

## ORIGINAL ARTICLE

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**Evaluation of treatment compliance and quality of life status of type 2 diabetes mellitus patients** **Tugba Caliskan Sengoz**,  **Hatice Esen***Antalya Training and Research Hospital, Department of Family Medicine, Antalya, Türkiye*

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**Abstract**

Diabetes mellitus (DM) is a serious and progressive disease that occurs when carbohydrates, fat and protein are not used effectively in the body, but it is a problem that greatly affects the individual when the desired level of control cannot be achieved. In this study, the relationship between Treatment Compliance and Quality of Life in Type 2 DM Patients aged 65 and over was evaluated to inform patients about chronic complications, prevent complications, and maintain appropriate care when complications develop. The research was planned as descriptive and cross-sectional. In the unit with a population of 4000, 90 people aged 65 and over with Type 2 DM were included in the study. The mean age of the participants was  $71.99 \pm 5.76$  years (min-max: 65-94). 55.6% of the patients were women, 84.4% were married and 55.6% were primary school graduates. The mean score of the Elderly Quality of Life Scale was  $23.32 \pm 6.59$ , and the mean score of the Patient Compliance Scale in the Treatment of Type 2 DM was  $86.67 \pm 8.68$ . In the study, the relationship between Treatment Compliance and Quality of Life in Type 2 DM patients aged 65 and over was evaluated, and a negative and independent significant relationship was found between scale scores. This study will set an example for patients diagnosed with Type 2 DM to adapt to their treatment and determine their quality of life and make future plans.

**Keywords:** Compliance treatment, diabetes mellitus, quality of life**Introduction**

Diabetes Mellitus (DM) is a chronic disease that requires continuous medical support, characterized by high blood sugar resulting from absolute or partial insufficiency of insulin secretion in the pancreas [1]. Diabetes continues to be an important health problem, which affects the individual and their families in a multidimensional and profound way, causes severe complications and causes mortality and morbidity at an early age [2]. Turkey Diabetes Epidemiology Study (TURDEP) II results, it has been revealed that the prevalence of diabetes in the Turkish adult population has reached 13.7%, that at least 10% of the population from the age group of 40-44 has diabetes, and the prevalence of diabetes in women is higher than in men [3]. As a result of complications caused by diabetes, various organ and function losses occur in the individual. Life expectancy and quality are affected, and social and economic losses that affect

the whole society occur [4,6]. Uncontrolled diabetes seriously affects the life of the individual by causing. Therefore, the disease emerges as a condition requiring constant monitoring and care (Alan [8]). The basis of diabetes management is determined by the attitudes and behaviors of patients regarding their own health. For this reason, the individual management of the diabetes patient is important in terms of ensuring effective participation and compliance in treatment and care [9]. For successful diabetes management, these patients must have knowledge, skills and positive attitudes [10].

Compliance with treatment in patients with Type 2 DM is important in terms of providing glycemic control, preventing the occurrence of acute complications and delaying the occurrence of chronic complications. As a result of successful compliance to treatment, the disease can be brought under control [10]. Non-compliance to drug therapy, as in other chronic diseases, is one of the most common causes of treatment failure in individuals with Type 2 DM [11,12]. Compliance with treatment is an important factor for patients to live a better quality of life [11]. Non-compliance with treatment, it is defined as the failure of patients to act in accordance with the recommendations of health care providers regarding

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treatment [13]. When there is non-compliance, the patient does not perform the treatment given by the doctor in the appropriate dose and time, does not come to appointments or attends late, does not follow the appropriate treatment behaviors and recommendations about drug use, and sometimes ends the treatment voluntarily [14]. Non-compliance with treatment manifests itself with devastating consequences for the individual, such as death and bed dependence in chronic diseases.

