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ORIGINAL PAPER

EVALUATION OF QUALITY OF LIFE OF PATIENTS WITH DIABETIC FOOT SYNDROME IN SELECTED HEALTH CARE FACILITIES OF MORAVIAN SILESIAN REGION

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Abstract

Aim: The aim of the study was to determine the quality of life of patients with diabetic foot syndrome in selected health care facilities in the Moravian-Silesian Region using the standardized WHOQOL-BREF questionnaire. *Methods:* A Czech version of the standardized WHOQOL-BREF questionnaire was used to determine the quality of life of patients with diabetic foot syndrome. The sample consisted of 84 patients. The results were compared with the population norm. Data were collected from November 2012 to February 2013 in selected health care facilities in the Moravian-Silesian Region: University Hospital Ostrava, Municipal Hospital Ostrava and Frydek-Mistek Hospital. *Results:* Patients with diabetic foot ulcers were found to have a poorer quality of life in the domain of physical health. In domain 1 (physical health) respondents rated as 'worst' the following items: "dependence on medical care" (2.54), "pain and discomfort" (2.76); while in domain 2 (perception), "negative feelings" (2.94) merited a rating of "worst". Being female, being over 75 years of age, and having a higher grade of ulcer (grades 3 and 4 according to Wagner´s classification) correlated with lower scores in all quality of life domains. *Conclusion:* Diabetic foot ulcer has a negative effect on health-related quality of life, particularly in the domain of physical health.

Key words: diabetic foot syndrome, quality of life, WHOQOL-BREF questionnaire.

Introduction

The WHO defines diabetic foot syndrome as ulceration or destruction of lower limb tissues in diabetic patients associated with neuropathy, with a different stage of ischemic disease of the lower limbs, often with infection (ČDS, 2012). According to the data provided by the Czech Institute of Health Information and Statistics for the year 2011, more than 825,400 people (389,600 men and 435,800 women) were treated for diabetes mellitus (ÚZIS ČR, 2012, p. 45), of which 98,714 were treated in the Moravian-Silesian region (ÚZIS CR, 2012, p. 70). In comparison to 2010, the total number of diabetic patients increased by 2.4%.

The number of diabetes related complications also rose from 228,000 in 2010 to 240,000 in 2011, of which 40% = retinopathy, 42% = nephropathy and 18% = affliction of lower limbs (also known as diabetic foot (5.6% in 2010). Amputation was performed in 10,408 cases, including 3,939amputations above the ankle (ÚZIS ČR, 2012, p. 45).

The presence of diabetic foot syndrome can have a significant influence on patients´ quality of life. Diabetic ulcerations may affect patients emotionally, physically and economically. Moreover, patients with diabetic foot syndrome are more likely to suffer from depression and are less satisfied with their overall quality of life. Diabetic ulceration can result in lower mobility, falls, higher dependence on others, loss of employment, lower income, higher risk of amputation, repeated medical check-ups, and higher living costs (Goodridge et al., 2005, p. 369). According to Dragomirecká and Bartoňová (2006, p. 9) the current main aim of medicine (including nursing) is not health or prolongation of life per se, but maintenance of or improvement in quality of life. The present is, nevertheless, characterized by increasing life expectancy and predominance of chronic, long-term diseases (Dragomirecká,

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Bartoňová, 2006, p. 9). Research into quality of life of patients who suffer from long-term health problems suggests that impaired health status negatively affects all aspects of quality of life (Dragomirecká, Bartoňová, 2006).

