*Jordan Medical Journal, Volume 57, No.3 2023*
DOI: https://doi.org/10.35516/jmj.v57i3.1671

# Assessment of Health-Related Quality of Life for Patients with Inflammatory Bowel Diseases in Palestine

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**Abstract**

**Background**: Inflammatory bowel disease (IBD) has a significant impact on quality of life (QoL). Disease activity has been suggested as an important indicator for QoL in patients with IBD. The aim of this study was to examine the association between disease activity and patient QoL.

**Methods**: A correlation cross-sectional study was conducted from July 2017 to February 2018. We collected a convenience sample from three major hospitals in southern and northern Palestine. A disease-specific inflammatory bowel disease questionnaire (IBDQ) was used to examine QoL, and the results were analyzed using SPSS version 20.

**Findings**: 132 patients were involved in this study. The mean age was 34 years (SD 13), and 77 (58.3%) patients were men. Active disease had been reported in 81 participants (61.4%) in the previous six months. The average IBDQ scores were 150.72 ± 30.08. Emotional and bowel domains were more disrupted than other domains. Active disease was the major significant factor associated with IBD patients' QoL in all-dimensional scores ($p$<0.001). Regression analysis revealed that patients in remission ($r^2$ = 0.436, $p$<0.001), with high educational status ($r^2$ =0.035, p=0.009) and using azathioprine ($r^2$ =0.017, *p=0.034*) were independently associated with high QoL.

**Conclusions**: This study showed a low QoL among Palestinian IBD patients compared to other countries, and identified a number of significant associated factors that should be considered when dealing with IBD.

**Keywords**: Inflammatory bowel disease, inflammatory bowel disease questionnaire, active disease, quality of life, Palestine

*(J Med J 2023; Vol. 57(3): 193–205)*

*Received* *November, 28, 2020* *Accepted* *August, 1, 2021*

## INTRODUCTION

Inflammatory bowel disease (IBD) is an autoimmune disorder, defined as a chronic progressive relapsing inflammation of the intestinal mucosa [1]. It is comprised of Crohn's disease (CD) and ulcerative colitis (UC). IBDs commonly appear in young adults between the ages of fifteen and thirty, but it may occur at any age [1]. Crohn's disease is a chronic IBD characterized by inflammation of the digestive or gastrointestinal (GI) tract. Crohn's can affect any part of the GI tract, from the mouth to the anus, although the terminal part is the most commonly involved (the ileum), at the beginning of the large intestine (or colon) [1]. Ulcerative colitis is a chronic relapsing inflammatory disease of the colon. It affects the

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colon and rectum and typically involves only the innermost lining or mucosa, manifesting as continuous areas of inflammation and ulceration, with no segments of normal tissue [2].

The reasons for IBD are thought to be a result of the complex relationship between genetic, infectious triggers, as well as immune-related and environmental factors, which contribute to clinical CD. Strong evidence suggests a genetic basis for IBD. Nearly 10–20% of IBD patients also have a family history of the disease, with the greatest risk being among first-degree relatives (mother, father, sister, or brother). Relatives of affected individuals have at least a tenfold increased risk for IBD [3].

In the past ten years, there has been an increasing awareness of the importance of QoL issues related to IBD. Health-related QoL studies are an important aspect of clinical trials, especially for chronic diseases. The concept measures the functional impact of a disease and its therapy on the patient's daily life [4]. QoL encompasses several dimensions in addition to physical functioning, including social, cognitive and emotional functioning, alongside participation in daily activities [5]. Several studies have indicated that QoL in IBD patients is impaired [6]. Patients with IBD need life-long medical treatment and specialist GI observation. Despite medical therapy reducing intestinal inflammation and ameliorating symptoms, there is no curative therapy as yet. Both UC and CD can be characterized as a course of exacerbations followed by periods of remission [7]. The disease itself limits the patient's lifestyle and daily activities.

Many studies have indicated a lack of communication between patients and their physicians concerning QoL. In the few studies on the association between drug adherence and health-related QoL in IBD patients, the data are conflicting [8]. Measuring health-related QoL, identifying the variables affecting it, and evaluating whether health-related QoL influences medication adherence and vice versa in IBD patients, is important for guiding professionals towards intervention strategies aimed at improving patients' QoL.

Our study aims to evaluate QoL for Palestinian patients with IBD and identify its predictors.

## MATERIALS AND METHODS

This section describes the population and the subjects of the study, sample size, the data collection instrument, and data analysis.

### Study design

This cross-sectional hospital-based study was conducted using standardized and validated assessment tools with IBD patients from July 2017 to February 2018.

### Study setting

This study was conducted in three major referral hospitals for the northern and southern districts of the West Bank, Palestine.

