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Quality of life of colorectal cancer patients: A literature review

Relevance: Colorectal cancer is a serious health problem that primarily affects the quality of life (QoL) of both the patients and their families.

The purpose was to study the problems of QoL of patients with colorectal cancer (CRC) in the world and Kazakhstan.

Results: The study examined the pre- and post-treatment QoL of CRC patients depending on age, gender, disease stage, the number of study participants. The analysis of literature sources revealed the predominance of men and people over 50 years among CRC patients. The CRC diagnosis often leads to disorders, mainly physical and functional, and a decrease in performance.

Conclusions: The QoL of CRC patients in several countries remains poor in physical, social, clinical, and financial aspects.

Keywords: colorectal cancer (CRC), quality of life (QoL), depression, anxiety.

Introduction: According to the WHO, colorectal cancer (CRC) ranks third in the structure of cancer morbidity and second in cancer mortality worldwide and is one of the global health problems (GLOBOCAN 2018).

Possible CRC development risk factors include age; a diet rich in animal protein, saturated fat and calories, and low in fiber; excessive alcohol consumption; the history of uterine or breast cancer; family history of CRC; the history of ulcerative colitis, the Crohn's disease or irritable bowel; overweight and obesity; smoking; lack of physical activity; the presence of polyps in the colon or rectum due to their potential malignization. CRC is a serious healthcare issue that primarily affects the quality of life (QoL) of both the patient and the family. Cancer patients and their caregivers often report increased depressive symptoms and worsening mental and physical health.

The purpose was to study the problems of QoL of patients with colorectal cancer (CRC) in the world and Kazakhstan.

Materials and methods:

Search strategy. This review addressing the QoL of CRC patients covered studies published from 2011 to 2020. The inclusion criterion was the study of QoL indicators in CRC patients. During the literature search, the following search engines were used: PubMed, Google, Google Scholar. Besides, we looked for similar studies in the materials of international conferences and republican conferences. We used the following search strategy in Medline: "quality" [MeSH Terms] OR "character" [All Fields] AND ("life" [MeSH Terms] OR "existence" [All Fields] OR "" [All Fields]) AND "colorectal cancer" [All Fields]. Link screening and data retrieval were

performed independently by two reviewers, and all differences were resolved by consensus. Epidemiological data, type of study, type of analysis of statistical data were extracted from each article. We found 152 publications on the topic of "assessment of QoL indicators in CRC patients"; of them, 24 publications met our research's main goal.

Results and Discussion: A five-year study in Iran to study the QoL of CRC patients showed very low physical, social, clinical, and financial indicators. In the study, 120 patients were interviewed using the EORTC Quality of Life Questionnaire (QLQ) -C30. The average QoL score was 77.37 ± 8.7 in women and 76.64 ± 8.7 in men. No significant gender-association was revealed. The average QoL was 77.28 ± 8.86 for colon cancer and 76.5 ± 8.47 for rectal cancer. That is, the differences between the average scores were not statistically significant [1].

A study on QoL indicators of survivors with CRC among the people of Ghana collected the data of patients who lived 1 to 8 years after being diagnosed in 2009-2015 at the Komfo Anokye Teaching Hospital (KATH). The results showed a very low survival with CRC in Ghana. Significant clinical and pathological prognostic factors: family history, chemotherapy, chemotherapy and radiation therapy, BMI, TNM tumor stage, depth of tumor invasion, lymph node metastases, distant metastases. The scientists suggested that those who die before one year had more advanced disease and more comorbidities than the survivors and would report a lower QoL. However, the hypothesis was not confirmed because the research did not include such patients. The research findings on QoL in CRC patients may improve understanding of the impact of cancer and its therapy on

the patients' lives and the ways to adapt the appropriate treatment strategies [2].

A multicenter cohort study conducted in Morocco from December 2009 to December 2011 showed that global health status was the most affected functional aspect of QoL at the time of inclusion in the study. At that, CRC stage III was associated with a significantly lower global health status, and the most important factors affecting the QoL were financial difficulties and fatigue. The study included 294 patients with early-stage CRC manifested by localized CRC stages I-II and III, of which 161 had colon cancer (54.7%) and 133 – rectal cancer (45.3%). Rectal cancer had a greater effect on emotional and social functions. Age and gender had less effect on QoL, while the effect of older age was ambiguous. Patients above 70 years had lower scores for global health status, physical role, and cognitive function. There was no significant difference between symptoms by age range. However, descriptive evidence suggests that patients above 70 years suffered from pain, shortness of breath, and constipation more often. Patients aged 60 to 69 had more diarrhea cases, while patients below 50 had higher nausea and insomnia frequency. In general, QoL functional parameters improved after chemotherapy [3].

