


Eysenck's Personality Characteristics Significantly Contribute to the Quality of Life of Colon Cancer Patients

Darjan Franjić¹, PhD candidate 

¹Clinic for Oncology, University Clinical Hospital Mostar, Mostar, Bosnia & Herzegovina

*Corresponding authors:

Darjan Franjić,
Clinic for Oncology, University Clinical Hospital Mostar, Mostar, Bosnia & Herzegovina
Email: darjanfranjić@gmail.com

Received: 27-04-2022

Revised: 14-05-2022

Accepted: 14-05-2022

Abstract

Background: Colon cancer is one of the leading cancers that cause death worldwide. Some studies show that personality characteristics play an important role in coping with colon cancer. This study aimed to explore the association between personality characteristics and quality of life in patients with colon cancer.

Methods: A cross-sectional study was conducted on 200 subjects at the Oncology Clinic of the University Clinical Hospital Mostar between April 2019 and June 2021. A socio-demographic survey, the Eysenck Personality Questionnaire, and the WHOQOL-BREF questionnaire (for assessing the quality of life) were used for collecting data.

Results: There was a significant positive correlation between extraversion and psychological health, social relations and the environment, and overall quality of life. A statistically significant negative correlation was found between neuroticism and physical health, mental health, and social relationships. Psychoticism correlated negatively with the domains of mental health and the environment. Neuroticism contributed negatively to the level of physical health, mental health, and social relations.

Conclusion: Extraversion positively contributes to the quality of life in colon cancer patients. Neuroticism and psychoticism negatively contribute to the quality of life in colon cancer patients.

Keywords: Personality, Quality of life, Colonic neoplasms

Please cite this paper as:

Franjić D. Eysenck's Personality Characteristics Significantly Contribute to the Quality of Life of Colon Cancer Patients. *Iran J Colorectal Res.* 2022;10(1):33-39. doi: 10.30476/ACRR.2022.95287.1143.

Introduction

Colon cancer is one of the leading cancers that cause death worldwide. Therefore, this disease poses a challenge to researchers from a wide variety of health and medical science fields. Some studies point out that personality characteristics are also responsible for the development of colon cancer, and that more emotional people are more likely to develop

colon cancer (1-3). Personality characteristics make people different; they refer to those characteristics of a person that explain the relatively enduring and stable patterns of feeling, thinking, and behavior (4). Personality is a set of mental characteristics and mechanisms within an individual, which are organized and relatively permanent (5). Eysenck's personality model is most commonly used in scientific biological research (6). According to Eysenck,

personality can be affected by three dimensions: extraversion, neuroticism, and psychoticism (7). Personality characteristics play a key role in how an individual adapts to difficult situations, one of which is being diagnosed with cancer (8). Many personality characteristics are shaped by genetic influences (9). Personality characteristics increase the likelihood of disease by increasing physiological activation, reducing social support, and interfering with healthy behavior, especially in people with a genetic predisposition (10). Research conducted to determine the association of cancer incidence with individual personality characteristics suggests the existence of a positive correlation between cancer incidence, low levels of neuroticism, and high levels of extraversion (11). Previous research shows that personality characteristics are associated with psychological and physical symptoms in people with cancer (12).

Numerous scientific studies have been conducted on the topic of the association between personality characteristics and quality of life in colon cancer patients. However, no such studies have been conducted on this topic in Bosnia and Herzegovina. The aim of this study was to determine the association between personality characteristics and quality of life in people with colon cancer.

Methods

Study Design

A cross-sectional study was conducted on 200 subjects at the Oncology Clinic of the University Clinical Hospital Mostar. Data were collected in the period between April 2019 and June 2021. We used the “drop-off” survey method. Patients were divided into four groups according to the pathohistological stage of colon cancer described in Dukes’ classification (A, B, C, D).

