STRESS AND QUALITY OF LIFE IN PATIENTS WITH GASTROINTESTINAL CANCER

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SUMMARY – This study aimed to answer the question whether it is possible to predict the quality of life in individuals with gastrointestinal cancer based on the number of life events, perceived stress levels and coping strategies. The study included 60 individuals (44 male and 16 female) aged 48 to 87 years, with malignant gastrointestinal tract diseases (56 with colon or rectal cancer, 2 with stomach cancer and 2 with pancreatic cancer). The following instruments were used: Questionnaire on General Information and Lifestyle Habits (developed for the purpose of this study); Scale for Measuring Quality of Life; Coping Inventory for Stressful Situations; and Life Events Scale. Results showed that the number of life events, perceived stress levels, emotion-oriented coping and avoidance were not predictive for the quality of life. Education was the only predictor for factors contributing to the quality of life (predictive variables on the Scale for Measuring Quality of Life). Task-oriented coping and education were predictors for satisfaction with past life and task-oriented coping was predictive for criterion variables on the Scale for Measuring Quality of Life and for factor related to future expectations and comparison to other people, but the proportion of explained variance was modest. The results of this study suggest that it is important to consider other variables (e.g., personality traits and sociodemographic factors) in predicting the quality of life and psychotherapeutic work with gastrointestinal cancer patients. It is important to bear in mind that there is no universally good individual coping strategy that is acceptable in all situations, but that coping flexibility or the ability to adequately change coping strategies in response to situational demands is by far more important.

Key words: *Neoplasms; Adaptation, psychological; life change events; Stress psychological; Quality of life*

Introduction

Quality of life is a multidimensional construct partially determined by external objective factors and to a significant extent by the subjective assessment of individuals, their personal experiences, aspirations, desires and values. According to the World Health Organization definition, emphasis in the quality of life is on "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns"[1]. The onset of chronic illness, especially life-threatening illness such as cancer, is a stressful experience that can affect the quality of life. Advances in treatment and longer survival of individuals with cancer have prompted many researchers to examine various quality of life aspects and their impact on survival[2-5]. Various studies on the quality of life in individuals with gastrointestinal cancer have generated somewhat different results depending on the time elapsed since the diagnosis and the instruments applied to examine the quality of life.

In many of these instruments, emphasis is on psychological and physiological aspects of the quality of life (hence the findings of a correlation between the quality of life and survival are not surprising). There are fewer studies dealing with social aspects of the functioning of individuals with colorectal cancer. Despite differences in the methods of assessment, the results of different studies show that a large number of long-term gastrointestinal cancer survivors have a quality of life comparable to the quality of life of healthy individuals.

A large number of studies deal with predictors of the quality of life in cancer patients. Different medical, sociodemographic and psychological variables have been examined. Some studies found medical variables such as adjuvant therapy, stage of disease, stoma presence, problems with fecal control, less physical activity and non-cancer comorbid conditions to be associated with a poorer quality of life[6,7]. Other studies, however, show that variables such as stoma presence and adjuvant therapy play a role in the quality of life during early post-diagnosis periods but not in long-term cancer survivors. Steginga *et al.*[6] report on an association between stoma formation and specific domains of the quality of life (colorectal cancer-specific additional concerns) but no association with other quality of life domains. Similarly, problems with fecal control were linked with lower levels of social and emotional well-being and not to the total score on the quality of life scale. The presence of comorbidities was a more significant predictor of physical and mental health in female long-term colorectal cancer survivors than factors related to colorectal cancer[7].

Regarding sociodemographic variables, some studies showed that females had a lower quality of life or some aspects of the quality of life (e.g., physical function, fatigue and pain), but this finding may be a consequence of differences in response styles between male and female patients (maybe some of male patients avoid responses indicating weakness or dependence)[8]. A poorer quality of life has been found to be correlated with a younger age at the time of diagnosis (but not in all studies), lower social support and lower income status[6]. Lavdaniti *et al.* report on higher levels of depression in divorced colon cancer patients (compared to married and single patients) and in patients holding a high school degree (compared to pa-

tients with primary school education)[9]. Many studies examined the influence of different psychological variables on the quality of life in cancer patients. The role of personality traits, anxiety, depression and self-efficacy was examined and special attention was paid to stress and coping strategies. Pereira *et al.* highlight the great predictive power of anxiety and depression for the overall quality of life in colorectal cancer patients[10]. The personality trait of neuroticism was consistently associated with poorer quality of life in cancer patients[11,12]. Although some studies examined the role of extraversion as a personality trait related to an increased risk of malignant disease[13,14], Sharma *et al.* report on an association between extraversion and better quality of life in cancer patients[15]. It is possible that these individuals are more prone to seeking social support and using more active coping strategies.