### Study population

The medical records of all hospitals in 2017 showed that the number of IBD patients in three hospitals was 200 during the study period (the numbers were taken from the hospitals' medical records and medication sheets).

### Sampling procedure and sample size calculation

The Raosoft sample size calculator (an automated software program (http://www.raosoft.com/samplesize.html) was used for sample size calculation. We used a 5% margin of error at a 95% confidence interval, as recommended; the required sample size was calculated to be 132 patients. Convenience sampling was used to recruit participants. The medical records of all participating hospitals in 2017 showed that the number of IBD patients in hospitals was 200 during the study period (the numbers were taken from the hospital medical records and medication sheets). The number of patients included in the study in each hospital was proportional to the total number of patients in the hospital (nearly 70% of all cases in the hospital during the study period). Patients who came to the hospital during the study period were interviewed.

### Inclusion and exclusion criteria

Patients were included if they: were aged 18 and over, had UC or CD, were having treatment for the disease, and agreed to be participants. Pregnant women were excluded.

**Data collection**

The data collection tool consisted of two parts. The first contained standard demographic questions used to document age, sex, and other background and clinical variables, such as disease duration, age at first diagnosis of the disease (age of onset), disease activity (remission or relapse), and method of treatment (medical or surgical). Disease activity was determined based on the patient's report of symptom persistence for the previous six months, using a six-level response format from (a–f). Active disease was defined as having experienced symptoms constantly to occasionally in the last six months (represented by one response from a–d), and inactive disease was defined as experiencing infrequent symptoms or feeling well (responses e or f).

The second part assessed health-related QoL using a disease-specific questionnaire IBDQ. The Arabic-translated validated version was obtained from McMaster University [9]. The IBDQ contains 32 questions classified into four domains: bowel symptoms (ten questions), social impairment (five questions), emotional function (12 questions) and systemic symptoms (five questions). The options for each question are graded from 1–7, with 1 indicating the worst symptoms and 7 the best. The total score ranges from 32 to 224, and the higher the score, the better the QoL. To evaluate reliability, Cronbach's alpha coefficient was calculated to assess internal consistency. The questionnaire was found to be reliable and valid, with a Cronbach's alpha coefficient of ($\alpha$=0.965).

Academic experts in clinical pharmacy and statistical analysis reviewed and evaluated measurement items for content validity and clinical accuracy. The questionnaire was completed during a face-to-face interview with patients and data collection forms about drug data were completed from hospital medical records.

**Statistical analysis**

All data were coded, entered, and analyzed using SPSS 20. A $p$ value of $\leq 0.05$ was considered significant. Multiple linear regression tests were used to examine the factors affecting the IBDQ score.

**Ethical considerations**

The study was approved by the Research Ethical Committee (REC) at Al-Quds University (Ref. number 34/REC/2018, Feb. 24, 2018). All patients were interviewed after receiving verbal consent.

## RESULTS

**Socio-demographic and clinical characteristics of the patients**

The sociodemographic data are summarized in Table 1. Seventy-seven participants (58.3%) were male. The mean ± standard deviation of the sample age equaled 34 ± 13 years, ranging from 18–70 years. The majority of patients had been diagnosed with CD 83 (62.9%), with a mean age of (32.73 ± 12.71), while those with UC 49 (37.1%) had a higher mean age (34.94 ± 12.69). Eighty-six (65.2%) participants were married. More than 52% of the participants were employed and 56 (42.4%) had a moderate monthly income level. 40% of the patients were university-educated. 51.5% of patients had been diagnosed between the ages of 15–30 years. 62.9% of patients had had the disease for less than five years, while 37.1% had had it for five years of longer. More than 32% of participants were smokers. 18.9% of participants had a first-degree relative (mother, father, sister, or brother) diagnosed with IBD. Active disease or relapse had been reported in 81 participants (61.4%) in the previous six months. All patients received medical treatment during the study period. Sixteen participants (12.9%) had had surgical treatment during the disease life (Table 1).