Research to assess health-related QoL (HRQOL) was conducted in a cohort of 1294 survivors from CRC in northern Germany in an average of 6 years after diagnosis, using a European Organization for Research and Treatment of Cancer questionnaire (EORTC QLQ-C30). Data analysis showed an average overall HRQOL of 87 (interquartile range: 75-94), the average global QoL was 75.0 (58.3–83.3). In the long run, CRC survivors had quite high HRQOL. A lower value HRQOL was associated with higher all-cause mortality [4].

A study involving 203 Italian CRC patients to study their need for supportive therapy, QoL level, and psychological comorbidity revealed their low functional roles and cognitive function. Symptoms of fatigue, nausea, vomiting, and financial problems were common. The severity of anxiety, depression, and deterioration in QoL varied significantly at different levels of need, consistent with a unique linear dependency. Patients with moderate or high needs had more severe anxiety and depression and lower QoL indicators (i.e., a lower level of functioning and more severe symptoms) than patients without needs or with lower requirements [5].

A prospective study involving middle-aged residents (45-64 years) from Queensland, Australia, was directed to study the relationship between the change in employment level within 12 months and the QoL of people with CRC than the control group. The results showed

that nearly half of CRC survivors (66/148, 45%) stopped job or reduced their employment volume during the study period compared to 27% in the control group (79/295, $p=0.001$). However, over the study period, the CRC participants experienced significant improvements in physical and functional well-being and overall QoL. One year after the diagnosis, the participants with CRC who maintained or increased their employment volume had significantly better functional well-being and overall QoL than those who have reduced their employment volume or retired [6].

A similar study was conducted in the United States. Qualitative analysis was performed to assess the financial burden and QoL level among 14 CRC survivors, diagnosed below 50 years, and one caregiver. The analysis showed that the employment issue (career trajectory, lost wages, health insurance/benefits, productivity) dominated the discussion of financial implications. Lifestyle effects of disease and survival included both emotional and physical side effects. Diagnostic experience, lack of information on CRC treatment and side effects, financial stress, and tension in relationships were the main topics for the overall impact on QoL [7].

Another study, conducted in East Azerbaijan in northwestern Iran, involved 303 patients (167 men, 136 women), all ≥ 18 years of age, diagnosed with CRC. Evidence showed a lower QoL level, bound of health (HRQoL), the survivors after CRC, especially in women. Women are more likely than men to harvest if the violations of the physical and social functioning after cancer and together if greater fatigue and pain than men (average assessments of physical ($b=-14.80$, $p=0.001$) and social functioning ($b=-9.14$, $p=0.038$)). Besides, women had higher mean scores on the subscales of pain ($b=10.74$, $p=0.022$) and fatigue ($b=12.53$, $p=0.007$) than men [8].

A study in Slovenia involving 197 patients operated for CRC from January 1, 2016, to December 31, 2017 utilized two standardized and validated questionnaires, EORTC QLQ-C30 version 3 and EORTC QLQ-CR29. The global health status of CRC patients was comparable to the general health status of the Slovenian population, but QoL was significantly lower on some scales. CRC patients reported weaker physical ($p<0.001$), role ($p=0.002$), cognitive ($p=0.021$), and social functions ($p<0.001$) with a higher incidence of constipation ($p<0.001$), diarrhea ($p<0.001$), and financial difficulties ($p<0.001$) compared to the general population. Female patients reported lower cognitive ($p=0.034$) and emotional ($p=0.008$) functioning, as well as higher rates of bloating ($p=0.049$) and hair loss ($p=0.01$). Compared with the younger group of patients, lower phys-

ical functioning ($p<0.001$) and higher urinary frequency ($p=0.007$), urinary incontinence ($p=0.007$), pain in the buttocks ($p=0.007$) and anxiety about weight bodies ($p=0.031$) were found among the older group of CRC patients [9].

