

Original article ■

Quality of Life in Type 2 Diabetic Patients

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SUMMARY

The presence of diabetes mellitus leads to a decrease in life quality in all domains. The aim of our study was to evaluate the quality of life (QOL) in diabetic patients and the factors affecting it in type 2 diabetic mellitus patients.

We conducted a cross-sectional study that included 86 patients with type 2 diabetes mellitus, in the territory of the City of Niš. Health-related QOL of patients was measured using the short form survey (SF-36) that produces an 8-scale health profile.

The average duration of diabetes was 12.76 ± 8.08 years. The best QOL in all areas was observed in patients diagnosed with diabetes less than 10 years ago ($p < 0.05$) and younger than 65 years. Male respondents perceived a better QOL compared to women, especially in the vitality and pain domains. The patients with comorbidity (93.64%) had lower QOL score in all domains. There was no significant difference in the QOL of patients with diabetes compared to the level of education.

High QOL represents an ultimate goal and an important outcome of all medical interventions in diabetic patients. Factors related to lower QOL included: older age, female gender, and existence of comorbidities. Uncontrolled diabetic patients had a lower QOL than controlled diabetics.

Key words: quality of life, diabetes mellitus, type 2, SF-36

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INTRODUCTION

Diabetes mellitus (DM) is one of the major world health problems of modern society. According to the Diabetes Atlas published by the International Diabetes Federation (IDF), around 382 million people suffer from this disease in 2013 (1).

Diabetes is a typical chronic medical condition that places serious constraints on patients' activities. There is a need for extensive education and behavior change to manage the conditions. Lifestyle changes must incorporate careful dietary planning, use of medication, and home blood glucose monitoring techniques for all diabetic patients (2).

Among those diagnosed with the disease, at least half still do not achieve satisfactory glycemic control, despite the availability of effective treatments. As a consequence, millions of people with diabetes are at elevated risk of suffering needlessly from serious complications of the disease (3). The risk of complications is associated with genetics, and it increases with the duration of hyperglycemia (4-6). Chronic complications of diseases are responsible for high morbidity and mortality of diabetes and significantly reduce the quality of life of patients (7).

The World Health Organization (WHO) defines Quality of Life (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 (8). It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment (9).

Although doctors and competent professionals may evaluate severity of the disease and degree of deterioration, their opinion of the patients' quality of life may not match with personal view of the patients. There is a great impact of psychosocial and cultural factors on the personal view of the patient (10, 11).

The interest in quality of life is higher thanks to life span prolongation and the fact that patients need to continue their lives with satisfying quality. It is necessary to take care about the influence of the patients' psychological structure while examining the results of self-estimation of the examinees' life quality (10).

The aim of our study was to evaluate the quality of life in diabetic patients and the factors affecting it in type 2 diabetic mellitus patients.

PATIENTS AND METHODS

We conducted a cross-sectional study that included 86 patients with type 2 diabetes mellitus. The survey was conducted within a 6-month period, from February to August 2013 in public pharmacy and primary health care in the territory of the City of Niš.

Basic demographic and epidemiological characteristics of the participants are shown in Table 1.

Table 1. Demographic and epidemiological characteristics of diabetic patients

Characteristics	N	%
Gender		
Male	35	40.7
Female	51	59.3
Age (years)		
≤ 65	41	47.7
> 65	45	52.3
Duration of diabetes (years)		
≤ 10	28	32.6
11-15	31	36.0
≥ 16	27	31.4

Due to the demands of the research, the patients were divided by gender, age and duration of diabetes. The study included 35 women and 51 men, average age 66.31 years (between 19 and 91 years of age).

Health-related QOL of patients was measured using SF-36 (12) (36-item Short Form survey). We also used a General questionnaire which contains questions on socio-demographic data, duration of diabetes, the last measured values of fasting glucose and glycosylated hemoglobin (HbA1c), total cholesterol and triglyceride levels and the presence of comorbidities.

The SF-36 is a survey form that produces an 8-scale health profile as well as quality of life related to an individual's health status. It is a well-known and widely utilized health status measure (13), which measures physical aspects (Physical Health Components) and psychosocial aspects (Mental Health Components) of quality of life. The Physical Health Components are categorized into four scales: physical health, role limitations due to physical health, bodily pain and general health, while the Mental Health Components scales are made up of vitality, social functioning, role limitations due to emotional problems and mental health (14). The SF-36 scores range from 0 to 100, with higher scores indicating better functioning, well-being, and state of health.

The Statistical Package for Social Sciences (SPSS) software (Version 15) was used for analysis. The categorical data such as gender, comorbidities, and level of education are presented as frequency and percentage. An unpaired Student's t test was used to compare the

means of each quality of life domain. Statistical significance was accepted at the 95% confidence level ($p < 0.05$).

