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Health Related Quality of Life (HRQoL) in Type 2 Diabetes Mellitus Patients Based on Antidiabetic Prescription Patterns

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ABSTRACT

Diabetes mellitus is characterized as a multifaceted metabolic disorder marked by elevated blood sugar levels or hyperglycemia. Among its types, type 2 diabetes mellitus is the most common globally, significantly affecting a large portion of the population. In Indonesia, there has been a notable increase in the prevalence of type 2 diabetes, indicating a rising trend. This condition necessitates continuous care and management since it is incurable, requiring patients to undergo lifelong treatment. The various therapeutic approaches available for managing type 2 diabetes have a significant impact on the quality of life of patients, highlighting the necessity for quality-of-life assessments. The primary objective of this study was to assess the quality of life among individuals diagnosed with type 2 diabetes mellitus. It also aimed to investigate the effects of different patterns of antidiabetic drug prescriptions on the Health-Related Quality of Life (HRQoL), employing the Diabetes Quality of Life Clinical Trial Questionnaire (DQLCTQ) for evaluation. This study was conducted as a quantitative, observational research using a cross-sectional approach and a descriptive analytical method. A total of 99 participants were included through purposive sampling, a non-probability sampling technique. The findings showed that the average quality of life score was 70.56, with 48 participants (48.5%) reported to have a good quality of life and 51 (51.5%) considered to have a poor quality of life. Importantly, significant results ($p<0.05$) were found regarding the positive effects of combining oral antidiabetic drugs with insulin on enhancing the quality of life in individuals with type 2 diabetes, underscoring the influence of medication regimens on patient health outcomes.

INTRODUCTION

Diabetes Mellitus represents a diverse group of metabolic disorders marked by elevated blood sugar levels. This condition stems from dysfunctions in the metabolism of proteins, fats, and carbohydrates, leading to complex, chronic health issues such as neuropathy, and both large and small vessel disease (Dipiro, 2016). It ranks as the fourth leading cause of death in emerging nations, with type 2 diabetes mellitus being the most frequently encountered form globally (International Diabetes Federation, 2017). Comprising around 90% of all diabetes cases, type 2 diabetes stands out as the predominant variant of the disease (American Diabetes Association, 2018a). This persistent metabolic condition not only has a significant and growing prevalence but also demonstrates a yearly

increase in incidence rates (Gregg, 2017; Ogurtsova *et al*., 2017).

In 2016, the WHO revealed that around 422 million people worldwide, aged 60 and older, making up about 95% of the global population, were living with type 2 diabetes mellitus. Year-over-year, there has been a consistent increase in the number of cases of this disease, a trend that can be attributed to various factors such as the aging global populace, rising obesity rates, and a decrease in physical activity (World Health Organization, 2016). Indonesia, a developing country, has seen a significant number of its population affected by type 2 diabetes mellitus. In 2010, the nation reported roughly 8.4 million cases of the disease, with forecasts indicating a jump to approximately 21.3 million by 2030 (World Health Organization, 2016). Among its regions, Riau Province ranks 15th in terms of type 2 diabetes mellitus prevalence, experiencing an increase from 1.3% in 2013 to 1.9% over the past five years, highlighting a growing concern (World Health Organization, 2018).

Type 2 diabetes mellitus requires lifelong treatment because it cannot be fully cured but can only be controlled (Davies *et al*., 2018; Inzucchi *et al*., 2015). Based on the therapy algorithm, the choice of anti-diabetic therapy is modified to the patient's requirements and clinical circumstances. oral antidiabetic monotherapy first, then combination antidiabetic therapy, and finally intensive insulin use (American Diabetes Association, 2018b).

Recognizing the importance of improving the well-being of those with type 2 diabetes is critical for the success of treatment strategies. Assessing how effective healthcare services are for these individuals requires an in-depth look at their quality of life, which is a key measure of success in both preventing and managing the disease (World Health Organization, 2016). The long-term use of medications for diabetes might negatively impact a patient's overall health. Sticking to an appropriate treatment regimen is associated with better quality of life outcomes. Enhancing the quality of life for individuals with type 2 diabetes is a fundamental objective in its management, because it directly influences the efficacy of treatments, the progression of the disease, and mortality rates associated with the illness (World Health Organization, 2014).

