

**THE RELATIONSHIP BETWEEN MEDICATIONS ADHERENCE AND
QUALITY OF LIFE AMONG PATIENTS WITH TYPE 2 DIABETES IN
HOSPITAL PAKAR UNIVERSITI SAINS MALAYSIA.**

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by

NUR SABRINA BT AFANDI

Dissertation submitted in partial fulfilment of the requirements for the degree of Bachelor of

Health Science (Honours) (Dietetics)

CERTIFICATE

This is to certify that the dissertation entitled “THE RELATIONSHIP BETWEEN MEDICATIONS ADHERENCE AND QUALITY OF LIFE AMONG PATIENTS WITH TYPE 2 DIABETES IN HOSPITAL PAKAR UNIVERSITI SAINS MALAYSIA.” is a genuine record of research work done by Ms NUR SABRINA BT AFANDI during the period from April 2024 to July 2024 under my supervision. I have read this dissertation and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation to be submitted in partial fulfilment for the degree of Bachelor of Health Science (Honours) (Dietetics).

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DECLARATION

I hereby certify that this dissertation represents solely my own research efforts, except where explicitly stated and officially acknowledged. Additionally, I affirm that it has not been previously submitted for assessment, either in part or in full, for any other academic qualification at Universiti Sains Malaysia the authorization to utilize my dissertation for educational, research, and promotional purposes.

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ABSTRAK

Diabetes mellitus adalah gangguan kronik yang menjejaskan kemampuan tubuh untuk menggunakan glukosa darah sebagai sumber tenaga penting bagi sel. Kajian ini bertujuan untuk mengkaji hubungan antara tahap kepatuhan pengambilan ubat dan kualiti hidup dalam kalangan pesakit diabetes mellitus jenis 2 di Hospital Pakar USM. Kajian ini dijalankan dalam kalangan pesakit luar, dan 84 peserta direkrut melalui persampelan bertujuan. Soal selidik kepatuhan perubatan diberikan untuk menilai kepatuhan pesakit terhadap rejim perubatan yang ditetapkan, manakala soal selidik kualiti hidup diabetes terdiri daripada 3 domain iaitu kepuasan, kesan, dan kebimbangan. Hasil kajian menunjukkan bahawa kebanyakan responden berumur antara 51 hingga 70 tahun (60.7%), lelaki (54.84%), Melayu (94.0%), berpendidikan peringkat menengah (65.5%), berkahwin (91.7%) dengan gaji lebih daripada RM1000 (86.9%). Selain itu, hasil juga menunjukkan bahawa majoriti peserta telah menghidap T2DM selama kira-kira 5 hingga 10 tahun (60.7%), menjalani rawatan monoterapi (65.5%), mengalami komorbiditi (82.1%) dan mengambil kurang daripada 3 ubat (92.9%). Kajian ini menunjukkan terdapat korelasi negatif sederhana yang signifikan secara statistik ($r = -0.469$, $p < 0.01$) antara kepatuhan perubatan dan kualiti hidup dalam kalangan 84 responden. Ini mencadangkan bahawa apabila kepatuhan terhadap rejim ubat berkurangan (skor Jumlah MCQ lebih tinggi), begitu juga kualiti hidup berkaitan diabetes (skor Jumlah DQOL lebih rendah). Sebaliknya, peningkatan kepatuhan terhadap ubat berkaitan dengan kualiti hidup yang lebih tinggi. Hubungan negatif ini menunjukkan bahawa peningkatan kepatuhan terhadap pengambilan ubat boleh meningkatkan kualiti hidup keseluruhan bagi pesakit diabetes. Tahap kepentingan ($p = 0.000$) menunjukkan bahawa hubungan ini tidak mungkin timbul secara kebetulan. Perbezaan dalam kualiti hidup antara kumpulan yang tidak patuh dan patuh adalah signifikan secara statistik. Ini menunjukkan bahawa kepatuhan terhadap rejimen atau terapi yang dikaji mungkin berkaitan dengan kualiti hidup yang lebih buruk, walau bagaimanapun sebab-sebab khusus untuk perbezaan ini memerlukan penilaian lanjut.

