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Coping with cancer and a history of health-related events

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Abstract

Background: Cancer is a source of stress related to the resulting change in lifestyle. The processes which take place when a patient is coping with a disease may be explained in terms of the transactional concept of psychological stress (Lazarus, Folkman) and the critical life events model (Filipp). These two complementary theoretical approaches set the direction and aim of the study which was to determine the role played by earlier events responsible for health loss due to a chronic, serious disease in the course of a stress transaction in cancer patients.

Materials and methods: The study involved 121 patients with either breast or colorectal cancer undergoing chemotherapy as part of their treatment. They were asked to complete a purpose-designed set of questionnaires which included Revised Illness Perception Questionnaire (IPQ-R), the Mini-Mental Adjustment to Cancer (Mini-MAC) questionnaire, the Hospital Anxiety and Depression Scale (HADS), Acceptance of Illness Scale (AIS). The interdependencies between variables were determined using difference significance tests (Mann-Whitney, Kruskal-Wallis) and the Dunn's correction test. The significance level (alpha) of 0.05 was assumed appropriate for the study.

Results: Patients with previous health-related events were found to expect the struggle with cancer to be a greater and more serious challenge. Those patients had suffered loss of health prior to getting cancer and their emotional reactions were heightened. This finding allowed the identification of patients more prone to creating a negative view of their disease.

Conclusions: When planning a psychological treatment of patients with cancer, an account must be taken of their past life events and earlier experiences of being ill, in order to implement appropriate psychological intervention aimed at reducing their emotional stress.

Key words: cancer; psychological care; Transactional Model of Stress and Coping

Introduction

Cancers occur globally but they vary in terms of the type prevalent in particular regions of the world. According to the World Health Organization (WHO), in 134 out of 183 countries analysed, cancer was either the first or the second leading cause of premature death. [1]. In 2018 a total of 9.5 million people were diagnosed with cancer worldwide. In Poland, the incidence has more than doubled over the past three decades [2], making cancer the second cause of death after cardiovascular dysfunction. Despite the growing public awareness, greater access to preventive screening and improved efficacy of oncological treatment, epidemiological projections indicate that over the next several decades cancer will become the most common cause of mortality worldwide [3]. This, in consequence, means that both the medical and non-medical care will need to evolve even more towards ensuring cancer patients receive an adequate range of support to help them to maintain a quality life despite the disease. It is a challenge which, apart from understanding the medical aspects of the disease and its treatment, requires from patient care professionals certain knowledge and awareness of the psychological mechanisms underlying the functioning of their patients.

The aim of the study was to analyse those psychological mechanisms. The assumption adopted for the purpose of determining how cancer patients coped with their disease depending on whether they or their family member experienced previous life-threatening diseases was that it would be most accurately done with the use of the Lazarus and Folkman transactional model of psychological stress and the Filipp critical life events model.

According to these models, what constitutes the source of stress and the consequences arising from it are not only the physical aspects of the disease, but other elements as well, such as patient's assessment of the disease and coping strategies adopted, or the events that had preceded the occurrence of the disease. According to Lazarus and Folkman, individuals confronting stress go through successive stages and those stages are determined and modified by specific factors. In the first stage, there is an attempt to establish whether or not the situation is really stressful and what the nature of the stress is. Once established, the patients consider the way or manner of handling the stressful situation and the resources that may help them to cope with it. Next, following the assessment made, specific coping strategies are activated, leading to certain outcomes in the form of: immediate assessment of the effects of the stress (the emotional state, physiological changes,

post-transactional quality of functioning) and distant assessment of the effects of the stress (emotional and social assessment of patient's evaluation of life. The course of a stress transaction is dependent on the presence of certain causal determinants which form the starting point for the analysis of how an individual functions in a psychological stress situation. A distinction is made between personal variables, i.e. the competences and experiences with which the individual enters into a stress transaction and situational variables which are considered to be the challenges which an individual has to face and deal with. The process of coping with stress is also determined by the characteristics of the stressor, i.e. its intensity, duration, controllability or the probability that it will occur in individual's life. Additionally, the model distinguishes factors that play a modifying role in it. They are: access to external and internal resources available to the individual in a stressful situation. These elements, along with the mental processes determining the evaluation of the situation and coping capacities, determine the overall end result of a stress transaction [4, 5]. In the concept of critical life events, Fillipp elaborated on the model of confronting stress by distinguishing particular types of stressors. She called these stressors critical life events (CLEs), and placed particular emphasis on the observation of the phenomena that occur at the time when a CLE occurs, and of the factors that precede its occurrence — the antecedents [6]. In the last dozen or so years, the research in the field of health and disease psychology has mainly focused on the analysis of the stress transaction in terms of types of coping [7, 8]. Similarly, till date, the literature has only hinted at the category of antecedents and their impact on coping with stress as a possible subject or focus of any analysis [9, 10].

