Quality of Life of Greek Patients with Type 2 Diabetes and the Role of Rehabilitation

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Abstract

Introduction: Diabetes mellitus is a chronic disorder that is increasing rapidly worldwide. Appropriate management of this chronic disease can improve patient's quality of life, increase life expectancy and relieve society of the huge financial burden.

Purpose: The aim of this study was to measure the quality of life of patients with type 2 diabetes and to investigate the role of rehabilitation.

Methodology: Data were collected with the use of a questionnaire that consisted of three (3) sections: The Short Form 36 Health Survey Questionnaire, (17) questions adapted from the Diabetes Satisfaction Questionnaire (DTSQs) and the Problem Areas In Diabetes (PAID) scale and questions regarding medical data and demographic information. The sample included a total of n = 122 individuals suffering from type 2 diabetes. The research was carried out in outpatient clinics of two general hospitals and private practices within the region of Western Greece. The results of the study were analyzed using the statistical program SPSS v.25.0.

Results: Age and the existence of another health problem besides diabetes have a negative impact on the quality of life of these patients on their physical and emotional health. As patients age, their quality of life decreases affecting all eight scales of the SF-36 Questionnaire. In contrast, patients who had several hours of professional work managed to have a positive outcome on all eight scales. Regarding these patient's rehabilitation, the results showed that the more satisfied the patients were regarding their treatment plan, doctor and nursing staff, their family's support, and their diabetic diet, the grater their functionality on all scales.

Conclusions: The results showed that it is important for patients with type 2 diabetes to have an active professional life and follow an appropriate rehabilitation program, in order to improve their quality of life.

Keywords: *Type 2 Diabetes, Quality of life, Rehabilitation.*

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Introduction

Type 2 Diabetes Mellitus (DM2) affects 85-90% of all people with type 1 Diabetes Mellitus (DM1)[1]. The risk of developing the disease increases with age, obesity and lack of physical activity[2] and occurs more frequently in women with a history of gestational diabetes and people

who have other cardiovascular risk factors[3]. Marshall et al.[4] report that a positive diagnostic result should also be confirmed on another day, unless clinical symptoms of hyperglycemia coexist. Other symptoms apart from hyperglycemia and random plasma glucose values of > 200 mg / dl are also evaluated such as thirst, polyuria and unexplained weight loss[5,6,7].

Epidemiological Data

There is a rapid increase in DM worldwide, triggered by the rapid and global increase in obesity and unhealthy lifestyle in general[8]. The effects of DM on public health are enormous due to the disease complications that lead to premature morbidity[9,10], reduction of life expectancy[11] and in addition a huge financial and social cost[12,13]. The annual incidence in Europe is around 7 cases per 1000 people per year[10]. In terms of gender, men suffer more from diabetes than women[14] while the age group of 40-59 represented the largest percentage of people affected by the condition[15] while living in low-income countries[16]. Finally, most people with DM live in urban areas compared to rural areas[14]. In Greece, in 2012 it was estimated that there were approximately 638,000 diabetic patients, with a prevalence rate of 5.22%[17] while higher rates were reported in men who were unaware of their condition[18].

According to the World Health Statistics in 2019, the mortality rate from DM reached 3.4 million deaths, accounting for 1.9% of the total global mortality and the 7th leading cause of death. The World Health Organization (WHO) predictions for 2030 is that the global mortality rates due to DM will double and at the same time constitute the 5th cause of death [19,20,21,22].

Treatment

Conservative treatment including diet and medication is considered important in the long-term management of the disease [23]. The scientific team should provide accurate information to people with diabetes on proper self-management of medication, diet, exercise, self-assessment and self-care[24].

Quality of life

McCall[25] argues that quality of life is based on the existence and accessibility of necessary factors that ensure happiness in a given society or region. Later, Veenhoven[26] proposed four dimensions of quality of life: livability of environment, life-ability of the person, utility of life, and the appreciation of life. The World Health Organization defines quality of life as the individual's perception related to his life, within the context of the cultural-value system he lives in, in relation to his goals, expectations, standards and concerns[27].

Health-related quality of life is a multidimensional concept that includes the individual concepts of physical health, social life, mental health, pain, and general perceptions of health[28], and is measured by specific questionnaires used to assess the quality of life of people suffering from a disease[29]. The progressive prevalence of a holistic approach to health and the view that the patient should be the center of care (patient-centered care) has also contributed to the study of quality of life. The better the patient's quality of life, the easier it is to adapt to his treatment[30].