CRC incidence is increasing mainly due to population aging. A prospective multicenter study conducted in Norway involved 180 patients with a mean age of 80 years at the starting point. Of them, 138 were involved three months after surgery, and 84 (69% of survivors) were involved in the long-term observation. A significant improvement in the QoL was observed three months after surgery and in a subgroup of debilitated patients. During the long-term observation, the QoL level went down but remained above the baseline. HRQOL could be improved in older patients after surgery for CRC, even in patients classified as impaired before surgery [10].

In Burgundy, France, 401 patients aged ≥ 65 years diagnosed with colon or rectum primary carcinoma from March 2003 to September 2005 were involved in a study of the relationship between survival and HRQOL. The data analysis showed that at the time of diagnosis, patients had the highest HRQOL levels in physical, cognitive, and social functioning, with a mean of 72.4 ($SD=25.1$), 73.2 ($SD=27.3$), and 73.7 ($SD=31.2$), respectively. A lower-median role-functioning indicator predicted lower survival (hazard ratio = 3.1, $p=0.015$). The average global health was 53.6 (hundred n -standard deviation, $SD=22.7$); a low HRQOL ratio is a risk factor for low survival in elderly CRC patients [11].

Turkey conducted a study on the QoL level variations depending on depression and anxiety indicators in CRC patients and Beck's depression using the State-Trait Anxiety Inventory (STAI). The study included 110 CRC patients who received chemotherapy from January 2004 to April 2007. The resulting scores on the EORTC-QLQ-C30 functional scales and the overall QoL of depressed patients ($BDI \geq 17$) were significantly lower than in patients without depression ($BDI < 17$). Patients with low STAI ($STAI < 45$) had significantly higher scores on the EORTC-QLQ-C30 functional scales and overall QoL than patients with high STAI levels ($STAI \geq 45$) [12].

Similar results were presented in another study: the scores on the EORTC-QoL-C30 functional scales and overall QoL in depressed patients ($HADS D \geq 7$) were significantly lower than in patients without depression ($HADS D < 7$). On the other hand, the EORTC-QoL-C30 symptom scale scores in depressed patients were significantly higher than in non-depressed patients. This study involved 105 Turkish patients diagnosed with CRC between June 2012 and April 2014. By gender,

male patients had a significantly higher score on the EORTC-QoL-C30 functional scale (except for emotional functions) and overall QoL than female patients. Such symptoms as fatigue ($p=0.029$), pain ($p=0.01$), insomnia ($p=0.023$), and financial problems ($p=0.02$) were much more pronounced in female vs male patients according to the EORTC-QoL-C30 scale [13].

A study involving 144 CRC patients who received chemotherapy in 2012 in Seoul, South Korea, revealed the need to address depression and physical symptoms to improve the QoL during chemotherapy in CRC patients. The analysis indicated depression as the strongest predictor, and the lack of appetite, followed by sleep disturbance and fatigue, was the most common symptom. The mean anxiety score was 5.40 with a prevalence of 23%, and the mean depression score was 8.85 with a prevalence of 64.6%. The average QoL was 81.93 out of 136; QoL variation of 75.3% was due to the depression, the disease symptoms, anxiety, place of treatment, and professional status [14].

Maintaining QoL during chemotherapy is an important aspect of cancer treatment. The study of QoL's physical and psychological predictors among 152 Chinese CRC patients during chemotherapy showed that male patients below 60 years with stage II CRC had higher QoL after 3 and 6 months (all $p<0.05$). Such symptoms as fatigue, nausea, loss of appetite, sleep disturbances, and vomiting peaked at three months and then decreased ($p<0.05$). Reducing distress and general anxiety symptoms served to improve the QoL in CRC patients during chemotherapy [15].

A cross-sectional study involving 138 CRC patients in southern Taiwan explored QoL using a Core-30 QoL questionnaire of the European Organization for Cancer Therapy. Researchers have studied the relationship between distress and depression and changes in QoL levels during and after treatment. After treatment, the group showed a significantly higher average QoL (68.68 versus 59.54; $p<0.05$). In terms of survival, depressive tendencies were the most affected, followed by relapses, symptom intervention, and surgery. The control variables corresponding to these predictors accounted for 38.5% and 40.9% of the global HRQOL variation [16].