**Table 1: Socio-demographic and clinical data of the study participants**

| Socio-demographic factors | | Frequency | Percentages (n=132) |
|---|---|---|---|
| **Gender distribution** | Men | 77 | 58.3% |
| | Women | 55 | 41.6% |
| **Type of Disease** | Crohn's disease | 83 | 62.8% |
| | Ulcerative colitis | 49 | 37.1% |
| **Marital status** | Single, never married | 46 | 34.8% |
| | Married | 86 | 65.2% |
| **Current status** | Student | 22 | 16.7% |
| | Employed | 69 | 52.3% |
| | Unemployed | 41 | 31.1% |
| **Income** | Less than ₪3000 | 48 | 36.4% |
| | ₪3000–₪4000 | 56 | 42.4% |
| | More than ₪4000 | 28 | 21.2% |
| **Level of education** | University or college or equivalent | 54 | 40.9% |
| | Intermediate between secondary level and university | 15 | 11.4% |
| | Secondary school | 40 | 30.3% |
| | Primary school only (or less) | 23 | 17.4% |
| **Age at 1st diagnosis** | Less than 15 years | 14 | 10.6% |
| | 15 to 30 years | 68 | 51.5% |
| | More than 30 years | 50 | 37.9% |
| **Disease duration** | Less than 5 years | 83 | 62.9% |
| | 5 years and more | 49 | 37.1% |
| **First degree relative** | No | 107 | 81.1% |
| | Yes | 25 | 18.9% |
| **Smoking habits** | No | 89 | 67.4% |
| | Yes | 43 | 32.6% |
| **Disease activity** | No | 51 | 38.6% |
| | Yes | 81 | 61.4% |
| **Method of Treatment** | Drugs | 115 | 87.1% |
| | Both surgical and drugs | 16 | 12.9% |

**Medications prescribed for IBD patients**

The most common medications prescribed were azathioprine (Imuran®) in 96 patients (72.7%), *5-ASA* (Pentasa®) in 68.2% of patients, and adalimumab (Humira®) in 26.5% of patients, as shown in Figure 1.

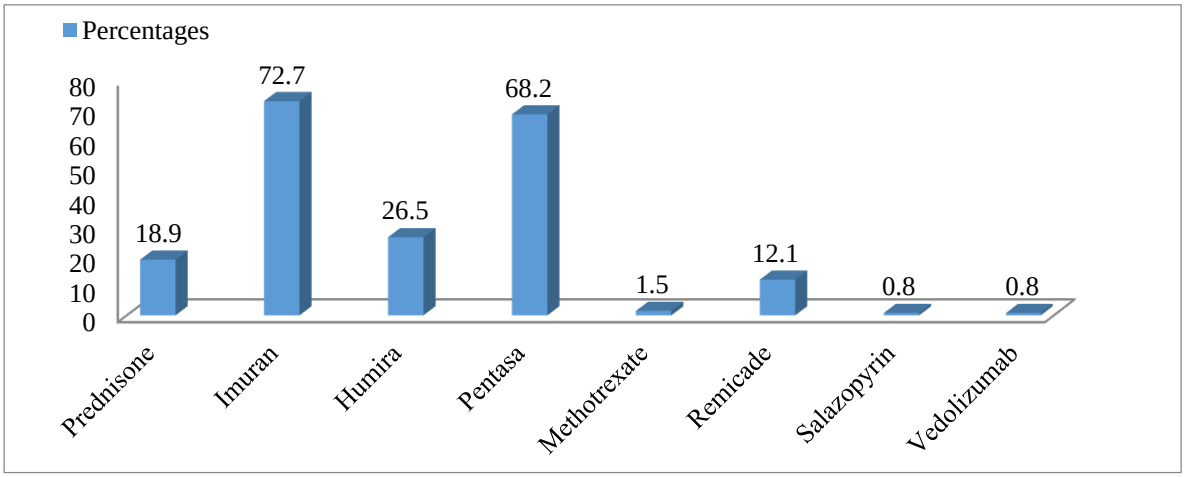


**Figure 1: Medications prescribed to treat IBD**

**Antibiotics prescribed to IBD patients**

One hundred and seventeen patients (88.6%) were not prescribed antibiotics during the study period, while others were prescribed ciprofloxacin, metronidazole or both in the following percentages 1.5%, 6.1% and 3.8%, respectively, as shown in Table 2.

**Table 2: Antibiotics prescribed to IBD patients**

| Antibiotic usage | Frequency | Percentages |
|---|---|---|
| Patients not prescribed antibiotics | 117 | 88.6% |
| Patients prescribed ciprofloxacin | 2 | 1.5% |
| Patients prescribed metronidazole | 8 | 6.1% |
| Patients prescribed both (ciprofloxacin and metronidazole) | 5 | 3.8% |

**Assessment of health-related QoL in IBD patients**

The mean score of IBDQ in the total sample of patients was (150.72 ± 30.08), ranging from 48.96 to 208.96. The total mean score was less than 157, representing a low QoL in these Palestinian IBD patients [10]. Comparison of the four domains of the IBDQ found that social and systemic domains had higher scores than other domains, with a mean per item ± SD equal to (24.75 ± 6.6), (23.7 ± 6.45), respectively.

