VIA MEDICA

Original article

NOWOTWORY Journal of Oncology
2023, volume 73, number 4, 213–219
DOI: 10.5603/NJO.a2023.0033

ISSN: 0029–540X, e-ISSN: 2300-2115
www.nowotwory.edu.pl

Mental adjustment to cancer in patients with colorectal cancer

Angelina P. Kaleta-Pilarska, Kamil Barański

Department of Epidemiology, Faculty of Medical Sciences, Medical University of Silesia in Katowice, Katowice, Poland

Introduction. Exploration of the psychological aspects of cancer may play a key role in the disease's progression. Active mental strategies have been associated with a better prognosis. Due to these associations, the aim of this study is to assess the prevalence and elucidate determinants influencing mental adjustment in patients with colorectal cancer.

Material and methods. A cross-sectional study identifying 200 patients with colorectal cancer. The mental state of patients was measured with an adaptation the of mini-MAC questionnaire.

Results. Constructive determinants influencing the occurrence of mental adaptation to colorectal cancer are the presence of the disease in the family, fitness status and smoking status. Education level is an important destructive determinant influencing the occurrence of mental adaptation to colorectal disease.

Conclusions. Among the patients with colorectal cancer, the destructive and constructive style of mental adaptation occurs with a similar frequency (26.5% and 22.5%).

Key words: colorectal cancer, mental adjustment, constructive style, destructive style, cancer

Introduction

Cancer diseases remain a significant health and social problem. The diagnosis of cancer is a source of long-term stress for the patient. Because of the treatment and associated side effects, the disease can impact the patient for prolonged periods. The disease is associated with decreased quality of life, decreased ability to work and reduced frequency of social relations. Aside from the physical symptoms, the patient can be exposed to a profound range of mental problems [1–3]. The mental attitude adopted by the patient towards the disease directly affects their quality of life and may also be a determinant in the efficacy of the final therapeutic effects [2, 4].

The stage of the disease is defined by the reaction on presented information about cancer and may change over time depending on the phase of treatment [5]. Axiomatically, mental adaptation to the disease is a process aimed at restoring the patient's psychological balance, as well as reducing their emotional discomfort [6]. Mental adjustment to the disease is most often measured in 4 strategies:

- anxious preoccupation,
- helplessness-hopelessness,
- fighting spirit,
- positive redefinition.

Combining the strategy of anxious preoccupation and helplessness-hopelessness creates a destructive style of managing

How to cite:

Kaleta-Pilarska AP, Barański K. ***Mental adjustment to cancer in patients with colorectal cancer.*** *NOWOTWORY J Oncol* 2023; 73: 213–219.

with the disease characterized by a lack of willingness to fight the disease. Fighting spirit and positive redefinition represents the constructive style that encourages the patient to fight the disease [7, 8].

Colorectal cancer in Poland is one of the most common cancers among both sexes [9], as well as one of the most common causes of cancer deaths. Consequently, it is important from a public health perspective to elucidate the psychological factors that may affect the course of the disease. Defining the strategy of mental adaptation to the disease may present both cognitive values and practical dimensions in the form of improving the methods of monitoring mental health in the progression of colorectal cancer, and perhaps also in the form of improving preventive recommendations.

Taking into consideration the research needs, this study assesses frequency of occurrence and elucidates factors that may influence mental adaptation to cancer in patients with colorectal cancer in the period immediately preceding the surgical intervention.

Material and methods

The cross-sectional study was conducted on 200 patients with diagnosed colorectal cancer in two medical centers' departments of surgery and oncology and in the department of oncological surgery of Zagłębiowski Center of Oncology in Dąbrowa Górnicza. All patients signed informed consent forms. Participation in the study was voluntary. The statistical analysis covered patients aged between 24–85 years of age. The study was conducted between May 2018 and June 2020. The protocol of the study was approved by the Bioethical Commission of the Medical University of Silesia in Katowice (decision no KNW/0022/KB59/18). The following criteria were identified for inclusion to the study:

- diagnosed colorectal cancer,
- hospitalization in medical centers selected for the purpose of the study and planned surgery for cancer removal,
- the signed informed consent of the patient to participate in the study.