The data obtained in a study of CRC patients aged 21 years and above in the United States evidence an interdependency of the QoL of patients and their family members. The patients reported worse physical and mental health than their caregivers. The patients' physical health was below the 25th percentile of the US population norm, while their mental health was comparable to the US population norm. On the other hand, the

caregivers' physical and mental health status was at about the 48th percentile of the US population norm. Mental health levels ($r=0.26$) and depressive symptoms ($r=0.27$) patients and those who provided them with VSH care were positively correlated. In light of this interdependence, psychosocial interventions for treating depressive symptoms should target both patients and their family members providing care. This could mitigate depressive symptoms and improve the QoL [17].

Social support is essential for cancer survivors. A British multicenter prospective cohort study of 857 CRC patients, conducted in November 2010 to March 2012 using the EQ - 5D 23 questionnaire, measured general health status / QoL by five parameters (mobility, self-care, usual activities, pain/discomfort, anxiety/depression). The analysis showed lower HRQOL (general health / QoL, decreased well-being, anxiety, and depression) at lower social support. Social support level went down after diagnosing and treating colon cancer in nearly a third of patients. It was a major risk factor for HRQOL restoration [18].

Another HRQOL study conducted in Hong Kong from October 2009 to July 2010 involved 566 adult Chinese patients diagnosed with various CRC stages for >6 months. Their preference scores on SF-6D were comparable to the Hong Kong population's general norm, except for patients with stage III and IV CRC. There was a gradual decline in HRQOL and health preference scores from a low-risk polyp to stage IV CRC. The sub-scores for FACT-C, SF-12v2 for physical functioning, role physical, general health, vitality, social functioning, PCS, and SF-6D were higher (but not significantly) in patients with stage II CRC than in patients with stage I [19].

A study conducted in Ireland involving 304 CRC patients six to 60 months after diagnosis explored a relationship between the CRC survivors' medical experience and their QoL using the Functional Assessment of Cancer Therapy-Colorectal cancer (FACT-C) questionnaire. The participants generally reported a fairly positive QoL level on all FACT-C subscales, with an average score of 111.9 (SD=18.8). More severe social difficulties were consistently associated with lower QoL in all domains (OR range: 2.9-9.7). Lower satisfaction with continuity of care predicted deterioration in physical (OR=2.6), social (OR=2.1), functional (OR=2.9), and overall QoL (OR=2.0). CRC survivors and those who contacted the cancer patients' support services more likely reported lower QoL levels [20].

Qualitative research conducted in Dublin, Ireland, through semi-structured interviews with 22 CRC survivors during the follow-up period of 1-5 years after diagnosis examined CRC survivors' perceptions about

the cancer treatment influence of their QoL. The analysis found that while cancer survivors were positive about their relations with healthcare workers, many experienced a range of unmet needs for information and supportive care. The participants described several positive and negative experiences as health system capacity dynamics, and navigation influenced their QoL. The experience of follow-up and medical assistance to cancer survivors may positively or negatively impact their QoL [21].

Sexual dysfunction is another factor influencing the QoL and the consequence of treatment for CRC (namely, colon cancer) survivors. Differences in HRQOL may arise depending on the ostomy status (constant stoma vs. anastomosis). CRC survivors with a stoma ($N = 181$) or anastomosis ($N = 394$) in Northern California and the US Northwest were investigated using a validated instrument measuring HRQOL and functional status. Survivors with a permanent stoma were more likely to be sexually inactive after surgery if it occurred before the year 2000 and experienced dissatisfaction with appearance, interference with personal relationships and intimacy, and a lower overall HRQOL. Sexual dysfunction is a frequent long-term consequence of rectal cancer treatment, with more problems being observed in survivors with a permanent stoma [22].

Another study in France examined the relationship between QoL and time perspective and the role of time perspective as a determinant of QoL. Data were collected from 69 patients who completed the questionnaire, which included certain QoL indicators (FACT-C), the measure of time perspective (ZTPI), an indicator of emotional distress (HADS), and a set of socio-demographic and health data. Analysis of QoL data showed that emotional distress negatively correlated with all QoL parameters. In addition, in male patients, the average QoL score in terms of "social / family well-being" was significantly higher compared to females ($M=21.80\pm2.96$, $M=20.10\pm4.12$, $p=0.047$, respectively). Participants living with a partner had a significantly higher average "physical well-being" score compared to the participants living alone ($M= 4.40\pm3.81$, $M=20.90\pm3.41$, $p=0.034$, respectively) [23].