**Table 3: Assessment of health-related QoL in IBD patients (n=132)**

| IBDQ domains | Range | IBDQ Scores ± SD | Median |
|---|---|---|---|
| Bowel functioning | 10–70 | 46.1 ± 12.2 | 47 |
| Emotional functioning | 12–84 | 54.48 ± 13.56 | 58 |
| Systemic domain | 5–35 | 23.7 ± 6.45 | 26 |
| Social domain | 5–35 | 24.75 ± 6.6 | 25 |
| **Total IBDQ score** | **32–224** | **150.72 ± 30.08** | **151** |

**Association of QoL with the socio-demographic and clinical variables of the patients**

Total IBDQ score was not affected by socio-demographic factors such as gender, marital status, occupation, level of education, income level, type of food, dietary restriction and smoking; however, the disease activity status had a statistically significant effect at the level of significance $\alpha \leq 0.05$. Mean IBDQ scores and domains showed that patients in remission (inactive disease stage) had better QoL scores

than those in relapse ($p$=0.000). The comparison of IBDQ scores between CD and UC showed no significant difference ($p$=0.882).

Clinical variables such as disease duration, age at disease onset, and treatment options were also evaluated and did not affect any IBDQ dimensional score. For the bowel domain, mean IBDQ scores showed significant differences depending on the presence of first-degree relatives in the family, while the mean systematic domain score had an almost significant difference among adalimumab users and non-users ($p$=0.047), as shown in Table 4. Although there was no significant correlation at the level of significance $\alpha \leq 0.05$ between age and IBDQ (r=0.065, $p$=0.232), there was a positive correlation between age and the emotional domain (r=0.174, $p$=0.024), as shown in Table 5.

**Table 4: Association between QoL and selected socio-demographic and clinical variables**

| Some socio-demographic and clinical variables | Sub-classification | | Systemic mean rank per item | Social mean rank per item | Bowel mean rank per item | Emotional mean rank per item | IBDQ mean ± SD |
|---|---|---|---|---|---|---|---|
| **Type of disease** | Crohn's disease | | 4.80 ± 1.25 | 4.95 ± 1.27 | 4.64 ± 1.21 | 4.50 ± 1.12 | 4.71 ± 0.93 |
| | Ulcerative colitis | | 4.64 ± 1.37 | 4.94 ± 1.40 | 4.57 ± 1.24 | 4.59 ± 1.15 | 4.70 ± 0.97 |
| | *p*-value | | *0.307* | *0.860* | *0.818* | *0.882* | *0.943* |
| **Level of education** | University or college | | 4.80 ± 1.27 | 5.22 ± 1.10 | 4.88 ± 1.04 | 4.79 ± 1.05 | 4.92 ± 0.73 |
| | Intermediate | | 4.76 ± 1.46 | 4.82 ± 1.49 | 4.80 ± 1.43 | 4.63 ± 1.29 | 4.72 ± 1.15 |
| | Secondary school | | 4.71 ± 1.17 | 4.73 ± 1.36 | 4.36 ± 1.24 | 4.21 ± 1.10 | 4.50 ± 0.97 |
| | Primary school only (or less) | | 4.62 ± 1.50 | 4.75 ± 1.54 | 4.30 ± 1.32 | 4.42 ± 1.15 | 4.56 ± 1.13 |
| | *p*-value | | *0.215* | *0.586* | *0.231* | *0.155* | *0.193* |
| **1st degree relatives** | No | | 4.73 ± 1.28 | 4.94 ± 1.33 | 4.64 ± 1.23* | 4.50 ± 1.12 | 4.69 ± 0.91 |
| | Yes | | 4.62 ± 1.31 | 4.99 ± 1.30 | 4.49 ± 1.17 | 4.71 ± 1.19 | 4.76 ± 0.69 |
| | *p*-value | | *0.320* | *0.099* | *0.031** | *0.486* | *0.228* |
| **Drugs used to treat IBD** | Prednisone | No | 5.02 ± 1.04 | 5.20 ± 1.05 | 4.85 ± 1.00 | 4.75 ± 0.96 | 4.89 ± 0.73 |
| | | Yes | 3.54 ± 1.56 | 3.85 ± 1.75 | 3.56 ± 1.54 | 3.64 ± 1.37 | 3.91 ± 1.28 |
| | *p*-value | | *0.889* | *0.899* | *0.702* | *0.493* | *0.762* |
| | Imuran | No | 4.67 ± 1.52 | 4.70 ± 1.61 | 4.73 ± 1.31 | 4.65 ± 1.34 | 4.57 ± 1.25 |
| | | Yes | 4.76 ± 1.20 | 5.04 ± 1.18 | 4.57 ± 1.18 | 4.49 ± 1.04 | 4.76 ± 0.80 |
| | *p*-value | | *0.262* | *0.887* | *0.860* | *0.615* | *0.696* |
| | Humira | No | 4.93 ± 1.15 | 5.11 ± 1.25 | 4.73 ± 1.11 | 4.70 ± 1.00 | 4.82 ± 0.85 |
| | | Yes | 4.19 ± 1.53 | 4.49 ± 1.40 | 4.29 ± 1.45 | 4.08 ± 1.33 | 4.38 ± 1.10 |
| | *p*-value | | *0.047** | *0.074* | *0.849* | *0.513* | *0.065* |
| | Pentasa | No | 4.62 ± 1.34 | 4.98 ± 1.16 | 4.65 ± 1.35 | 4.36 ± 1.16 | 4.72 ± 0.94 |
| | | Yes | 4.79 ± 1.27 | 4.93 ± 1.39 | 4.60 ± 1.16 | 4.62 ± 1.11 | 4.70 ± 0.93 |
| | *p*-value | | *0.423* | *0.062* | *0.229* | *0.575* | *0.217* |
| | Methotrexate | No | 4.73 ± 1.30 | 4.95 ± 1.33 | 4.61 ± 1.22 | 4.52 ± 1.13 | 4.72 ± 0.94 |
| | | Yes | 5.20 ± 0.28 | 4.95 ± 0.00 | 4.90 ± 0.85 | 5.25 ± 0.59 | 4.70 ± 0.93 |
| | *p*-value | | *0.874* | *0.716* | *0.709* | *0.120* | *0.687* |
| | Remicade | No | 4.74 ± 1.32 | 4.93 ± 1.34 | 3.63 ± 1.21 | 4.55 ± 1.16 | 4.71 ± 0.95 |
| | | Yes | 4.69 ± 1.12 | 5.06 ± 1.15 | 4.49 ± 1.29 | 4.46 ± 0.89 | 4.71 ± 0.00 |
| | *p*-value | | *0.420* | *0.642* | *0.440* | *0.852* | *0.671* |
| | Salazopyrin | No | 4.74 ± 1.29 | 4.95 ± 1.32 | 4.62 ± 1.22 | 4.54 ± 1.13 | 4.70 ± 0.98 |
| | | Yes | 4.80 ± 0.00 | 5.4 ± 0.00 | 4.30 ± 0.00 | 4.42 ± 0.00 | 4.78 ± 0.58 |
| | *p*-value | | *0.050** | *0.170* | *0.661* | *0.687* | *0.331* |
| | Vedolizumab | No | 4.73 ± 1.29 | 4.95 ± 1.32 | 4.61 ± 1.22 | 4.53 ± 1.13 | 4.71 ± 0.94 |
| | | Yes | 5.2 ± 0.00 | 4.95 ± 0.00 | 5.50 ± 0.00 | 5.50 ± 0.00 | 4.59 ± 0.00 |
| | *p*-value | | *0.941* | *0.890* | *0.551* | *0.341* | *0.998* |
| **Disease activity** | Active Disease | | 4.22 ± 1.33 | 4.45 ± 1.37 | 4.11 ± 1.24 | 4.09 ± 1.15 | 4.31 ± 0.94 |
| | Inactive disease | | 5.55 ± 0.65 | 5.73 ± 0.69 | 5.40 ± 0.60 | 5.24 ± 0.63 | 5.32 ± 0.53 |
| | *p*-value | | *0.000** | *0.000** | *0.000** | *0.000** | *0.000** |