Regarding stressful events, Costanzo *et al.* report on similar numbers and types of stressful events in cancer patients and comparison groups[16]. Affective, somatic and physiological responses to stress were also comparable. Cancer survivors, however, showed a modest tendency towards perceiving daily stressors, particularly those involving interpersonal tensions, as more disruptive. They showed a greater increase in negative affect, a decreased positive affect and an increased number of physical symptoms in response to interpersonal conflicts, affecting cancer survivors' quality of life. Moreno-Smith *et al.* report on links between chronic stress, depression, social isolation and cancer progression[17]. They argue that chronic stress leads to tumor growth *via* the activation of specific signaling pathways in cancer cells and tumor microenvironment. Kreitler *et al.* report that the quality of life in cancer patients is affected negatively by both health stresses (related to advanced disease stage, long disease duration and treatment) and social stresses (unemployment, recent immigration and older age), the latter being more related to several domains of quality of life than the former[18]. In addition, they found the effects of health stresses to be mediated primarily by the experience of perceived stress. This finding indicates an important distinction between antecedents of the quality of life and mediators of the effect of antecedents. Coping strategies are very important mediators of the effects of stressful events on the quality of life. Lazarus and Folkman defined coping strategies

as "the person's constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the person's resources"[19]. Many coping measures include scales to assess three basic coping dimensions: problem-focused strategies, emotion-focused strategies, and avoidance. Problem-focused strategies are aimed at solving a problem, its cognitive reconceptualization and minimization of its effects[20]. Emotion-focused coping strategies refer to person-orientation; they include emotional response and serve as an attempt to regulate distressing emotions. Avoidance represents an attempt to avoid stressful situations and may include either person-oriented (seeking out other people) or task-oriented (engaging in other activities) strategies[20,21]. Studies on individuals with cancer describe different coping patterns. Dunkel-Schetter *et al.* describe five patterns of coping with cancer: seeking or using social support, distancing, focusing on the positive, cognitive escape-avoidance and behavioral escape-avoidance[22]. Most of their patients used multiple coping methods, indicating flexibility, which is a prerequisite for successful coping.

Studies on predictors of the quality of life in newly diagnosed melanoma and breast cancer patients suggest an association between behavioral escape-avoidance and a worse quality of life[19]. Kasparian *et al.* suggest that patients with melanoma who use problem-focused coping strategies demonstrate better adjustment to melanoma than those who use passive or avoidant coping styles[23]. They also report positive correlations between avoidance and anxiety, depression, confusion and mood disturbance in individuals with melanoma. Van Laarhoven *et al.* report similar results in curative and palliative cancer patients[24]. It was found that avoidant coping strategies were also related to a poorer quality of life in non-cancer patients, e.g., among lung transplant candidates[25].

There have been attempts to examine the association between coping strategies and survival/recurrence in patients with cancer. Petticrew *et al.* provide an overview of these studies and report that they found little convincing evidence for the effects of coping strategies on outcome[26].

The aim of this study was to examine the association between stressful life events, coping strategies and quality of life in individuals with gastrointesti-

nal cancer. This study aimed to answer the question whether it is possible to predict the quality of life in individuals with gastrointestinal cancer based on the number of life events, self-reported stress levels and coping strategies. It can be assumed that the number of stressful life events is less predictive for the quality of life and that assessment of stress levels and coping strategy types are more significant predictors for the quality of life.

Subjects and Method

Subjects

The study was conducted at the Department of Abdominal Surgery and Department of Psychiatry and Clinical Psychology, Požega General County Hospital in Požega during 2012. The Ethics Committee of the Požega General County Hospital approved the study protocol. All study subjects signed the informed consent form for participation in the study.