The criteria for inclusion of patients were: patients of the Oncology Clinic suffering from colon cancer with pathohistological findings (confirmed by gastroenterologists and oncologists), aged between 35 and 75 years, who completed treatment and are in the monitoring phase, knew the Croatian language (reading and writing) and could complete the questionnaire independently. Respondents who completed treatment within six months were included. Patients who incorrectly filled in the questionnaire were excluded from the research. Questionnaires in which patients gave full answers to questions and claims were considered valid. The exclusion criteria were: diagnosed mental illness and mental retardation as well as diagnosed severe organ disease (stroke, heart attack, severe disability, and other organ diseases that reduce the quality of life).

A sample size of 140 subjects was required for a test strength of $\beta=0.80$. In order to raise the quality and strength of the research, the total sample size in this paper was 200. A total of 18 patients refused

to participate in the survey or did not return the questionnaire, so the response rate was 91.7%.

Ethics

Patients were informed of all possible advantages and disadvantages of participating in the research; all gave their written consent to participate and had the right to withdraw at any time. Confidentiality was obtained by encrypting personal data, and the first author kept the list of names and associated codes in a secure place. Permission for this study was obtained from the Ethics Committee of the University Clinical Hospital, Mostar (23/07/2019-405/19).

Questionnaires

A socio-demographic questionnaire specifically designed for this study was used to obtain data on patients such as age, gender, education, marital status, whom they live with, employment, place of residence (city or village), smoking (yes or no), cancer stage, and type of treatment.

The Eysenck personality questionnaire (EPQ) was used to assess personality traits in people with colorectal cancer, consisting of 90 items: extraversion (17 items), neuroticism (23 items), psychoticism (25 items), and a lie scale (19 items). The task of the respondents in completing this questionnaire was to answer the questions by circling the answer “yes” or “no” (13). The reliability coefficient for the scale related to the measurement of the level of personality dimension neuroticism is 0.83. The internal consistency coefficient is 0.62 for extraversion, 0.56 for psychoticism, and 0.61 for the lie scale. Many researchers suggest a coefficient value of 0.70 as the minimum criterion value for labeling scales as internally consistent (14). In contrast, many authors find that levels of internal consistency lower than 0.70 are also acceptable under specific conditions (15, 16). This is especially true of those low-consistency scales that are not used in decision-making that may harm a person, but are used to analyze a particular set of data and in interpretation at the group level and early stages of research (16). Therefore, the reliability of the scales for estimating the dimensions of extraversion, psychoticism, and for the lie scale can be considered acceptable.

The WHOQOL-BREF Quality of Life Questionnaire was used to assess the quality of life. Perceptions of quality of life in each of the four domains of quality of life (physical health, mental health, social relations, and the environment) are scored, with the scale positively directed. The questionnaire consists of 26 particles, and each question is scored on a Likert scale from 1 (worst) to 5 (best). After the transformation of points, which is performed in two steps, the points for each domain fall within the scale of 0–100 (17). Based on the equidistant structure of the Likert scale, this study took into account that patients with a value greater than 60%

of the scale maximum (SM) in a particular domain have a good quality of life in the same domain, and those with a value below 60% SM have a poor quality of life in that same specific domain. The confidence coefficients for this questionnaire were 0.80 for the domain of physical health (7 particles), 0.82 for the domain of mental health (6 particles), 0.65 for the domain of social relations (3 particles), 0.76 for the domain of environment (8 particles), and 0.60 for overall quality of life (2 particles). A lower confidence coefficient of the internal consistency type was recorded in relation to the scale used to measure the domain of social relations and overall satisfaction with the quality of life. The reason for this may be the small number of particles on their scales. Nevertheless, the social relations and overall quality of life domain scales did not have internal consistency coefficients lower than the established scale acceptance criterion (0.55), so no scale was omitted from further analysis procedures.

All aforementioned questionnaires used in this study were standardized, validated, and approved by the authors and expert commissions.

Statistical Analysis

The collected data were processed by the method of descriptive statistics. The statistical software used for data analysis was SPSS for Windows, version 26.0 (IBM, Armonk, New York, USA).

