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ASSESSMENT OF DRUG UTILIZATION PATTERN AND QUALITY OF LIFE USING MODIFIED DIABETES QUALITY OF LIFE (MDQoL)-17 QUESTIONNAIRE

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ABSTRACT

Introduction: Type II Diabetes Mellitus is a chronic metabolic disease characterized by insulin resistance and impaired insulin secretion. The wide range of antidiabetic medications and patient-specific factors contribute to diverse drug utilization patterns. Understanding these patterns is crucial for identifying potential issues such as irrational drug use, polypharmacy, and non-adherence. **Objectives:** To evaluate drug utilization patterns in Type II DM patients and determine quality of life using the Modified Diabetes Quality of Life (MDQoL-17) questionnaire. **Materials and Methods:** An observational cross-sectional study was conducted at Shridevi Institute of Medical Sciences and Research Hospital, Tumakuru, involving 100 Type II DM patients. Patients were included in the study only after obtaining written informed consent form; all relevant data were collected from case record forms and were analysed to assess the drug utilization while Health-related quality of life was assessed using MDQoL-17. Data was analyzed using JAMOVI version 2.6.44. **Results:** Most participants were aged 51-60 years (35%) with mean age 56.7±11.9 years; 52% were males. Hypertension (52%) was the most common comorbidity. Glimepiride Metformin was the most prescribed regimen. Mean MDQoL-17 scores showed lowest values in general health perception (40.00±19.71) and energy/fatigue (51.00±28.48). Higher HbA1C significantly correlated with lower QoL ($p<0.05$). **Conclusion:** Glimepiride+Metformin was most commonly prescribed, reflecting rational therapy. Quality of life was moderately affected, mainly in general health and energy domains. Effective glycaemic control and holistic management are essential to improve overall well-being. **Word Count:** 248 words.

KEYWORDS: Type II Diabetes Mellitus, Drug Utilization Pattern, Modified Diabetes Quality of Life (MDQoL-17), Quality of Life, Glycaemic Control.

INTRODUCTION

Diabetes is a group of metabolic diseases characterized by hyperglycaemia resulting from either insulin deficiency, insulin resistance, or both.[1] The chronic hyperglycaemia is associated with long-term damage, leading to micro and macrovascular complications which degrade quality of life. Complications include altered metabolism of lipids, carbohydrates, proteins and an increased risk of vascular diseases.[1] The prevalence of this disease across the world was estimated to be 2.8% in 2000 and 4.4% in 2030. The number of people affected with diabetes is projected to increase from 172 million in 2000 to 366 million in 2030.[2]

The vast majority of cases of diabetes fall into two broad etiopathogenetic categories, namely Type I and Type II diabetes mellitus.[3] Type I diabetes is caused by an absolute deficiency in insulin secretion, often identified by serological evidence of an autoimmune pathologic process occurring in the pancreatic islets and by genetic markers.[4] Type II diabetes is caused by a combination

of resistance to insulin action and an inadequate compensatory insulin secretory response.[3]

Oral hypoglycaemic agents are useful in the treatment of Type II DM. These include sulphonylureas, biguanides, alpha-glucosidase inhibitors, meglitinide analogues, and thiazolidinediones.[5] The main objective of these drugs is to correct underlying metabolic disorders such as insulin resistance and inadequate insulin secretion. They should be prescribed in combination with an appropriate diet and lifestyle changes.[5]

Drug utilization study was defined by WHO in 1977 as "the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social, and economic consequences."[6] The principal aim of drug utilization studies (DUS) is to facilitate the rational use of drugs in population. DUS is an essential part of pharmacoepidemiology as it describes the extent, nature and determinants of drug exposure and is used to identify treatment adherence problems.[7] The results of drug utilization studies can suggest modifications in the existing prescribing practices to the prescribers, policy makers as well as drug and therapeutic committees in order to encourage rational use of drugs.[8] Understanding these patterns is crucial for identifying potential issues such as irrational drug use, polypharmacy, non-adherence, or suboptimal therapy.[7]