A study conducted in Brazil in June-July 2015 to determine the level of self-esteem (SE) and HRQOL in 36 patients with a stoma due to CRC showed an average global health status / QoL of 77.77. In the study, ostomy patients considered their QoL as satisfactory since the score was close to the maximum of 100. The mean scores on the functional scales were above 60. The symptom score was low on average, corresponding to a low level of symptoms. The comparison between

the EORTC domains and gender showed no significant difference; men and women had a similar perception of QoL [24].

However, no studies of QoL in CRC patients have taken place in Kazakhstan. Epidemiological indicators and screening results up to 2014 were studied. The Kazakh Institute of Oncology and Radiology reported the following CRC incidence rates for 2018: colon cancer – 5.2% (vs. 5.3% in 2017), rectal cancer – 4.8% (vs. 4.5% in 2017). The mortality rate was: colon cancer – 5.3% (vs 4.9% in 2017), rectal cancer – 4.8% (vs 5% in 2017). In cancer pathology structure, colon and rectal cancers rank 5th and 6th, respectively [25].

Conclusion: Thus, the QoL of CRC patients in some countries remains low in physical, social, clinical, and financial aspects. In many countries, QoL in women with CRC is significantly lower than in men. Namely, women have more developed impairments to physical and social functioning. According to literary sources, CRC is most common in the elderly and senile age. Financial difficulties and fatigue have been the most important factors affecting the QoL. The literature review shows that such variables as personal characteristics, lifestyle, stage of the disease, depressive tendencies, and distress symptoms affect the QoL level in CRC patients in terms of treatment and survival.

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ТҰЖЫРЫМ

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Тоқ ішек қатерлі ісігімен ауыратын науқастардың өмір сүру сапасы: әдеби шолу

Өзектілігі. Тоқ ішек қатерлі ісігі – бұл денсаулық сақтау саласындағы маңызды сырқаттардың бірі болып саналады, ең алдымен пациенттің де, оның отбасының да өмір сүру сапасына әсер етеді.

Зерттеудің мақсаты: Тоқ ішек қатерлі ісігі бар науқастардың өмір сүру сапасы мәселелеріне Қазақстанда және жақын шет елдерде зерттеу жүргізу.

Зерттеу әдістері. Шолуда тоқ ішек қатерлі ісігімен ауыратын науқастардың жасына, гендерлік айырмашылығына, аурудың сатысына, зерттеуге қатысушылардың санына және емделуге дейінгі/кейінгі өмір сүру сапасының көрсеткіштері зерттелген. Әдеби дереккөздерді талдау барысында тоқ ішек қатерлі ісігімен сырқаттану көбінесе ер адамдарға бейім екенін көрсетті, ал сырқатқа ұшыраған пациенттердің негізгі жасы 50-ден асқан адамдар. Сонымен қатар, тоқ ішек қатерлі ісік диагнозы көбінесе физикалық және функционалды бұзылуларға, сондай-ақ өнімділіктің төмендеуіне әкеледі.

Қорытынды. Бірқатар елдерде тоқ ішек қатерлі ісігі бар пациенттердің өмір сүру сапасы физикалық, әлеуметтік, клиникалық және қаржылық аспектілер тұрғысынан бұрынғысынша төмен болып қалуда.

Түйінді сөздер: тоқ ішек қатерлі ісігі, өмір сүру сапасы, күйзеліс, мазасыздық.

АННОТАЦИЯ

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Качество жизни больных колоректальным раком: обзор литературы

Актуальность: Колоректальный рак (КРР) – серьезная проблема здравоохранения, в первую очередь, влияющая на качество жизни (КЖ) как пациента, так и его семьи.

Цель исследования – изучение проблем КЖ пациентов с КРР в мире и в Казахстане.

Результаты: В обзоре изучены показатели КЖ пациентов с КРР до и после лечения в зависимости от возраста, гендерных различий, стадии заболевания, количества участников исследования. Анализ литературных источников показал, что подвержены КРР чаще всего мужчины, а основной возраст приходится на людей преимущественно старше 50 лет. Кроме этого, диагноз КРР часто приводит к нарушениям, преимущественно физическим и функциональным, а также к снижению работоспособности.

Выводы: Качество жизни пациентов с КРР в ряде стран по-прежнему остается низким с точки зрения физических, социальных, клинических и финансовых аспектов.

Ключевые слова: колоректальный рак (КРР), качество жизни (КЖ), депрессия, тревога.