Categorical variables are shown by numbers and percentages. The differences between them were tested using the chi-squared test. Pearson's correlation analysis was used to assess the strength of the linear relationship between personality characteristics and quality of life. To assess which personality characteristic most predicts the quality of life of colon cancer patients, we used multiple regression analysis. In the aforementioned tests, the probability level of $P < 0.05$ was taken as statistically significant.

Results

Patient's Demographic and Clinical Characteristics

The mean age of the respondents in this study was 62.86 (SD=8.021) years. The majority of the respondents were male (69.5%); most participants had secondary education (60.0%), were married (76%), unemployed (63%), non-smokers (77.0%) living with a spouse (52.0%). The largest number of respondents was in stage C disease (30.5%). The difference in the number of respondents according to the stage of colon cancer was not statistically significant ($P=0.034$) (Figure 1).

Most respondents were treated with surgical treatment in combination with chemotherapy (30.5%). The difference between the groups of respondents with different types of treatment was statistically significant ($P < 0.001$) (Figure 2).

Personality Characteristics and Quality of Life – Descriptive

Most respondents (43.5%) had an average level of extraversion, while 34.0% of the respondents were extroverts ($P < 0.001$). Most respondents had an average level of neuroticism ($P < 0.001$). Low levels of neuroticism were noted in 24.0% of respondents, and very high levels in 19.0%. Most respondents (58%) had lower scores on psychoticism ($P < 0.001$). No statistically significant difference was found between respondents with low and high levels of socially desirable responses ($P=0.066$). The results of the Kolmogorov–Smirnov test showed that the variables deviated significantly from the normal distribution ($P < 0.001$).

The highest scores were obtained on the quality of life domains of social relations (72.46 ± 17.5), environmental (71.55 ± 14.4), and psychological (70.97 ± 17.3) quality of life. The lowest scores were obtained in the physical health domain (62.90 ± 17.5).

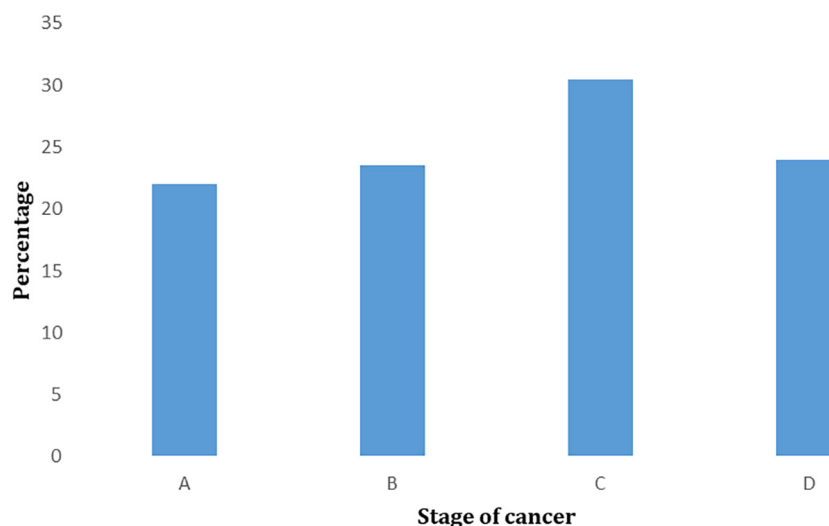


Figure 1: Percentage of respondents by stage of cancer.