The study included 60 individuals (44 male and 16 female) suffering from malignant gastrointestinal tract diseases. The participants' age ranged from 48 to 87 (mean (M) 68.70, standard deviation (SD)=9.20) years. According to education level, 29 subjects had secondary school, 22 primary school, five college and four university degree. Most participants were retired (n=53), which was conditioned partially by the shift towards an older age in the sample and partially by the diagnoses. Fifty-five (91.7%) study subjects were married. Fifty-six (93.3%) subjects suffered from colon or rectum cancer, two from stomach cancer, and two from pancreatic cancer. In 55 participants, the diagnosis was adenocarcinoma. All participants had undergone surgery. The average interval between surgery and examination was 3 years and 4 months (ranging from 11 months to 13 years). Seventeen patients had a stoma. In most study subjects (70%), regional lymph nodes were not affected, while tumors had not penetrated the intestine wall in 88.3% of cases.

Procedure

Participants recruited based on a list of individuals treated for malignant gastrointestinal tract diseases in a county hospital were sent a letter in which they were asked to participate in a study on the psychoso-

cial aspects of malignant diseases. In the letter, they were asked to come to the hospital for examination by an abdominal surgeon and to complete a number of questionnaires concerning personality traits, stressful events, stress coping strategies, anxiety, depression, anger expression methods, quality of life, as well as the Questionnaire on General Information and Lifestyle Habits. For the purpose of this study, the following instruments were used: Questionnaire on General Information and Lifestyle Habits (developed for the purpose of this study); Scale for Measuring Quality of Life[27]; Coping Inventory for Stressful Situations[28]; and Life Events Scale.

Measurement instruments

The Questionnaire on General Information and Lifestyle Habits was developed for the purpose of this study and included information on the participant age, sex, education, marital and employment status, family member illness, previous diseases and habits (drug and alcohol use, eating habits and physical activity).

The Scale for Measuring Quality of Life[27] is designed to examine the experience of (dis)satisfaction with life as a result of constant reevaluation of experiences in different areas of life. There are three different scale forms which are applied depending on the individual's age (scale for individuals aged 16 to 23-25, scale for adults up to the age of 60, and scale for elderly individuals above the age of 60). There are separate scale forms for males and females. In this study, depending on the participant age, scale forms for adults and elderly individuals were used. Scales can be applied individually or in groups; in this study, they were applied individually. Participants were asked to rate on a scale from one to five their degree of satisfaction/dissatisfaction with certain areas of their life. A higher score marks a higher degree of satisfaction (replies expressing greatest dissatisfaction received 1 point, replies indicating slight dissatisfaction received 2 points, replies where participants were indecisive received 3 points, replies indicating slight satisfaction received 4 points, while replies indicating great satisfaction received 5 points).

The scales include predictor variables which are related to factors that influence the quality of life (e.g., questions related to satisfaction with family relationships, social status, financial status, health, etc.) and

the number of variables differs in the scale forms with respect to age. The following indicators were used in this study: total predictor variables results, total results of 6 criterion variables, which are the same in different scale forms (possible range: 6 to 30) and results of two factors within the context of criterion variables described by the authors[27]. The first of these factors is determined by the results of four items that include individual assessments of satisfaction with the quality of life which individuals are certain about because they pertain to past experiences. The possible results range of this factor is 4 to 20. The second factor is determined by two items which pertain to future expectations and comparison to other people (possible results range: 2 to 10). Criterion variables pertain to general satisfaction with life, satisfaction with life in the past year, satisfaction with achieved goals, wishes and hopes, future expectations, and comparison with other people's lives.

The Life Events Scale has been drawn up along the lines of the Social Readjustment Rating Scale[29] and includes a list of different life events such as death of close individuals, illness, relocation, stressors related to family life and work, lifestyle changes, one's own illness and illness of family members, etc. Participants are required to reply to the question whether they have experienced a particular stressor (the list included a total of 41 events) and, if so, how stressful it was for them. Stress levels are assessed on a scale of 4 levels, with 1 marking the lowest stress level and 4 indicating the impression that the event was very stressful.

The Coping Inventory for Stressful Situations[28] includes 48 claims and participants are required to rate on a scale from 1 to 5 to which extent they use certain activity types when they find themselves in a stressful or disturbing situation. The authors divided claims based on a factor analysis study into three subscales with 16 items: emotion-oriented coping, task-oriented coping and avoidance[20,21]. The avoidance subscale includes two components: distraction and social diversion. Research on Croatian samples did not provide homogeneous information on the three-factor structure of this inventory. Sorić and Proroković[28] have reported a similar factor structure as described by the inventory author. Sorić and Proroković[28], however, found on a sample of teachers that the first two factors contentually corresponded to the original factors, the

third factor contentually corresponded to social diversion, while the distraction factor was not confirmed. In various researches on refugees, returnees and soldiers, differing factor resolutions were found. The most frequently found factor structure includes five factors: emotion-oriented coping, problem-oriented coping, seeking for social support, avoidance and distraction[28].

