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Original Study • DOI: 10.2478/ahem-2022-0003 • AHEM • Vol. 76 Issue 1/2022 • 111-116

AHEM

Advances in Hygiene and Experimental Medicine
Postępy Higieny i Medycyny Doświadczalnej

The relationship of quality of life and selected sociodemographic factors in patients with inflammatory bowel disease

Original Study

Joanna Chrobak-Bień[1], Marcin Włodarczyk[2], Anna Ignaczak[3], Anna Lakoma[4], Ewa Małecka-Panas[5], Anita Gąsiorowska[6], Ewa Borowiak[7]

[1]*Department of Conservative Nursing, Medical University of Łódź, Poland*
[2]*Department of General and Colorectal Surgery, Medical University of Łódź, Poland*
[3]*Department of Conservative Nursing, Medical University of Łódź, Poland*
[4]*Department of Surgery, McGill University, Montreal, Canada*
[5]*Department of Gastrointestinal Diseases, University Clinical Hospital No.1 in Łodz, Medical University of Łódź, Poland*
[6]*Department of Gastroenterology, University Clinical Hospital, Medical University of Łódź, Poland*
[7]*Department of Conservative Nursing, Medical University of Łódź, Poland*

Received 09 December, 2020, Accepted 17 November, 2021

Abstract

Introduction. Inflammatory bowel disease (IBD) is a group of chronic inflammatory diseases of the gastrointestinal tract with relapsing-remitting episodes that are very burdensome for the patient. Understanding the sociodemographic factors that affect a patient's quality of life helps us to better understand the behavior and life circumstances of the patient as well as the patient's ability to cope with the stresses caused by IBD.
Aim. The aim of the study was to identify factors that affect the quality of life of patients with IBD.
Material and methods. The study involved 100 patients with confirmed IBD (50 subjects with Crohn's disease and 50 subjects with ulcerative colitis). Women constituted 45% (n=45) of the study group, while the remaining 55% (n=55) of the group were men. The mean age of the respondents participating in the study was 37.27±13.38. The youngest patient was 20 years old and the oldest was 76. The respondents were treated at the Department of General and Colorectal Surgery and at the Department of Digestive Tract Diseases (both at Medical University in Łódź, Poland). Data were collected using the SF-36 general questionnaire, the IBDQ specific questionnaire, and the original author's questionnaire. Participation in the study was anonymous and voluntary. A significance level of 0.05 was adopted in the statistical analysis.
Results. The study showed that the quality of life of IBD patients is reduced. The psychosocial factors influencing the quality of life of IBD patients include education, place of residence, professional activity, having a spouse, and lack of surgical intervention. However, no significant relationship was found between the respondents' gender and age and their quality of life in any of the domains of the SF-36 and IBDQ questionnaire.
Conclusions. The occurrence of IBD, a chronic and incurable disease, reduces the quality of life of those patients. However, a higher level of education, living in a larger community, and increased physical activity all have a positive impact on the quality of life of patients with IBD.

Keywords

inflammatory bowel disease • quality of life • functioning

Introduction

According to WHO (World Health Organization), quality of life is a subjective assessment by an individual of their life situation in relation to the culture in which they live; their value system; and their goals, expectations, and interests. The medical sciences are increasingly using the concept of health-related quality of life (HRQoL), which is based on the WHO definition and encompasses full physical, mental, and social well-being in addition to the absence of disease or disability. The most commonly used tools to measure the quality of life are questionnaires, which we divide into three groups: general (used in healthy patients as well as in subjects with various health problems), specific (concerning a specific group of patients and more sensitive to changes in health), and mixed (containing elements of the general questionnaire, but intended for a specific disease). Systematic assessment of the quality of life during medical care significantly improves the doctor-patient relationship, increases the effectiveness of treatment, and reduces the incidence of psychoemotional disorders related to the disease.