Based on these theoretical assumptions, in order to determine whether the manner of coping with stress adopted by cancer patients varies depending on their previous chronic, serious diseases, the following components of coping with cancer stress have been identified in this paper:

- events preceding the disease and their impact on the course of the new (current) one. Such events include loss of health as a result of a chronic, serious disease experienced by the patient or a relative of the patient prior to cancer; following the approach of WHO [11] and the reports submitted by Howard Leventhal et al. [12] a chronic disease is a long-lasting event (continued for more than one year), characteristic of a slow progress and a possibility of leading to a mental breakdown or even a loss of life;
- assessment of the current critical life event, i.e. the cancer contracted, taking into account its objective properties (type), and subjective properties, analysed in terms of the cognitive representation of the disease;

- strategies available to the patient to cope with cancer;
- consequences of the disease, covering the level of adaptation to the disease and the severity of depression, anxiety and irritability/aggression.

The way in which the antecedent events are perceived by patients as well as their impact on the course of the current (new) critical event in patient's life presented here may be an original contribution to the knowledge of how to cope with cancer in terms of the transactional concept of stress and dealing with it.

Materials and methods

The study was carried out in years 2017–2019 (COMMENT 6). It covered a group of 121 patients aged between 18 and 85 [the mean age was 51.77; standard deviation (SD) = 11.40]. Both sexes participated in the study but there were four times as many females as males. Regarding the level of education, the most numerous group consisted of patients with secondary education. Full socio-demographic data of the participants are presented in Supplementary File — Table S1.

The group involved patients diagnosed with colorectal cancer (n = 51) and breast cancer (n = 70) who were undergoing radical chemotherapy treatment at the Chemotherapy Department of the Greater Poland Cancer Centre in Poznań. Individuals diagnosed with a mental disease were excluded, if that was likely to affect their responses and the results of the study. (this sentence has been moved up from below). Detailed inclusion and exclusion criteria are shown in Supplementary File — Table S2.

The patients selected for the study completed specially prepared questionnaires. Their purpose was to identify the occurrence of any previous health loss that had occurred as a result of a chronic, serious disease suffered by the patient or their relatives prior to being diagnosed with cancer, and to assess the coping with it as a function of those past experiences. The following standardised questionnaire methods were used:

- the Revised Illness Perception Questionnaire (IPQ-R) (adapted by Wojtyna 2012 [13]). This questionnaire allows measuring patient's self-perception of their disease. It consists of three parts. Part I seeks to establish whether, in the patient's perception, the disease manifests itself in only very few, or rather quite many symptoms. Part II presents patient's beliefs on the following seven aspects: 1. duration of the disease (acute/chronic), 2. consequences of the disease, 3. frequency of the symptoms/the course of the disease in the context of the recurrence of the symptoms experienced, 4. self-control/ ability to influence the state of

health through individual actions, 5. control of treatment/ ability to influence the state of one's health through treatment, 6. sense of coherence/ understanding of the disease, 7. emotional representation/emotional response to the disease. Part III of the questionnaire allows patient's beliefs about the causes of their disease to be determined in four areas: (i) psychological explanations, (ii) action of risk factors, (iii) patient's immune system, (iv) accident or coincidence;

- the Mini-Mental Adjustment to Cancer (mini-MAC) questionnaire (adopted by Juczynski 2001 [14]). This questionnaire measures four coping strategies: anxiety preoccupation, fighting spirit, hopelessness-helplessness, positive reappraisal;
- the Hospital Anxiety and Depression Scale (HADS) (adopted by de Walden-Gałuszko, 2001 [15]). The scale allows the evaluation of patients' emotional state at various stages of cancer development, in terms of anxiety, depressive states, irritability/aggression.
- the Acceptance of Illness Scale (AIS) (adopted by Juczynski, 2001 [14]). The questionnaire is used for measuring the degree of acceptance of the disease.

Patients included in the study received a thorough introduction to the procedure and were informed about the purpose of the analysis. They also gave their informed consent to participate, having been assured that their participation was anonymous, voluntary and could be discontinued at any time with no need to state a reason. Moreover, a refusal to participate or decision to discontinue participation did not in any way affect their relationship with the medical staff providing their treatment. Participation in the study did not interfere with the therapeutic treatment procedure during hospitalisation. Also, because difficult life events were discussed, psychological monitoring and a follow-up were offered and the patients were promised psychological assistance if needed.