Data on surgeries, stoma presence/absence, disease stage, and age at the time of surgery were obtained from medical records.

Results

Data were statistically analyzed with the SPSS for Windows 11 software. Regression analyses were conducted to see whether the results of the Inventory for Stressful Situations and the Life Event Scale were predictive for the results on the Scale for Measuring Quality of Life in individuals with gastrointestinal cancer.

Descriptive data on the Scale for Measuring Quality of Life, Life Events Scale and Coping Inventory for Stressful Situations

Predictive variables results on the Scale for Measuring Quality of Life were comparable to normative data obtained on a student sample[30]. All means ranged from 3.70 to 4.98 (possible result range is 1 to 5; higher values indicate a higher level of satisfaction). These variables include satisfaction with the family of origin (M=4.60, SD=0.78), children (M=4.98, SD=0.13, N=57), grandchildren (M=4.97, SD=0.16, N=36), sons-in-law/daughters-in-law (M=4.28, SD=1.13, N=38), partner's relationship (M=4.45, SD=1.11), sexual life (M=3.81, SD=1.22), love (M=4.53, SD=0.92), friends' relationship (M=4.58, SD=0.74), education (M=4.11, SD=1.10), employment (M=4.00, SD=1.33, N=30), social status (M=4.30, SD=0.88), social environment (M=3.90, SD=1.05), health (M=3.70, SD=1.38), ways of spending leisure time (M=4.30, SD=0.86), religion (M=4.41, SD=0.92), material status (M=3.90, SD=1.10) and housing (M=4.60, SD=0.80). As can be seen, participants assessed children and grandchildren as the greatest source of satisfaction, followed by primary family and housing. Six participants had experienced divorce and expressed the lowest degree

of satisfaction on the item referring to former spouse. Other participants expressed the lowest degree of satisfaction on the item referring to satisfaction with health (M=3.70, SD=1.38), but the authors of the scale listed similar values for the Croatian student samples (M=3.69, SD=1.14)[27]. Participants expressed greater satisfaction on four items included in factor 1 (satisfaction with life to date, M=16.38, SD=3.10, possible result range: 4 to 20) than on two items included in factor 2 (future expectations and comparison to others, M=7.10, SD=1.67, possible result range: 2 to 10). By observing responses to individual items included in factor 1 it can be seen that participants expressed great satisfaction with their life to date (M=4.40, SD=0.66, response range: 3 to 5) and realization of their goals, wishes and hopes (M=4.13, SD=1.01, response range: 1 to 5). Comparisons of these results with student results stated in the manual for the Scale for Measuring Quality of Life[27] showed that participant results were higher than student results on items included in factor 1 (e.g., in the student group, the means of satisfaction with life to date and realization of goals, wishes and hopes are 3.80, SD=0.98 and 3.65, SD=1.064, respectively).

Study participants, however, exhibited slightly lower future expectations (M=3.31, SD=1.26) than students (M=4.86, SD=0.88), although in comparison to others, participants assessed their life as better (M=3.78, SD=0.94) than students (M=3.17, SD=0.83).

Table 1 shows that most participants reported 3 to 4 stressful life events, followed by participants who reported 10 or more stressful life events (13.3%); 11.7% of participants reported two stressful life events and six (10%) participants reported 6 such events.

According to types of stressful life events, most participants (86.7%) reported death of a family member, which is not surprising given the shift towards older age in the sample, so death of a parent was stated most frequently, followed by illness of a family member (36.7%), death of a close friend (35%), separation of children (30%), death of a spouse (16.7%), difficulties with superiors (16.7%), changes in sleeping habits (16%), change of residence (15%), adaptation to situations at work (15%), changes in living conditions (13.3%), job loss (13.3%), divorce (13.3%), changes in eating habits (10%), and taking out a loan

Table 1. Frequency of stressful life events

Number of stressful life events	Number of participants	Percentage (%)	Stress level (average *per* event)	
			Mean	SD
1	5	8.3	3.60	0.54
2	7	11.7	2.71	0.85
3	9	15.0	2.70	1.16
4	9	15.0	2.61	0.80
5	5	8.3	2.16	0.92
6	6	10.0	2.47	0.77
7	5	8.3	2.57	0.82
8	2	3.3	2.56	0.61
9	4	6.7	2.33	0.74
10	2	3.3	2.90	0.28
11	2	3.3	2.77	0.06
12	2	3.3	1.91	2.59
13	1	1.7	2.15*	
15	1	1.7	2.26*	

*standard deviation (SD) is not presented as only one participant was involved

(10%). On the other hand, none of the participants reported changes in activities related to leisure time and changes in religious beliefs. Problems with partner's relatives, personal advancement, changes in social activities, reconciliation with the spouse, and problems with one's own sexuality were reported by only one participant each.