ABSTRACT

Diabetes mellitus is a chronic disorder that affects the body's ability to utilize blood glucose, a vital source of energy for cells. This study aims to study the relationship between medication adherence level, and quality of life among type 2 diabetes mellitus patients in Hospital Pakar USM. The study is conducted in outpatients settings, and 84 participants were recruited via purposive sampling. Medical compliance questionnaire is given out to assess patients' adherence to prescribed medical regimens while diabetes quality of life questionnaire consists of 3 domains, which are satisfaction, impact and worry. Results revealed that most respondents are aged of 51 to 70 years old (60.7%), male (54.84%), Malays (94.0%), secondary education level (65.5%), married (91.7%) with salary more than RM1000 (86.9%). In addition, results also revealed that majority of participants had suffered from T2DM for about 5 to 10 years (60.7%), undergo monotherapy treatment (65.5%), experience comorbidities (82.1%) and taken less than 3 medication (92.9%). The study demonstrates a statistically significant moderate negative correlation ($r = -0.469$, $p < 0.01$) between medical compliance and quality of life among 84 respondents. This suggests that lower medication compliance (higher MCQ Total scores) correlated with lower diabetes-related quality of life (lower Total IDQOL scores). The significance level ($p = 0.000$) indicates that this link was unlikely to arise by coincidence. The difference in QoL between the non-adherent and adherent groups is statistically significant. This shows that adherence to the regimen or therapy under study may be related with a worse QoL. However, further investigation is required to confirm and identify other factors that may also contribute this present finding.

CHAPTER 1: INTRODUCTION

1.1 Background of study

Diabetes mellitus is a long term, chronic metabolic disorder that has been a serious worldwide issue as it poses a significant global burden on the public health and the economy (Jing et al., 2018). It is characterized by the persistent hyperglycaemia, which is due to impaired insulin secretion, resistance to peripheral action of insulin or both. World Health Organization defined diabetes as a chronic condition when the body either produces insufficient amounts of insulin or is unable to use the insulin that is produced by the pancreas (WHO,2021).

In the past few years, prevalence of diabetes has increased globally. It was reported by IDF Diabetes Atlas, that in 2021, 537 million adults are currently living with diabetes and 3 out of 4 adults with diabetes come from a low-income and middle-income countries (International Diabetes Federation, 2021). The number is also expected to further increase to 643 million diabetes patients by year of 2030. Malaysia unfortunately has the highest rate of diabetes in Western Pacific region, and one the highest in the world. The prevalence of diabetes rose from 11.2% in 2011 to 18.3% in 2019, with a 68.3% increase. According to a national survey report, in Malaysia in 2019, 3.6 million adults (18 and above years) had diabetes, 49% (3.7 million) cases were undiagnosed. Diabetes is expected to affect 7 million Malaysian adults aged 18 and older by 2025 (Akhtar et al., 2022).

Unfortunately, a cure is not available for type 2 diabetes mellitus but there are ways to help in managing diabetes, which are losing weight, exercising, and managing a proper, healthy diet. Diabetes medication or insulin therapy would be recommended when the blood sugar level cannot be managed by simple diet and exercise. Common medications that are usually prescribed to Malaysian Type 2 Diabetes Mellitus (T2DM) patients are metformin which help to lower blood glucose up to 1.5% and does not cause hypoglycemia, and thiazolidinediones (TZD) medication. It is very important for T2DM patients to be adherent to diabetes medications prescribed to them as a proper medication intake is vital in management of T2DM which contributed to therapeutic success (Marin-Penalver et al.,2016). Medication adherence can be defined as the compliance of patients in taking medication as prescribed and in the continuation in taking a prescribed medication (Ho et al., 2009).

A good and positive quality of life perceived by patients is an important criterion in evaluation of an effectiveness of management T2DM (Hale et al.,2019). Measurement of quality of life (QoL) is based an individual's functioning and wellbeing in terms of physical, emotional, and social (Abedini et al.,2020). Both medication adherence and quality of life are interrelated and important aspects to be considered when assessing and determining the effectiveness of T2DM management treatment for patients (Zioga et al.,2016). When planning for a management plan for T2DM patients, a few aspects must be taken into consideration like the patients current physical and emotional condition as well as the readiness and will of patients to be adherence to medication. Poor adherence of medication would lead to uncontrollable diabetes with complications of nephropathy and retinopathy in consequences (Alodhaib et al.,2021). On the other hand, poor quality of life is most likely due to patients unable to keep up with rigid management plan treatment for insulin injection or others (Brod et al.,2014). Thus, a T2DM patient with poor medication adherence and a poor quality of life together would not receive a proper and effective treatment T2DM