The study was commenced following a positive opinion of the proposal, where its scope and plan were presented, obtained from the Bioethics Committee at the Karol Marcinkowski University of Medical Sciences in Poznań (Resolution No 744/16 of 1 June 2016).

To address the research problem raised in the study, the statistical analyses were performed using the IBM SPSS Statistics package. The Mann-Whine and the Kruskal-Walis tests as well as the Dunn's correction test were used to analyse the differences in the groups compared. The obtained results were considered statistically significant if p-value was 0.05 or less. They are presented in compliance with the rules of the American Psychological Association (APA).

Results

The analysis of the results involved determining whether the presence or absence of a serious, chronic disease experienced by a patient or a family member prior to developing cancer had any impact on patients' perception of a newly contracted cancer; the coping strategies chosen; the degree of acceptance of the disease; and the patient's emotional state in terms of anxiety, depression and irritability/aggression. Due to the fact that the distribution of variables in the analyses did not meet the criterion of normal distribution, tests for non-parametric data were applied.

The oncology patients participating in the study were first divided into four groups according to their experience of a serious, life-threatening disease prior to their cancer. The following groups were distinguished:

- group I — patients without prior experience of a life-threatening disease;
- group II — patients with their own prior experience of a life-threatening disease;
- group III — patients with prior experience of a life-threatening disease in their close family member;
- group IV — patients with prior experience of a life-threatening disease both in themselves and in a close family member.

No statistically significant differences in the perception of the disease, the coping strategies adopted and the level of acceptance of cancer currently developed were found between patients with the occurrence of a serious disease in themselves or their family member before contracting cancer and those with no such experience. A statistically significant difference occurred in terms of the emotional state in the following dimension: the intensity of irritability or aggression. A post hoc test (Dunn's test) was used for making intergroup comparisons. The test confirmed that, indeed, those with no experience of their own serious disease showed statistically significantly lower levels of irritability/aggression than those with such experience before developing cancer. Figure 1 and Table 1 show the differences in the emotional state and indicate statistically significant differences. The full protocol of interdependences examined in our study is shown in Supplementary File — Table S3.

The next step was to verify whether the type of cancer differentiates the perception of the current disease, the coping strategies chosen by the patient, the acceptance of the disease and the emotional state, depending on the history of a serious, chronic disease in the patient or a close relative. In order to examine this, patients were divided into two groups:

- group A: those with an experience of a serious, chronic disease before contracting cancer;
type of cancer: breast or colorectal cancer;
- group B. those with no experience of a serious, chronic disease before contracting cancer;
type of cancer: breast or colorectal cancer.

The Mann Whitney test was used to carry out the statistical analysis. Figures 2 and 3 show only the statistically significant differences. The full protocol of interdependences examined in our study is shown in Supplementary File — Tables S4 and S5.

It has been found that in the group of subjects with no experience of a serious, chronic disease prior to developing cancer, those with colorectal cancer report a greater number of symptoms occurring since contracting the disease (self-perception of the disease dimension) than those with breast cancer. There was no indication in this group (patients with no experience of a serious disease in themselves or a family member in the past) that the type of cancer contracted influenced patients' other behaviours that differentiated other aspects studied, such as coping strategies, level of acceptance of the disease or emotional state.

Contrary to the above, in the group of subjects who experienced a serious, chronic disease in themselves or a close family member, the type of cancer which they contracted differentiated their self-perception of the disease in the following subscales: the level of the sense of coherence and the effect of risk factors. It appears that in this group, breast cancer patients have a higher level of the sense of coherence and a lower level of risk factor effects than colorectal cancer patients. The other variables, i.e. coping strategies, level of acceptance of the disease and emotional state, did not vary significantly in respect of both types of cancer contracted.

Discussion

The main issue addressed in the study was the similarities or differences in coping with stress by cancer patients depending on their own or family member's history of life-threatening diseases.