Since these were participants with a very different number of stressful events, which necessarily led to high differences in the overall level of stressfulness, average stress level values were calculated *per* event (total score for stress level divided by the number of stressful events). The range of thus obtained values was from 1 (lowest stress level) to 4 (very high stress level). Means and standard deviations for stress levels

Table 2. Descriptive statistics for results on the Coping Inventory for Stressful Situations

Scale/subscale	Mean (range)	SD
Task-oriented coping	58.21 (37-78)	8.88
Emotion-oriented coping	47.78 (16-69)	10.73
Avoidance	43.48 (20-62)	8.14
Distraction	18.16 (9-29)	4.25
Social diversion	17.06 (5-25)	4.03

SD = standard deviation

for subgroups with a different frequency of stressful events are reported in Table 1, showing that participants with the lowest number of stressful events assessed these events as more stressful than participants with more events. Here, however, it should be borne in mind that these subgroups consisted of a small number of participants and that results ranged from 1 to 4 in practically all groups.

Table 2 shows results of the participants on the Coping Inventory for Stressful Situations. It can be seen that participants mostly used task-oriented coping, while avoidance was used the least (the maximum result on these scales is 80). This table also shows data on the subscales of distraction and social diversion. It can be seen that participants used distraction to a lesser extent (possible result range: 8-40) than social diversion (possible result range: 5-25). Because of high correlations between these subscales and the parent scale (avoidance), they were not included in regression analysis.

Regression analyses

In order to obtain an answer to the main question in this study regarding the possibility to predict the quality of life based on the number of stressful events, stress level assessment and coping strategies, a number of regression analyses were carried out. In all analyses, the

Table 3. Regression analysis with estimates of individual quality of life aspects (i.e. predictive variables from the Scale for Measuring Quality of Life) as criterion and results on the Coping Inventory for Stressful Situations and Life Events Scale as predictors

	Criterion: estimates of individual quality of life aspects (predictive variables from QOLS)		
	Predictor	β	ΔR^2
Step 1	Age Sex Marital status Interval surgery-examination **Education** Stoma	- 0.165 - 0.059 - 0.092 - 0.238 **0.361*** - 0.052	0.11
Step 2	Number of stressful events Stress level Task-oriented Emotion-oriented Avoidance	- 0.142 - 0.090 0.208 - 0.068 - 0.252	0.07
	Total R²		0.18

*p<0.05; QOLS = Quality of Life Scale

Table 4. Regression analysis with criterion variables (Scale for Measuring Quality of Life) as criterion and results on the Coping Inventory for Stressful Situations and Life Event Scale as predictors

		Criterion: criterion variables from QOLS	
	Predictor	β	ΔR^2
Step1	Age Sex Marital status Interval surgery-examination Education Stoma	0.059 - 0.002 - 0.114 - 0.031 0.214 0.163	0,02
Step 2	Number of stressful events Stress level **Task-oriented** Emotion-oriented Avoidance	0.057 - 0.311 **0.416**** - 0.206 - 0.156	**0.16***
	Total R²		**0.18***

*p<0.05; **p<0.01; QOLS = Quality of Life Scale

following predictor variables were entered in the first step: age, sex, marital status, education, interval from the date of surgery to the time of examination, and stoma presence/absence. The following variables were entered in the second step: number of stressful events, average stress level *per* event, and 3 results obtained from the Coping Inventory for Stressful Situations (task-oriented, emotion-oriented and avoidance). The following were used as indicators of the quality of life (and as criterion variables): total score on predictor variables (i. e. estimates of individual aspects of the quality of life), total score of 6 criterion variables and results on two factors (satisfaction with past life and expectations for the future and comparisons between one's own life and others' lives) from the Scale for Measuring Quality of Life. Results are reported in Tables 3-6.