According to family medicine discipline principles and family medicine practice regulations, family physicians should take an active role in the prevention, diagnosis and treatment of chronic diseases in primary care [15]. In this context, they have duties as both an educator and a practitioner in diabetes self-management. Family physicians should monitor their quality of life and treatment compliance while following up patients with Type 2 DM, informing patients about chronic complications will increase their effectiveness in the prevention and early diagnosis of complications, and in maintaining appropriate care when complications develop [16]. It is known that the follow-up of Type 2 DM patients by their family physicians in their adaptation to their disease plays an important role in the ability of Type 2 DM individuals to manage their own treatment, to ensure a healthy diet, regular exercise, and to prevent future complications. Family physicians should be aware of the potential problems faced by Type 2 DM patients and should make plans for this. Individuals with Type 2 DM should seek expert help in order to plan their lifestyle in accordance with their disease and to be successful in maintaining their treatment. Quality of life in individuals with diabetes is accepted as an important indicator of the outcome of treatment and care. In the Type 2 DM treatment guideline, it is stated that the primary goal of diabetes treatment is to improve the quality of life [17]. Studies have shown that complications adversely affect the quality of life in individuals with diabetes [18].

This study, we aimed to improve the quality of care of individuals with Type 2 DM, to determine and correct negative attitudes about treatment compliance and quality of life of patients in order to improve metabolic controls, and to improve positive attitudes of patients with Type 2 DM, to determine their compliance with their treatment and quality of life status of patients with Type 2 DM.

## Material and Methods

The study was approved by the Health Sciences University Antalya Training and Research Hospital Clinical Research Ethics Committee (28.04.2022-9/15). The data collection process was performed in accordance with the rules of Declaration of Helsinki. This research was planned as a cross-sectional and descriptive study. 45 family medicine unit were involved in Antalya Turkey in order to evaluate the compliance of patients diagnosed with Type 2 DM to their treatment. The sociodemographic questionnaire developed by the researcher with the knowledge of the relevant literature, and the scale of compliance to treatment and the quality of life scale, for which permissions were obtained, were used. "Quality of Life Scale for the Elderly" consists of 13 questions and "Patient Compliance Scale in Type 2 DM Treatment" consists of 30 questions. Scale forms were answered by phone or face to face. Total population was 4000, and the total number of Type 2 DM patients aged 65 and over was determined as 200. The number of samples to be selected from the universe of 200 people was found

to be 150, with an error level of 0.05 and a probability of  $P=0.05$ . After applying the voluntary basis and exclusion criteria (Type 2 DM patients aged 65 and over will be included in the study. Patients with any psychiatric disease and unable to understand the questions will not be included in the study), 90 people were included in the study between 01 May/30 June 2022.

## Statistical Analysis

All data were analyzed using IBM SPSS Statistics for Windows, Version 23.0 (IBM Corp., Armonk, NY). A bilateral  $p$  value less than 0.05 was considered statistically significant. Continuous data were presented as mean $\pm$ standard deviation (SD) and range (min-max). The results of categorical data were expressed as frequency (n) and percentage (%). Normality assumptions were tested with the Shapiro-Wilk test. Mann-Whitney U test and Kruskal-Wallis test were used to compare scale scores between independent groups. Post-hoc analysis was performed using Bonferroni correction. Spearman correlation test was used to investigate the relationship between CASP and Type 2 DM Treatment Compliance Scale. Multiple linear regression analysis was performed to determine the relationship of independent variables with CASP. Cronbach's alpha coefficients were calculated for reliability analysis.

## Results

A total of 90 patients with a mean age of  $71.99\pm5.76$  years (min-max: 65-94) and 71.1% of whom were in the 65-74 age range were included in the study. 55.6% of the patients were women, 84.4% were married and 55.6% were primary school graduates. The monthly income of 53 patients (58.9%) was minimum wage and above. The mean duration of diabetes of the patients was  $11.64\pm6.74$  years (min-max: 2-30). 34 patients (37.8%) had diabetes for more than 10 years. It was determined that most of the patients (88.9%) received oral antidiabetic treatment. Ten patients (11.1%) were receiving insulin therapy. 85.6% of the patients had chronic disease and 10% had cigarette smoking (Table 1).