*****$p \leq 0.05$

**Table 5: Correlation between age and IBDQ scores using Pearson correlation coefficient**

| QoL scores | Age | |
|---|---|---|
| | R | Sig |
| **Bowel domain** | 0.085 | *0.169* |
| **Emotional domain** | 0.174 | *0.024 ** |
| **Systemic domain** | 0.042 | *0.317* |
| **Social domain** | 0.027 | *0.380* |
| **IBDQ** | 0.065 | *0.232* |

*****$p \leq 0.05$

**Predictors of QoL domains**

Regression analysis, using QoL score as a dependent variable and other factors as independent variables found that patients in remission status ($r^2$=0.436, p<*0.001*), patients with high educational levels ($r^2$=0.035, $p$=0.009) and those using azathioprine ($r^2$=0.017, $p$=0.034) were independently associated with high QoL. The factors significantly associated with QoL according to stepwise regression analyses are summarized in Table 6.

Stepwise regression analysis explained 54.1% of variation in QoL, with these independent variables (disease status, level of education, using corticosteroid, antibiotics and azathioprine. The factor that affected IBDQ the most was disease status, which interpreted 43.6% of the variation in the IBDQ. Furthermore, it is the factor that affected bowel, systemic, social and emotional domains the most, at 41.1%, 41.2%, 37.7% and 40.7% of the variation in each domain, respectively.