Regression analysis with estimates of individual aspects of the quality of life (i.e. predictive variables) from the Scale for Measurig Quality of Life as a crite-

rion and results on the Coping Inventory for Stressful Situations and Life Event Scale as predictors (Table 3) revealed in the first step that variables such as age, sex, marital status, interval from the date of surgery to the time of examination, education and stoma presence/absence explained 11% variance in the criterion, but only education was a significant predictor. In the second step, the explained variance percentage amounted to 18%, but no variable connected to stress and coping strategies proved to be significant. Education remained the only significant predictor of satisfaction on factors contributing to the quality of life.

Regression analysis with criterion variables of the Scale for Measuring Quality of Life as a criterion and results on the Coping Inventory for Stressful Situations and Life Event Scale as predictors (Table 4) revealed that task-oriented coping was a significant predictor for criterion variables of the quality of life with a modest proportion of explained variance (16%).

Table 5. Regression analysis with factor 1 as criterion (satisfaction with past life) and results on the Coping Inventory for Stressful Situations and Life Event Scale as predictor

		Criterion: satisfaction with past life	
	Predictor	β	ΔR^2
Step 1	Age	- 0.026	0.04
	Sex	0.001	
	Marital status	- 0.117	
	Interval surgery-examination	- 0.056	
	Education	**0.300***	
	Stoma	0.131	
Step2	Number of stressful events	0.018	
	Stress level	- 0.264	
	Task-oriented	**0.330***	
	Emotion-oriented	- 0.191	
	Avoidance	- 0.164	**0.11***
	Total R²		**0.15***

*p<0.05

Table 6. Regression analysis with factor 2 (future expectations and comparison to others) as criterion and results on the Coping Inventory for Stressful Situations and Life Event Scale as predictors

		Criterion: future expectations and comparison to others	
	Predictors:	β	ΔR^2
Step 1	Age	0.202	0.05
	Sex	- 0.007	
	Marital status	- 0.078	
	Interval surgery-examination	0.024	
	Education	- 0.004	
	Stoma	0.178	
Step 2	Number of stressful events	0.117	
	Stress level	- 0.322	
	Task-oriented	**0.466****	**0. 09***
	Emotion-oriented	- 0.179	
	Avoidance	- 0.099	
	Total R²		**0.14***

*p<0.05; **p<0.01

Education and task-oriented coping were significant predictors for factor 1 (satisfaction with past life), while the proportion of explained variance was modest (Table 5).

The only significant predictor for factor 2 (future expectations and comparison to others) was task-oriented coping (Table 6).

The number of stressful events, stress level, emotion-oriented coping and avoidance did not prove to be significant in any of the analyses.

Discussion

Quality of life in individuals with gastrointestinal cancer, as measured on the Scale for Measuring Quality of Life, is comparable to the quality of life of healthy individuals[30]. This finding is in accordance with a study reporting that approximately three-quarters of individuals with colorectal cancer have a mod-erate or high quality of life five years after diagnosis, a small number of patients reported a decline in the quality of life three years after diagnosis, while one of five of these individuals will have a lastingly reduced quality of life[5]. Variables such as age, sex, marital status, interval between surgery and examination and stoma presence/absence are not significant predictors for the quality of life.

This study confirmed an association between active coping strategies or task-oriented coping and a better quality of life, but the proportion of explained variance was modest and there was no significant association between task-oriented coping and estimates of individual aspects of the quality of life (i.e. predictive variables) from the Scale for Measuring Quality of Life. This finding is partly consistent with the results of other studies demonstrating that the use of active coping strategies leads to a better quality of life. It was found that active coping strategies and acceptance

were positively associated with general and functional measures of the quality of life and negatively with symptom scales, depression and hopelessness in curative and palliative cancer patients[24].

However, the number of stressful events, perceived stress level, emotion-oriented coping and avoidance were not significant predictors for any quality of life aspect. This finding is partly surprising and inconsistent with the findings from other studies. Some other studies report that avoidant coping strategies in cancer patients and in non-cancer patients were negatively associated with the quality of life and positively with depression and hopelessness[24,25].

