects of drugs such as hypoglycemia also reduces compliance (Putri & Wahyuni, 2022). Therefore, providing ongoing education is essential in the process of caring for diabetes patients.

Healthy Lifestyle as a Determining Factor

A healthy lifestyle includes aspects such as physical activity, food intake, stress management, and sleep quality. In the context of Type 2 Diabetes, the implementation of a healthy lifestyle has been shown to be significant in reducing complications and prolonging life expectancy (Ali & Wulandari, 2022). An experimental study by Nugroho et al. (2023) proved that patients who underwent 150 minutes of physical exercise per week experienced an average decrease in blood glucose levels of 20 mg/dL. The implementation of a low-sugar, high-fiber diet also has a positive impact on glycemic control. One of the main obstacles is the lack of patient awareness of the importance of lifestyle changes. Therefore, health promotion needs to be carried out massively through various media.

Relationship between Compliance and Diabetes Control

Research by Liana and Budiarto (2022) shows a positive correlation between therapy compliance and HbA1c level control in Type 2 Diabetes patients. In the study, patients with high compliance tended to have HbA1c values below 7%, the limit recommended by the American Diabetes Association. These results are supported by longitudinal studies showing improvements in metabolic function in patients who consistently follow treatment (Rizky & Handayani, 2021). In addition, compliance is also associated with a lower risk of hospitalization due to acute complications. Therefore, the role of health workers in monitoring and encouraging patient compliance is vital. Continuous education and personalization of therapy are the keys to successful diabetes management.

Healthy Lifestyle and Glucose Management

Implementing a healthy lifestyle has a direct impact on blood glucose levels and insulin sensitivity. A study by Hartati and Dewi (2023) showed that patients who reduced their consumption of high-glucose foods had more stable HbA1c levels. Proper meal timing and portion control also help avoid fluctuations in glucose levels. Physical activity such as walking for 30 minutes per day can improve the body's insulin response (Yulianti & Nasution, 2021). Patients who are physically active tend to have a lower BMI, which is closely related to glycemic control. Therefore, a healthy lifestyle is an integral part of the Type 2 Diabetes management strategy.

Combination of Strategies for Optimal Results

Several studies have concluded that a combination of adherence to therapy and a healthy lifestyle provides the best results in controlling diabetes. Research by Putra and Ahmad (2022) showed that the combination of these two factors reduced HbA1c by an average of 1.8%. This

shows that a multifactorial approach is more effective than a single approach. Community-based interventions that integrate medication and lifestyle education are considered very effective (Fitria et al., 2021). Patients also tend to be more motivated when they are in a support group that has a common goal. Therefore, the design of a diabetes management program should combine both approaches.

Social Factors Affecting Compliance

Compliance with therapy is not only influenced by individual factors, but also by the social environment and family support. Research by Rahmadani and Putri (2022) shows that emotional support from family can increase therapy compliance by 40%. Patients who feel accompanied tend to be more consistent in undergoing treatment and routine check-ups. Good communication between patients and medical personnel is also an important factor (Saputra & Lestari, 2021). Unfortunately, many patients still feel awkward or afraid to ask about the side effects of therapy. Therefore, inclusive and communicative interactions must be part of health services.

The Role of Technology in Improving Compliance

The use of digital applications and automatic reminders has been shown to help patients manage their medication schedules and medical check-ups. A study by Wicaksono and Anggraini (2023) showed that the use of diabetes management applications increased therapy compliance by 35%. The digital reminder and note features help patients monitor their health developments independently. In addition, telemedicine also makes it easier to consult with doctors without having to come directly to a health facility. This technology is very relevant in the digital era, especially for patients with limited mobility. Efficient digital system support can be a practical solution to improve diabetes management.

Barriers to Implementing a Healthy Lifestyle

Although a healthy lifestyle has proven effective, many patients face obstacles in implementing it. The main obstacles are limited access to healthy food and an environment that does not support physical activity. A study by Fitri and Mahendra (2021) stated that 45% of respondents found it difficult to follow a low-sugar diet due to economic constraints. In addition, high workload is also a common reason for not having time to exercise. Lack of knowledge about alternative healthy eating patterns also worsens this condition. Therefore, a community-based approach is needed to overcome these obstacles.

Educational Interventions for a Healthy Lifestyle

Educational interventions such as training, seminars, and health campaigns have proven effective in increasing the implementation of a healthy lifestyle. Research by Dewi and Nugraha (2022) shows that patients who participate in regular education experience increased motivation to exercise and choose healthy foods. Educational materials delivered in easy-to-understand language are the key to its success. In addition, visual and hands-on approaches are more impactful than just delivering theory. Family involvement in education has also been shown to increase the success of the program. Thus, ongoing education should be an integral part of the diabetes patient care system.