The mean score of the Elderly Quality of Life Scale was  $23.32\pm6.59$ , and the mean score of the Patient Compliance Scale in the Treatment of Type 2 DM was  $86.67\pm8.68$ . The Cronbach's alpha reliability coefficient was calculated as 0.851 for the Quality of Life Scale in the Elderly and 0.759 for the Patient Compliance Scale in the Treatment of Type 2 DM. The reliability coefficients of the sub-dimensions of the scale range from 0.900 to 0.963 (Table 2).

A moderate negative correlation was found between the scores of the Quality of Life in the Elderly Scale and the Patient Compliance Scale in the Treatment of Type 2 DM ( $r=-0.497$ ;  $p<0.001$ ) (Figure 1).

No significant correlation was found between the patients' age ( $p=0.241$ ), gender ( $p=0.863$ ), marital status ( $p=0.474$ ), duration of diabetes ( $p=0.267$ ) and presence of chronic disease ( $p=0.780$ ) and Quality of Life Scale for the Elderly scores. While it was observed that primary school and high school-university graduate patients had higher Quality of Life Scale for the Elderly scores, it was not found to be statistically significant ( $p=0.096$ ). Patients with a monthly income of the minimum wage and above had higher Quality of Life Scale scores for the elderly, but it was not significant ( $p=0.081$ ). The mean score on the Quality of Life in the

Elderly Scale of the patients using oral antidiabetic ( $23.75 \pm 6.66$ ) was significantly higher than the patients using insulin ( $19.9 \pm 5.13$ ) ( $p=0.040$ ). The mean score of the Quality of Life Scale was calculated as  $18.44 \pm 6.27$  in patients who smoke and  $23.86 \pm 6.44$  in non-smokers. The mean score of the Quality of Life Scale of smokers was lower ( $p=0.049$ ).

Gender ( $p=0.591$ ), marital status ( $p=0.626$ ), education ( $p=0.727$ ), monthly income ( $p=0.688$ ), duration of diabetes ( $p=0.157$ ), Type 2 DM treatment ( $p=0.809$ ), There was no significant difference in the mean scores of the Patient Compliance Scale in the Treatment of Type 2 DM according to the presence of chronic disease ( $p=0.416$ )

and smoking ( $p=0.480$ ). Patients aged 65-74 years had a higher mean score on the Patient Compliance Scale in the Treatment of Type 2 DM, and this difference was not statistically significant ( $p=0.068$ ) (Table 3).

In Table 5, factors associated with the Quality of Life in the Elderly score were analyzed by multiple linear regression analysis. As a result of the analysis, it was determined that the Patient Compliance Scale in the Treatment of Type 2 DM score was negatively correlated with the Elderly Quality of Life Scale score ( $\beta=-0.563$ ,  $p<0.001$ ).

**Table 1.** Demographic characteristics of the patients

| Variables (n=90)                                                                                     | n   | %    |
|------------------------------------------------------------------------------------------------------|-----|------|
| <b>Age ( <math>\bar{X} \pm SD</math>: <math>71.99 \pm 5.76</math>; min-max: 65-94 )</b>              |     |      |
| 65-74                                                                                                | 64  | 71.1 |
| 75-84                                                                                                | 23  | 25.6 |
| 85 and above                                                                                         | 3   | 3.3  |
| <b>Gender</b>                                                                                        |     |      |
| Woman                                                                                                | 50  | 55.6 |
| Male                                                                                                 | 40  | 44.4 |
| <b>Marital status</b>                                                                                |     |      |
| Married                                                                                              | 76  | 84.4 |
| Single                                                                                               | 14  | 15.6 |
| <b>Educational status</b>                                                                            |     |      |
| Illiterate                                                                                           | 22  | 24.4 |
| Primary education                                                                                    | 50  | 55.6 |
| High school                                                                                          | 17  | 18.9 |
| University                                                                                           | one | 1.1  |
| <b>Monthly Income Status</b>                                                                         |     |      |
| Below minimum wage                                                                                   | 37  | 41.1 |
| Above minimum wage                                                                                   | 53  | 58.9 |
| <b>Diabetes duration ( <math>\bar{X} \pm SD</math>: <math>11.64 \pm 6.74</math>; min-max: 2-30 )</b> |     |      |
| 10 Years And Below                                                                                   | 56  | 62.2 |
| Over 10 Years                                                                                        | 34  | 37.8 |
| <b>Diabetes treatment modality</b>                                                                   |     |      |
| Oral Antidiabetic                                                                                    | 80  | 88.9 |
| Insulin                                                                                              | 10  | 11.1 |
| <b>Chronic Disease</b>                                                                               |     |      |
| Yes                                                                                                  | 77  | 85.6 |
| No                                                                                                   | 13  | 14.4 |
| <b>Smoking</b>                                                                                       |     |      |
| Yes                                                                                                  | 9   | 10.0 |
| No                                                                                                   | 81  | 90.0 |