To evaluate quality of life of patients with diabetic foot syndrome generic (e.g. Medical Outcomes Study 36-item Short-Form Health Survey SF-36, WHOQOL-BREF, European Quality of Life Questionnaire – Version EQ-5D) and/or specific (e.g. Diabetic Foot Ulcer Scale: DFS, Diabetic Foot Ulcer Scale – short form: DFS-SF, Neuro QOL) questionnaires are used (Goodridge et al., 2005, p. 375). SF-36 is the most commonly used generic tool (Hogg et al., 2012, p. 553), chosen, for example, by the authors Ribu et al. (2007), Valensi et al. (2011), Yekta et al. (2011) for research into quality of life of patients with diabetic foot syndrome. Specific tools were designed to precisely identify factors influencing patients' quality of life. They assess a relatively narrow spectrum of factors that are directly associated with specific diseases. However, these tools do not evaluate general areas that codetermine overall quality of life (Gurková, 2011, p. 149). A systematic review of Hogg et al. (2012, p. 564) indicated a wide range of available tools for evaluation of quality of life of patients with diabetic ulceration. Yet, no tool can be considered ideal, each having its own particular limitations. For this reason, no single tool is deemed the gold standard for assessment of quality of life of patients with diabetic ulceration.

Aims

The aim of the study was to determine the quality of life of patients with diabetic foot syndrome, using the standardized WHOQOL-BREF questionnaire, in selected health care facilities in the Moravian-Silesian Region.

Methods

Quality of life was measured using a Czech version of the WHO quality of life WHOQOL-BREF questionnaire (Dragomirecká, Bartoňová, 2006). The questionnaire consists of 26 items: two individual items that evaluate overall quality of life and satisfaction with health, and 24 items clustered into four domains (physical health, perception, social relations, and environment). The range of the scale for individual items is 1-5, while the score in domains is on a scale of 4-20, with a higher score indicating better quality of life.

The results of the WHOQOL-BREF questionnaire were analysed as follows:

a) values of answers of two individual items that evaluate overall quality of life Q1 and overall health status Q2,
b) domain scores representing average approximate score calculated from relevant items, including transformation into a scale of 4 – 20.

The questionnaire also included other questions related to sociodemographic and clinical characteristics: age, sex, diabetes type, weight, height, duration of diabetes mellitus in years, domicile, diabetes treatment, awareness of foot care, membership of diabetes care organizations, wearing prescription shoes, and presence of pain and its intensity. Other additional data were obtained from patients´ medical records: a type of diabetic ulceration according to the Wagner ulcer classification (grade 0-5); confirmed ischaemic disease of the lower extremities and its progress according to the Fontaine classification; presence of other diabetic complications (retinopathy, polyneuropathy, nephropathy, etc.); length of diabetic ulcer treatment, ulceration treatment, dressings, and offloading the lower limbs.

Data were collected from November 2012 to February 2013 in selected health care facilities in the Moravian-Silesian region: University Hospital Ostrava, Municipal Hospital Ostrava and Frydek-Mistek Hospital. The research was approved by the Ethics committee of the Faculty of Medicine, University of Ostrava. The management of the health care facilities gave written consent for the research. The patients assessed were informed about the purpose and course of the research and signed an informed consent form. Participants had to meet the following inclusion criteria:

- aged over 18 years,
- diagnosed with diabetic foot syndrome,
- completion of informed consent form.

Approximate domain scores were calculated and transformed in accordance with Dragomirecká, Bartoňová (2006).

For a descriptive analysis, basic statistical characteristics were used – frequency numbers, arithmetical mean, standard deviation, and minimum and maximum values. A T-test for two independent samples was used to compare the mean of individual domains according to sex, age and degree of ulceration. Statistical tests were analysed at a 5% level of significance.

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Results

The sample (n = 84) consisted of 28 (33%) women and 56 (67%) men. The average age was 67.31 years (standard deviation SD = 10.72 years), with a variation range of 37 to 84 years. From the total of 84 patients, 81 were addressed at an outpatient podiatric clinic and three patients completed a questionnaire during their stay in hospital in the surgical unit. An outline of individual sociodemographic and clinical characteristics is shown in Table 1 and Table 2. Most participants were men (67%) aged over 65 (58%) and diagnosed with type 2 diabetes (94%). Ischaemic disease of the lower extremities was confirmed in 64 (76%) patients (11 patients at stage I; 18 patients at stage II (a); 17 patients at stage II (b); 8 patients at stage II (c); 5 patients at stage III; and 5 patients at stage IV. Leg pain was present in 64 (76%) patients. Most participants described pain intensity on the Visual Analogue Scale at grades IV (n = 12), VI (n = 11), III (n = 11), V (n = 10), and VII (n = 8). Six participants indicated grade II for pain intensity; four patients grade VIII; one patient grade I; and one patient grade IX. Average pain was 4.86. Eighty-three (99%) patients reported that they had received instruction on foot care. Only two participants were members of diabetes care organizations.