1.2 Problem statement

Despite the advancements in medical interventions for T2DM, the effective management of this chronic condition remains a challenge. One crucial aspect that significantly impacts treatment outcomes is medication adherence. Non-adherence to prescribed medications not only jeopardizes glycaemic control but may also influence various dimension of quality of life in T2DM patients. Existing research has hinted at the intricate relationship between medication adherence and quality of life, but a comprehensive and statistically rigorous exploration of this association is lacking (Bosworth et al., 2011). The problem arises from a dearth of detailed insights into the factors influencing medication adherence patterns and the subsequent impact on the diverse aspects of quality of life among T2DM patients. Understanding these factors is essential for developing targeted interventions and personalized healthcare strategies. A statistical study is imperative to quantify the extent of medication adherence, assess the statistical significance of its correlation with glycaemic control, and identify the specific dimensions of quality of life that are most affected. A robust statistical examination of the various dimensions of quality of life, will allow for a nuanced understanding of how medication adherence influences physical, emotional, and social well-being. Subgroup analyses based on demographic factors can uncover potential variations in the medication adherence-quality of life relationship. Thus, the research aims to fill the existing gap in knowledge regarding the relationship between medication adherence and diabetes specific quality of life.

1.3 Research questions

1. What is the level of medication adherence among T2DM patients at Hospital Pakar USM?
2. How does medication adherence affect the quality of life among type 2 diabetes mellitus patients at Hospital Pakar USM?

1.4 Research objectives

1.4.1 General objective

To study the relationship between medication adherence level, and quality of life among type 2 diabetes mellitus (T2DM) patients in Hospital Pakar USM.

1.4.2 Specific objective

1. To assess the level of medication adherence and quality of life among T2DM patients at Hospital Pakar USM
2. To identify factors that contribute to variation in medication adherence among T2DM patients at Hospital Pakar USM.

1.5 Research Hypothesis

1.5.1 Hypothesis 1

Null Hypothesis (Ho): There is no relationship between medication adherence and quality of life among type 2 diabetes mellitus patients in Hospital Pakar USM.

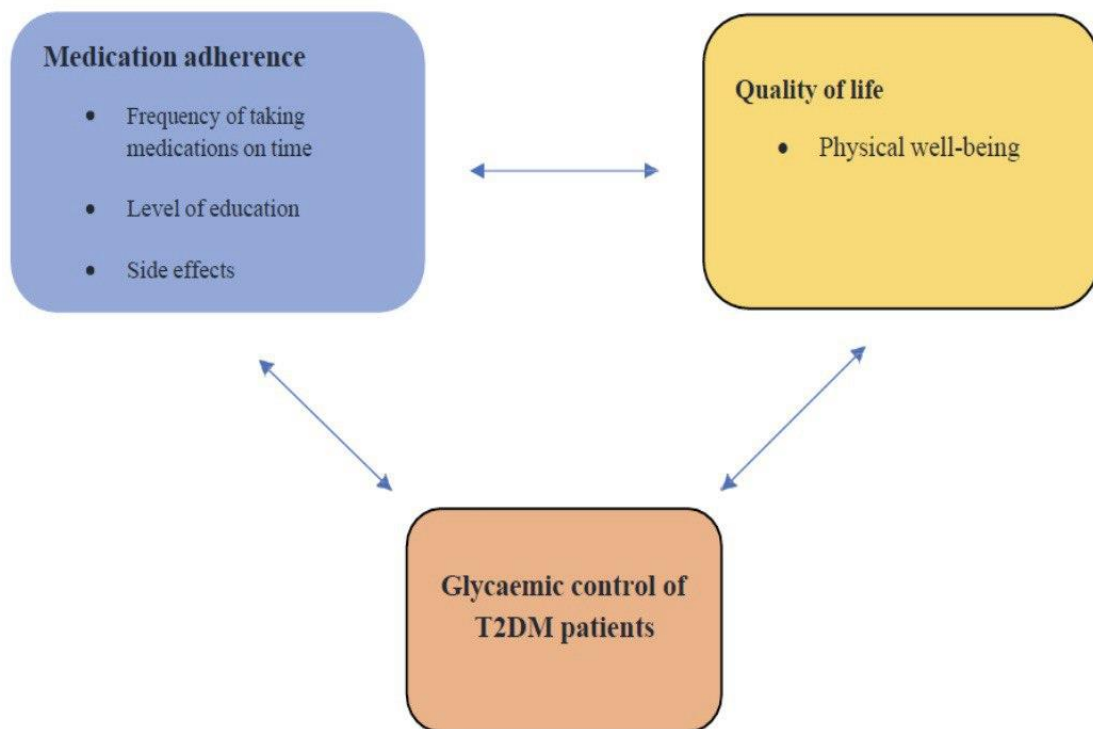
Alternative Hypothesis (HA): There is a relationship between medication adherence and quality of life among type 2 diabetes mellitus patients in Hospital Pakar USM.