Exploring the well-being of those living with type 2 diabetes mellitus offers crucial knowledge for medical practitioners and society at large. Such insights enable individuals to actively engage in preventing and controlling their condition more efficiently (World Health Organization, 2016). The study employs the Diabetes Quality of Life Clinical Trial Questionnaire (DQLCTQ) as its main instrument for measuring life quality in people with type 2 diabetes mellitus. Originating from Shen *et al*.'s (1999) research, the DQLCTQ is tailored for assessing the life quality specifically in this group. It contains 8 sectors and has been rigorously verified for its accuracy and reliability. This ensures that its content and wording are suitably precise for gauging life quality among these patients (Adikusuma *et al*., 2016). The questionnaire indeed offers an in-depth and accurate framework for assessing the effects of type 2 diabetes mellitus on patients' lives with great specificity.

According to studies done by Hayek (2014) and Perwitasari *et al*. (2014), the findings indicate that individuals with type 2 diabetes mellitus who undergo oral combination therapy alongside insulin exhibit a superior quality of life compared to those who receive insulin monotherapy or oral monotherapy. Similar to the results of research by Owens (2013), this pattern suggests that patients with type 2 diabetes mellitus utilizing oral combination therapy with insulin demonstrate improved clinical outcomes due to its ability to enhance pancreatic beta cells, mitigate glucotoxicity, avert endothelial damage, and suppress the inflammatory process. Consequently, these factors can contribute to enhanced treatment satisfaction, ultimately leading to an improvement in quality of life (Owens, 2013).

However, different results were shown in research conducted by Sepulveda *et al*. (2015), which demonstrated a lower quality of life in the areas of physical function, social function, and overall health perception in type 2 diabetes mellitus patients who used insulin monotherapy compared to patients who received oral monotherapy. Even though using insulin can control blood sugar levels well, some patients experience negative effects from using insulin such as fear, pain, anxiety, and discomfort caused by side effects, namely hypoglycemia. Apart from insulin, there are several common side effects of oral antidiabetics, for example metformin can cause gastrointestinal disorders such as nausea, vomiting, diarrhea and lactic acidosis of around 20-30% (Fatima *et al*., 2018). Acarbose can cause bloating and diarrhea (Gao *et al*., 2018). Sulfonylureas can cause hypoglycemia, skin rashes, nausea, vomiting, constipation and headaches (Yadav *et al*., 2018), so that the discomfort and risk of side effects due to long-

term use of antidiabetic drugs can affect the patient's quality of life.

The Bangkinang District General Hospital, managed by the Kampar Regency's Regional Government, serves as the primary referral center for the region. Within this facility, type 2 diabetes mellitus has emerged as the most prevalent condition among the top 10 diseases, recording 5,938 cases and 542 fatalities over the previous year. Despite the high incidence rate, there has been no assessment of the health-related quality of life among patients with type 2 diabetes mellitus using the Diabetes Quality of Life Clinical Trial Questionnaire (DQLCTQ) questionnaire at this institution. This gap has sparked interest among researchers to explore the quality of life related to health among patients with type 2 diabetes mellitus at the Bangkinang District General Hospital.

The aim of this study is to employ the DQLCTQ to evaluate the quality of life of patients with type 2 diabetes mellitus, focusing on the antidiabetic prescribing patterns observed at Bangkinang District Hospital. Given the notable variation in treatments, which could potentially influence patients' quality of life, this research seeks to uncover such impacts. The advantages of this study lie in its potential application in pharmacoeconomic research, particularly in Cost Utility Analysis (CUA). Additionally, the data gathered from this study can serve as foundational information for measuring Quality-Adjusted Life Years (QALYs) in patients diagnosed with type 2 diabetes mellitus.

METHODS

The study took place over the period spanning from January to July 2023 at the Internal Medicine Clinic of Bangkinang Regional General Hospital (RSUD) in Kampar, Riau. It adopts a cross-sectional design and utilizes a quantitative approach, specifically descriptive analytical observational research. The participants in this study were individuals diagnosed with type 2 diabetes mellitus who received outpatient care at Bangkinang Regional Hospital from January to December 2022. It is noteworthy that these participants did not present any co-morbid conditions nor complications. The sample for this study comprised patients diagnosed with type 2 diabetes mellitus at Bangkinang Regional Hospital between January and December 2022. A non-probability sampling technique, specifically purposive sampling, was utilized to select participants for this study. The minimum number of respondents required for the study was determined to be 64 samples, calculated using the Lemeshow formula to ascertain the appropriate sample size.