Table 1 Basic socio-demographic and clinical characteristics of patient sample (n = 84)

Characteristics		N	%
Sex	Women	28	33%
	Men	56	67%
Age	37 - 64 yrs.	35	42%
	65 - 75 yrs.	28	33%
	Over 75 yrs.	21	25%
Cohabitation	Alone	14	17%
	With partner	57	68%
	With somebody else (children, at a health care facility)	13	15%
DM Type	Diabetes Type 1	5	6%
	Diabetes Type 2	79	94%
DM treatment	Insulin	49	58%
	Insulin + diet	25	30%
	ODM	5	6%
	ODM + diet	3	4%
	Insulin + ODM	1	1%
	Diet	1	1%
Confirmed IDLE		64	76%
Retinopathy		31	37%
Polyneuropathy		23	27%
Nephropathy		16	19%
Myocardial infarction		18	21%
Ictus		3	4%
State after vascular reconstructive surgery		17	20%
Help with care needed		41	49%
Length of duration of DM average (SD), min., max.		12.8 yrs. (9.35) 0.5; 38	

DM – diabetes mellitus; ODM – oral diabetic medications; IDLE – Ischaemic disease of lower extremities; SD – standard deviation

Diabetic ulcer had occurred in 30 (36%) patients for the first time, other patients had repeatedly suffered from ulcers. Wagner classification was used to determine the degree of ulceration: 0 – without ulceration, risk diagnosis (deformity); 1– superficial ulceration (extending into dermis), most often under the metatarsal head; 2 – deeper ulceration extending into the subcutaneous fat layer without clinically significant infection (does not penetrate joints and bones); 3 – deep ulceration with an abscess, more extensive phlegmon, osteomyelitis or infectious arthritis, tendinitis or necrotizing fasciitis; 4 – localized gangrene (toes, forefoot, or heel), 5 – gangrene or necrosis of the whole foot (Fejfarová, 2009, p. 133). According to Wagner ulcer classification, the majority of patients from our sample suffered from diabetic ulceration at grade 2 (36%) and grade 3 (27%). Diabetic ulceration treatment included both debridement (n = 75; 89%) and antibiotic cure (n = 18; 21%). Almost one third

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of patients (69%) had experienced repeated diabetic ulceration. Wet therapy was selected in 47 (56%) cases and standard therapy in 34 (40%) cases. In order to offload the lower limbs, patients used crutches (n = 60; 71%), a wheelchair (n = 22; 26%) and bed rest (n = 21; 25%) most often.

Table 2 Clinical characteristics of patient sample (n = 84) with diabetic ulceration

Characteristics		N	%
Patient has diabetic ulcer	For the first time	30	36%
	For the second time	36	43%
	For the third time	7	8%
	More than 3 times	11	13%
Grade of ulceration (Wagner classification)	Grade 1 - superficial	15	18%
	Grade 2 – ulcer extension	30	36%
	Grade 3 - deep	23	27%
	Grade 4 – localized gangrene	16	19%
Ulcer treatment	Debridement	75	89%
	ATB	18	21%
	PTA (angioplasty)	2	2%
	Others (ointment)	4	5%
Dressings	Wet therapy	47	56%
	Standard therapy	34	40%
	Ointment	3	4%
Offloading of lower limbs	Crutches	60	71%
	Wheelchair	22	26%
	Bed rest	21	25%
	Orthosis	7	8%
Wearing prescription shoes		47	56%
Foot pain		64	76%
Length of diabetic ulcer treatment mean (SD), min., max.		36 weeks (57.66), 3; 288	