The questionnaire was used *via* direct interview at the place of hospitalization. The patients answered the questions in a separate room in a face-to-face meeting with the researcher. The final dataset was anonymized. The interview was performed preceding surgical intervention.

During the interview, the author's questionnaire was used, as well as the Polish version of psycho-oncological diagnosis of patients' attitudes towards cancer (mini-MAC). The authors questionnaire included 26 questions which included anthropometric and social and economic variables. The questions also included detail related to the suspicion and diagnosis of colorectal cancer.

The mini-MAC questionnaire is an adaptation of Z. Jurczyński [10] and is constructed with 29 claims. The adaptation measures four strategies in managing with the disease. These are:

- anxious preoccupation,
- fighting spirit,
- helplessness-hopelessness,
- positive redefinition.

In each claim the responded uses a 4 answer scale (1 – definitely no, 2 – rather no, 3 – rather yes, 4 – definitely yes). The results are calculated for each strategy separately.

Each category is constructed with 7 claims. The higher the score in strategy, the more intense the behavior characterized for each strategy. Anxious preoccupation and helplessness-hopelessness represents the destructive style of managing the disease, fighting spirit and positive redefinition represents the constructive style. After totaling the points obtained in the relevant strategies, the scores are converted into sten units and interpreted as high, low or average results. A result between 1–4 for a sten score is interpreted as a low score, 5–6 as average and 7–10 as high. The high score is interpreted as the presence of the specific style of managing with the disease [10].

The statistical analysis included descriptive and analytical methods. In the case of quantitative variables, the mean, standard deviation, median and range were used for description. The normality of quantitative variables was assessed with the Shapiro-Wilk test. The numbers and percentage were used to describe qualitative variables. The study assessed the statistical significance of differences in anthropometric and socio-economic characteristics using the alpha level <0.05. For this purpose, the Mann–Whithey U-test was performed for the analysis of quantitative variables, while the Chi^2 test, with the Yates correction and the Fisher's exact test were performed for the analysis of qualitative variables. The non-parametric Mann–Whithey U-test was used as the distribution of quantitative variables analysed in the study differed from the normal distribution (Shapiro-Wilk test result).

The variables from the mini-MAC questionnaire (anxiety absorption, fighting spirit, helplessness-hopelessness and positive redefinition) were transformed due to the key importance of three diagnoses:

- constructive style,
- destructive style,
- undefined style.

The results of univariable analyses were verified using logistic regression. The regression coefficients and the p-value were calculated from full model (fully adjusted). Additionally, the stepwise procedure was employed. In this analysis, the predictors of the dependent variable were identified using a criterion of statistical significance at the level of $p < 0.1$. Here the odds ratio (OR) and 95% confidence interval (CI)were calculated. Analyses were performed in SAS 9.4 (SAS Institute, Cary NC).

Results

The analysis included 200 patients (89 females and 111 males) with a diagnosis of colorectal cancer. The participants were 65

Table I. Age, weight and height of subjects

Variable	Mean and standard deviation		Median		Range		p value
	Females	Males	Females	Males	Females	Males	
age (years)	63.4 ± 12.4	66.3 ± 10.3	64.0	69.0	24.0–85.0	32.0–82.0	0.06
age during the diagnosis of colorectal cancer (years)	62.8 ± 12.4	66.0 ± 10.3	64.0	69.0	24.0–85.0	29.0–82.0	0.04
body mass (kg)	68.8 ± 15.2	79.1 ± 15.6	68.0	82.0	42.0–105.0	44.0–120.0	<0.001
height (cm)	164.4 ± 5.7	173.0 ± 5.2	165.0	173.0	150.0–175.0	157.0–190.0	<0.001
BMI (kg/m^2)	25.5 ± 5.7	26.3 ± 4.7	24.6	26.9	15.2–41.1	15.2–37.5	0.11

* Mann–Whithey U-test

± 11,3 aged (range: 24–85). The mean age when the participants were diagnosed with cancer was 64.6 ± 11.4 years. Table I presents the characteristics of patients regarding anthropometric variables.