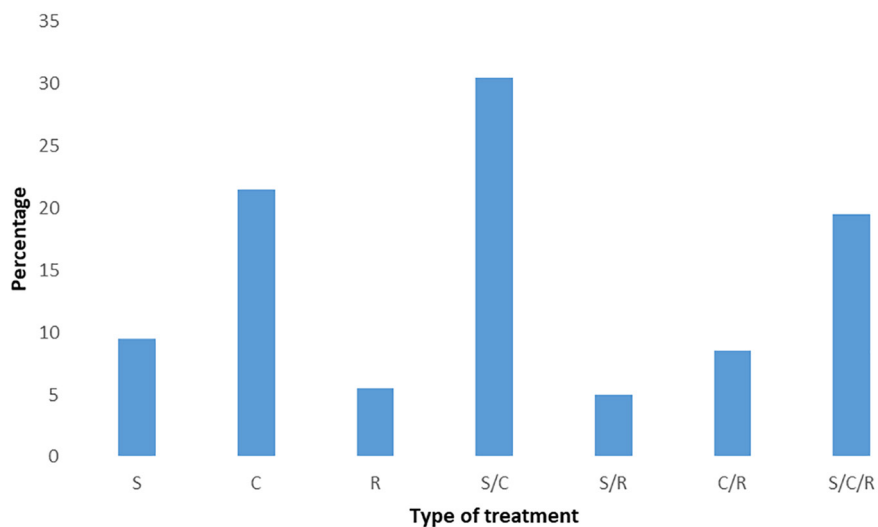


Figure 2: Percentage of respondents by type of treatment. S: Surgical; C: Chemotherapy; R: Radiotherapy; S/C: Surgical and Chemotherapy; S/R: Surgical and Radiotherapy; C/R: Chemotherapy and Radiotherapy; S/C/R: Surgical, Chemotherapy and Radiotherapy

Association of Personality Characteristics and Quality of Life

At a low level, there was a significant positive correlation between extraversion and mental health, social relations and the environment, and overall quality of life. At a moderate level, there was a significant negative correlation between neuroticism and physical health, mental health, and social relationships. The strongest level of negative correlation was recorded between neuroticism and mental health. A statistically significant negative correlation of psychoticism with the domains of mental health and the environment was found. No statistically significant correlation was found between psychoticism and other quality of life domains. A statistically significant positive correlation was found between the lie scale and the domains of mental health, social relations, and overall quality of life. The level of correlation was low (Table 1).

The results of the standard regression analysis show that neuroticism negatively contributed to physical health, mental health, and social relations. Other traits had no significant effect on physical health and social relations. Extraversion, neuroticism, and psychoticism did not significantly affect the environmental domain and overall quality of life. All regression models were statistically significant. The highest percentage of explained variance was found in a model that analyzed the contribution of personality traits to the

environment subscale (Table 2).

Discussion

Our study shows that extraversion positively correlated with the domains of psychological, social relations, and the environment. Neuroticism correlated negatively with physical health, psychological health, and social relationships. Psychoticism was negatively associated with the domains of quality of life, mental health, and the environment. Neuroticism negatively contributed to the levels of physical health, psychological health, and social relationships. No statistically significant contribution of extraversion and psychoticism to the level of quality of life was found across all its domains. No statistically significant contribution of extraversion and psychoticism to the respondents' overall satisfaction with their quality of life was found.

Our findings are consistent with previous results. Extraversion and neuroticism have been shown to have a strong association with affective components of subjective well-being. Neuroticism is associated with frequent experiences of anxiety, nervousness, sadness, and other unpleasant emotions, while extraversion is associated with positive affect (18). Extraversion and neuroticism affect the subjective quality of life through the likelihood of experiencing

Table 1: Correlation of personality traits with quality of life

	Extraversion		Neuroticism		Psychoticism		Lie scale	
	r	P	r	P	r	P	r	P
Physical health	0.086	0.224	-0.283	0.001	-0.109	0.126	0.102	0.152
Psychological	0.175	0.013 ⁺	-0.437	0.001	-0.159	0.025 ⁺	0.210	0.003 ⁺⁺
Social relations	0.206	0.003 ⁺⁺	-0.274	0.001	-0.131	0.065	0.142	0.045 ⁺
Environment	0.188	0.008 ⁺⁺	-0.240	0.001	-0.160	0.024 ⁺	0.076	0.285
Overall quality of life	0.207	0.003 ⁺⁺	-0.221	0.002 ⁺⁺	-0.055	0.436	0.213	0.002 ⁺⁺

R: Pearson's correlation analysis; ⁺P<0.05; ⁺⁺P<0.001

Table 2: Predictive contributions of personality characteristics on quality of life