It was expected that the number of stressful events was not predictive of the quality of life, as it is well known that stress experience is determined not only by the objective nature of stressors but is always linked to the individual's assessment whether such events are threatening or harmful and depends on coping resources. In other words, perceived stress is a mediating variable in stress experience and it is not absolutely proportional to the objectively adverse nature of a particular event. Participants in this study reported some events that could be considered normative stressful events (e.g., death of a parent or close friend, separation of children are events expected in late adulthood), which could have affected the level of perceived stress. A survey of particular answers indeed showed that many participants assessed death of a parent, for example, as a moderately stressful event. All participants had in common that they had had an objectively stressful experience of a life-threatening disease. This experience, however, may have not only harmful consequences. In recent times, many studies have shown that individuals have found benefits in different medical problems (and other traumatic events). Among these benefits, improved relationships with their environment, changes in life priorities, greater life appreciation, increased spirituality and personal growth were frequently described[31]. Dunn *et al.*[32] report a clearer perspective on what is important in life (without preoccupation with small problems) and a profound sense of being much better off than others in a small sample of patients with colorectal cancer. It can be assumed that the participants in this study might have also experienced positive changes that were reflected in the assessment of certain objectively

unpleasant events as less stressful or that a stressful experience such as a life-threatening disease helped them face other adverse life events. The majority of participants successfully passed through the traumatic acute phase of their disease, which could have somehow strengthened them and positively affected their self-efficacy and thus reduced the adverse effects of stressful events on the quality of life. This, however, is merely a presumption to assess which broader battery of measuring instruments aimed at both earlier and current functioning should be applied.

More years of education are associated with a higher degree of satisfaction on individual factors contributing to the quality of life and satisfaction with past life (but the explained variance percentage was modest). One possible explanation for this finding can lie in the contents of items included in two subscales. In the former, items related to satisfaction with education, social status, ways of spending leisure time and social environment are included and more educated individuals report a higher degree of satisfaction on this item. They report greater satisfaction with past life and realization of their goals, desires and hopes.

More surprisingly, there was no association between task-oriented coping and estimates of individual aspects of the quality of life (i.e. predictive variables) from the Scale for Measuring Quality of Life, while the association between task-oriented coping and other quality of life indicators was modest. It is possible that other variables such as personality traits (e.g., neuroticism) have a greater influence on the quality of life than coping strategies[30]. The possibility of different correlation patterns in more distressed participants and participants with worse quality of life cannot be excluded.

Participants in this study used task-oriented coping to a larger extent than emotion-oriented coping and avoidance. Despite the tendency of some authors to view task-oriented (or problem-focused) strategies as more adaptive and emotion-oriented coping and avoidance as less effective, it is quite clear that there is no single strategy that is effective in all situations. Strategy selection thus depends on situational demands, but also on factors linked to personality that determine subjective appraisals of stress situations, one's own resources and the best coping methods. Cancer represents multiple stress sources and includes

physical discomfort, pain, concerns and fears about the future, as well as changes in social relationships. Problem-focused strategies such as seeking a physician's help are adequate for coping with physical problems, but emotion-focused strategies or avoidance are more adaptive for dealing with concerns and fears about the future[22].

Failure to find an association between emotion-oriented coping, avoidance and quality of life in this study has implications on clinical practice. In therapeutic work with oncologic patients, great effort is often invested in changes to coping strategies towards the adoption of more adaptive strategies, including reduction in emotion-oriented coping and avoidance (due to a presumed detrimental effect on the quality of life) and the more frequent use of active strategies. These results show that not all avoidance is associated with adverse effects on the quality of life. Myaskovsky *et al.*[25] conclude that intermittent disease denial (as avoidance behavior) may be an adaptive coping strategy (especially in case of illnesses that are difficult to cure). It seems appropriate to encourage coping flexibility in practical work with oncologic patients, i.e. the ability to respond flexibly and appropriately to situational demands. In other words, problem-focused or task-oriented coping is most appropriate in changeable situations, while in unchangeable situations emotion-oriented coping or even avoidance may be better strategies. Bennett *et al.*[33] pay direct attention to the fact that the use of coping strategies not matching situational demands may increase distress.