The etiopathogenesis of inflammatory bowel disease (IBD) is not fully understood. Numerous studies indicate that a significant share of genetic and environmental factors as well as disorders in the immune system are implicated in IBD. Smoking is one such important factor contributing to the development of IBD. In addition, nicotine may also be a factor that, with appropriate genetic susceptibility, will determine the development of the disease towards UC or CD [1]. Research also confirms that subjects who start smoking between the ages of 10 and 15 suffer from IBD much more often than nonsmokers or those who started smoking at a later age [1, 2, 3]. There are growing numbers of IBD cases worldwide. In Poland, this group of diseases affects tens of thou-

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* *E-mail: joanna.chrobak-bien@umed.lodz.pl*

sands of patients, with the incidence of IBD rapidly increasing in recent years [4]. IBD usually affects young subjects (mainly in the period of their highest activity), who are then forced to change their current lifestyle, significantly modify their way of thinking, and set new priorities. Conducting research on the quality of life of patients with IBD may be helpful in monitoring the course and assessing the effectiveness of IBD treatment.

The aim of the study was to assess the HRQoL in a group of patients diagnosed with IBD, as well as to identify factors that may affect the quality of life of the studied patients. Additionally, obtaining information from patients on health-related quality of life allows for a holistic view of their problems, which should positively affect the success of the therapy.

1. Material and methods

The study included 100 patients with a confirmed diagnosis of IBD (50 subjects with Crohn's disease [CD] and 50 subjects with ulcerative inflammatory colitis [UC]) hospitalized at the General and Colorectal Surgery Clinic of the Medical University of Lodz and under the specialist care of the Gastroenterological Clinic at the University Teaching Hospital No. 1 in Lodz. Participation in the study was voluntary and anonymous. After obtaining the consent of the institution – the Bioethics Committee of the Medical University of Lodz (RNN/177/16/KE of June 14, 2016) – the research began in July 2016 and was completed in May 2017.

The study was conducted using the following three data-gathering mechanisms: (1) the so-called diagnostic survey, utilizing the SF-36 questionnaire (The Short Form [36] Health Survey, version 2) after obtaining the license (Student License Agreement QM035225 - CT177402 - OP052598); (2) the IBDQ (Inflammatory Bowel Disease Questionnaire) after obtaining the license (No. 24153, McMaster University, Hamilton, Ontario, Canada); and (3) the authors' survey questionnaire.

The SF-36 questionnaire consists of 36 questions assessing the quality of life in 11 domains [5, 6]: physical functioning (PF), limitations in performing roles due to physical health (RP), pain (BP), general sense of health (GH), vitality (VT), social functioning (SF), limitations in fulfilling roles resulting from emotional problems (RE), sense of mental health (MH), change in health (HT), functioning in the physical dimension, total physical health (PCS), functioning in the mental dimension, and total mental health (MCS). The quality of life in each of the domains is expressed by a number in the range 0–100. Higher numbers indicate better quality of life. The standard form of SF-36 examines the quality of life on the basis of the last 4 weeks, while one question concerns the assessment of health in comparison with the state from a year ago (HT domain).

The IBDQ is specific to the IBD patient population and consists of questions assessing the quality of life pertinent to this patient group. It consists of 32 questions and assesses the quality of life in 5 domains: general quality of life (TS), intestinal function (BS), emotional health (EF), systemic functioning (SS), and social functioning (SF). The results are interpreted using a scale from 1 to 7, where 1 means the presence of very severe symptoms and 7 means no symptoms. Higher numbers indicate better quality of life.

The author's questionnaire contained 24 questions addressing demographic variables, disease duration, and treatment method.

2. Statistical analysis

Due to the lack of normality of the distribution of variables (result from the Shapiro-Wilk test), comparisons of quantitative variables in two groups were performed using the Mann-Whitney test. Comparisons of quantitative variables in more than two groups were performed using the Kruskal-Wallis test. Dunn's test was used as a post-hoc procedure. Correlations between quantitative variables were assessed using the Spearman correlation coefficient. The analyses were performed at the significance level of 0.05. R software version 3.6.2 was used.

3. Results

One hundred (100) patients with a confirmed diagnosis of IBD participated in this study. Of these, 45 were women and 55 were men. The mean age for the entire study group was 37.27 years (SD = 13.38), including the mean age of the surveyed women of 35.76 (SD = 13.93), and the surveyed men of 38.51 (SD = 12.83). The mean duration of the disease was 7.26 years (SD = 4.34), including 5.92 years in patients with CD. In patients with UC, the average duration of the disease was longer, at 8.6 years.