Most of the respondents (55.5%) were men. The majority of the participants were living in cities (91.0%). The most frequently declared education level was secondary education (41.0%). In the majority of the individuals participating in the study (54.5%), the detection of neoplastic disease was made by visiting a doctor after noticing disturbing symptoms of the disease. In around 44% of patients, colorectal cancer had not been identified in their family history. Chronic cardiovascular disease was the most frequent comorbidity (43.0% of the respondents). Women and men who participated in the study did not differ according to distribution of age and body mass index (BMI). The significant differences were found according to the age when the diagnosis of cancer was confirmed ($p = 0.04$), body mass ($p < 0.001$) and height ($p < 0.001$).

Table II presents the four strategies of mental adjustment to cancer disease of participants of the study. The highest percentage of respondents presents the strategy of positive redefinition (90.0%), the least frequent in this group is the strategy of helplessness-hopelessness (38.0%).

Table II. Strategies of mental adjustment to cancer in patients with colorectal cancer

Variable		N; %
anxious preoccupation	yes	95 (47.5%)
	no	105 (52.5%)
fighting spirit	yes	132 (66.0%)
	no	68 (34.0%)
helplessness-hopelessness	yes	76 (38.0%)
	no	124 (62.0%)
positive redefinition	yes	180 (90.0%)
	no	20 (10.0%)

The analysis of mental adjustment to cancer disease confirmed that in 51.0% of patients, it was impossible to describe the type of mental adjustment to the disease. The constructive style and destructive style occurred almost at the same frequency, i.e. 22.5% and 26.5% respectively.

Among the circumstances accompanying the presence of a constructive style of mental adaptation to cancer, statistical significance was found for the following variables:

- education ($p < 0.001$),
- family support ($p = 0.02$),
- circumstances of suspicion of cancer ($p = 0.004$),
- physical fitness ($p < 0.001$),
- smoking before the diagnosis of colorectal disease ($p = 0.03$).

The remaining variables did not have a statistically significant relationship with the occurrence of the constructive style (Chi^2 test result). The results of univariable analyses were verified using multivariable analysis in a logistic regression model with respect to the defined dependent variable – constructive style.

Table III shows the results of the analysis of the logistic regression model. The statistical significance in the analysis of the logistic regression model for determinants in developing the constructive style of mental adjustment to cancer revealed the following variables:

- sex ($p = 0.02$),
- educational level ($p = 0.004$),
- financial status ($p = 0.047$),
- the occurrence of colorectal cancer in the family previously ($p = 0.03$).

Done stepwise procedure. In the final model the following variables have been selected as predictors:

- sex (female *vs.* male) – OR = 0.40 (95% CI: 0.16–0.99),
- education level (below high school *vs.* high school and master's degree) – OR = 0.25 (95% CI: 0.10–0.62),

Table III. The results of the analysis of a logistic regression from full model (fully adjusted) for the circumstances accompanying the presence of a constructive style of mental adjustment to cancer

Variable	Regression coefficient	p value
sex (female *vs.* male)	–0.61	0.02
place of residence (city *vs.* country)	–0.58	0.09
education level (lower than secondary level *vs.* secondary and higher education)	–0.71	0.004
marital status (in a relationship *vs.* single)	0.03	0.94
employment (working person *vs.* unemployed person)	0.03	0.90
belief (believer *vs.* unbeliever)	0.15	0.63
housing conditions (alone *vs.* with a family member)	0.47	0.42
support from family (no *vs.* yes)	0.20	0.96
financial status (satisfactory *vs.* non-satisfactory)	–0.96	0.047
circumstances of cancer diagnosis (by a patient *vs.* by a doctor)	0.29	0.23
a family history of colorectal cancer (yes *vs.* no)	–1.03	0.03
satisfaction with medical care (yes *vs.* no)	0.38	0.49
occurrence of chronic disease – without mental disease (yes *vs.* no)	0.09	0.71
occurrence of other cancers diseases (yes *vs.* no)	–0.14	0.85
fitness status (*vs.* worse)	0.65	0.06
nutritional status (unchanged *vs.* worse)	–0.24	0.27
smoking status before being diagnosed with cancer (no *vs.* yes)	0.44	0.09
consuming alcohol before being diagnosed with cancer (no *vs.* yes)	0.20	0.56

- financial situation (satisfying *vs.* non satisfying) – OR = 0.22 (95% CI: 0.05–0.96),
- occurrence of colorectal cancer in family (yes *vs.* no) – OR = 3,33 (95% CI: 1.44–7.89),
- physical condition (not worse *vs.* worse) – OR = 4.94 (95% CI: 1.67–14.62),
- smoking status before diagnosis of cancer disease (no *vs.* yes) – OR = 2.43 (95% CI: 1.01–5.83).