Dependent variables	Predictors	β	t	P	R ²	P
Physical health	Extraversion	-0.084	-1.132	0.259	0,149	<0.001
	Neuroticism	-0.197	-2.694	0.008		
	Psychoticism	0.008	0.115	0.909		
	Lie scale	0.061	0.865	0.388		
Psychological	Extraversion	-0.041	-0.611	0.542	0.293	<0.001
	Neuroticism	-0.331	-4.971	<0.001		
	Psychoticism	0.035	0.529	0.597		
	Lie scale	0.148	2.296	0.023		
Social relations	Extraversion	0.052	0.708	0.480	0.395	<0.001
	Neuroticism	-0.166	-2.285	0.023		
	Psychoticism	-0.009	-0.130	0.897		
	Lie scale	0.080	1.130	0.260		
Environment	Extraversion	-0.012	-0.173	0.863	0,468	<0.001
	Neuroticism	-0.084	-1.196	0.233		
	Psychoticism	-0.070	-1.004	0.317		
	Lie scale	0.003	0.045	0.964		
Overall QoL	Extraversion	0.053	0.714	0.476	0.394	<0.001
	Neuroticism	-0.128	-1.758	0.080		
	Psychoticism	0.088	1.208	0.229		
	Lie scale	0.188	2.665	0.008		

β : Standardized beta coefficient; t: T-test; P-value from the t-test for significant coefficients; P-value from the F-test for significant overall regression; QoL: Quality of life

positive and negative emotions. According to that, extroverts would be more likely to experience positive emotions than introverts. Emotionally unstable individuals would be more likely to experience negative emotions in certain situations than emotionally stable individuals. Similar circumstances to which individuals of different personality characteristics are objectively exposed to would lead to different outcomes in terms of subjective well-being. It is possible that personality characteristics are related to the likelihood of experiencing certain situations that elicit a greater or lesser sense of subjective well-being. Minami et al. state that extroverts have more positive experiences and neurotics have more negative experiences, leading to differences in perception of quality of life (19).

The presence of psychological symptoms, feelings of anger, and negative personality traits affect the poorer quality of life in gastrointestinal cancer patients (18). Therefore, resilience is extremely important as it positively affects the quality of life of patients with colon cancer and speeds up their recovery (20, 21). Resilience (as a personality characteristic) and religiosity have proven to be extremely important for raising the quality of life in patients with other types of cancer (22, 23). Respondents with cancer and a higher level of extraversion have a lower risk and fear of death. Personality traits significantly impact the development and progression of colon cancer (24). Some authors stated that patients with cancer are mostly open and have a high level on the extraversion scale (25, 26).

Sharma et al. state that there is a significant association between quality of life and extraversion

and that extraversion is negatively correlated with the duration of postoperative recovery in people treated for colorectal cancer (27). Aschwanden et al. state that high scores on the extraversion scale are associated with a higher level of quality of life in colorectal cancer patients (25). This is in good agreement with our findings. Turhal et al. point out that extroverted people with social support experience post-traumatic growth (28). Although extraversion has been associated with a better quality of life in colorectal cancer patients, this personality dimension has also been associated with an increased risk of developing malignancies (29).

Our results show a significant negative impact of neuroticism on the level of physical and mental health in patients with colon cancer, which coincides with the results of a study conducted by Glavić et al. (30). Den Oudsten et al. state that neuroticism is associated with various aspects of cancer survival, such as fatigue, lower quality of life, and depression (31). Wang et al. state that the degree of fatigue caused by cancer is associated with psychoticism, extraversion/intraversion, and neuroticism (32). Yamaoka et al. found a positive correlation between quality of life, psychoticism, and extraversion in people with different medical conditions (33). In line with our results, theoretical findings suggest that personality characteristics play an important role in relation to the treatment outcomes among colon cancer patients (34-36).

Study Limitations

Our research may have some limitations. The first is the study's design; to monitor changes in research variables over a certain period, we recommend

that future studies use a longitudinal design. Secondly, data were collected using questionnaires completed by patients in the form of self-reports, which could have affected their honesty. We recommend that future studies additionally apply the focus group method, which will provide more subjective explanations of patient attitudes. These limitations highlight the difficulty of collecting data on personality characteristics and quality of life.