Most of the respondents (91%) declared that they lived in a city. More than half of the respondents (54%) possessed higher education, while 34% had secondary, and 12% had vocational education. In the study, professionally active patients predominated (71%), while 16% were on a disability pension, 9% were studying, and 4% were retired. The majority of respondents (59%) were married and had children (53%). The vast majority of respondents (94%) were aware of the harmful effects of smoking on health and did not use cigarettes or other tobacco products. The detailed characteristics of the study group are presented in Table 1.

Assessing the quality of life of IBD patients in individual life domains of the SF-36 questionnaire through the analysis of mean values reveals that the respondents felt the best quality of life in the domains of physical functioning (PF), emotional problems (RE), and perceived pain (BP), and worse quality of life in the domains of vitality (VT), change in health (HT), and general health (GH). Additionally, the respondents functioned slightly worse in the mental dimension (MCS) than in the physical dimension (PCS) (Table 2).

Assessing the quality of life of IBD patients in individual life domains of the IBDQ questionnaire through the analysis of mean

Table 1. Characteristics of the studied group

Feature n		Together	
		%	
Sex	Woman	45	45
	Man	55	55
Age	Up to 30 years	42	42
	31-40 years	27	27
	41-50 years	15	15
	51-60 years	7	7
	Over 60 years old	9	9
Place of residence	City up to 100,000	34	34
	City 100-500 thousand	19	19
	City > 500 tys.	38	38
	Village	9	9
Marital status	Miss, bachelor	41	41
	Married	59	59
Having children	Having children	53	53
	Childless	47	47
Education	Professional	12	12
	Medium	34	34
	Higher	54	54
Duration of the disease	Up to one year	4	4
	1-3 years	17	17
	3-5 years	21	21
	5-10 years	34	34
	Over 10 years	24	24
Professional activity	Working	71	71
	Learning	9	9
	Pensioner	16	16
	Pensioner	4	4

Legend: n- total number of patients

values reveals that the respondents had the best quality of life in the intestinal function (BS) and social functioning (SF) domains, and the weakest in the systemic functioning (SS) and emotional health (EF) domains (Table 3).

In the study, statistical analysis of the data showed no relationship ($p>0.05$) between the sex and age of patients and their quality of life. However, patients with tertiary education expressed higher quality of life in most domains of the SF-36 questionnaire (PF, GH, VT, SF, RE, MH, PCS, MCS) than patients in the professional and secondary education group. Also, p-values reached significance (<0.05) for TS, EF, and SF domains included in the IBDQ questionnaire, which further indicates a better quality of life among respondents who possessed tertiary education.

A statistical analysis of the IBDQ questionnaire showed that patients living in large urban agglomerations (>500,000 inhabitants) had a significantly higher quality of life in terms of gut function (BS) than patients from smaller towns or villages. This relationship was not confirmed in any of the SF-36 questionnaire domains. The professional activity of the respondents strongly affected their quality of life and was higher for the working class ($p<0.05$) in nearly all SF-36 questionnaire domains. This was corroborated in the analysis of the IBDQ questionnaire data, which showed that active patients reported significantly better quality of life ($p<0.05$) in terms of overall quality of life (TS), emotional health (EF), systemic functioning (SS), and social performance (SF).

The impact of having children ($p>0.05$) on the perceived quality of life in the domains of the SF-36 questionnaire was not demonstrated. However, analysis of the IBDQ data show that married persons with children ($p<0.05$) score higher in the social dimension (SF).

The last goal of the study was to examine the impact of the duration of the disease and the treatment method on the respondents' quality of life. Statistical analysis of the obtained data from the SF-36 questionnaire showed that the longer the disease duration, the worse the patients' quality of life ($p <0.05$) in terms of changes in health status (HT). This relationship was not confirmed in any of the domains of the specific IBDQ questionnaire.

Furthermore, the study showed that respondents who had not been required to undergo surgery so far had a better quality of life ($p <0.05$) in the PF, RP, SF, RE, BP, MH, PCS, and MCS domains of the SF- 36 and in all domains of the IBDQ questionnaire ($p <0.05$ for TS, BS, EF, SS, SF) compared to patients who had already been operated on one or more times.