Health-related quality of life can be explored in two dimensions, the objective perception of the nursing staff and the subjective perception of the patients[31]. Although the nursing staffs' perception may be objective and record accurate data, they may not be fully aware of the physical and emotional changes that patients may experience[32]. On the other hand, patients themselves may not have the appropriate knowledge to accurately record the symptoms they may experience and their level of functionality with complete objectivity[32].

Current studies have shown that the quality of life and mental health of a person suffering from a chronic illness is related to the views and beliefs that the person develops about health, illness and its treatment (health beliefs)[33]. Each patient, when confronted with an illness, creates personal interpretations and representations about that illness so as to feel capable of dealing with the problems that will arise during the treatment[34].

Quality of life Scales

Although researchers have a wealth of reliable tools to their disposal, they are confronted by the following dilemmas: use quantitative or qualitative tools? generic or disease specific tools? Despite their differences, the tools that measure quality of life evaluate the individual's perceptions of a lived experience as well as their tolerance of this new experience[35].

Rehabilitation

The aging population suggests an increase in the level of disability, which is known to reflect an increased burden of health and social care cost[36]. According to Hansen et al.[37] rehabilitation is the time during which all necessary measures including professional, educational, medical of other interventions are used either public or private in order for the individual to regain their independence after an illness, loss or injury. The main goal of rehabilitation is to enable people to live the way they want, despite the limitations imposed on their activities by the deficits of an illness or injury. In order for a rehabilitation program to work effectively, the needs and abilities of the individual, the prognosis of the condition [38,39], the nature of the deficits, as well as the individual's ability to participate and acquire new skills and knowledge must be taken into account[40,41].

The importance of rehabilitation has been explored extensively in the literature. Without rehabilitation, the likelihood of complications and loss of functionality increases, leading to a delayed hospital discharge [42]. In addition, in many cases there may be problems such as immobility, pain, swallowing and feeding problems, bladder and bowel problems, communication problems, complications of underlying conditions[43]. Rehabilitation should be continued even after the patient is discharged from hospital, in order to prevent, social isolation, secondary health problems, unnecessary patients' admission to nursing homes and urgent hospital re-admission[44].

Rehabilitation Team for Chronic Diseases

Rehabilitation is an interdisciplinary activity that depends on good communication between the professional members involved. In order for the team to succeed a) it must have clear, objective rehabilitation goals for the patient, b) members must work as part of an interdisciplinary team respecting the roles and values of each other and c) be patient-oriented[45]. In Greece, diabetes is monitored during the rehabilitation by pathologists and endocrinologists[46], while the role of the nursing staff, although multidimensional, is not very developed [47,48]. There are few studies in Greece that investigate the quality of life to people with BM and both studies had participants from the hospital environment. There are no studies to measure quality of life in the rehabilitation phase.

Material & Method

Purpose

The aim of this study was to measure the quality of life of Greek patients with type 2 diabetes and to investigate the role of rehabilitation.

Data collection

Data were collected with the use of a questionnaire that consisted of three sections. Specifically, the first section consisted of the Short Form (36) Health Survey Questionnaire, a valid and reliable questionnaire which has been translated into Greek[49]. The second section of the questionnaire included seventeen (17) questions adapted from the Diabetes Satisfaction Questionnaire (DTSQs) and the Problem Areas In Diabetes (PAID) scale as to assess the role of rehabilitation, regarding these patients. Finally, the third section of the questionnaire included questions regarding medical data and demographic information.

Sample

Convenience sampling was used. The sample inclusion criteria were: adult patients, diagnosed with DM2, permanent residence of Western Greece, with a good perceptual level, who were in the rehabilitation phase of their condition and had regular follow up appointments with their doctor[50]. The sample included

127 patients suffering from DM2 in the region of Western Greece. However, 122 patients submitted the completed questionnaires to the researchers yielding a response rate of up to 96%. Participants were informed of the purpose of the study and recruited once they completed a written consent form during their regular follow up appointments in outpatient clinics and private practices. The distribution of the questionnaires was conducted by the researchers during the fall of 2019.

Procedure

The approval research protocol was submitted to both public hospitals and private clinics requesting permission. After permission was granted, the research team approached patients in the outpatient clinics. They stressed the importance of anonymity and confidentiality of participants' data and explained to patients the right to withdraw their participation at any time during the procedure. Patients were given the questionnaires to take home to complete and returned them on their next scheduled doctor's appointment.