Interpretation of individual items of the WHOQOL-BREF questionnaire

Participants rated overall quality of life and satisfaction with health worse on average than the population norm (Table 3). Patients with diabetic foot syndrome were least satisfied in the domain of physical health (11.72). In the first domain, the items "dependence on medication" (2.56) and "pain and discomfort" (2.76) in particular were evaluated negatively. Mobility was also evaluated worse in comparison with the general population. Patients rated individual items in other domains similarly to the general population, apart from the item "negative feelings" in the domain Perception (2.94). Patients indicated that they often experienced negative feelings such as resentment, hopelessness, anxiety, and depression. The domain Environment received slightly better ratings than the population norm, especially the items transport, access to health and social care, recreation and leisure, home environment, physical environment, and financial resources. The results are shown in Table 3.

On average, men evaluated greater satisfaction with various domains of life in the last two – four weeks than women did. Statistically significant difference was found in the total score for domain 4 - Environment (Table 4).

Patients over 75 years old evaluated satisfaction with all domains of life of the WHOQOL-BREF questionnaire as worse than patients of less than 75 years of age. Statistically significant difference was found in domains 2 – Perception, 3 – Social relationships and 4 – Environment (Table 5). Age had no significant influence on the evaluation of satisfaction in the domain of Physical health. In comparison with the population norm (Dragomirecká, Bartoňová, 2006, p. 43), the patient group at over 75 years of age rated quality of life worse on average in all domains, with the biggest difference in evaluation indicated in domain 4 – Environment.

Patients with ulceration degree three and four on the Wagner ulcer classification rated domains 2 – Perception, 3 – Social relationships and 4 – Environment worse on average than patients with diabetic ulceration degree one and two. Statistically significant differences were found in the evaluation of satisfaction in domains 3 – Social relationships and 4 – Environment.

Table 3 Mean score of items and domains WHOQOL-BREF in patients with diabetic foot syndrome (n = 84) and population norm

Domains and items	Patients with diabetic foot syndrome		Population norm*	
	Mean	SD	Mean	SD
Quality of life	3.38	0.71	3.82	0.72
Satisfaction with health	3.01	0.91	3.68	0.85
Dom 1 Physical health	11.72	1.81	15.55	2.55
Pain and discomfort	2.76	0.91	4.03	1.05
Dependence on medication	2.56	0.78	4.16	0.95
Energy and fatigue	3.44	0.93	3.62	0.93
Mobility	3.08	1.03	4.27	0.84
Sleep and rest	3.07	0.98	3.61	0.99
Dom 2 Perception	13.92	2.6	14.78	2.43
Pleasure in life	3.69	0.91	3.83	0.90
Meaning of life	3.64	0.86	3.86	0.85
Concentration	3.56	0.85	3.55	0.88
Body image	3.58	0.94	3.90	0.82
Self esteem	3.55	0.87	3.57	0.76
Negative feelings	2.94	0.96	3.47	0.95
Dom 3 Social relationships	14.06	2.34	14.98	2.89
Physical safety and security	3.27	0.74	3.24	0.79
Personal relations	3.85	0.79	3.75	0.91
Sex	3.41	0.84	3.64	1.07
Practical social support	3.91	0.83	3.85	0.80
Dom 4 Environment	13.35	2.28	13.30	2.08
Home environment	3.16	0.88	2.85	0.92
Financial resources	3.09	0.99	2.87	1.08
Information and skills	3.58	0.93	3.87	0.77
Recreation and leisure	3.41	0.93	3.33	1.00
Physical environment	3.89	0.82	3.54	0.86
Access to health and social care	3.87	0.88	3.70	0.79
Transport	3.61	0.81	3.19	1.07

*Dragomirecká, Bartoňová, 2006, p. 41; SD – standard deviation

Table 4 Differences of domain scores according to sex

Domains	Men (n = 56) Mean (SD)	Women (n = 28) Mean (SD)	p
Dom 1 Physical health	11.79 (1.65)	11.59 (2.11)	0.6459
Dom 2 Perception	14.3 (2.65)	13.17 (2.36)	0.0593
Dom 3 Social relationships	14.4 (2.39)	13.38 (2.1)	0.0578
Dom 4 Environment	13.71 (2.39)	12.64 (1.88)	0.0432

Discussion

As the research indicates, patients with diabetes mellitus have a poorer quality of life than patients without chronic disease (Yekta et al., 2011, p. 393). The presence of diabetic ulceration has a negative influence on all aspects of quality of life. As Price (2004, p. S131) points out, everyday experience of patients with diabetic ulceration can even be worse than that of patients who have undergone amputation.

