Patient-reported health-related quality of life after colorectal surgery

ABSTRACT:

Introduction: Colorectal cancer is one of the most common cancers worldwide. In most of these patients, quality of life is deteriorated.

Aim: The aim of our study was to analyze how the disease affects health-related quality of life (HRQoL) and to examine the role of demographic, disease-related, and other factors in the overall quality of life. The second aim was to identify areas where HRQoL could be improved.

Material and methods: A cross-sectional questionnaire survey was conducted. The study included a modified version of EQ-5D, as well as clinical and socioeconomic characteristics of the country. Patients over the age of 18, who had colorectal surgery, and were followed up at our clinic, were included in the survey.

Results: In patients after colorectal surgery, bowel control is a major concern that has an impact on their quality of life. The majority of patients expressed gratitude for the care they received and thanked the health-care providers for it. With the EQ-5D modified questionnaire, the concept of “perfect” health was reviewed and analyzed. A response “no difficulty” in any of the five domains was classified as perfect health. Only one-third of the patients said their health was “ideal” (no problems in any of the EQ-5D five domains).

Discussion: According to the results of this study, patients with CRC have considerably poorer HRQoL than the general population, as indicated by the EQ-5D utility scores. This discovery is in line with some previous research.

Conclusion: Colorectal surgery survivors’ total HRQoL has been found to be lower than in the general population.

KEYWORDS: colorectal cancer, Health-related quality of life, survey

INTRODUCTION

Currently colorectal cancer is among the most frequently detected cancers worldwide [1, 2]. It affects both men and women. This is the second most commonly diagnosed cancer in women and the third most commonly diagnosed cancer in men [3]. Therefore, many scientific approaches have been developed with an impact on diagnosis and treatment, leading to an increased survival rate and quality of life in colorectal cancer patients over the years [4–8]. This remarkable achievement has negative sequelae. Due to surgery, chemotherapy, and radiotherapy those patients have poorer quality of life [2]. Assessment of the health-related quality of life (HRQoL) as patient-reported outcome measure shows self-assessment of how the patients feel and how their state affects their psychological, physical functioning, level of independence, social relationship, and personal beliefs [9]. Frequent psychological problems experienced by colorectal cancer patients include anxiety, depression, decreased self-respect and self-confidence [9, 10]. On the other hand, frequent physical complaints include: bowel problems, ataxia, pain, muscle weakness, nausea, sleeping disturbances, stoma care problems [11, 12]. Patients with colorectal cancer also may have relationship problems with family, friends and colleagues [13]. Researchers has been assessing disease outcomes, and not only in terms of mortality but also in terms of HRQoL [12, 14, 15]. HRQoL plays a valuable role in clinical decision making, although this approach has rarely been used by anesthesiologists [16]. To our knowledge, there is no available data in the literature regarding HRQoL in colorectal cancer patients in a middle-income country like ours.

Various HRQoL instruments are available. They usually have a scoring system based on a public preference. The most widely used questionnaire for assessing HRQoL is perhaps EQ-5D, due to its availability worldwide. Its newest version, i.e., EQ-5D-5L, is supplemented by an increased combination of health states and is believed to be more sensitive to detecting differences in HRQoL [17].

The aim of our study was to investigate HRQoL, which is affected by the disease, and to assess the impact of demographic, disease-related and other factors on the overall quality of life. The second aim was to highlight the areas which could be improved to increase HRQoL after colorectal cancer surgery.

STUDY DESIGN

Study subjects and data collection

Colorectal cancer patients as per the International Classification of Disease Register include all patients with cancer of the colon, recto-sigmoid junction or rectum [18]. A cross-sectional questionnaire...
The survey was conducted while the patients visited the hospital for follow-up. Irrespective interviewers who had no personal relationship with the patients administered the survey. A total of 66 eligible participants were confirmed by the interviewers. Of these eligible participants, 20 declined to participate and 6 were deemed incapable due to physical or physiological difficulties.