Data Analysis

The Statistical Package for Social Sciences v.25.0 was used for data analysis.

Findings

The majority of the participants were men (59.8%), with an average age of 60.7 years, high school graduates (61.5%), married (64.8%) and lived in a rural area of Western Greece (41.8%). Also, 36.1% of the sample worked 2 to 3 hours a day while 33.6% of the sample worked 6 to 8 hours a day. Finally, 38.5% of the sample declared a total annual family income of less than 10,000 euros while 34.4% declared 10,001-20,000 euros.

Table 1: Important factors for a good quality of life.

Factors	Frequency (N)	Percentage (%)
Safety	34	27,9
Professional recognition/acceptance	31	25,4
Social recognition/acceptance	28	23,0
Clean environment	18	14,8
Family peace	44	36,1
Spiritual development	15	12,3
Health	100	82,0
Emotional well-being	46	37,7
Steady monthly income	42	34,4

The participants declared that health, emotional well-being, family peace and a steady monthly income are the most important parameters for a good quality of life.

Cronbach's alpha internal consistency coefficient regarding all items of the SF-36 scales were 0.841 and 0.954 respectively, satisfying the criterion of 0.70[51] .

Table 2: Analysis of descriptive statistics of the SF - 36 scale.

SF -36 Scales	Minimum value	Maximum value	Mean value	Standard deviation (SD)
Physical functioning	10	100	66,76	30,86
Physical functioning role	0	100	45,90	40,83
Emotional functioning role	0	100	50,27	43,97
Social functioning	0	100	54,47	30,63
General Health	0	100	48,65	30,78
Vitality	0	100	54,34	26,56
Emotional well-being	8	100	62,26	24,18
Pain	0	100	51,23	29,17

Participants reported relatively moderate values on all SF-36 scales. The highest average score was recorded on the '*physical functioning'* scale with an average value of 66.76 (SD 30.86) and the lowest score was recorded on the *'physical functioning role'* scale with an average value of 45.90 (SD 40.83).

Regression Analysis (eight scales of the SF-36 tool and the demographic-occupational-medical characteristics)

It was found that for all scales, age (negative effect), working hours per day (positive effect) and the existence of a health problem other than diabetes were the variables that affected patients quality of life with DM2 ($p < 0.05$). It is worth mentioning that patient's *'social functioning'* scale and the location of permanent residency was statistically significant ($p < 0.05$). Additionally, patient's *'general health'* scale and following a diabetic diet was also statistically significant ($p < 0.05$).

Table 3: Descriptive analysis of the questions related to the role of rehabilitation

Variables	Mean value	Standard Deviation (SD)
How satisfied are you with your current treatment?	3,86	,884
How flexible have you been finding your treatment to be recently?	3,28	1,344
How satisfied are you with your doctor?	3,99	1,016
How satisfied are you with the nursing staff during your rehabilitation period?	4,06	1,015
How satisfied are you with your family's understanding of diabetes?	4,14	,865
How clear do you think the plan for treating your diabetes is?	4,08	,887
Do you feel that your diabetes plan is discouraging to you/for you?	2,54	1,254
Do you feel scared when you think about living with diabetes?	3,61	1,131
Do you feel uncomfortable in social situations related to your diabetes care (e.g. people telling you what to eat)?	2,03	1,142

Cont... **Table 3: Descriptive analysis of the questions related to the role of rehabilitation**

Do you feel deprived regarding food and meals?	3,11	1,293
Do you feel satisfied with your diabetic diet?	3,68	1,093
Do you feel 'burned out' by the constant effort needed to manage diabetes?	2,98	1,266
Do you worry about episodes of low blood sugar?	3,24	1,330
Do you worry about the future and the possibility of serious diabetes complications?	3,84	1,128
Do you feel that your family is not supportive of your diabetes management efforts?	1,80	1,098
Do you feel that your friends are not supportive of your diabetes management efforts?	2,19	1,268
Do you feel anxious when you don't stick to the program regarding the treatment of your diabetes?	3,13	1,259

The participants answered that they are quite satisfied with their doctor and treatment while they claim that the nursing staff helped them during their rehabilitation period. They also mentioned that they are satisfied with their family's support, consider their treatment plan quite clear and to a great extent express fear with the thought of living with diabetes. Finally, participants mentioned they were concerned about their future and worried about the possibility of serious complications due to diabetes, while they claim that family and friends are supportive of their efforts to manage their condition.