**Table 2.** Mean scale scores of the patients

| Scales                                          | $\bar{X} \pm SS$ | Min - Max | Cronbach's Alpha |
|-------------------------------------------------|------------------|-----------|------------------|
| Quality of Life Scale for the Elderly           | $23.32 \pm 6.59$ | 3-33      | 0.851            |
| Patient Compliance Scale in Type 2 DM Treatment | $86.67 \pm 8.68$ | 73-99     | 0.759            |

**Table 3.** Comparison of the scale scores according to the demographic characteristics of the patients

| Quality of Life Scale for the Elderly |    |                  |              | Patient Compliance Scale in Type 2 DM Treatment |              |
|---------------------------------------|----|------------------|--------------|-------------------------------------------------|--------------|
| Variables                             | n  | $\bar{X} \pm SS$ | Test Value/p | $\bar{X} \pm SS$                                | Test Value/p |
| Age                                   |    |                  |              |                                                 |              |
| 65-74                                 | 64 | 22.77±6.84       | z=1.173      | 87.72±8.3                                       | z=-1.823     |
| 75 And Above                          | 26 | 24.69±5.83       | p=0.241      | 84.08±9.2                                       | p=0.068      |
| Gender                                |    |                  |              |                                                 |              |
| Woman                                 | 50 | 23.12±6.53       | z=0.173      | 87.2±8.51                                       | z=-0.538     |
| Male                                  | 40 | 23.57±6.75       | p=0.863      | 86±8.94                                         | p=0.591      |
| Marital Status                        |    |                  |              |                                                 |              |
| Married                               | 76 | 23.64±5.99       | z=-0.717     | 86.92±8.58                                      | z=-0.488     |
| Single                                | 14 | 21.57±9.31       | p=0.474      | 85.29±9.4                                       | p=0.626      |
| Educational Status                    |    |                  |              |                                                 |              |
| Illiterate                            | 22 | 20.41±6.49       | kW=4.688     | 89.09±5.43                                      | KW=0.639     |
| Primary Education                     | 50 | 24.3±6.55        | p=0.096      | 85.56±9.49                                      | p=0.727      |
| High School University                | 18 | 24.17±6.11       |              | 86.78±9.33                                      |              |
| Monthly Income Status                 |    |                  |              |                                                 |              |
| Below Minimum Wage                    | 37 | 21.62±6.86       | z=1.746      | 87.51±7.72                                      | z=-0.401     |
| Above Minimum Wage                    | 53 | 24.51±6.19       | p=0.081      | 86.08±9.31                                      | p=0.688      |
| Diabetes Duration                     |    |                  |              |                                                 |              |
| 10 Years And Below                    | 56 | 22.59±6.62       | z=1.110      | 87.89±8.08                                      | z=-1.416     |
| Over 10 Years                         | 34 | 24.53±6.46       | p=0.267      | 84.65±9.35                                      | p=0.157      |
| Diabetes Treatment Modality           |    |                  |              |                                                 |              |
| Oral Antidiabetic                     | 80 | 23.75±6.66       | z=-2.050     | 86.45±8.92                                      | z=0.242      |
| Insulin                               | 10 | 19.9±5.13        | p=0.040      | 88.4±6.54                                       | p=0.809      |
| Chronic Disease                       |    |                  |              |                                                 |              |
| Yes                                   | 77 | 23.27±6.6        | z=0.279      | 86.88±8.67                                      | z=-0.813     |
| No                                    | 13 | 23.62±6.83       | p=0.780      | 85.38±8.93                                      | p=0.416      |
| Smoking                               |    |                  |              |                                                 |              |
| Yes                                   | 9  | 18.44±6.27       | z=1.970      | 90±3.87                                         | z=-0.706     |
| No                                    | 81 | 23.86±6.44       | p=0.049      | 86.3±8.99                                       | p=0.480      |