The results of our research indicate that patients with diabetic ulceration have a poorer quality of life in the domain of Physical health. A lower limit of the norm of quality of life was found in the domains of Perception and Social Relationships. Average quality of life was established in the domain of Environment. In the first domain of Physical health, dependence on medication, pain, and discomfort were evaluated worst. Mobility, in comparison with the population

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norm, was rated significantly worse. The negative impact of diabetic ulceration on the quality of life is associated to a great extent with lower mobility. A loss of mobility influences an individual´s ability to take part in everyday activities and in other leisure time activities (Goodridge et al., 2005, p. 369).

In domain 2 – Perception, the item Negative Feelings was evaluated worst. As Goodridge et al. (2005, p. 369) point out, based on the results of several studies, the sociodemographic characteristics that are associated with poorer quality of life in patients with diabetes mellitus are higher age, female gender and lower socioeconomic status. The presence of complications also negatively influences quality of life. We were therefore interested as to whether sex, age and degree of diabetic ulceration also influence the evaluation of quality of life of patients with diabetic foot syndrome.

Most participants in our sample were men (67%). Similar sex distribution was to be found in samples of studies on quality of life of patients with diabetic foot syndrome carried out by French authors Valensi et al. (2005, p. 266) and Iranian authors Yekta et al. (2011, p. 395). In both research studies, quality of life was assessed using a standardized SF-36 questionnaire. In the study performed by Yekta et al. (2011), the authors compared demographic and clinical characteristics that have an influence on the quality of life of patients with diabetic ulceration and without diabetic ulceration. In the study, men (diabetic patients without ulceration) had a higher score in all domains of quality of life. In our study, in which the sample consisted only of patients with diabetic ulceration, men evaluated quality of life in all domains better on average than women. However, a statistically significant difference was found only in the total score of domain 4 – Environment (Table 4). Women take a more proactive approach towards their health, self-care and prevention, while men´s approach is more indifferent.

Degree of ulceration is another factor that has an influence on the quality of life of patients with diabetic foot syndrome. Authors Yekta et al. (2011, p. 397) found a significant correlation between quality of life and degree of diabetic ulceration. Our research has produced similar findings: patients with diabetic ulceration degree three and four according to Wagner ulcer classification rated domains 2 – Perception, 3 – Social relationships and 4 – Environment as worse on average than patients with diabetic ulceration degree one and two. Statistically significant differences were found in evaluating satisfaction in the domains of Social relationships and Environment. In our patient sample, degree of diabetic ulceration had no influence on evaluations regarding the domain of Physical health.

According to Valensi et al. (2005, p. 263) significant predictors of poorer quality of life are higher age, the presence of type 2 DM, higher degree of ulceration according to Wagner ulcer classification, longer duration of diabetic ulceration, and the presence of multiple ulcerations.

Quality of life as a multidimensional construct is a significant indicator of the influence of disease on a patient´s life and effectiveness of patient care (Goodridge et al., 2005, p. 376). Monitoring quality of life should be a part of a complex assessment and care for a patient with diabetic ulceration.

Conclusion

Diabetic foot syndrome has a significant influence on patients‘quality of life. The results of our research confirmed poorer quality of life for patients with diabetic ulceration in the domain of Physical health. Neither age, sex nor degree of diabetic ulceration proved influential in evaluations in this domain.

Ethical aspects and conflict of interest

The research was approved by the Ethics committee of the Faculty of Medicine, University of Ostrava and permission for the research was granted by the management of selected health care facilities. Patients were informed of the purpose of the research and those who agreed to participate in the study signed an informed consent form. We are not aware of any conflicts of interest.

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