Our study has shown that the levels of irritability/aggression in people with a previous experience of loss of health is significantly higher than that in those without such an experience. This can be explained by the fact that the former tend to react to their new illness with aggression, knowing that again they are facing a struggle with another life-threatening disease. This, in turn, entails violent emotions, eventually becoming a source of severe emotional distress. Research reports so far have only briefly tackled the problem of oncology patient's anger and uncertainty as a consequence of patient's reduced sense of security already shaken in the past when they experienced a life-threatening disease, particularly if it involved complications [16, 17]. Manifestations of anger, such

as yelling or accusations (e.g. blaming the healthcare service for the disease contracted) as well as irritation, may, according to Groves' typology [18], contribute to classifying an individual as a litigious patient (colloquially, a "difficult" patient). Socially unacceptable anger in this case serves no other purpose than to mask helplessness, fear and anxiety, as well as concerns about the treatment of the disease. The data obtained also allow us to suppose that one's own experience of a serious, chronic disease (and in particular a recurring one) is a unique experience and the intensity of emotional reactions in such a situation cannot be really compared to the reactions in the event of such a disease in a close family member. This may also indicate a direction for further studies.

Taking into account the type of cancer, certain regularities were observed regarding the self-perception of the disease within each group. The "with experience" group (who, before developing cancer, had encountered loss of health as a result of a serious, chronic disease affecting themselves and/or a family member) diagnosed with breast cancer had a higher sense of understanding of the disease contracted (as measured by the sense of coherence subscale — self-perception of the dimension of the disease) and the patients were less focused on discovering its causes than those diagnosed with colorectal cancer in the same group. However, in the "no experience" group, patients diagnosed with colorectal cancer, contrary to those with breast cancer, tended to notice or identify more symptoms since the diagnosis, but did not associate them directly to cancer. No statistical differences were found in this group regarding the coping strategies (activity) or the level of acceptance of the disease as well as the intensity of anxiety, depression, irritability/aggression (consequences of the diagnosis).

The results show that breast cancer patients with an experience of previous serious, chronic disease create a more adequate representation of their current disease. In contrast, patients with colorectal cancer, regardless of whether they have a prior history of a serious disease or not, present a lower awareness of the nature of the disease. This may suggest that within a specific group of patients, depending on the diagnosis, previous experience of a health stressful situation helps to create a more accurate view of a new disease when facing another health loss situation.

As shown in the literature, the perception of one's disease depends on a number of variables. Among the most frequently mentioned factors are earlier social events and psychological experiences [19]; medical knowledge acquired earlier, the emotional condition of the patient, patient's personality and previously shaped cognitive schemes involving health, disease and treatment [20]; social anxiety of cancerous diseases [21]. There is, however, no mention of studies aimed at examining directly the dependence between patient's medical history and the perception of this patient's current disease and coping with it.

According to Łosiak [22], the basis for the formation of a picture of the disease may be an illness in the family that precedes that of the patient's. In such a clinical situation, the previous experience with an illness of a family member makes the picture of the disease more structured, complete and containing more relevant information. The data presented by Łosiak are similar to the results obtained in our study, showing that some patients with a previous experience of health loss as a result of a serious, chronic disease (including health loss of a relative) created a more favourable representation of cancer. However, although this proved true for patients with a specific diagnosis of breast cancer, it was not observed in the group of patients with colorectal cancer.

The results of our study indicate that cancer is not the only stressful event with which patients have to cope. The diagnosis of the disease, its treatment, as well as the medical, psychological or social consequences are embedded in the context of other stressful life events that precede the disease and, eventually, come into interaction with cancer. Oncology patients with previous health loss events as a result of a serious, chronic disease may experience more negative psychological consequences as a result of their life history. This, in turn, may represent a source of deterioration in their overall psychological well-being, leading to a weakening of the adaptation processes and a general worsening of their ability to cope with the stress of cancer. In addition, depending on the diagnosis, patients may develop a specific representation of the illness (more positive for breast cancer patients and less positive and less supportive for coping with colorectal cancer). The results of this study may serve as additional information on testing the Lazarus and Folkman model of patients' coping with stress depending on the occurrence of antecedents (preceding events that meet the criteria of a serious, chronic disease).

We are aware that our study has some limitations.

The group of patients participating in the study was not very numerous. Only 48.4% responded and filled in the questionnaires. In consequence, out of the 250 distributed questionnaires only 126 were returned of which 5 were empty and had to be disregarded. Based on the information received from patients who refused to participate in the study, the main reasons for refusal were negative consequences of the therapy which they were undergoing, such as increased fatigue and impaired cognitive functions, including concentration and memory problems. An additional reason for the participation in the study to be rather poor was the requirement to meet certain inclusion criteria, such as the type of cancer (breast cancer or colorectal cancer), the specific type of oncological treatment administered (radical treated with cytostatic drugs) and recruitment limited to patients from one treatment centre only (Grater Poland Cancer Centre).