RESULTS

The presence of diabetes mellitus leads to a decrease in life quality in all domains. The average duration of diabetes was 12.76 ± 8.08 years. Figure 1 explains the influence of disease duration on the parameters of quality of life. The best quality of life in all areas was observed in patients diagnosed with diabetes less than 10 years before ($p < 0.05$).

Results of testing the gender quality of life are shown in Figure 2. Male respondents perceived a better quality of life compared to women. Records showed a statistically significant gender-related differences ($p < 0.05$) in the vitality and pain in our patients.

Correlation between the level of education and quality of life in type 2 diabetic patients is given in Figure 3. There was no significant difference in the quality of life of patients with diabetes compared to the level of education.

Figure 4 shows the effect HbA1c values on quality of life. Analysis of the value of fasting glucose and HbA1c showed that patients with optimal glycemic control reported lower quality of life in all domains (except mental health). There was a statistically significant correlation between the level of HbA1c and the occurrence of comorbidity ($p < 0.05$).

The patients with comorbidity had lower quality of life score in all domains compared to the group without comorbidity. The most prevalent comorbidities are shown in Figure 5.

Comorbidity was present in 93.64% of patients. It was 18% of patients with three or more diabetes-related complications. The most frequent comorbidities were hypertension (75.96%), chronic cardiovascular diseases (CVS) (32.48%), chronic renal failure (23.3%), polyneuropathy (23%), dyslipidemia (19.76%), retinopathy (15.54%), chronic obstructive pulmonary disease (6.73%) and other diseases (7.7%).

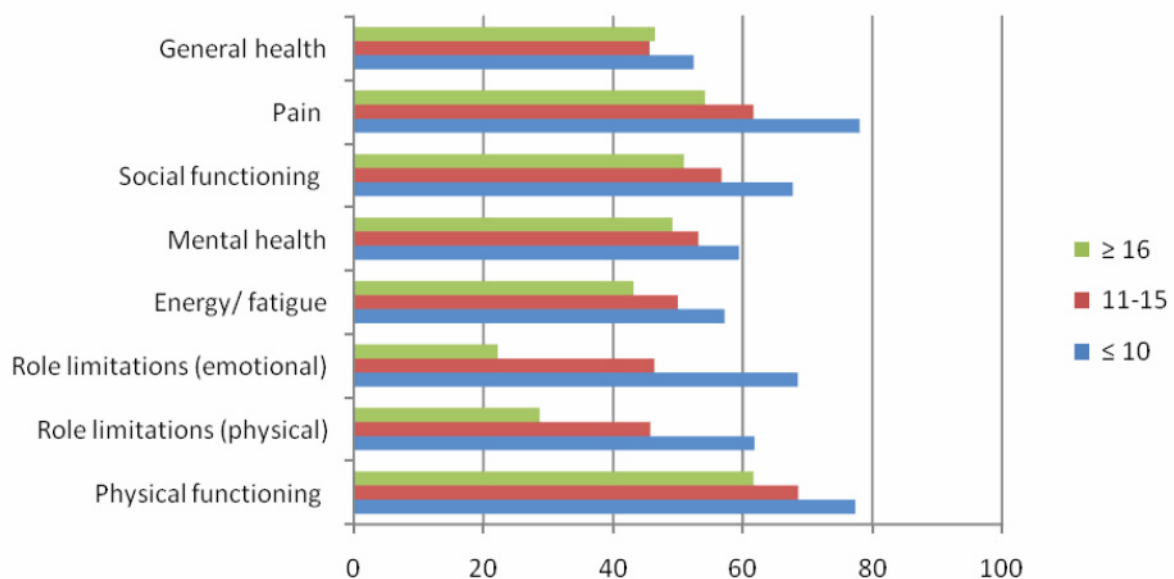


Figure 1. Quality of life in diabetic patients depending on duration of the disease