The research procedure begins with arranging a research permit letter starting with a submission to the Administration Section of the Riau College of Pharmaceutical Sciences, in the form of a research permit application letter at the Bangkinang Regional General Hospital, then processing an Ethics Review Letter to the Ethics Commission of the Riau University Faculty of Medicine (FK UR). This research has obtained approval from the ethical commission of the Faculty of Medicine, Riau University with number B/030/UN19.5.1.1.8/UEPKK/2023. The processing of this permit is forwarded to the Human Resources (HR) and Education Section of Bangkinang Regional General Hospital. The first sheet of this research questionnaire contains instructions for filling it out and the patient's identity in the form of name, age, length of suffering, education level and employment status. The questions on the second to seventh sheets are the DQLCTQ items.

Primary data as well as secondary data were used in this study. The researcher explained first how to fill out the questionnaire based on the respondent's condition using the DQLCTQ. Secondary data collection was carried out by recording medical record data in the form of the type of antidiabetic obtained by the respondent. The data obtained is managed and transferred to a data collection sheet and kept confidential. This research instrument consists of an informed consent sheet, using a data collection form and the DQLCTQ, anti-diabetic prescribing patterns for outpatient type 2 diabetes mellitus respondents were recorded from medical records. Regional General Hospital of Bangkinang. Data analysis in this study used descriptive analytical research, including Respondent Characteristics, Description of Antidiabetic Prescribing Patterns, HRQoL in Type 2 Diabetes Mellitus Patients, and the Relationship between Antidiabetic Prescribing Patterns and HRQoL, which use the Kruskal Wallis and post hoc test to see which groups have differences. The ethics of this research included Informed Consent, Anonymity, Confidentiality, Ethical Clearance, and Coding.

RESULTS AND DISCUSSION

Characteristics of Respondents

Gender

In sex characteristics, the female group is the largest group with type 2 diabetes mellitus with 56 patients (56.6%). The male group had 43

patients (43.4%). This is because visits at Bangkinang Hospital in the last 4 years have more females than males. This finding is corroborated by a study conducted by Pasha *et al*. (2021) that indicated that the female population is more affected by type 2 diabetes mellitus, with 86 patients (74.14%) compared to 30 patients (25.86%) in the male group. This observation aligns with the fact that women are more prone to experiencing a greater increase in body mass index (BMI), leading to the accumulation of fat tissue. As fat tissue accumulates, the body becomes more resistant to insulin, making women more susceptible to developing type 2 diabetes mellitus (Fatimah, 2015).

Age

In the age characteristics of the age group 40-59 years, it is the largest age group that has type 2 diabetes mellitus with 56 (56.6%), followed by the age group ≥60 years with 40 patients (40.4%), then the age group <40 years with 3 patients (3%). This is because the data taken were outpatient data, where patients between the ages of 40 and 59 are a group that is still able to move and perform daily tasks. The results of this study are supported by Imelda's research (2019) which stated that the age group of 40-59 years is more susceptible to type 2 diabetes mellitus, which is 94 patients (79.7%) compared to the age group of >60 years as many as 24 patients (20.3%). The aging process, which begins after the age of 30, is associated with various anatomical, physiological, and biochemical changes in the body. One consequence of aging is an increased risk of developing type 2 diabetes mellitus. This heightened risk is attributed to factors such as changes in metabolism, decreased insulin sensitivity, and alterations in body composition, all of which become more pronounced with age (Jelantik *et al*., 2014).

Education Level

In the characteristics of the education level, the group most affected by type 2 diabetes mellitus was the lower education group as many as 53 patients (53.5%) while the higher education group as many as 46 patients (46.5%). This result is supported by research by Ratnasari *et al*. (2019) which stated that lower education groups are more affected by type 2 diabetes mellitus because education is related to knowledge about blood glucose treatment and control. Higher education groups will usually have more knowledge about health and with this knowledge, higher education groups will have awareness in maintaining their health (Isnaini and Ratnasari, 2018).

Employment Status

In the characteristics of employment status, the group most affected by type 2 diabetes mellitus was the group with working status as many as 52 patients (52.5%), followed by the non-working status group as many as 47 patients (47.5%). This result is supported by research conducted by Nugraha (2021) that type 2 diabetes mellitus is suffered more by the working patient group, which was 68 patients (70.10%) compared to the non-working patient group of 29 patients (29.9%).