The change in disease activity from remission to relapse status was negatively associated with change in QoL score. Relapse resulted in a decrease in IBDQ and all domain scores. High educational level and using azathioprine (Imuran®) were also positive predictors for IBDQ scores. Taking corticosteroid medication was negatively associated with IBDQ scores and all its dimensional scores, as shown in Table 6.

**Table 6: Stepwise regression models testing for the predictors of QoL of IBD patients in Palestine**

| Model | Variable | R | R Square | R Square Change | B | Sig. |
|---|---|---|---|---|---|---|
| **Bowel domain** | Disease activity status | 0.641 | 0.411 | 0.411 | -0.462 | 0.000* |
| | Level of education | 0.673 | 0.453 | 0.042 | 0.209 | 0.002* |
| | Corticosteroid drug | 0.700 | 0.490 | 0.037 | -0.617 | 0.003* |
| | Disease duration | 0.716 | 0.513 | 0.024 | -0.370 | 0.015* |
| | Stress-related conditions | 0.728 | 0.530 | 0.017 | -0.353 | 0.035* |
| **Systematic domain** | Disease activity status | 0.642 | 0.412 | 0.412 | -0.432 | 0.000* |
| | Corticosteroid drug | 0.678 | 0.459 | 0.047 | -0.739 | 0.005* |
| | Adalimumab drug | 0.696 | 0.484 | 0.025 | -0.502 | 0.008* |
| **Social domain** | Disease activity status | 0s.614 | 0.377 | 0.377 | -0.443 | 0.000* |
| | Azathioprine drug | 0.640 | 0.409 | 0.032 | 0.459 | 0.009* |
| | Corticosteroid drug | 0.666 | 0.444 | 0.034 | -0.681 | 0.006* |
| | Level of education | 0.683 | 0.466 | 0.023 | 0.179 | 0.022* |
| | Antibiotics | 0.696 | 0.485 | 0.019 | -0.258 | 0.034* |
| **Emotional domain** | Disease activity status | 0.638 | 0.407 | 0.407 | -0.426 | 0.000* |
| | Level of education | 0.666 | 0.443 | 0.036 | 0.198 | 0.005* |
| | 5-ASA | 0.688 | 0.474 | 0.030 | 0.312 | 0.008* |
| | Corticosteroid drug | 0.703 | 0.495 | 0.021 | -0.461 | 0.023* |
| | Adalimumab drug | 0.716 | 0.512 | 0.017 | -0.350 | 0.036* |
| **IBDQ** | Disease activity status | 0.660 | 0.436 | 0.436 | -0.347 | 0.000* |

| Model | Variable | R | R Square | R Square Change | B | Sig. |
|---|---|---|---|---|---|---|
| | Level of education | 0.686 | 0.471 | 0.035 | 0.148 | 0.009* |
| | Corticosteroid drug | 0.709 | 0.503 | 0.031 | -0.460 | 0.006* |
| | Antibiotics | 0.724 | 0.525 | 0.022 | -0.184 | 0.022* |
| | Azathioprine drug | 0.736 | 0.541 | 0.017 | 0.276 | 0.034* |

***p* ≤0.05 **R**: regression coefficient, **B**: standardized coefficient, **Sig.:** significance

**DISCUSSION**

This study is the first of its type in Palestine to assess IBD patients' QoL, demographic and clinical characteristics, and the factors affecting their health-related QoL. The study provides health care professionals with information concerning IBD patients' QoL in Palestine and assessed the extent to which different socio-demographic factors (age, gender, etc.), and clinical variables impacted the QoL of IBD patients. In our study, the IBDQ instrument was applied to measure IBD patients' QoL. IBDQ has also been used to assess QoL in IBD patients in different countries [11–14]. The total score for IBDQ of IBD patients was 150.72 (± 30.4), indicating that our population had a relatively lower QoL than other populations such as the Netherlands, England, Greece, and Saudi Arabia. Our population's total score was lower than Han et al., Athansions et al., and Alowais et al., as they scored 173.7 (± 33.1), 178.1 (± 36.9) and 160.3 (± 42.7), respectively. Our scores were higher than those in the De Boer et al. study (n=271), in which the total QoL score was 119.1 (± 22.0) [11–14].

These variations in QoL may be due to several factors: 1) differences in methodology, such as different patient population; 2) differences in cultural understanding, attitudes towards the disease aspects and the degree of social support between different populations; 3) ethnicity and genetic factors may contribute to disease behavior and patient response to treatment, thus affecting QoL; and, 4) the inclusion of patients with severe symptoms who seeking medical advice. Generally, patients in developing countries do not seek medical advice until debilitating symptoms or complications appear [15], and so a delay in treatment that results in a reduction in patient's QoL may occur.