Among the circumstances for the presence of the destructive style in managing cancer, the significant variables were educational level (p = 0.048). The other variables were not significantly associated with occurrence of the destructive style (Chi² test result). The results of univariable analysis were verified with multivariable analysis, in the logistic regression model, regarding the occurrence of the destructive style as a dependent variable.

Table IV shows the results of the analysis of the logistic regression model. In the logistic regression model for the assessment of the occurrence of the destructive style of mental adjustment to cancer, there were no significant variables noted. In further analysis, a stepwise selection was performed. The final predictive variable for occurrence of the destructive style of mental adjustment to cancer was educational level (below high school *vs.* high school + master's degree) – OR = 1.85 (95% CI: 0.97–3.55).

The multivariable analysis was also performed in the logistic regression model, differentiating the constructive style from the destructive style. The results are presented in table V.

As a result of the logistic regression analysis differentiating the constructive style from the destructive style (in accordance with the record: mental adaptation style to cancer – constructive style / destructive style), the following variables were reported as statistically significant: educational level (p = 0.01) and alcohol consumption before cancer diagnosis (p = 0.02). Done stepwise procedure. Final predictors of the dependent variable were identified, such as:

- educational (below high school *vs.* high school and master's degree) – OR = 5.33 (95% CI: 1.85–15.20),
- circumstances of suspicion of cancer diagnosis (by a patient *vs.* by a doctor) – OR = 0.40 (95% CI: 0.14–0.98),
- family history of colorectal cancer (yes *vs.* no) – OR = 0.24 (95% CI: 0.11–0.78),
- alcohol consumption before cancer diagnosis (no *vs.* yes) – OR = 0.21 (95% CI: 0.03–0.82).

Discussion

The aim of this study was to assess the prevalence and elucidate determinants influencing mental adjustment in patients with colorectal cancer.

Table IV. The results of the analysis of a logistic regression from full model (fully adjusted) for the circumstances accompanying the presence of a destructive style of mental adjustment to cancer

Variable	Regression coefficient	p value
sex (female *vs.* male)	0.24	0.30
place of residence (city *vs.* country)	0.25	0.48
education level (lower than secondary level *vs.* secondary and higher education)	0.36	0.07
marital status (in a relationship *vs.* single)	0.78	0.21
employment (working person *vs.* unemployed person)	0.21	0.32
belief (believer *vs.* non-believer)	–0.04	0.85
housing conditions (alone *vs.* with a family member)	0.65	0.29
support from family (no *vs.* yes)	0.16	0.65
financial status (satisfactory *vs.* non-satisfactory)	0.18	0.66
circumstances of cancer diagnosis (by a patient *vs.* by a doctor)	–0.24	0.20
a family history of colorectal cancer (yes *vs.* no)	0.44	0.36
satisfaction with medical care (yes *vs.* no)	0.18	0.64
occurrence of chronic disease – without mental disease (yes *vs.* no)	–0.05	0.83
occurrence of other cancers diseases (yes *vs.* no)	0.39	0.35
fitness status (unchanged *vs.* worse)	0.25	0.28
nutritional status (unchanged *vs.* worse)	0.08	0.67
smoking status before being diagnosed with cancer (no *vs.* yes)	–0.34	0.14
consuming alcohol before being diagnosed with cancer (no *vs.* yes)	–0.46	0.22

Table V. The results of the analysis of a logistic regression from full model (fully adjusted) differentiating the constructive style from the destructive style