Quality of life (QoL) is a term used to appraise the patient's functional capacity, psychological and social health, and overall sense of well-being.[9] The World Health Organization Quality of Life (WHOQOL) group defined QoL as an individual's perception of their position in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns.[9] Routine assessment of quality of life as part of clinical practice has the ability to improve communication between patients and providers, identify frequently overlooked problems, prioritize problems, and evaluate the impact of therapeutic efforts at the individual patient level.[9]

In our study, we have used the MDQoL-17 questionnaire developed by Acharya et al. in 2014.[10] It contains 17 diabetes-specific questions and 8 concepts for physical, social functioning, role limitations due to personal and emotional problems, psychological impact, energy/fatigue, bodily pain, and general health perceptions. This was used to assess the QoL in Type II diabetes mellitus patients with and without complications and get a better understanding of the patients' perspective regarding the disease and impact of disease on their QoL.[10]

This project will contribute to appraising the rationality of current prescribing trends, identifying the relationship between drug therapy and QoL outcomes, and also helps in generating data that can guide more patient-centred therapeutic decisions.[1] Hence, this study is significant for improving patient care by promoting rational drug use and enhancing the life quality in individuals living with Type II DM.[1]

MATERIALS AND METHODS

Study Design and Patients

An observational cross-sectional study was carried out at Shridevi Institute of Medical Sciences and Research Hospital (SIMS & RH), Tumakuru-572106 for a period of 3 months. The approval of the Ethics Committee of the Institution was obtained prior to the commencement of the study. This study protocol was approved by the Institutional Review Board, SIMS & RH, Tumakuru. (Reference No: SIMSRH/IEC/2025-2026/439) This study included 100 patients from the Department of General Medicine, Department of Surgery and Department of Orthopaedics who were diagnosed with Type II diabetes mellitus. All the participants included in the study were explained clearly about the purpose and nature of the study in the language they understood and were included in the study only after obtaining a written Informed Consent (ICF).

Methods

Considering the inclusion and exclusion criteria, All individuals of either sex, aged above 18 years of age, diagnosed with type II diabetes mellitus were included in the study, while those diagnosed as gestational diabetes or type I diabetes were excluded from the study. The detailed information of the participants pertaining to age, sex, occupation, relevant medical history, past history and drug therapy administered were obtained from their case files and were recorded in the Case Record Form (CRF). Details regarding the treatment of diabetes such as the drugs used, the dose, duration and the frequency of administration, type of dosage form used etc. were also recorded. For measuring the patient's quality of life, the Modified Diabetes Quality of Life-17 (MDQoL-17) questionnaire was administered to all the patients.

MDQoL-17 questionnaire is a standard and validated tool that is used to measure the patient's quality of life in 7 different health-related domains: physical functioning, role limits resulting from physical health issues, role restrictions resulting from personal or emotional issues, emotional wellness, social functioning, energy, weariness, and general health perceptions. All these 7 domains comprise 17 questions and for each question scores range from 0-100. Better quality of life was experienced by patients with a QoL score of 70 or higher, moderate quality of life by those with a score between 50 and 70, and poor quality of life by those with a score below 50.

Statistical Analysis

The collected data was analyzed using statistical free software JAMOVI version 2.6.44 for different demographic factors and drug utilization assessment. Descriptive statistics were used for the comparison of the

QoL scores and comorbidities, diabetes with and without complications, demographics, diabetes-related complaints and covariates. Two-group mean comparisons were conducted using independent student test, and three-group mean comparisons were conducted using one-way ANOVA test. If p-value less than 0.05, it was considered as statistically significant.

RESULTS

Most participants were aged 51-60 years (35%) with a mean age of 56.7±11.9 years, and 52% were males. Hypertension (52%) was the most common comorbidity, and Glimepiride+Metformin was the most prescribed regimen. General health perception and energy/fatigue were the most affected QoL domains, while social functioning was least affected. Poor glycaemic control (higher HbA1C) was significantly associated with lower QoL scores ($p<0.05$).