4. Discussion

IBD, due to its chronic relapsing-remitting nature, incurs high treatment costs and significant social costs related to partial or complete inability to work. It has a significant and multifactorial impact on each of the domains of human life, forcing the person affected by IBD to change his or her current lifestyle.

In the conducted study, it was not shown that either of the sexes coped better with IBD. Also, Azza et al. [7] did not find a relationship between sex and quality of life in their study. On the other hand, different results were obtained by the authors of [8, 9, 10, 11] who showed that, on average, men assess their quality of life slightly higher than women do.

Two incidence peaks are observed in IBD: the first is in the second or third decade of life when young subjects are just entering adulthood, and the second occurs after the age of 65. In our own study, the majority of the respondents were young subjects (the average age of the study group was 37.27); how-

Table 2. Mean values for the domains of the SF-36 questionnaire

Domain	n	Average	SD	Median	Min	Max	Q1	Q3
PF	100	71.16	28.14	80	0	100	60	92.5
RP	100	56.19	28.97	62.5	0	100	31.25	76.56
BP	100	56.5	31.02	60	10	100	27.5	90
GH	100	41.2	16.47	40	15	90	30	50
VT	100	47.75	19.31	45	10	85	33.75	65
SF	100	53.12	33.45	50	0	100	25	87.5
RE	100	66.58	29.74	75	0	100	50	100
MH	100	53.4	17.91	52	20	88	36	68
HT	100	37.25	30.25	25	0	100	25	50
PCS	100	56.38	19.63	51.52	12.12	95.45	40.15	76.52
MCS	100	54.06	20.85	53.85	10.77	90.77	36.54	72.69

Legend: n- total number of patients, Q1, Q3- quartiles

Table 3. Mean values for the domains of the IBDQ

Domain	n	Average	SD	Median	Min	Max	Q1	Q3
TS	100	4.74	1.37	4.78	1.59	6.81	3.58	5.86
BS	100	5.21	1.22	5.35	1.9	7	4.38	6.3
EF	100	4.57	1.48	4.46	1.08	6.92	3.58	5.96
SS	100	4.15	1.57	4.1	1.2	6.8	3	5.8
SF	100	4.8	1.97	5.2	1.4	7	3.2	6.6

Legend: n- total number of patients, Q1, Q3- quartiles

ever, statistical analysis did not show that the patients' ages significantly impacted the quality of life they experienced. Marcinkowska et al. [12] obtained different results in her work, showing that patients over 40 perceived the overall QoL to be much better compared to patients between the ages of 18 and 40. In contrast, Azza et al. [7] found that patients in the 20 to 30 age group had a better quality of life than those over 30 years of age. Given these differing findings, a relationship between the age of patients with IBD and their quality of life is not well established.

Significant sociodemographic factors influencing the reduction of the respondents' quality of life were a low level of education and living in a small town or in the countryside. Similarly, other authors proved that patients with a diploma had a higher quality of life due to their easier access to information and the ability to use it in everyday life [8, 13]. Likewise, Andrzejewska et al. [14] examined the quality of life of patients with IBD in Poznań and showed that there is a strong relationship between the quality of life and their place of residence, with higher quality of life for IBD patients who live in large cities. The observed lower quality of life experienced by IBD patients living in small towns and villages may be the result of inferior access to medical specialists and support groups. Living in a small community may also predispose to social stigmatization of the patient.

Professional activity and the economic situation are two very important factors in the life of every person. The statistical analysis of the conducted research showed that professionally active respondents had a higher quality of life. On review of literature, the quality of life in terms of professional work of IBD patients is worse compared to the general population, and it reduces the overall quality of life they feel [15, 16, 17, 18].

A patient's family situation also strongly influences the patients' mental state and quality of life. The chronic relapsing-remitting nature of the disease and the associated troublesome ailments, especially when the disease exacerbates, significantly hinder the daily lives of these affected subjects. Therefore, the assistance of the patients' relatives (including spouses and children) in performing their daily activities of living is extremely important in improving quality of life.