1.5.2 Hypothesis 2

Null Hypothesis (Ho): There is no significant difference on quality of life and medical compliance among type 2 diabetes mellitus patients in Hospital Pakar USM.

Alternative Hypothesis (HA): There is significant difference on quality of life and medical compliance among type 2 diabetes mellitus patients in Hospital Pakar USM

1.6 Conceptual framework



Medication adherence in T2DM patients is based on the frequency of patients taking the medication on time based on the quantity of drug treatment prescribed. Medical treatment for T2DM patients could be classified into oral and non-oral treatment (insulin therapy). Side effects experienced by patients like nausea and hypoglycemia would affect the medication adherence. Though, it is also important for T2DM patients to practice a healthy lifestyle as a combination of a good lifestyle and pharmacological treatment is needed to achieve good metabolic control in diabetic patients in a long term (Juan et al.,2016). Non adherent patients are reported to be mostly likely to have poor glycemic control based on the study conducted in Northwest Ethiopia as 74.7% of participants had a poor glycemic control with low medication adherence (Ashenafi et al.,2022). Level of education also affected the T2DM as patients with low level of education often have misconception on how their medication work to manage their blood sugar level which led to poor health and poor medication adherence (Fredericksen et al., 2018). Physical well-being on a T2DM patient would always be challenged because of the illness's intricate and widespread impacts on several organ systems. Among factors that affect the physical well-being of T2DM patients is due to insulin resistance. In T2DM patients' cell, blood glucose level increase as the cell became resistance towards the insulin effect which then cause hyperglycaemia. Persistent hyperglycaemia would lead to inflammation, oxidative stress and damage to blood vessels and internal organs. Primary focus for insulin resistance treatment is modification of lifestyle as poor quality of life result in poor glycaemic control (Andrew et al.,2023).

1.7 Significance of study

This study is to determine the level of medication adherence level, and quality of life among T2DM patients at Hospital Pakar Universiti Sains Malaysia. This topic is important because that findings would have a clinical impact on patients and healthcare professional so that they would understand that the effectiveness of management plan treatments is based on an individual' discipline in following the prescribed drug treatment.

1.8 Operational definition

Medication adherence: Compliance of patients in taking medication as prescribed and in the continuation in taking a prescribed medication. (Ho et al., 2009)

Quality of life: An individual perception of physical, emotional, and social status (Jing et al., 2018).

CHAPTER 2: LITERATURE REVIEW

2.1 Medication adherence

Medication adherence is defined as the compliance of patients in following instructions for a prescribed medication. According to Vanelli et.al, (2019) discontinuation of the medications on the 30 days treatment reached 42% and non – oral treatment of diabetes has a higher rate of discontinuation. Insulin therapy is a non-oral treatment and among common intensive regimen for T2DM is long-acting insulin like glargine or detemir, need to be taken one or twice a day with a rapid acting insulin; aspart, lispro, before meals in order stabilise the high blood glucose levels. T2DM patients often have misconception about insulin therapy as it is usually carried out by injection. Often, patients are reluctant to take and continue this insulin therapy treatment due to fear to needles, and guilt as they are “proper” management of T2DM through oral treatment. Other, also due to fear of experiencing hypoglycaemia (Marian.,2011). World Health Organization (WHO) also reported in 2003 that average patient adherence in long-term therapy for chronic disease in develop countries is only 50% while in developing countries, it is much lower. Nonadherence in oral anti diabetic treatment was associated with the incidence of end-stage renal failure, results more significant in metformin polytherapy (Piragine et al., 2023).