Variable	Regression coefficient	p value
sex (female *vs.* male)	0.72	0.06
place of residence (city *vs.* country)	0.61	0.20
education level (lower than secondary level *vs.* secondary and higher education)	0.89	0.01
marital status (in a relationship *vs.* single)	5.91	0.88
employment (working person *vs.* unemployed person)	–0.20	0.50
belief (believer *vs.* non-believer)	–0.51	0.32
housing conditions (alone *vs.* with a family member)	5.54	0.90
support from family (no *vs.* yes)	5.23	0.89
financial status (satisfactory *vs.* non-satisfactory)	1.50	0.07
circumstances of cancer diagnosis (by a patient *vs.* by a doctor)	–0.39	0.11
a family history of colorectal cancer (yes *vs.* no)	–0.61	0.08
satisfaction with medical care (yes *vs.* no)	–1.20	0.23
occurrence of chronic disease (without mental disease) (yes *vs.* no)	–0.33	0.41
occurrence of other cancers diseases (yes *vs.* no)	1.49	0.19
fitness status (unchanged *vs.* worse)	–0.44	0.54
nutritional status (unchanged *vs.* worse)	0.20	0.61
smoking status before being diagnosed with cancer (no *vs.* yes)	–0.41	0.22
consuming alcohol before being diagnosed with cancer (no *vs.* yes)	–1.51	0.02

The results suggest that 26.5% of participants of the study express the destructive style of mental adjustment to cancer. Among the participants who had a lower educational level, the mean risk of qualification above-mentioned style was two times higher (OR = 1.85). The constructive style of mental adjustment to cancer disease is expressed among 22.5% of participants. This style occurred 3 times more in participants with a family history of colorectal cancer (OR = 3.33), almost 5 times more often in participants who declared a non-worsening condition (OR = 4.94) and 2.4 more often in respondents with a non-smoking history. Female sex, lower educational levels and the declaration of a satisfactory financial status were factors which decreased the chance of occurrence of the constructive style (OR = 0.40, OR = 0.25, and OR = 0.22, respectively).

The study by I. Kapela [11] presents significantly different results. The authors of the study observed among 34.5% of the respondents features indicating the presence of a destructive style, while the features of the constructive style were noted among 77.2% of the respondents. The differences in the percentage values presented in the author's own work and in the work by I. Kapela may be related to a longer time period since the diagnosis of cancer in the group of patients participating in the cited study. Most of the patients participating in the above-mentioned study were individuals diagnosed with the disease up to 4 years prior, while the group of patients in our study are exclusively individuals with a newly diagnosed cancer who qualified for surgical treatment.

In this study, people with lower than high school education presented less often with a constructive style than people with a master's degree. This relationship was also confirmed in the study by J. A. Glińska et al. from 2020 [12], where the constructive style was expressed more often in the group of respondents with a higher educational level.

A limitation of this study is the number of participants who were not representative of patients with colorectal cancer. Primarily, this is because the enrolment for the study took place only in one hospital and implemented randomly. Only patients who were awaiting surgery to remove their cancer and gave informed consent to participate in the study were included in the study. Consequently, the study did not include people living outside the Silesian Voivodship, or outside the Upper Silesian-Zagłębie Metropolis, who were being treated in other hospital centers.

The advantage of this study is the complete response rate to the questionnaires. This was the result of direct contact between the respondent and the interviewer that took place in the treatment hospital. During the interview the patients were separated, focusing only on the questionnaire and interviewer. Potentially, this could decrease the risk of disruption during the interview by external sources. Additionally, it could decrease the chance of misunderstanding questions included in the questionnaire. Finally, the study used a validated questionnaire commonly used in research in Poland, in this case, the questionnaire is the only research tool that can be used in this type of research.

Another advantage of the study was the comparable number of men and women (89 and 111, respectively), with a non-statistically significant difference in age. Importantly, the author's own study uses a multivariable analysis, which enables the control of confounding factors. This procedure is sometimes omitted in the works of other authors. Cogently, there are reasons to assume that the conducted study has a significant impact for the current knowledge about the frequency and conditions of disease acceptance among patients with colorectal cancer.

The results may be used in planning and conducting psychological care in patients with colorectal cancer qualified for surgery.