The patients who participated in the study represented two unbalanced sex groups which was a natural consequence of the fact that females with diagnosed breast cancer constituted the dominant group of patients in the ward where the study was performed. Since the objective was to include many patients, there was practically no real age limit for inclusion but, as a result, the group was not uniform. The sociodemographic data of the participants were excluded from the analysis since they were beyond the scope of the subject of this paper.

Moreover, it is worth broadening the study to include other properly designed tools for assessing pre-cancer health events, such as, for example, a structured interview questionnaire encompassing an analysis of earlier events. However, it is our strong belief that despite its shortcomings, the study presented here constitutes a useful and valuable source of information on factors which may help patients to cope with the stress caused by cancer.

Conclusions

Patients who themselves experienced a life-threatening illness before developing cancer are at risk of experiencing a more dynamic and negative struggle when coping with cancer in terms of psychological after-effects. In addition, the type of cancer and the previous history of health loss may differentiate the way in which patients cope with their current disease in terms of how they perceive it.

Thus, in cancer patients, previous experience of living with an illness should be taken into account when planning psychological support for specific groups, aimed at introducing tailored psychological interventions to reduce the level of mental distress in oncology patients.

Conflict of interest

The authors report no conflicts of interest.

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Table 1. Prevalence of experience of a chronic, serious disease in self of relatives prior to cancer vs the emotional state

Emotional state	Previous experience of a serious disease (average rank)							
	Group I (n = 27)	Group II (n = 10)	Group III (n = 75)	Group IV (n = 9)	Inter-group. compar	Kruskal-Wallis test (df=3)	p	ϵ^2
Anxiety	57.06	87.95	58.07	67.33		7.12	0.07	
Depression	60.63	71.85	60.34	55.56		1.22	0.75	
Irritability/Aggression	48.50	78.50	64.44	50.78	<	7.72	0.05	0.03

*p < 0.05; Group I — patients with no experience; Group II — patients with own previous experience; Group III — persons with a close family member's experience; Group IV — persons with own and a close family member's experience

Figure 1. Statistically significant differences in the emotional state

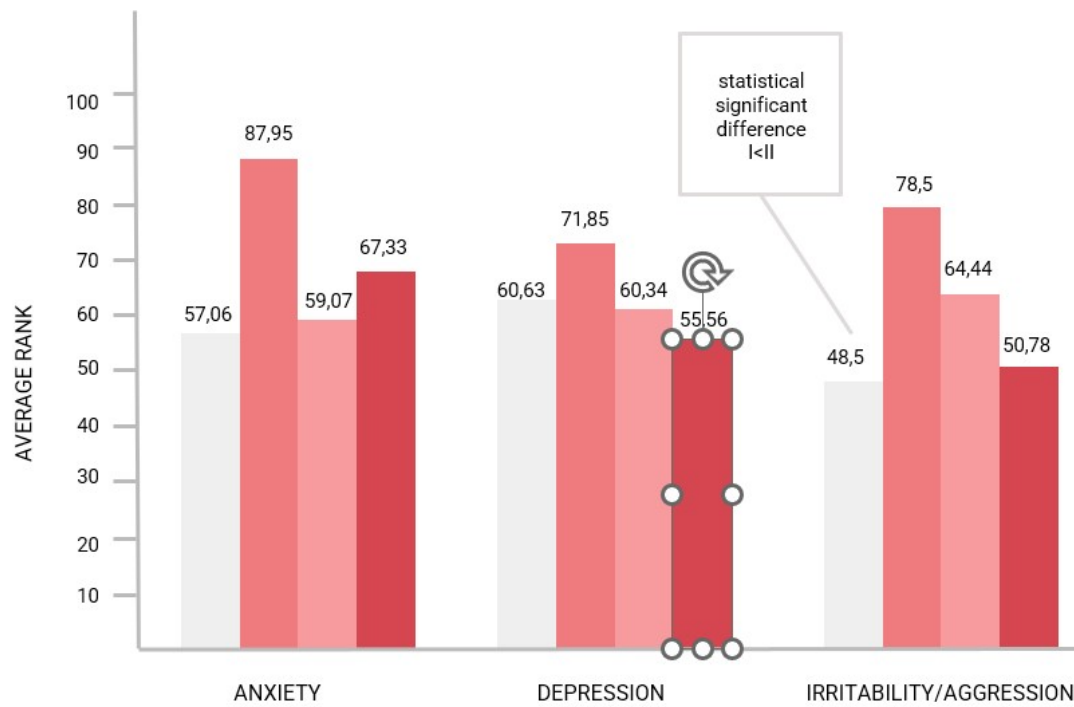


Chart 1 / Statistically significant differences in the emotional state

LEGEND

- group I patients with no experience
- group II patients with own previous experience
- group III persons with a close family member's experience
- group IV persons with own and a close family member's experience