Upon analysis of the effect of disease duration on quality of life of patients with IBD, it was shown that the duration of disease adversely affects only one (HT) of eleven domains of life included in the SF-36 questionnaire. Other authors corroborate this finding and show that in patients with noncommunicable diseases, the duration of the disease does not significantly affect the deterioration of quality of life [19, 20, 21].

The respondents' quality of life is influenced by the type of treatment used (surgical and pharmacological). In our study, it was shown that patients who so far had not required surgery had better quality of life in most domains of the SF-36 questionnaire and in all domains of the IBDQ questionnaire. Petryszyn et al. [22] presented the negative impact of surgical intervention on the quality of life of IBD patients. However, despite the fact that surgical treatment causes additional pain, fatigue, and a physical setback in the patient, after its completion, patients show an improvement in the quality of their life [13, 23, 24, 25, 26]. Hence, the necessity of surgical treatment of IBD likely indicates a more severe IBD disease state, which adversely affects the QoL of the examined patients.

5. Conclusion

In conclusion, we found that IBD patients with CD and UC reported a diminished quality of life. The factor that most correlated with higher quality of life was education level, which positively affected several domains of human life (PF, GH, VT, SF, RE, MH, PCS, MCS) in the SF-36 questionnaire and in the domain of TS, EF, and SF in the IBDQ questionnaire. Hence, the higher the level of education of the respondents, the better their quality of life with IBD. In addition, living in a larger community improves the quality of life of respondents in terms of intestinal function (BS). Specifically, this study showed that patients living in large urban agglomerations (> 500,000 inhabitants) reported a significantly higher quality of life than patients from smaller cities or villages. The study also showed that the activity level of the surveyed subjects positively correlates with significantly improved quality of life, both in the domains of the SF-36 questionnaire (PF, RP, BP, VT, SF, RE, MH, HT, PCS, MCS) and the IBDQ questionnaire (TS, EF, SS, SF). In professionally active subjects, quality of life was significantly higher. Therefore, patients should be encouraged to continue their careers despite the progression of the disease. The support from patients' family (spouse, children) also provides a very beneficial effect on the functioning of patients in the social dimension. The study also showed that disease duration does not impact overall quality of life, except for worsening in the HT domain of the SF-36 questionnaire.

The study showed no statistically significant differences between the quality of life of patients with CD and those with diagnosed UC.

Assessing the systematic qualify of life of patients with chronic diseases (including IBD) helps clinicians choose the most effective formula for treating the disease and achieving the intended outcome. This motivates patients to exercise self-control and comply with medical recommendations, which in turn reduces the anxiety and fear felt by those patients. Due to incurable nature of IBD, special attention is paid to the need to provide multi-specialist care with the participation of nursing and medical teams as well as cooperation with psychologists and nutritionists. Apart from optimizing treatment, the aim of systemic quality of life assessment is to improve the functioning of the patient in social, family, and professional life and to provide a holistic approach to IBD management.

Authors' Contribution

J.C.B.: research concept and design, supervising the project, carrying out the experiments, acquisition of data, data analysis and interpretation, writing – original draft preparation, writing – review and editing, visualization, literature review, final proofreading and approval of the version for publication, funding acquisition; **M.W.:** data analysis and interpretation, writing – original draft preparation, writing – review and editing, visualization, literature review; **A.I.:** visualization, literature review; **A.L.:** literature review, final proofreading and approval of the version for publication; **E.M.P.:** visualization, literature review, final proofreading and approval of the version for publication; **A.G.:** research concept and design, supervising the project, visualization, literature review, final proofreading and approval of the version for publication; **E.B.:** visualization, literature review, final proofreading and approval of the version for publication.

ORCID

Joanna Chrobak-Bień https://orcid.org/0000-0003-0910-8512
Marcin Włodarczyk https://orcid.org/0000-0001-9118-4623
Anna Ignaczak https://orcid.org/0000-0002-0843-7800
Ewa Małecka-Panas https://orcid.org/0000-0002-1825-1807
Anita Gąsiorowska https://orcid.org/0000-0001-8288-3721
Ewa Borowiak https://orcid.org/0000-0003-1790-3516

Conflict of Interest

The authors have no potential conflicts of interest to declare.

Ethics Approval

The study was approved by the Bioethics Committee in Łódź (RNN/177/16/KE) on June 14, 2016.

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