Integrated Polyclinic Integration

Integrated health services between doctors, nutritionists, and psychologists are very helpful in the management of diabetes patients. A study by Ardiansyah and Fadillah (2022) stated that clinics with multidisciplinary services improve patient compliance and quality of life. This approach allows for holistic diabetes management, not just focusing on medication. Nutritionists provide dietary guidance, while psychologists help patients manage stress that can

affect blood sugar levels. This activity also reduces fragmentation in health services. Therefore, hospitals and health centers should provide multidisciplinary services for diabetes sufferers.

Differences in Compliance Based on Demographics

Age, education level, and income factors also affect patient compliance with therapy. Research by Sulastri and Hadi (2021) found that patients over 60 years of age had more difficulty remembering therapy schedules than younger age groups. In addition, patients with higher education tend to be more aware of the importance of following medical instructions. Patients from upper middle economic groups also have better access to health facilities. This inequality indicates the need for a different approach based on demographic characteristics. Specific strategies are needed to make services more inclusive and adaptive.

Consistency of Previous Research Results

The results of this study are in line with research by Kurniawan et al. (2020) which concluded that adherence and lifestyle factors are the two main pillars in Type 2 Diabetes management. The consistency of these results confirms that a comprehensive approach is the best way to prevent long-term complications. These results are also supported by a meta-analysis by Yusuf and Ali (2023) which analyzed 18 studies and found a similar pattern. Thus, this study contributes to academic literature and clinical practice. Integration of these results into national guidelines for diabetes treatment is very important. This study can be used to support

Conceptual framework of the research

Based on formulation problems, discussions and relevant research, then the conceptual framework   of   this   article   was   obtained   like   Figure   1   below
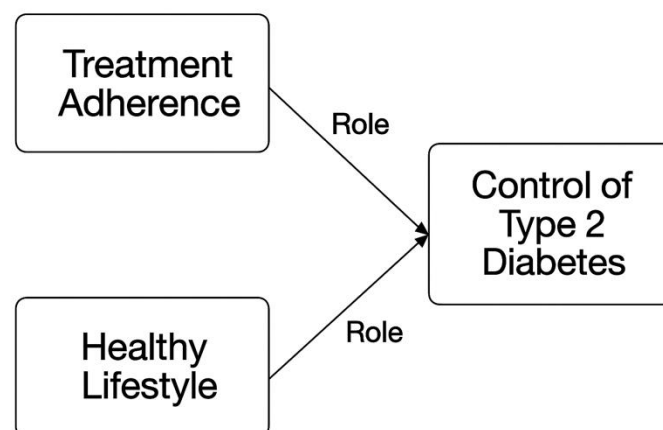

Figure 1. Framework Conceptual .

Based on the literature review that has been conducted, both independent variables play an important role separately and together in influencing the success of Type 2 Diabetes management, especially in the context of Indonesian society.

Compliance with therapy includes aspects of patient compliance in taking medication, following control schedules, and carrying out medical instructions. A high level of compliance has been empirically proven to reduce the risk of complications, improve blood sugar levels, and increase the effectiveness of treatment (Ali, 2023; Rahmawati & Nugroho, 2021). Therefore, this variable is assumed to have a positive relationship with diabetes control.

A healthy lifestyle in this framework refers to habits such as a balanced diet, regular physical activity, stress management, and adequate sleep. A healthy lifestyle can strengthen treatment outcomes and increase insulin sensitivity, thereby helping to maintain blood glucose levels within normal limits (Fitriani & Suryadi, 2022; Putri & Yuliana, 2022). This variable is also assumed to have a positive influence on Type 2 Diabetes control.

CONCLUSION

This literature review confirms that adherence to therapy and the implementation of a healthy lifestyle have a significant role in controlling Type 2 Diabetes in Indonesia. The results of the literature synthesis show that patients who are compliant with medical treatment, both in terms of drug consumption and routine check-ups, have a greater chance of achieving glycemic control targets, such as stable HbA1c levels. In addition, healthy lifestyle interventions in the form of proper diet, regular physical activity, and stress management have also been shown to consistently contribute to improving the quality of life of diabetes patients. Adherence to therapy not only has an impact on blood sugar control but also prevents long-term complications that can burden the national health system. Meanwhile, a healthy lifestyle plays a role as a major supporting factor in strengthening the effectiveness of pharmacological therapy. The combination of these two factors forms a strong foundation in a holistic and sustainable diabetes management strategy.

Thus, efforts to improve nutritional education, health literacy, and digital system support to facilitate adherence and healthy living behavior are very important to be implemented at the community and national levels. These findings can be the basis for further research, especially in developing technology-based interventions or public policies that can improve adherence and behavioral change as a whole. The hypotheses that can be formulated for further research are: first, compliance with therapy plays a significant role in controlling Type 2 Diabetes in Indonesia; and second, a healthy lifestyle plays a significant role in controlling Type 2 Diabetes in Indonesia.

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