According to Persaud and Williams (2017) and Falco *et al* (2015) working patients tend to experience stress, where stress conditions can be a factor causing type 2 diabetes mellitus because it has the potential to increase blood glucose levels and insulin resistance. Someone who works will be generally be busier than someone who does not work, so that irregular lifestyles or irregular eating patterns cause health issues that increase type 2 diabetes mellitus risk (Pratiwi *et al*., 2014).

Long Suffering

In the characteristics of long suffering, the group suffering from type 2 diabetes mellitus was obtained the most, namely the 5-10 years group as many as 45 patients (45.5%), then followed by the <5 years group as many as 31 patients (31.3%), then the >10 years group as many as 23 patients (23.2%). This finding aligns with research conducted by Ratnasari *et al*. (2019), which indicated that the highest prevalence of type 2 diabetes mellitus occurs in the 5-10 years age group, with 81 patients (40.5%), followed by the >10 years age group, with 60 patients (30%), and not much different from the <5 years group with as many as 59 patients (29.5%). According to Alsheed *et al.* (2016) stated that patients with a duration of suffering 5-15 years will have a high risk of suffering from chronic complications in the future.

Table 1. Type 2 Diabetes Mellitus patients' characteristics

Characteristics of Patients	Patients (n= 99)	
	n	%
Gender		
Male	43	43.4
Female	56	56.6
Age		
<40 years	3	3
40-59 years	56	56.6
≥60 years	40	40.4
Level of Education		
Elementary Education	53	53.5
Higher Education	46	46.5
Job Status		
Work	52	52.5
Doesn't Work	47	47.5
Long Suffering		
<5 years	31	31.1
5-10 years	45	45.5
>10 years	23	23.2

Table 2. Distribution of Antidiabetic Prescribing Patterns

No	Prescribing Patterns	n=99	%
1	Oral Monotherapy	15	15.2
2	Insulin Monotherapy	33	33.3
3	Oral Combination	22	22.2
4	Insulin Combination	14	14.1
5	Oral Combination with Insulin	15	15.2

Overview of Antidiabetic Prescribing Patterns

Antidiabetic prescribing patterns in the Outpatient Installation of RSUD Bangkinang are categorized into five groups, namely oral monotherapy, insulin monotherapy, oral combination, insulin combination, and oral combination with insulin. The oral antidiabetics used are Acarbose, Forbetes (metformin), Gliabetes (pioglitazone), Glimepiride, Januvia (sitagliptin), Metformin, and Pioglitazone HCl. The insulin used is Apidra (glulysine), Novorapid (aspart), Novomix (protamine aspart and aspart), Lantus (glargine), Levemir (detemir), Rizodeg (aspart and degludec), and Sansulin (glargine). In this study, the most widely used antidiabetic type groups were insulin monotherapy as many as 33 patients (33.3%), oral combination as many as 22 patients (22.2%), oral monotherapy as many as 15 patients (15.2%), oral combination with insulin as many as 15 patients (15.2%), and insulin combination as many as 14 patients (14.1%).

This is because insulin monotherapy is given if oral antidiabetic doses do not provide improvements to blood glucose levels so that insulin therapy becomes necessary when oral antidiabetic medications fail to adequately control blood glucose levels. Patients with type 2 diabetes mellitus who have contraindications or allergies to oral antidiabetic drugs may be prescribed insulin monotherapy as an alternative treatment solution. Individuals with type 2 diabetes mellitus continue to generate insulin, yet their cells fail to properly react to it, prompting the use of insulin to circumvent this resistance and regulate blood sugar levels (Indonesian Society of Endocrinology, 2015)

Table 3. HRQoL of Type 2 Diabetes Melitus Patients

Questions		Condition	n=99	%
Q1	How has your general health been in the last 4 weeks?	Very, very good	7	7.1
		very well	19	19.2
		Good	22	22.2
		Mediocre	37	37.4
		Bad	14	14.1
Q2	Compared to before suffering from diabetes mellitus, how is your overall health status now?	Better than before DM	58	58.6
		Somewhat better than before DM	30	30.3
		Approximately the same as before DM	11	11.1
		Worse compared to before DM	0	0
		Very bad compared to before DM	0	0