Age Distribution

A total of 100 participants were included. Most were aged 51-60 years (35%), followed by 41-50 years (29%) and 61-70 years (17%). Few were 71-80 years (10%), 30-40 years (5%), 81-90 years (3%) and >90 years (1%). Overall, most participants were middle-aged to elderly.

Table 1: Age Distribution.

Age in Years	No. of Participants	Percentage
30-40	5	5.00
41-50	29	29.00
51-60	35	35.00
61-70	17	17.00
71-80	10	10.00
81-90	3	3.00
>90	1	1.00
IQR	47-64.75	-
Mean±SD	56.75±11.91	-
Total	**100**	**100.00**

Gender Distribution

The study included 100 participants, comprising 52 males and 48 females. The largest proportion was in the 51-60 years age group (35%), followed by 41-50 years (29%) and 61-70 years (17%). Smaller proportions were observed in the 71-80 years (10%), 30-40 years (5%), 81-90 years (3%), and above 90 years (1%) groups. The age distribution was fairly similar between males and females across categories, and the chi-square test ($\chi^2=32.867$, $p=0.523$) indicated no statistically significant association between age group and gender.

Table 2: Gender Distribution.

Age in Years	Male	Female	Total
30-40	2	3	5
41-50	10	19	29
51-60	23	12	35
61-70	10	7	17
71-80	5	5	10
81-90	1	2	3
>90	1	0	1
Chi-square test	32.867	-	-
P-value	0.523	-	-
Total	**52**	**48**	**100**

Drug Utilization Pattern

The combination of Glimepiride+Metformin (GP1) emerged as the most commonly prescribed antidiabetic regimen (38%), followed by Metformin monotherapy (25%). Other notable combinations include Metformin with Sitagliptin, Dapagliflozin, and Vildagliptin. The variety of treatment regimens suggests that participants have different disease severities and treatment responses, highlighting the need for personalized diabetes management.

Table 3: Distribution of Drug Utilization Pattern in Type II DM Participants.

Generic Names	No. of Participants
Metformin	25
Glimepiride+Metformin (GP1)	38
Glimepiride+Metformin (GP2)	12
Sitagliptin+Metformin	2

Sitagliptin+Dapagliflozin	1
Dapagliflozin+Metformin	5
Vildagliptin+Metformin	2
Glimepiride+Voglibose+Metformin HCl	2
Pioglitazone+Metformin+Glimepiride	1
Diabetron	1
Metformin+Glimepiride+Metformin (GP1)	2
Metformin+Sitagliptin+Metformin	1
Metformin+Glimepiride	1
Glimepiride+Metformin (GP1)+Metformin (GP2)	3
Metformin+Vildagliptin	1
Glimepiride+Metformin (GP2)+Dapagliflozin	2
Vildagliptin+Metformin+Pioglitazone+Glimepiride	1
Total	**100**

MDQoL-17 Domain Scores

The MDQoL-17 assessment shows a moderately reduced quality of life among participants. General health perception scored lowest (40.00±19.71), indicating poor self-rated health. Physical functioning (51.67±31.93) and energy levels (51.00±28.48) were moderately affected, impacting daily activities. Emotional well-being (55.80±24.06) and social functioning (63.85±29.25) were better preserved but still showed some burden. Overall, quality of life was most impacted in general health, physical functioning, and energy, while social functioning was relatively maintained.

Table 4: Mean Scores of the Individual Domains of MDQoL-17.