**Table 4.** Examination of factors related to Patient Compliance in Type 2 DM Treatment by Multiple Linear Regression Analysis

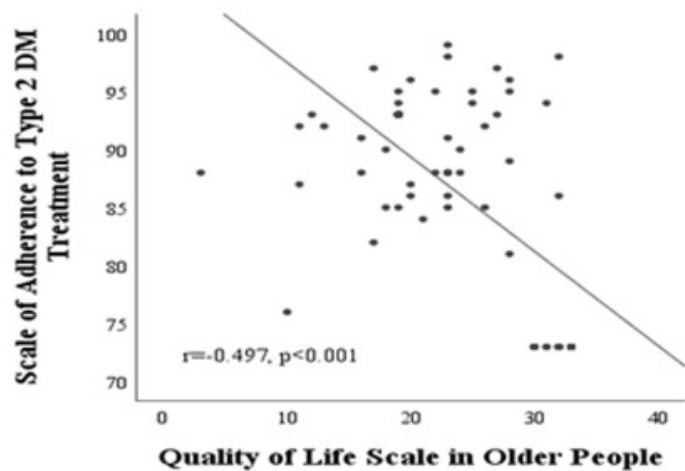
| Model                             | Patient Compliance Scale in Type 2 DM Treatment |       |         |        |        | 95% Confidence Interval |         |
|-----------------------------------|-------------------------------------------------|-------|---------|--------|--------|-------------------------|---------|
|                                   | B                                               | SE    | $\beta$ | t      | .      | Lower                   | upper   |
| Constant                          | 103.049                                         | 3.523 |         | 29.249 | <0.001 | 96.043                  | 110.055 |
| Age <75                           | 1.831                                           | 1.661 | 0.096   | 1.102  | 0.274  | -1.473                  | 5.135   |
| Diabetes duration $\leq$ 10 years | 1.345                                           | 1.608 | 0.076   | 0.836  | 0.405  | -1.853                  | 4.543   |
| Insulin use                       | -0.129                                          | 2.610 | -0.005  | -0.049 | 0.961  | -5.318                  | 5.061   |
| Smoking                           | -0.734                                          | 2.666 | -0.026  | -0.275 | 0.784  | -6.036                  | 4.568   |
| CASP                              | -0.790                                          | 0.118 | -0.601  | -6.695 | <0.001 | -1.025                  | -0.556  |

Durbin-Watson=1.680, R=0.632, R<sup>2</sup> = 0.399, p<0.001

**Table 5.** Examination of the factors related to Quality of Life in the Elderly by multiple linear regression analysis

|                                                       | Quality of Life Scale for the Elderly |       |        |        |        | 95% Confidence Interval |        |        |
|-------------------------------------------------------|---------------------------------------|-------|--------|--------|--------|-------------------------|--------|--------|
|                                                       |                                       |       |        |        |        | Shallow                 |        |        |
| Constant                                              | 57.913                                | 6.198 |        | 9.344  | <0.001 | -                       | 45.584 | 70.243 |
| Age ≥75                                               | 0.164                                 | 1.256 | 0.011  | 0.130  | 0.897  | 1.123                   | -2.335 | 2.663  |
| Educational status                                    | 0.964                                 | 0.922 | 0.098  | 1.045  | 0.299  | 1.304                   | -0.871 | 2.799  |
| monthly income above minimum wage                     | 1.390                                 | 1.267 | 0.104  | 1.098  | 0.276  | 1.346                   | -1.130 | 3.910  |
| Diabetes duration >10 years                           | 0.780                                 | 1.186 | 0.058  | 0.657  | 0.513  | 1.146                   | -1.580 | 3.140  |
| Insulin use                                           | -2.588                                | 1.910 | -0.124 | -1.355 | 0.179  | 1.248                   | -6.386 | 1.211  |
| Smoking                                               | -2.359                                | 1.972 | -0.108 | -1.196 | 0.235  | 1.212                   | -6.281 | 1.564  |
| Patient Compliance Scale score in Type 2 DM Treatment | -0.428                                | 0.065 | -0.563 | -6.559 | <0.001 | 1.099                   | -0.558 | -0.298 |