Table 4. HRQoL of Type 2 Diabetes Melitus Patients

Utility	Quliality of Life	n=99	%
DQLCTQ	Good	48	48.5
	Bad	51	51.5

Health Related Quality of Life (HRQoL) in Type 2 Diabetes Mellitus Patients

The DQLCTQ questionnaire also has questions that can describe the state of patients with type 2 diabetes over the previous four weeks, where the questions consist of Q1 and Q2 which can be seen in Table 3. In question Q1, the most patient condition groups were obtained, namely the mediocre group of 37 patients (37.4%), the good group of 22 patients (22.2%), the very good group of 19 patients (19.2%), the bad group of 14 patients (14.1%), and the very very good group of 7 patients (7.1%). This is because patients with type 2 diabetes mellitus generally already suffer from type 2 diabetes mellitus >5 years, where patients are accustomed to consuming and using antidiabetics to control their blood sugar, so that patients can accept and respond to the disease they suffer (Hestiana, 2017).

In assessing the quality of life among patients with type 2 diabetes mellitus using utility values derived from specific domains, the average life quality score among 99 individuals was found to be 70.56. Scores below 70.56 were classified as indicating poor quality of life, while scores equal to or above this threshold suggested a good quality of life. According to the scores from the DQLCTQ items, 48 patients (48.5%) were identified as having a good quality of life, and 51 patients (51.5%) were seen to have a poor quality of life. Interestingly, the second part of the questionnaire revealed that 37 patients (37.4%) reported feeling mediocre about their condition, suggesting that perceptions of quality of life are highly subjective. Overall, the study observed a greater tendency towards poor quality of life among the participants. This outcome contrasts with findings by Laoh and Tampongangoy (2015), who reported that 19 patients (63.3%) experienced a good quality of life, while 11 patients (36.7%) had a poor quality of life. The impact of type 2 diabetes mellitus varies across different measurement domains for each patient. Many factors, such as compromised physical function, heightened energy requirements, health concerns, mental state, personal satisfaction, contentment with treatment, side effects of treatment, and the rarity of symptoms, play a role in the reduced quality of life reported by individuals with this condition (Yuswar *et al*., 2022).

The progression of type 2 diabetes mellitus and its associated health complications and treatment protocols significantly affect patients' quality of life. This often results in diminished physical and psychological health, limiting patients' abilities to perform everyday activities or routines (Yuswar *et al*., 2022). Research by Laoh and Tampongangoy (2015) highlighted that improving quality of life is a primary objective in managing type 2 diabetes mellitus. Proper glucose control can prevent physical issues arising from both sudden and gradual complications.

Table 5. Prescription patterns for diabetes medications and HRQoL

Antidiabetic Prescribing Patterns	HRQOL			p *value*
	Median	Min	Maks	
Oral Monotherapy	62.02	47.78	88.63	0.346
Insulin Monotherapy	72.84	48.23	107.39	
Oral Monotherapy	62.02	47.78	88.63	0.065
Oral Combination	72.52	50.47	97.62	
Oral Monotherapy	62.02	47.78	88.63	0.412
Insulin Combination	72.12	51.45	95.41	
Oral Monotherapy	62.02	47.78	88.63	0.000
Oral Combination with Insulin	91.97	78.72	101.76	
Insulin Monotherapy	72.84	48.23	107.39	0.238
Oral Combination	72.52	50.47	97.62	
Insulin Monotherapy	72.84	48.23	107.39	0.970
Insulin Combination	72.12	51.45	95.41	
Insulin Monotherapy	72.84	48.23	107.39	0.000
Oral Combination with Insulin	91.97	78.72	101.76	
Oral Combination	72.52	50.47	97.62	0.360
Insulin Combination	72.12	51.45	95.41	
Oral Combination	72.52	50.47	97.62	0.000
Oral Combination with Insulin	91.97	78.72	101.76	
Insulin Combination	72.12	51.45	95.41	0.000
Oral Combination with Insulin	91.97	78.72	101.76	

Relationship between Antidiabetic Prescribing Patterns and Health Related Quality of Life (HRQoL)

This analysis was conducted with the aim of seeing if there were statistical differences in antidiabetic prescribing patterns with quality of life in patients' health. First, data analysis was carried out first with a data normality test. The purpose of the normality test is to determine whether or not each variable is normally distributed so that the appropriate test can be chosen (Dahlan, 2014).