Despite these limitations, our methodological validity and significant findings shed fresh light on the complex relationship between personality traits and quality of life in colon cancer patients. The results of this study may guide the establishment of personality change interventions and promote a holistic approach to the treatment of colon cancer patients.

References

1. Guinney J, Dienstmann R, Wang X, de Reyniès A, Schlicker A, Sonesson C, et al. The consensus molecular subtypes of colorectal cancer. *Nat Med*. 2015;21(11):1350-6.
2. Müller MF, Ibrahim AE, Arends MJ. Molecular pathological classification of colorectal cancer. *Virchows Arch*. 2016;469(2):125-34.
3. Wright M, Beatty JS, Ternent CA. Molecular markers for colorectal cancer. *Surg Clin North Am*. 2017;97(3):683-701.
4. Chamoro-Premuzic T, Furnham A. Personality, intelligence and approaches to learning as predictors of academic performance. *Pers Individ Differ*. 2008;44(7):1596-1603.
5. Larsen RJ, Buss DM. Personality psychology: Areas of knowledge about human nature. Zagreb: Naklada Slap; 2007.
6. Repišti S. Personality psychology: theory and empire. 1st ed. Sarajevo: IndeksLine; 2015.
7. Repišti S. Personality psychology: theory and empire. 2nd ed. Sarajevo: IndeksLine; 2016.
8. Larsen RJ, Buss DM. Personality psychology: Areas of knowledge about human nature. Zagreb: Naklada Slap; 2008.
9. Havelka M. Health psychology. Zagreb: Medicinski fakultet Sveučilišta u Zagrebu; 1995.
10. Nietzel MT, Bernstein DA, Milich R. Introduction in clinical psychology. Zagreb: Naklada Slap; 2002.
11. Berndt H, Gunther H, Rothe G. Stress and Cancer. Toronto: C.J. Hogrefe; 1980.
12. Zimmermann C, Burman D, Swami N, Krzyzanowska MK, Leighl N, Moore M. Determinants of quality of life in patients with advanced cancer. *Support Care Cancer*. 2011 May;19(5):621-9.
13. Eysenck SBG, Eysenck HJ, Barrett P. A revised version of the psychoticism scale, personality and individual differences. *Pers Individ Differ*. 1985;6:21-29.
14. Milavić B, Grgantov Z, Aleksovska-Velickovska L. Age and positional differences in psychological coping skills of young female volleyball players. *PESH*. 2013;2(1):9-16.
15. Allen MS, Greenlees I, Jones M. Personality in sport: a comprehensive review. *Int Rev Sport Exerc Psychol*. 2013;6(1):184-208.
16. Ho Y, Kwon Y, Park SY, Yoon TY, Kim Y. Reliability and validity test of the Korean version of Noe's evaluation. *Korean J Med Educ*. 2017;29(1):15-26.
17. Nagano J, Kono S, Toyomura K, Mizoue T, Yin G, Mibu R, et al. Personality and colorectal cancer: the Fukuoka colorectal cancer study. *Jpn J Clin Oncol*. 2008 Aug;38(8):553-61.
18. The WHOQOL Group. Development of the World Health Organization WHOQOL-BREF quality of life assessment. *Psychol Med*. 1998;28:551-8.
19. Bratko D, Sabol J. Personality traits and basic psychological needs as a predictors of life satisfaction: results of online research. *Druš Istraž Zagreb*. 2006;4-5(84-85):693-711.
20. Franjić D, Babić D, Marijanović I, Martinac M. Association between resilience and quality of life in patients with colon cancer. *Psychiatr Danub*. 2021 Dec;33(Suppl 13):297-303.
21. Franjić D, Marijanović M, Babić D. Colon cancer and resilience. *Health bulletin*. 2019;5(2):81-92.
22. Boškailo E, Franjić D, Jurić I, Kiseljaković E, Marijanović I, Babić D. Resilience and quality of life of patients with breast cancer. *Psychiatr Danub*. 2021 Spring-Summer;33(Suppl 4):572-579.
23. Kvesić A, Babić D, Franjić D, Marijanović I, Babić R, Martinac M. Correlation of religiousness with the quality of life and psychological symptoms in oncology patients. *Psychiatr Danub*. 2020 Sep;32(Suppl 2):254-261.
24. Minami Y, Hosokawa T, Nakaya N, Sugawara Y, Nishino Y, Kakugawa Y, et al. Personality and breast cancer risk and survival: the Miyagi cohort study. *Breast Cancer Res Treat*. 2015;150:675-684.
25. Aschwanden D, Gerend MA, Luchetti M, Stephan Y, Sutin AR, Terracciano A. Personality traits and preventive cancer screenings in the Health Retirement Study. *Prev Med*. 2019;126:105763.
26. Sumalla EC, Ochoa C, Blanco I. Posttraumatic growth in cancer: reality or illusion? *Clin Psychol Rev*. 2009;29(1):24-33.
27. Sharma A, Sharp DM, Walker LG, Monson JRT. Patient personality predicts postoperative stay after colorectal cancer resection. *Colorectal Dis*. 2007;10:151-156.
28. Turhal NS, Demirhan S, Satici C, Cinar C, Kinar A. Personality traits in cancer patients. *Asian Pac J Cancer Prev*. 2013;14(8):4515-8.
29. Nakaya N, Tsubono Y, Hosokawa T, Nishino Y, Ohkubo T, Hozawa A.