According to the IBDQ the emotional and bowel dimensions scores in our sample were more disturbed than the systemic and social ones, indicating that patients with IBD suffer from significant psychological stress that affects their QoL due to their chronic disease and symptoms. The social domain had a higher score in our sample and this is similar to a 2012 study conducted by Horváth et al. which used the SF-36 questionnaire to measure QoL in the sample. The authors showed that QoL impairments were lower for social function than other domains [16]. These results also differ from studies that showed IBD had more impact on social and systemic symptoms compared to emotional and bowel symptoms [11–13].

The social domain was the least affected in our sample and this finding could be explained by differences in the socio-demographic characteristics of the participants, as a high proportion of our sample (52.3%) was employed and 16.7% were students, either at university or secondary school. Both categories were mostly involved in daily activities, which enhances social communication.

According to relationships between socio-demographic factors and patients' QoL, gender did not affect any QoL domain in our sample. This result is in agreement with a study by Zahn et al., which concluded that demographic parameters did not significantly affect IBDQ scores [17]. However, some studies have indicated that women are associated with a lower QoL than men [18, 19]. This may be due to differences in socio-demographic and clinical characteristics of the genders in these studies.

The importance of age as a variable in patient QoL has been indicated in several studies [18–20]. In our study, similar to other reports [22–24] age was not found to affect QoL in IBD patients; this result is in line with Moradkhani et al. [18]. Increasing age increased the emotional domain

scores in our study and this may be related to the patient's improved ability to cope with the disease, relapse symptoms, or complications of therapy.

Disease duration, treatment options and prescribed medication also had no impact on patient health-related QoL. No statistical difference was found due to a disease duration of either less than five years or more. This agrees with the findings of Kalafateli et al., who did not find differences in patients with either a short or long history of IBD regarding their QoL [25], but does not align with Jäghult et al., who indicated that patients with short disease duration had lower QoL scores compared with patients with long [26].

Imuran® (azathioprine) and Pentasa® (5-ASA) were the two most commonly used medications by this Palestinian patient population (72.7% and 68.2%, respectively). Prednisone was prescribed to 18.6% of the sample, as is consistent with general practice. Prednisone can be used during flare ups and two biological drugs may be utilized, Humira® and Remicade® [27, 28].

Information concerning the impact of different treatments on QoL in previous studies was conflicting [23, 28, 29]. In this study, no significant difference was found among users and non-users of corticosteroids, 5-ASA, and immunosuppressive therapy, except for adalimumab ($p$=0.047). However, this may be due to the small number of patients included.

Despite our results showing no significant association between IBDQ scores and method of treatment, Blanco et al. showed in a 2005 study that patients undergoing surgery during their disease life had lower IBDQ scores compared to those who received medical treatment only and the difference was significant [31].

Smoking is a well-known factor in the clinical course of IBD. However, the influence of cigarette smoking on QoL is less well known [31]. Our results showed no significant difference between smokers and non-smokers regarding QoL, which supports the study by Casellas et al. of 354 patients with IBD interviewed in Spain [32].

68% of our patients had dietary restrictions based on patients' opinions. This is around the percentage reported in a systematic review in which approximately 70% of IBD patients were known to employ elimination diets to prolong their remission status [33]. Our data showed no significant association regarding QoL and dietary restrictions.

Patients in active disease status (relapse) had statistically lower IBDQ scores than those in remission (Table 2). This has been documented in several studies [6, 29, 35], as disease activity is one of the most important independent variables responsible for IBDQ scores and patients QoL [36]. This may be due to the active disease symptoms compared to those in clinical remission who suffer from fewer symptoms and fewer complications [37]. Relapse symptoms such as GI and extra intestinal symptoms and their complications have a significant effect on patient health, concerns, anxiety, and depression, and reduced patients QoL [22].

In this study, no significant difference in QoL was observed between CD and UC patients. This finding is in line with other studies where diagnosis (CD vs. UC) was not related to bowel symptoms, emotional function, social impairment or systematic impairment, suggesting that diagnosis is not a key determinant of QoL in IBD [20, 31, 34, 38]. On the other hand, several studies have indicated that CD has more impact on psychosocial function, well-being, and QoL scores in comparison to UC [29, 35, 39]. This may be related to the severity of CD, which varies in different areas of the world.

Identifying predictors of IBD patients' QoL could help with interventions that improve health and overall management [18]. Several publications have indicated that the most important variable for predicting health-related QoL is disease activity status, such as the presence of relapse [14, 34, 35]. The present study found that relapse was a significant predictor for the systemic, social, bowel and emotional domains, as well as IBDQ. Relapse or active disease resulted in a decrease of QoL scores (Table 6).