According to Cramer's (2004) the total adherence rate in prospective and retrospective trials ranged from 36 to 93%. This supported the finding that many T2DM patients did not take their medications as prescribed, including insulin and OHA (Cramer, 2004). Additionally, according to Capoccia et al (2016) and Odegard & Capoccia (2007), medication adherence rates in some investigations were found to be as low as 31 to 33%. The age range of the study population and the use of various adherence assessment instruments may be the cause of the disparities in these results.

2.2 Effect of level of health literacy on medication adherence

It is important for patients to be able to recognise their medication as well as being able to differentiate the drug treatment given based on the side effects and purpose of each medication. T2DM patients that can do so are expected to benefit more from the management of treatment planned. Health literacy is defined as the extent to which a person can access, communicate, process, and comprehend essential health information and services to make informed health decisions (Kendir & Breton, 2020). T2DM patients with high health literacy has a good level of medication adherence as inadequate health literacy are associated with medication non-adherence, medication errors, higher medical expenses, and increased hospitalization. The capacity to comprehend health information, how to take medications correctly, how to read prescriptions, and nutrition tables will all be worse the lower one's health literacy. Medication adherence is strongly correlated with health literacy (Saqlain et al., 2019).

About 50% of the chronic disease patients are unable to follow their medication prescription due to misconception regarding their disease and treatment. To improve the medication adherence of T2DM patients, their knowledge and understanding regarding their disease and treatment must be improved to build up motivation and appropriate health behaviors needed (Miller, 2016). According to data from the National Diabetes of Registry Report, the average age of T2DM patients in Malaysia is 63 years old, it is expected for T2DM patients to have a low health literacy, Thus, the health care professionals need to play a role in educating the patient regarding T2DM and medication adherence. Special material education like visual aid is recommended for easier communication in educating the elderly patient. Also, it is important to assess the level of health literacy before prescribing medication for patients to ensure an effective management plan and a better glycemic control among T2DM patients (The America Diabetes Association,2021).

2.3 Quality of Life (QoL)

Quality of Life (QoL) is measured based on the physical and social functioning and perceived physical and mental well-being (Post, 2014). In a specific context, WHO (2012) defines QoL as “an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns. The importance of QoL among diabetes patients has been slowly recognised. Malaysian local study has proved the impact of T2DM patients with poor quality of life (QoL) (Dhillon et al., 2019). Poor QoL is mainly caused by the microvascular and macrovascular complications like cardiovascular disease and severity of diabetes. Microvascular complications would affect retinopathy and nephropathy. If left untreated, it would vision impairment and result in kidney damage.

T2DM patients are often facing challenges and substantial demands in their everyday life as they need to undergo adjustment like food type, meal timing, regular exercise, and blood glucose monitoring. Treatment such as insulin therapy could impact the patient in both positive and negative manner based on how the individual faced the situation. Depression and anxiety also have been observed among T2DM patient via bio-behavioural effects, poor QoL result in those patients. T2DM patient need a holistic care to ensure the effectiveness of the treatment (Berberine for Diabetes: The Holistic Benefits for Managing Type 2 Diabetes, 2023).

2.4 The effect of physical well-being of quality of life

Physical well-being of T2DM patients often suffered which result in a poor quality of life. T2DM patients would often feel tired and increase in hunger, thirst, and urination. Some of T2DM medication like metformin would cause patients to feel nausea. This symptom had to be endured by patients throughout their entire life as there is no cure available for T2DM. Despite T2DM patients often feeling tired, it is especially important to still maintain a sufficient physical activity level to avoid from developing macrovascular and microvascular complications. Regular exercise helps to increase insulin sensitivity, improve glycaemic control and quality of life (Bukht et al., 2019). Increased glucose absorption into working muscles during physical activity is counterbalanced by the generation of glucose in the liver; as physical activity intensity rises, so does the need for carbohydrates to power muscular activity (The American College of Sports Medicine,2010).

T2DM patients might experience complications like retinopathy which would cause them to suffer from vision impairment which has an unreversible effects.1% of out 2.2 billion vision impaired are related with diabetic retinopathy (WHO,2023). T2DM patients with vision impairment would have reduced field vision, distortion of visual, perceptual difficulties in either or both eyes (Seid et al., 2022). The quality of life would further worsen as T2DM patients with vision impairment would often be fired from their workplace due to lack of work productivity.