Conclusion

Extraversion positively contributes to the quality of life, while neuroticism and psychoticism negatively contribute to the quality of life in colon cancer patients. As personality characteristics play an important role in the quality of life, the value of a holistic approach to the treatment of colon cancer should not be underestimated.

Acknowledgments

We are grateful to all patients of Clinic for Oncology in University Clinical Hospital Mostar who participated in the study, especially those patients who have since passed away.

Conflicts of interest: None declared.

- Personality and the risk of cancer. *J Natl Cancer Inst.* 2003;95(11):799-805.
30. Glavić Ž, Galić S, Krip M. Quality of life and personality traits in patients with colorectal cancer. *Psychiatr Danub.* 2014;26(29):172-180.
31. Den Oudsten BL, Van Heck GL, Van derSteeg AF, Roukema JA, De Vries J. Predictors of depressive symptoms 12 months after surgical treatment of early-stage breast cancer. *Psychooncology.* 2009; 18:1230-1237.
32. Wang SH, He GP, Jiang PL, Tang LL, Feng XM, Zeng C, et al. Relationship between cancer – related fatigue and personality in patients with breast cancer after chemotherapy. *Psychooncology.* 2013;22:2386-2390.
33. Yamaoka K, Shigehisa T, Ogoshi K, Haruyama K, Watanabe M, Hayashi F, et al. Health-related quality of life varies with personality types: a comparison among cancer patients, non-cancer patients and healthy individuals in a Japanese population. *Qual Life Res.* 1998;7:535-544.
34. Sebag-Montefiore D, Stephens RJ, Steele R, Monson J, Grieve R, Khana S. Preoperative radiotherapy versus selective postoperative chemoradiotherapy in patients with rectal cancer (MRC CR07 and NCIC-CTG C016): a multicentre randomised trial. *The Lancet.* 2009;373(9666):811-820.
35. Hyphantis T, Paika V, Almyroudi A, Kampletsas EO, Pavlidis N. Personality variables as predictors of early non-metastatic colorectal cancer patients' psychological distress and health-related quality of life: A one-year prospective study. *J Psychosom Res.* 2011;70:411-421.
36. Sales PM, Carvalho AF, McIntyre RS, Pavlidis N, Hyphantis TN. Psychosocial predictors of health outcomes in colorectal cancer: a comprehensive review. *Cancer Treat Rev.* 2014;40(6):800-9.