**MEASUREMENT**

Several HRQoL measures with a public preference rating methodology are available including the EuroQol five-dimension (EQ-5D), the Health Utilities Index and the Short-Form Six-Dimension survey [19–21]. The EQ-5D is likely the most extensively used tool for assessing HRQoL based on public opinion, as well recommended by many governmental agencies and researchers. The survey consisted of the modified Macedonian version of EQ-5D and the clinical features and socioeconomic characteristics of the nation. The questionnaire included 26 questions divided into the following sections: general, outcome, overall support and care, and a section named “about you.” The general section included questions regarding the type of treatment, the type of surgery and whether patients had stoma or not, the period from the last treatment, and the present condition in terms of mobility, self-care, and usual activities. Questions about the emotional state (anxiety/depression) and physical state (pain/discomfort) of the patients were included in the outcome section. Questions about lifestyle, health care that patients received in tertiary care, support and access to information were covered in the section on overall support and care. In the last section, entitled “about you” we included demographic questions, about: sex, age, ethnicity, presence of long-term conditions and deprivation. If patients felt there was something not covered in the questionnaire or if they wanted to add some information or comments, a free survey was conducted in the Clinical University Center “Mother Theresa” in Skopje, in Macedonia, a middle-income country with 2 million population. Data were collected between May 2020 and May 2021. Every patient above 18 years of age, operated on in our clinic and subjected to regular follow-ups was included in the survey. Informed consent was obtained from each participant. Every patient with psychiatric disorder or any severe medical condition that limited objective assessment was excluded.

### Table I. Demographic characteristics of the patients.

<table>
<thead>
<tr>
<th>Gender of respondents</th>
<th>No</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>29</td>
<td>72.5%</td>
</tr>
<tr>
<td>Female</td>
<td>11</td>
<td>27.5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age of respondents</th>
<th>No</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>40–50 years of age</td>
<td>14</td>
<td>35%</td>
</tr>
<tr>
<td>50–60 years of age</td>
<td>21</td>
<td>52.5%</td>
</tr>
<tr>
<td>60–70 years of age</td>
<td>5</td>
<td>12.5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Religion of respondents</th>
<th>No</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orthodox</td>
<td>22</td>
<td>55%</td>
</tr>
<tr>
<td>Muslims</td>
<td>14</td>
<td>35%</td>
</tr>
<tr>
<td>Gipsy</td>
<td>4</td>
<td>10%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Long-term conditions</th>
<th>No</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alzheimer’s disease or dementia</td>
<td>/</td>
<td>//</td>
</tr>
<tr>
<td>Angina</td>
<td>6</td>
<td>15%</td>
</tr>
<tr>
<td>Arthritis</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Asthma or other chronic chest problem</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Blindness or visual impairment</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Deafness or hearing impairment</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Diabetes</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Heart condition</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>15</td>
<td>37.5%</td>
</tr>
<tr>
<td>Kidney disease</td>
<td>4</td>
<td>10%</td>
</tr>
<tr>
<td>Learning difficulty</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Liver disease</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Long-term back problems</td>
<td>16</td>
<td>40%</td>
</tr>
<tr>
<td>Long-standing mental health problem</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Long-standing neurological problem</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Another long-standing condition</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>None of these conditions</td>
<td>9</td>
<td>22%</td>
</tr>
</tbody>
</table>

The survey was conducted while the patients visited the hospital for follow-up. Irrespective interviewers who had no personal relationship with the patients administered the survey. A total of 66 eligible participants were confirmed by the interviewers. Of these eligible participants, 20 declined to participate and 6 were deemed incapable due to physical or physiological difficulties.
comment box was included. Each dimension was graded on a five-point scale: no problem, minor problem, moderate problem, serious problem and extreme difficulty.

STATISTICAL ANALYSIS

Statistical analysis was performed with the Statistical package of social science (SPSS) program. Categorical variables were expressed as number (percentage) and continuous variables as mean ± standard deviation.