Level of education was a significant predictor for bowel, social and IBDQ scores, as patients

with higher education levels reflected higher QoL scores (Table 6). Generally, the relationship between education and QoL in chronic diseases is well known and represented in the literature [40–42]. Moradkhani et al. concluded that education may improve the way in which patients deal with chronic diseases [43]. Highly educated patients have a higher chance to read about their disease and symptoms and learn how to deal with frequent relapses, and so improvement in QoL scores has been detected. Also, their knowledge makes them less anxious regarding symptoms. This is relevant for patients with IBD because depression is considered a good predictor for subjective impairment in QoL [44].

Differences in IBDQ score in patients receiving different medications may be explained by differences in disease activity status from relapse to remission. Using corticosteroid medication was negatively associated with the bowel, systemic, emotional, and social domains as well as overall IBDQ score, as shown in Table 6. As corticosteroids are the core of 'rescue' therapy for patients who are experiencing a flare [28], the reduction in patients' QoL may be related to disease activity status rather than the drug itself. However, a study conducted by Vivan et al. concluded that patients who were taking prednisone had better QoL [45], although a small number of patients were included in their sample (n=58). Azathioprine (Imuran®) was considered a positive predictor for increasing QoL in both social domain and IBDQ scores, and 5-ASA (Pentasa®) for emotional domain. 5-ASA is highly effective in mild to moderate UC and can be used in conjugation with other therapies in the clinical remission of CD.

## CONCLUSIONS

This study revealed a low QoL among Palestinian IBD patients compared to other countries and identified a number of significant associated factors that should be considered when dealing with IBD. The results may help healthcare providers identify patients at risk of low QoL, especially those in relapse with active symptoms. Healthcare providers and policy makers should increase knowledge about IBD in order to improve IBD patients' QoL.

**Conflict of interest**: None declared.

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# تقييم جودة الحياة المتعلقة بالصحة للمرضى المصابين بأمراض التهاب الأمعاء في فلسطين

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**الملخص**

**الخلفية والأهداف** : يعد مرض الأمعاء الالتهابي ذو تأثير كبير على جودة حياة المرضى. وذكر نشاط المرض كمؤشر مهم لجوده حياة المرضى المصابين بهذا المرض وتهدف هذه الدراسة هو دراسة العلاقة بين نشاط المرض وجودة حياة المرضى.

**منهجية الدراسة** :أجريت دراسة مستعرضة من تموز / يوليو 2017 إلى شباط / فبراير 2018. وتم جمع البيانات من ثلاثة مستشفيات كبرى في شمال وجنوب فلسطين. تم استخدام أداة مخصصة لهذا المرض وهي استبيان مرضى التهاب الأمعاء التقرحي (IBDQ) لدراسة جودة حياتهم. تم قياس مدى الالتزام بالأدوية باستخدام مقياس مورسكي المعدل للالتزام بالدواء (MMAS-8). وتم تحليل النتائج باستخدام برنامج الحزمة الإحصائية للعلوم الاجتماعية (SPSS ) باستخدام الاصدار 20.

**النتائج:** شارك مئة واثنان وثلاثون مريضا في هذه الدراسة. متوسط أعمار من شاركوا بالدراسة حوالي 34 ± 13 سنة وكان 77 مريضا منهم (58.3%) من الذكور. 81 مشارك منهم (61.4 ٪) بالدراسة كان مرضهم نشط خلال الستة شهور الماضية باستخدام مقياس مورسكي المعدل للالتزام، كان حوالي39.4 ٪ من المشاركين لديهم التزام متدني للأدوية. متوسط جودة حياة المرضى باستخدام استبيان مرضى التهاب الأمعاء التقرحي سجل 150.79 ± 30.08 درجات. كانت الناحية العاطفية, وأعراض التهاب الأمعاء هما الأكثر تأثرا بالمقارنة مع النواحي الأخرى. ووجدنا أن نشاط المرض هو العامل الرئيسي المرتبط بجودة حياة المرضى) قيمة .(P<0.001كشف تحليل المخاطر أن المرضى الذين يعانون من مرحلة شفاء للمرض0.436 = r2, ) قيمة (P<0.001، والمرضى الذين لديهم مستوى تعليمي عالي 0.035= r2 ,) قيمة(0.034= P، والذين يستخدمون دواء Azathioprine قيمة,(0.017= P = r2 قيمة ( 0.009 =P ارتبطوا وبشكل مستقل بجودة حياة أفضل.

**الاستنتاج:** أظهرت هذه الدراسة انخفاضًا في جودة الحياة بين مرضى داء الأمعاء الالتهابي مقارنة بالدول الأخرى وحددت عددًا من العوامل الهامة المرتبطة التي يجب أخذها في الاعتبار عند التعامل مع مرض التهاب الأمعاء.

**الكلمات الدالة:** التهاب الأمعاء التقرحي، استبيان التهاب القولون التقرحي، المرض النشط، جودة الحياة، فلسطين .