Durbin-Watson=1.990, R=0.670, R2 = 0.450, p<0.001



**Figure 1.** Correlation between the Elderly Quality of Life Scale and the Patient Compliance Scale in the Treatment of Type 2 DM

Discussion

In this study, we evaluated the compliance of treatment and quality of life in Type 2 DM patients and a moderate level of compliance to treatment and quality life was found. In order to increase the success of treatment in Type 2 DM, which is a chronic disease, activities that can increase the level of compliance to treatment should be studied. It was determined that the Patient Compliance Scale in the Treatment of Type 2 DM score was negatively correlated with the Elderly Quality of Life Scale score. It is thought that this result makes it difficult to comply with the treatment, as diabetes is a disease that requires long-term drug use and follow-up, and the majority of the patients are at an advanced age.

When the findings in the study were evaluated, it was determined that the majority of the patients were women and advanced age, and this is consistent with the literature [19-23]. The Type 2 DM disease compliance score of the patients participating in our study was between 79 and 95, and the average was found to be 86.67±8.68. Compliance with the treatment of all patients was evaluated as moderate. Ozonuk (2017) found that the mean diabetes treatment compliance score of individuals with Type

2 DM was 66.5 ±16.1 (min-max: 15-95) [22]. In Arslan (2011) research reported that 57.3% of the participants in the study had good compliance to treatment [23]. In the study conducted by Baykal and Kapucu (2015), it was determined that 66.2% of the individuals showed good compliance with the treatment, 29.3% showed moderate compliance and 4.5% did not comply with the treatment according to their own statements [16]. Compliance with the treatment of the patients participating in our study was found to be moderate. Studies conducted in Europe have shown that 23%-28% of diabetic patients do not comply with treatment [24,25]. While the level of non-compliance was 60% in the Korean study [26], this rate was 71.3% in the Egyptian study [25]. In our study, a moderate level of compliance to treatment was found in line with the literature. This situation shows that compliance with diabetes treatment is an important problem and that new methods and initiatives should be developed on how to manage the disease.

The relationship between compliance to treatment and gender, marital status, education, monthly income and duration of diabetes, chronic disease and smoking was investigated. There was no significant difference in the mean scores of the Patient Compliance Scale in the Treatment of Type 2 DM. Patients aged 65-74 years had a higher mean score on the Patient Compliance Scale in the Treatment of Type 2 DM, and this difference was not statistically significant (p=0.068). In this study, it was observed that the level of compliance to treatment did not change according to health and social characteristics such as age, gender, marital status, monthly income, duration of diabetes, and Type 2 DM treatment. The results of the study conducted in Egypt report that the level of compliance to treatment increases as the education level of diabetes patients increases. Contrary to these studies, there are studies reporting that education level is not associated with treatment compliance. In other studies, as in this study, it has been shown that the gender and marital status of patients with diabetes do not affect compliance to treatment [27,28]. In Arslan (2011) research, 57.3% of the participants in the study stated that their compliance to treatment was good. In that study, 71.8% of those with a diagnosis of DM for more than 19 years reported good compliance to treatment, while only 46.6% of those with a diagnosis of less than five years had good compliance to treatment [23]. In our study, we found that individuals with DM for less than 10 years were more compliant

with treatment than individuals in the other group. Our results are not compatible with the literature. The reason for our results is that the study was single-centered, elderly patients were included in the study, struggling with a chronic disease for many years creates a heavy social and psychological burden for the patients and decreases in treatment compliance over the years.