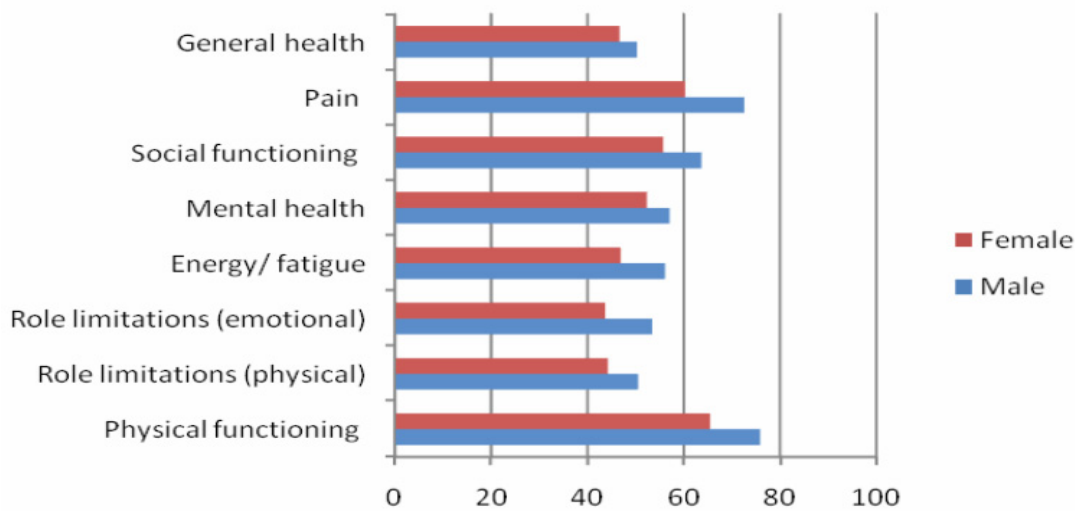


Figure 2. Correlation between gender and quality of life in type 2 diabetic patients