The assessment of data normality in this context employs the Kolmogorov-Smirnov test for sample sizes larger than 50, and the Shapiro-Wilk test for samples up to 50. A dataset is judged to follow a normal distribution if the p-value derived from these statistical evaluations, including both the Shapiro-Wilk and Kolmogorov-Smirnov tests, meets or exceeds the threshold of 0.05. On the other hand, a p-value falling below 0.05 indicates that the dataset does not adhere to a normal distribution. In instances where the dataset exhibits normal distribution characteristics, a parametric test is utilized. However, for data not displaying normal distribution, the initial step involves data normalization or transformation. Should this transformation not adjust the distribution to normal, a non-parametric test is then applied to analyze the transformed data still showing non-normal distribution traits (Dahlan, 2014).

When the distribution of prescribing patterns for anti-diabetic drugs in relation to quality of life follows a normal curve, a parametric statistical method, typically the one-way ANOVA, is often applied. Conversely, should the distribution deviate from normality, a non-parametric statistical approach, such as the Kruskal-Wallis test, becomes the preferred choice. In the present investigation, testing for normality yielded a p-value at or below 0.000, signifying an abnormal distribution of the data. Efforts to normalize the data through Log10 transformation were made, yet the distribution persisted in its non-normal state, evidenced by a p-value of 0.012, which is still below the threshold of 0.05. As a result, the study proceeded with the Kruskal-Wallis test, a

suitable non-parametric statistical method, for analysis.

The examination of the link between the quality of life in patients with type 2 diabetes and their anti-diabetic drug prescription habits was carried out using the Kruskal-Wallis statistical test. The findings from this test revealed a p-value of 0.000, falling below the threshold for statistical significance set at 0.05. This finding indicates a meaningful variance in how anti-diabetic drugs are prescribed and the life quality of individuals with type 2 diabetes mellitus. Supporting this conclusion, Perwitasari and colleagues (2014) have also documented a notable contrast in the quality of life of patients with type 2 diabetes when compared to the prescription trends for anti-diabetic drugs. Further analysis was conducted to identify the specific groups showing differences.

The outcome of the subsequent analysis indicated significant distinctions in the effectiveness of DQLCTQ among different treatment groups. The comparison between the group receiving oral medication alone and the group treated with a combination of oral medication and insulin showed a significant difference, with a p-value of 0.000 ($p<0.05$). Similarly, a significant difference was observed when comparing the insulin-only treatment group with the combined oral and insulin treatment group, also registering a p-value of 0.000 ($p<0.05$). Furthermore, both the group treated with a combination of oral medications and the group receiving a combination of insulin therapies compared with the oral and insulin combination therapy group showed significant differences, each with a p-value of 0.000 ($p<0.05$). The superior blood sugar management and the reduced likelihood of adverse effects in the group receiving combined oral and insulin therapy account for these differences when contrasted with groups undergoing oral monotherapy, insulin monotherapy, oral combination therapy, and insulin combination therapy (Madelina *et al*., 2018).

The research by Ratnasari and colleagues (2019) conducted at the Panembahan Senopati Bantul Hospital in Yogyakarta, focusing on patients with type 2 diabetes mellitus, discovered a notable discrepancy between the prescribing patterns for antidiabetic medications and the quality-of-life scores as assessed by the DQLCTQ items. The analysis of the data revealed a p-value below 0.05, precisely $p=0.000$, underscoring a substantial difference. Owens (2013) further elaborated that patients with type 2 diabetes mellitus who combine insulin with oral medications tend to achieve superior clinical outcomes. This combination therapy enhances the function of pancreatic beta cells, mitigates glucotoxicity, protects against endothelial damage, and reduces inflammation, thereby leading to increased satisfaction with treatment and, consequently, a better quality of life.

The research outcomes reveal significant variances in life quality among individuals with type 2 diabetes mellitus, especially those receiving a mix of oral medications and insulin treatments. This particular group showed a marked improvement in their quality of life in comparison to patients undergoing different treatment regimens.

CONCLUSIONS

The study conducted at Bangkinang Hospital on the health-related quality of life (HRQoL) in individuals with type 2 diabetes mellitus, based on the patterns of anti-diabetic medication prescriptions, revealed an average quality of life score of 70.56. It was observed that out of the total participants, 48 individuals (48.5%) experienced a high quality of life, whereas 51 participants (51.5%) experienced a low quality of life. The findings of the research indicated a significant enhancement in the quality of life for patients with type 2 diabetes mellitus when their treatment regimen included both oral antidiabetic drugs and insulin.

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