Before drawing final conclusions, a number of limitations associated with this study should nevertheless be borne in mind. The sample included participants differing in terms of the interval between surgery and examination, with an overrepresentation of participants with longer intervals between surgery (or diagnosis) and examination. As already mentioned, coping strategies in cancer patients also depend on disease stage[22,34,35], while the level of adaptation to illness and consequently quality of life change with disease duration, and it is possible that examination during acute disease stages would have generated different results. It seems that participants in this sample had developed coping flexibility and did not rely on merely one strategy (although they used task-oriented coping to a larger extent than emotion-oriented cop-

ing or avoidance), which could have also reduced the impact of particular coping strategy on their quality of life. This, of course, opens up the question of the stability of particular coping strategies or variability depending on situation, which can be answered only based on longitudinal research. And finally, the Scale for Measurement of Quality of Life emphasizes the psychosocial aspects of the quality of life, so it is possible that the application of a scale that also includes physiological aspects of the quality of life will yield different results. However, similar findings on the quality of life in gastrointestinal cancer patients were found in some studies using other measures, such as EuroQol and SF-36 Health Survey, which emphasize to a larger extent physical aspects of health and well-being. The main results of these studies indicated that the quality of life in patients fell immediately after surgery but rapidly recovered from temporary decline to the preoperative level or became even higher[36]. Fast recovery of the quality of life is found in patients who have undergone surgical treatment of liver metastases[37] and similar findings are found in rectal cancer patients, independently of surgical approach (open surgery *versus* laparoscopic surgery)[38]. Results of studies using measures that include physiological aspects of the quality of life emphasize poorer social support, lower optimism, neuroticism as a personality trait and a more negative cognitive appraisal of the negative effect of cancer on identity, relationships and perceived future as contributing factors to a poorer quality of life in all aspects[5,30]. Dunn *et al.*[5] speak about individuals' resilience to cancer as the ability to sustain trauma without reactive psychopathology leading many patients to maintain a stable sense of life satisfaction after their cancer experience and regardless of physical symptoms.

In conclusion, it can be said that task-oriented coping, but not emotion-oriented coping and avoidance, is associated with the quality of life in individuals with cancer. It is possible that a different correlation pattern would be given in more distressed individuals (where coping strategies are obviously less effective) through the application of other, less general quality of life measures. The results of this study suggest that it is important to consider other variables (e.g., personality traits, coping flexibility and sociodemographic factors) in predicting the quality of life and therapeutic work with gastrointestinal cancer patients.

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Sažetak

STRES I KVALITETA ŽIVOTA U BOLESNIKA S KARCINOMOM PROBAVNOG SUSTAVA

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Cilj ovoga istraživanja bio je odgovoriti na pitanje je li moguće na osnovi broja stresnih događaja, opažene razine stresnosti i strategija suočavanja sa stresom predvidjeti kvalitetu života u osoba s karcinomom probavnoga sustava. U istraživanju je sudjelovalo 60 osoba (44 muškarca i 16 žena) u dobi od 48 do 87 godina u kojih je dijagnosticirana maligna bolest probavnoga sustava (u 56 rektalni karcinom ili karcinom crijeva, u 2 karcinom želuca i u 2 karcinom gušterače). Korišteni su sljedeći instrumenti: Upitnik općih podataka i životnih navika (razvijen za potrebe ovoga istraživanja), Ljestvica za mjerenje kvalitete življenja, Upitnik suočavanja sa stresnim situacijama i Ljestvica životnih događaja. Rezultati pokazuju da kvalitetu života nije moguće predvidjeti na osnovi broja stresnih događaja, opažene razine stresnosti, na emocije usmjerenog suočavanja i izbjegavanja. Obrazovanje je bilo jedini prediktor čimbenika koji doprinose kvaliteti života (prediktivnih varijabli iz Ljestvice za mjerenje kvalitete života). Prediktori zadovoljstva prošlim životom bili su na zadatak usmjereno suočavanje i obrazovanje, a na zadatak usmjereno suočavanje bilo je prediktor kriterijskih varijabla iz Ljestvice za mjerenje kvalitete života te faktora povezanog s očekivanjima za budućnost i usporedbu s drugima, ali je proporcija objašnjene varijance skromna. Rezultati ovoga istraživanja pokazuju da je u predviđanju kvalitete života i psihoterapijskom radu s bolesnicima oboljelim od karcinoma probavnog sustava važno uzeti u obzir druge varijable (npr. crte ličnosti i sociodemografske čimbenike). Važno je imati na umu da nema univerzalno dobre pojedinačne strategije suočavanja koja je prihvatljiva u svim situacijama, nego da je mnogo važnija fleksibilnost u suočavanju sa stresom, odnosno sposobnost odgovarajuće promjene strategija suočavanja kao odgovor na situacijske zahtjeve.

Ključne riječi: *Tumori; Adaptacija, psihološka; Životne promjene, stresne; Stres, psihološki; Kvaliteta života*