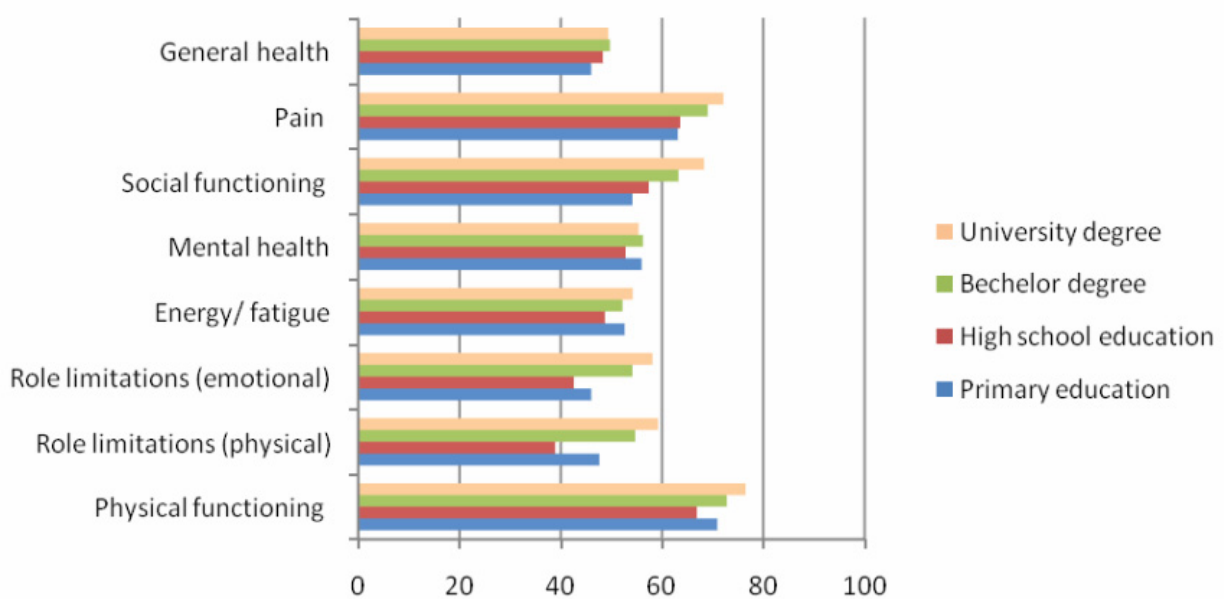


Figure 3. Quality of life in diabetic patients and their level of education

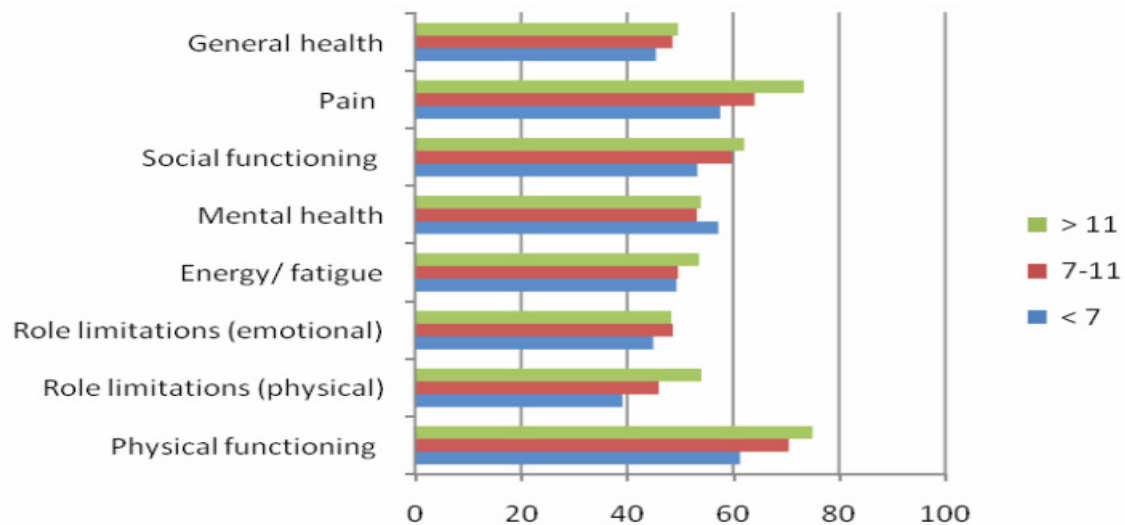


Figure 4. Quality of life in diabetic patients regarding HbA1c

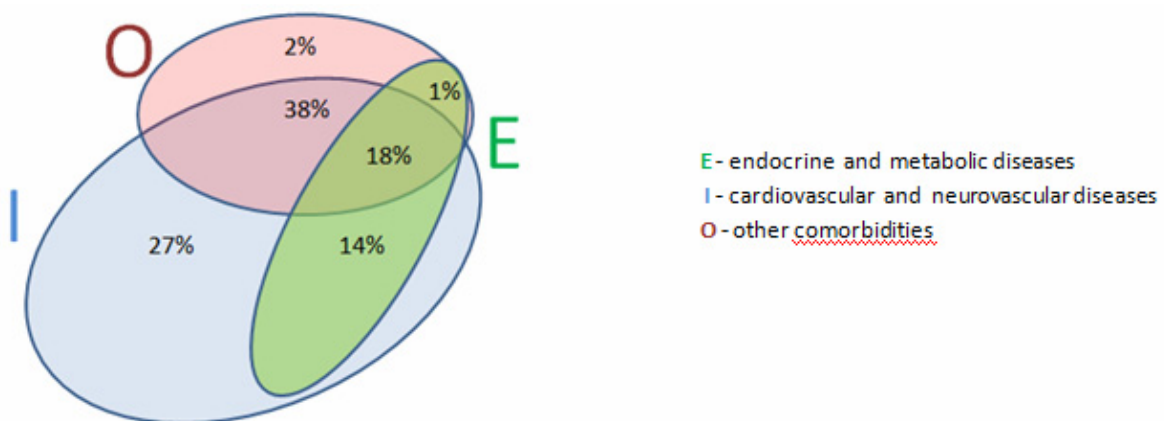


Figure 5. Prevalence of comorbidity in patients with DM

DISCUSSION

It is very important for medical and clinical disciplines to examine the quality of life and find opportunities to improve it. The results of our research have shown that people with type 2 diabetes have a lower quality of life in all aspects than those without diabetes, which is in accordance with previous studies (15, 16). Furthermore, it has been stated that the present comorbidities have a major impact on the decrease of the quality of life. This research has shown that the most frequent comorbidities are hypertension, whereas dyslipidemia was present in 19.76% of diabetic patients, ophthalmological complications in 15.54%, and polyneuropathy in 23% of

patients. The results of this study are in keeping with previous results (17-20).

It was found that diabetic complications had more impact on the quality of life in patients younger than 65 years old. A possible explanation is that complications are likely to have a greater impact on the health of this group because they have less comorbidity and have not adjusted to the idea of accepting lesser health. The differences could also be explained by the fact that this younger subgroup has responsibilities such as work and family as well as relationship issues that are not found in the older subgroup. Also, one Norwegian study indicates that their results are quite similar (21).

In patients younger than 65 years of age, a better quality of life was achieved in spite of the high values of fasting glucose and HbA1c. The lesser duration of diabetes and lesser tendency to have any complications in this group could be the reason. This age group is more likely to use better medical facilities and is likely to enjoy more family support. The young patients are more care-free, optimistic and they have a positive outlook on life. Previous studies have also concluded that youths with diabetes enjoyed similar quality of life as non-diabetic youth population (22). Statistically significant lower quality of life was verified in elderly patients (over 65 years of age) and longer treatment duration. Consequently, these results match the studies which show that there are more and more elderly people in the entire population (23, 24), which leads to a higher frequency of chronic diseases and use of medications. The reason for low quality of life in diabetic patients lies in the fact that the elderly people usually have more than one chronic disease, which means that they are taking several medications at the same time, and have cognitive complications, as well (11, 24-26).