RESULTS

Fig. 1 shows a consort diagram of the patients that were enrolled in the study. A total of 66 patients were assessed for eligibility, 26 patients refused to answer or were incapable of answering the questionnaire, therefore were excluded from the evaluation. The final data of 40 patients was included in the results. All 40 patients returned a fully completed questionnaire, giving a response rate of 60% (Fig. 1.). All participants completed a questionnaire in hospital settings. The survey respondents’ characteristics were analyzed and divided by answer types (Tab. I.). The majority of individuals were aged under 55 years (70%) and a lower proportion were over 55 years (30%). The mean age of respondents was 53 ± 6.4 years. A higher proportion of respondents were male (72.5%). This pattern was reflected across all ages. The proportion of males was much higher than that of females, particularly in the age group of 47–61 years. Of all respondents, 72.5% answered that they still have stoma present, 27.5% said that their stoma had been reversed, 47.5% reported they were in remission, 45% answered that the disease was still present, and 7.5% answered that they do not know the condition of their illness (Fig. 2.).

The split by number of long-term conditions was consistent across all respondents, with 22.5% of patients reporting that they had no other long-term condition. Nearly half of patients reported that they had one other long-term condition and around one third respondent they had two or more long-term conditions. The most often reported long-term condition was back pain, in 40% of respondents. The proportion of males was much higher than that of females, particularly in the age group of 47–61 years. Of all respondents, 72.5% answered that they still have stoma present, 27.5% said that their stoma had been reversed, 47.5% reported they were in remission, 45% answered that the disease was still present, and 7.5% answered that they do not know the condition of their illness (Fig. 2.).

Bowel control is a key issue that affects the quality of life in individuals with colorectal surgery. Fig. 3 shows that 44% of patients with reversed stoma felt that they had little or no bowel control and 55% felt that they only had good bowel control. Patients with stoma reported the following bowel control: 45% had no bowel control, 48% satisfactory bowel control and only 6.4% good bowel control (Fig. 4.). Only one patient reported losing weight and 5% reported insignificant loss of weight. Changes in the eating pattern and appetite loss were reported by 35% of patients. Urinary incontinence was reported by 7.5% of patients.

The physiological effect of colorectal surgery was evaluated as well (Fig. 5.). Respondents were asked to rate themselves on a set of statements. As many as 32.5% of respondents did not report having any psychological problem. As many as 32% reported mild depression and anxiety and 33% reported moderate anxiety and depression. Only 7.5% of patients reported no changes in the sleeping pattern; while almost 46% reported having sleep problems, and 50% did not have opinion on this subject. A high number of patients (about 25%) reported having no trouble with mobility, 37.5% reported small problems with mobility, 25% had moderate problems with mobility and 12.5% had difficulties with mobility. Problems with self-care and common activities were reported by 17.5% of the subjects, vs 12.5%, respectively, and not having problem at all with self-care and common activities was reported by 27.5% vs 25%, respectively. Almost 12% of patients reported a constant pain, 25% reported not having pain at all, and 62.5% reported a moderate pain. Presence of constant fatigue was reported by 35% and not feeling fatigue at all by 7.5%. As many as 30% of respondents reported not having problems in the care of those dependent of them (partner, children, parents), 60% reported small problems.

Of all 40 patients who completed the questionnaire, none took the option to provide a comment.

The majority of patients expressed gratitude and showed appreciation to health care professionals for the given care.

The concept of “perfect” health using EQ-5D modified questionnaire was evaluated and analyzed (Fig. 6.). Perfect health overall was defined as a response “no problem” to any of the five domains.
Anxiety/depression is, in fact, the most common psychological condition among cancer patients [33, 34]. Pain/discomfort management, as well as anxiety/depression management, should be improved further. This study has highlighted the potential impact of colorectal cancer survivors on physical functioning including mobility and self-care. The impact of physical activity on the quality of life in colorectal cancer survivors has been studied in a small number of randomized controlled trials. Wydra showed that when a patient is in good biological health and has the help of an internal medicine specialist, age is not a risk factor for postoperative problems [35]. Other most current systematic review and meta-analysis on this topic was published in 2013, and it included five randomized controlled trials of 238 people [36]. Only three of the studies analyzed the quality of life [37–39]. Each of the three experiments resulted in a positive outcome. Each of the three studies offered home-based exercise programs ranging in length from 12 to 16 weeks, as well as a standard care/control group. Gillis et al. investigated the efficacy of pre-rehabilitation with rehabilitation exercise training in colorectal cancer patients undergoing resection. Pre-rehabilitation is based on the idea that getting some exercise before starting treatment will help patients have better outcomes both during and after treatment. In general, no significant differences between the two groups were seen on any of the SF-36 subscales [40]. Overall, the evidence regarding the function of physical activity in improving the quality of life in colorectal cancer survivors appears to be weak from randomized controlled studies [41]. Compared to our study, only one quarter of the respondents reported not having problem with mobility and self-care.