Correlation factors

The researchers investigated the role of rehabilitation during the treatment of DM2 and the health-related quality of life of patients (eight scales of the SF-36). In all SF-36 scales it was observed that the more satisfied the patients were regarding their treatment plan, doctor and nursing staff, their family's support, and their diabetic diet, the grater their *'physical functioning'* and the higher the score for the '*physical functioning role'*, '*emotional functioning role'*, *'social functioning'*, *'general health'*, *'vitality*, *'emotional well-being'* and *'pain'* scales ($p < 0.05$). Also, the more patients diagnosed with DM2 felt fear for the future, lack of support, anxiety, feelings of deprivation, the lower the scale regarding their *'physical functioning'* and the lower their scores were regarding their '*physical functioning role'*, '*emotional functioning role', 'social functioning'*, *'general health'*, *'vitality'*, *'emotional well-being'* and *'pain'* scales ($p < 0.05$).

Discussion

Although the review of the literature showed that while research has been conducted in many countries on the subject, in Greece it is limited. Therefore, it was deemed necessary to conduct research in Western Greece as no similar research was found in the literature which assess how patients with DM2 perceive the quality of life related to the role of rehabilitation.

The study found three variables that have a statistically significant effect on the health of patients with DM2, such as age (negative effect), hours of occupation per day (positive effect) and the existence of a health problem other than diabetes. Other studies have found similar results[47,48]. The survey showed that 33.6% of the sample answered that they work 6 to 8 hours a day. Patients who had an active professional life demonstrated better scores related to their quality of life and rehabilitation. Similar results are reported by other researchers [2,52].

Regarding the *'physical functioning'* scale of patients with DM2, this study concluded that age, hours of work per day and marital status were statistically significant variables. Specifically, it appears that age has a negative effect on the '*physical functioning'* scale of these patients, thus for each year that their age increases, their '*physical functioning'* score decreases.

Studies with similar results have been recorded [47, 48] as these patients age there is a significant reduction in their physical abilities. Also, physical exercise seems to have a positive effect on the participants health and rehabilitation which is also mentioned in the literature[53]. Finally, a statistically significant difference was found regarding the participants marital status and the '*physical functioning'* scale, resulting in a negative effect[54].

It is worth mentioning that age had a negative effect on the *'emotional functioning role'* of patients. Patients with diabetes over time experience significant emotional decline[55]. However, participants daily working hours appeared to have a positive effect on the *'emotional functioning role'* scale. According to the literature, patients who work or exercise daily are in a better mood than other patients with DM2[56]. Regarding '*social functioning'* there is evidence that as the participants age increases their '*social functioning'* score decreases, while participants daily working hours appeared to have a positive effect on this scale. Finally, those living in urban areas appear to demonstrate a higher score on the same scale. It appears that living in urban areas gives patients plenty of options related to their social life. It is noteworthy that significant statistical findings were made in relation to participants *'emotional well-being'*. Specifically, the rate of daily working hours has a positive effect on patients' *'emotional well-being'*.

Finally, the majority of patients participating in the study stated that the nursing staff helped them during their recovery period, thus recognizing their significant role in contributing to these patient's rehabilitation. Patients also stated that the more satisfied they were with their treatment plan, their doctor, the nursing staff, their family's support of their condition, and their diabetic diet, the higher the score regarding their '*emotional functioning role'*.

Study Limitations

A limitation of this research study is the small sample size included. Although the findings provided important data on the quality of life and views on rehabilitation of patients with DM2, it may be necessary in the future to use a larger sample.

Conclusions

DM is a modern deceptive enemy since a poor diet and lack of physical activity are a few of the main causes of the condition. The results of this study demonstrate that patients with DM2 who have an active working life, fell supported by their family, are satisfied with their doctor and the nursing staff and follow a proper diabetic diet appear to have a better quality of life and rehabilitation than patients that are in an older age group or have another health problem other than diabetes.

It is important for patients with DM2 in the future to have an active professional life, as well as to follow an appropriate rehabilitation program in an effort to eliminating the chances of additional health problems arising other than diabetes in order to improve their quality of life the older, they become. This can be achieved by adopting a healthier lifestyle, which includes exercise, a Mediterranean diet, maintaining normal body weight and regular blood tests.

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