Previous research showed that metabolic disease control was directly associated with the emergence of diabetes complications and the quality of life (27, 28). The prospective study of type 2 diabetes in the United Kingdom (*UK Prospective Diabetes Study - UKPDS*) (29) showed that the reduction of average yearly values of HbA1c by only 1% reduces the risk of microvascular complications by 37%, of peripheral vascular disease by 43%, of heart attack by 14% and of stroke by 12%. These study results confirmed the use of HbA1c as an extremely important parameter of following metabolic diabetes control in everyday work. Lowering HbA1c to under or around 7% reduces the risk of microvascular and neuropathic complications of type 1 and type 2 diabetes (29).

Physical activity influences the success of therapy and diabetes control to a great extent. The meta-analysis which included 20 studies and 1892 individuals confirmed that patients with diabetes should be physically active to improve disease control and quality of life (30). Similarly, Romain et al. found that an individual's stages of change for exercise was positively associated with self-perceived QOL, with a correlation between the stages of change for exercise and physical functioning in addition to general health and vitality (31). According to the results of our research, 57.9% of examinees were physically active daily, on an average scale. However, in a survey conducted in India, only 46.5% of examinees were regularly physically active; the same study showed better health state with male examinees in the domain of general well-being and energy (17).

Our study shows that men have a better quality of life compared to women, with statistically important difference in the domain of vitality and pain. Better social life and physical activity might contribute to higher satisfaction levels in men. Studies have shown that men

were more confident of their ability to control diabetes and reported a higher quality of life and were less likely to get depression or anxiety compared to women (32). Female mental and physical structure, in addition to subjectivity of the self-administered quality of life score, may justify this finding. Also, women tend to be more expressive and thus are more likely to complain about a poor quality of life. Significant effect of gender on the QOL in diabetes patients has been demonstrated in other studies (20, 33).

The results of this study did not show statistically important impact of the level of education on the life quality of patients with diabetes, which was not in accordance with a study conducted in Mexico (34). Highly educated males with a strongly positive attitude had better opportunities of improving their results in the psychological domain and the domain of social relations (34). Other studies have confirmed the linear correlation between the level of education and quality of life (32, 35, 36).

The major limitation of this study is the cross-sectional design which only provided information about associations but did not present causality between some of the variables. Further, the limited sample size may limit the power for some of the comparisons concerning the presence or absence of complications.

CONCLUSION

High quality of life represents the ultimate goal and an important outcome of all medical interventions in diabetic patients.

According to the results of this study, type 2 diabetic patients show low quality of life in all domains. Our study showed statistically significant differences in quality of life depending on gender, age and existence of comorbidities. Quality of life was lower in older patients and was affected by many factors. Females had lower quality of life than males, probably due to less physical activity and poorer social conditions. Uncontrolled diabetic patients had a lower quality of life than controlled diabetics. Improving quality of life in diabetic patients is important.

Acknowledgments

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KVALITET ŽIVOTA BOLESNIKA SA DIJABETES MELITUSOM TIP 2

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Sažetak

Prisustvo dijabetesa dovodi do pada kvaliteta života u svim domenima. Cilj našeg istraživanja bio je da procenimo kvalitet života bolesnika sa dijabetesom tip 2 i da utvrdimo faktore koji na to utiču.

Sprovedena je studija preseka na teritoriji grada Niša kojom je obuhvaćeno 86 bolesnika sa dijabetes melitusom tip 2. Kvalitet života bolesnika procenjen je pomoću upitnika SF-36.

Prosečna dužina trajanja dijabetesa iznosila je 12.76±8.08 godina. Najbolji kvalitet života u svim domenima uočen je kod bolesnika mlađih od 65 godina i kod onih kod kojih je dijabetes melitus dijagnostikovao pre manje od 10 godina (p<0.05). Muškarci su prijavili bolji kvalitet života od žena, posebno u oblasti vitalnosti i bolova. Bolesnici sa komorbiditetima (93.64%) su imali niži kvalitet života u svim domenima. Nije zabeležena značajna razlika u kvalitetu života ispitanika obolelih od dijabetesa u odnosu na stepen obrazovanja.

Kvalitet života je važan zdravstveni ishod i predstavlja konačni cilj svih zdravstvenih intervencija. Faktori koji utiču na niži kvalitet života bili su ženski pol, starost i postojanje komorbiditeta.

Ključne reči: kvalitet života, dijabetes mellitus tip 2, SF-36