The presence of a stoma is a clear indication of poor HRQoL [27]. Patients with a stoma have a lower HRQoL in the postoperative period than those without one, according to subgroup studies in

One third of all patients reported “perfect” health (no problems to any of the EQ-5D five domains). The overall HRQoL of colorectal surgery survivors was identified as slightly lower than that of the general population.

DISCUSSION

We developed and evaluated 26 HRQoL questions in a group of patients who underwent colorectal cancer surgery. The findings of this study give baseline health utility values for CRC patients, which researchers can use to calculate quality-adjusted life years, a key indicator in health economic evaluations such as cost–utility analyses. Unfortunately, we do not have any characteristics of the non-respondent group to see whether particular characteristics had any influence on patient’s unwillingness to complete the questionnaire.

Previous studies evaluating HRQoL after colorectal surgery have been sparse [22–26], with the majority finding a worsening in HRQoL [22, 24–26]. Due to the fact that a gold standard for measuring HRQoL after colorectal cancer surgery does not exist, we chose the modified version of EQ-5D, the most widely used measure for assessing HRQoL, and it is also endorsed by numerous government bodies and studies [27].

According to the results of this study, patients with CRC have considerably poorer HRQoL than the public, as indicated by the EQ-5D utility scores [28]. This discovery is in line with earlier research [29–31].

We discovered that pain/discomfort is the most commonly reported problem (60%, all levels included) among respondents, which is similar to what patients with colorectal cancer in the Netherlands and the United Kingdom experience [32]. In addition, in our study 65% of individuals with colorectal cancer had anxiety or depression. Anxiety/depression is, in fact, the most common psychological condition among cancer patients [33, 34]. Pain/discomfort management, as well as anxiety/depression management, should be improved further.

This study has highlighted the potential impact of colorectal cancer survivors on physical functioning including mobility and self-care.
our survey. The survey gathered information on a variety of functional outcomes. Almost a quarter of colorectal cancer survivors (those who did not have a stoma) said they had no or little control over their bowels. The reversal of a stoma resulted in bowel control levels that were comparable to those who had never had a stoma. Qualitative analysis of the respondents’ answers revealed that a large proportion of patients reported positive experiences of care in hospital. However, substantial numbers had neutral experiences and these relate particularly to information on self-management and treatment of side effects. According to Lewandowski a higher degree of education may play a role in increasing colorectal cancer awareness and knowledge. Given the magnitude of the problem posed by colorectal cancer, it is vital to engage in more extensive measures to raise awareness of the disease [42].

Our study has some limitations. Since the respondents were restricted to colorectal cancer surgery patients, the study involved a small sample size, and the assessment was at a single time point. Secondly, due to the EQ-5D scores’ highly skewed distribution, a small sample size, and the assessment was at a single time point. Our study has some limitations. Since the respondents were restricted to colorectal cancer surgery patients, the study involved a small sample size, and the assessment was at a single time point. For rehabilitation. In the future, the development of a standardized colorectal surgery HRQoL classification would be helpful and studies that are more detailed are needed to assess the health and socioeconomic effect of decreased HRQoL resulting from colorectal surgery. HRQoL after colorectal cancer surgery has adverse effects on long-term HRQoL due to self-reported decline of patients in the physical, social, emotional, mobility, self-care and pain/discomfort.

CONCLUSION
Colorectal surgery survivors’ total HRQoL has been found to be somewhat lower than in the general population.

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Corresponding author:
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