MDQoL-17 Parameters	Mean±SD
General health perceptions	40.00±19.71
Physical functioning	51.67±31.93
Role limitations due to physical health problems	62.95±27.16
Emotional well-being	55.80±24.06
Role limitations due to emotion	54.00±25.71
Social functioning	63.85±29.25
Energy/fatigue	51.00±28.48

Association of MDQoL-17 scores with HbA1C Levels

Out of 100 participants, none had HbA1C <5.7%. Participants with HbA1C 5.7-7.4% had higher MDQoL-17 scores, while those >9.4% showed lower scores (12.4-48.4). The Kruskal-Walli's test (H=68.41, p=0.045) showed a significant link between higher HbA1C and poorer quality of life.

Table 5: Association of MDQoL-17 scores by HbA1C Level Investigation of Participants.

MDQoL-17 (average)	<5.7%	5.7-6.4%	6.5-7.4%	7.5-8.4%	8.5-9.4%	>9.4%	Total
12.4-24.4	0	0	0	0	0	2	2
24.4-36.4	0	1	1	0	0	6	8
36.4-48.4	0	0	3	6	9	13	31
48.4-60.4	0	0	2	3	5	7	17
60.4-72.4	0	0	6	5	5	13	29
72.4-84.4	0	1	4	1	2	5	13
Kruskal-Wallis H test	68.41						
P-value	0.055						
Total	**0**	**2**	**16**	**15**	**21**	**46**	**100**

HbA1C Distribution

The HbA1C investigation among the 100 participants demonstrates that the majority had poor long-term glycaemic control. None of the participants had HbA1C levels below 5.7%, while only 2% were in the pre-diabetic range (5.7-6.4%). About 16% had levels between 6.5-7.4% and 15% were in the range of 7.5-8.4%. A further 21% had HbA1C values between 8.5-9.4%, and the largest proportion, 46%, recorded HbA1C levels greater than 9.4%. These findings highlight that a significant majority of participants had uncontrolled diabetes, reflecting poor glycaemic management and increased vulnerability to long-term complications.

Table 6: Distribution of HbA1C Investigation in the Study Participants.

HbA1C Level	No. of Participants	Percentage
<5.7%	0	0.00
5.7-6.4%	2	2.00
6.5-7.4%	16	16.00
7.5-8.4%	15	15.00
8.5-9.4%	21	21.00
>9.4%	46	46.00
Total	**100**	**100.00**

DISCUSSION

In this study, most participants were middle-aged to elderly, with a slight male predominance, reflecting the age and gender profile typically associated with diabetes prevalence. The predominance of housewives and retired individuals may indicate reduced physical activity, which is a known risk factor for diabetes progression. A significant association between gender and occupation (p=0.001) further highlights sociocultural influences on disease distribution.

Substance use was minimal, suggesting that lifestyle factors such as diet and physical inactivity may contribute more strongly to disease burden in this population. Hypertension was the most common comorbidity, consistent with previous studies showing its strong link with diabetes and its negative impact on quality of life (MDQoL-17).

Most participants lacked a family history of diabetes, indicating that environmental and lifestyle factors might play a larger role. Poor glycaemic control, reflected by higher HbA1C levels, was clearly associated with lower quality of life scores, emphasizing the importance of achieving optimal glycaemic targets.

Glimepiride+Metformin combination therapy was most commonly prescribed, aligning with current treatment guidelines for type 2 diabetes. The pattern suggests rational prescribing based on disease severity and patient response.

Among MDQoL-17 domains, the lowest scores were observed in general health and energy, while social functioning remained relatively preserved. This pattern indicates that physical limitations and perceived health status contribute more strongly to reduced quality of life than social or emotional factors.

CONCLUSION

In conclusion, the study revealed that Glimepiride + Metformin was the most commonly prescribed antidiabetic regimen, reflecting rational prescribing practices. Overall, participants exhibited a moderate quality of life, with general health, physical functioning, and energy being the most affected domains. Factors such as age, weight, and occupation significantly influenced quality of life. The findings emphasize the importance of holistic diabetes care combining rational drug use, lifestyle modification, and emotional support to enhance treatment outcomes and overall well-being in Type II Diabetes Mellitus patients.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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