Conclusions

1. Among the patients with colorectal cancer in the period immediately preceding surgical intervention, the destructive and constructive style of mental adaptation to colorectal cancer occurs with a similar frequency, in 26.5% and in 22.5% of patients respectively.
2. Frequent presentation for the constructive style of behavior is observed in the case of patients with a family history of colorectal cancer, as well as in patients declaring unchanged fitness status. The destructive style of behavior qualification is more frequent among patients with lower educational levels (lower than secondary level).

Acknowledgments

We would like to express our gratitude to Charles Predergast for improving the English language of this manuscript.

Source of financing

This study was funded by the Medical University of Silesia in Katowice, within a grant intended for young scientist funds. Grant no PCN-2-095/N/0/Z titled: *Personality, acceptance and adaptation of patients with colorectal cancer*.

Conflict of interest: none declared

Angelina P. Kaleta-Pilarska
Medical University of Silesia in Katowice
Faculty of Medical Sciences
Department of Epidemiology
ul. Medyków 18
40-752 Katowice, Poland
e-mail: akaleta@sum.edu.pl

Received: 5 Jan 2023
Accepted: 20 Jun 2023

References

1. Lueboonthavatchai P. Prevalence and psychosocial factors of anxiety and depression in breast cancer patients. J Med Assoc Thai. 2007; 90(10): 2164–2174, indexed in Pubmed: 18041438.

2. Religioni U, Czerw A, Deptała A. Patient mental adjustment to selected types of cancer. Psychiatr Pol. 2018; 52(1): 129–141, doi: 10.12740/PP/OnlineFirst/44732, indexed in Pubmed: 29704420.
3. Kulpa M, Ciuba A, Duda T, et al. Mental adaptation to cancer diagnosis and the health locus of control in patients undergoing treatment. Nowotwory. Journal of Oncology. 2022; 72(5): 275–281, doi: 10.5603/njo.a2022.0041.
4. Greer S, Morris T, Pettingale KW. Psychological response to breast cancer: effect on outcome. Lancet. 1979; 2(8146): 785–787, doi: 10.1016/s0140-6736(79)92127-5, indexed in Pubmed: 90871.
5. Malicka I, Szczepańska J, Anioł K, et al. Zaburzenia nastroju i strategie przystosowania do choroby u kobiet leczonych operacyjnie z powodu nowotworu piersi i narządów rodnych. Współcz Onkol. 2009; 13(1): 41–46.
6. Kulpa M, Owczarek K, Stypuła-Ciuba B. The impact of mental adjustment to cancer to the quality of life. Med Paliat. 2013; 5(3): 106–113.
7. Greer S, Watson M. Mental adjustment to cancer: its measurement and prognostic importance. Cancer Surv. 1987; 6(3): 439–453, indexed in Pubmed: 3326657.
8. Anagnostopoulos F, Kolokotroni P, Spanea E, et al. The Mini-Mental Adjustment to Cancer (Mini-MAC) scale: construct validation with a Greek sample of breast cancer patients. Psychooncology. 2006; 15(1): 79–89, doi: 10.1002/pon.924, indexed in Pubmed: 15880660.
9. Miklewska MJ, Barańska K, Wojciechowska U, et al. Morbidity and mortality trends of the most common cancers in 1990 – 2019. Poland's position compared to other European countries. Nowotwory. Journal of Oncology. 2023; 73(1): 46–55, doi: 10.5603/NJO.a2022.0065.
10. Juczyński Z. Zmaganie się z chorobą. In: Narzędzia Pomiaru w Promocji i Psychologii Zdrowia. Pracownia Testów Psychologicznych Polskiego Towarzystwa Psychologicznego, Warszawa 2009: 162–166.
11. Kapela I, Bąk E, Krzemińska S, et al. Evaluation of the level of acceptance of the disease and of satisfaction with life in patients with colorectal cancer treated with chemotherapy. Nursing and Public Health. 2017; 7(1): 53–61, doi: 10.17219/pzp/64689.
12. Glińska JA, Dańko E, Dziki Ł. Mental adaptation of people with cancer after surgery. Pieleg Chir Angiol. 2020; 3: 106–111.