Because Type 2 DM requires long-term follow-up and causes complications that affect life, a significant decrease in the quality of life of patients is observed. It can achieve this effect by creating physical and mental difficulties on the patient with the difficulty of the treatment protocols and complications to be experienced. Improving the quality of life has been emphasized as the primary goal of diabetes treatment for many years. Therefore, it is important to assess quality of life in individuals with diabetes [25]. It has been found that improving the quality of life of patients with Type 2 DM also helps to implement strategies for good management of the disease and ultimately improves the therapeutic outcome [29].

No significant correlation was found between the patients' age ( $p=0.241$ ), gender ( $p=0.863$ ), marital status ( $p=0.474$ ), duration of diabetes ( $p=0.267$ ) and presence of chronic disease ( $p=0.780$ ) and Quality of Life Scale for the Elderly scores. While it was observed that primary school and high school-university graduate patients had higher Quality of Life Scale for the Elderly scores, it was not found to be statistically significant ( $p=0.096$ ). Patients with a monthly income of the minimum wage and above had higher Quality of Life Scale scores for the elderly, but it was not significant ( $p=0.081$ ). Analyses showed that poor socio-economic status was associated with higher rates of Type 2 DM risk. It has been determined that individuals with high socio-economic status adopt a healthier lifestyle behavior and have fewer risk factors for the disease. People of lower socio-economic class have less access to health services and information, and are more likely to be obese, physically inactive, and smokers. In addition, lower socio-economic status individuals are less likely to eat a healthy diet, which is also associated with the development of Type 2 DM [28].

The mean score on the Quality of Life in the Elderly Scale of the patients using oral antidiabetic ( $23.75\pm6.66$ ) was significantly higher than the patients using insulin ( $19.9\pm5.13$ ) ( $p=0.040$ ). The results of our study were found to be compatible with the literature [30]. It is seen that patients with chronic disease organize their lives according to drug intake and change their behaviors in order to fight the disease and live a better quality of life [31]. Since the use of insulin is a more challenging process than the use of oral antidiabetic, the patients' quality of life scores are expected to be low.

The mean score of the Quality of Life Scale was calculated as  $18.44\pm6.27$  in patients who smoke and  $23.86\pm6.44$  in non-smokers. The mean score on the Quality of Life Scale of smokers was lower and was consistent with the literature. ( $p=0.049$ ). Studies show that smoking and alcohol use affect treatment in patients with DM, and that patients' self-care and quality of life are low due to their addiction [32].

Studies have found that treatment non-compliance is up to 38.5% among DM patients [33]. It has been demonstrated that good glycemic control level is significantly associated with drug compliance in Type 2 DM. It has been found that those with low

drug compliance have poor glycemic control [34]. When we examine the literature, it is seen that treatment compliance, quality of life and depression are important in the management of the disease in Type 2 DM patients [35].

## Limitations

As a limitation of the study, collecting data at a single family medicine unit affects the generalizability of the results. In addition, level of participation in this study was low and maybe collecting data by phone was another problem for collecting data. However, being conducted in primary care, is the strength of the study.

## Conclusion

In order to prevent the progression of Type 2 DM and complications, primary care physicians knowing the patients well and being cautious in terms of long-lasting chronic disease care and complications will bring along an effective care process. Family physicians can make long term follow-ups of the disease more efficient by closely monitoring the patients' compliance to treatment and their quality of life. According to the results of this study, patients' compliance to treatment rates was evaluated as moderate. In daily practice, it is thought that family physicians can better follow-up chronic diseases by using treatment compliance and quality of life scales. Training and seminars can be planned to increase the awareness of family physicians in order to follow patients more effectively.

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## Patient Consent:

*Since there was no invasive procedure, verbal consent was obtained from the patient.*

## Conflict of interests

*The authors declare that there is no conflict of interest in the study.*

## Financial Disclosure

*The authors declare that they have received no financial support for the study.*

## Ethical approval

*Ethics Committee Approval dated 28.04.2022 and numbered 9/15 was obtained from the Health Sciences University Antalya Training and Research Hospital Clinical Research Ethics Committee for the study.*

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