Figure 2. Statistically significant differences in self-perception of the disease in group with experience of a chronic, serious disease prior to developing cancer vs. type of cancer

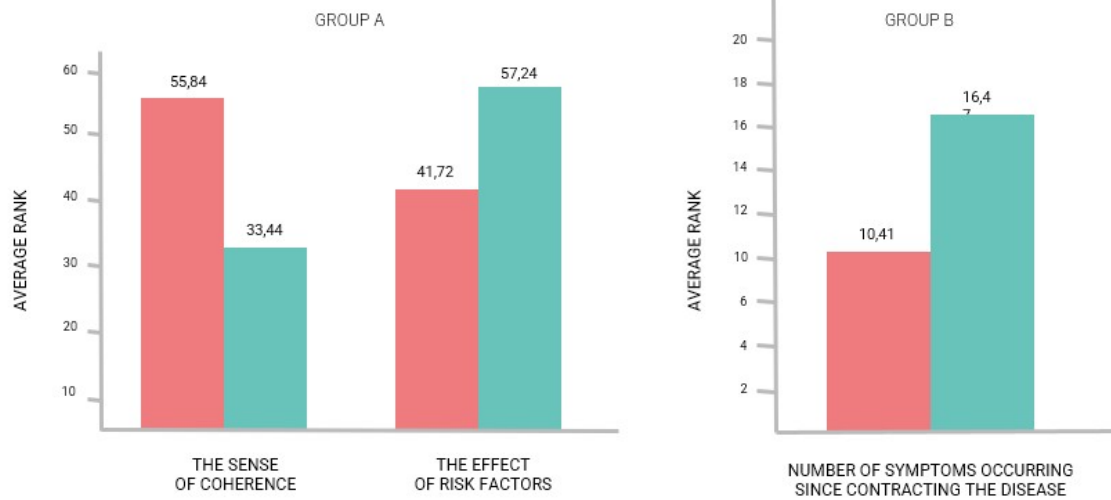


Chart 2 / Statistically significant differences in self-perception of the disease in **group with experience of a chronic, serious disease** prior to developing cancer vs type of cancer

Chart 3 / Statistically significant differences in self-perception of the disease in **group with no experience of a chronic, serious disease** prior to developing cancer vs type of cancer

LEGEND ■ breast cancer ■ colorectal cancer

Figure 3. Statistically significant differences in self-perception of the disease in group with no experience of a chronic, serious disease prior to developing cancer vs. type of cancer

Supplementary File

Table S1. The sociodemographic description of the group in the study

GROUP n = 121			
Sex	Female	n = 95	79.30%
	Male	n = 26	20.70%
Age	Mean		51.77±11.40
Education	Primary	n = 1	0.9%
	Vocational	n = 25	20.7%
	Secondary	n = 57	47.2%
	Tertiary	n = 38	32.2%
Residence	Rural	n = 38	31.4%
	Urban	n = 83	68.6%
Occupation	Not employed	n = 19	15.8%
	Pensioner	n = 28	23.1%
	Disability pension	n = 13	10.7%
	Different forms of occupation	n = 61	50.4%
Marital status	Not in a relation	n = 14	12%
	Married	n = 91	75%

	In an informal relation	n = 16	13%
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Table S2. Criteria for inclusion or exclusion from the participation in the study

INCLUSION CRITERIA	CHARACTERISTICS OF THE CRITERION
Type of cancer	Breast and colorectal cancer
Advancement of the disease	Cancer at an earlier stage of development
Type of treatment	In the course of neoadjuvant and adjuvant therapy (radical treatment)
Age	18 to 85years of age
Consent to participate in the study	Conscious consent to participate in the study
Mental disorders	No diagnosed mental disorders
EXCLUSION CRITERIA	CHARACTERISTICS OF THE CRITERION
Type of cancer	Other cancers apart from the breast or colorectal cancer
Advancement of the disease	Cancer at an advanced stage of development
Type of treatment	In the course of a paliative chemotherapy
Consent to participate in the study	No consent given to participate in the study
Mental disorders	Diagnosed mental disorder

Table S3. Existence of an experience of a chronic, serious disease in oneself or in a close family member before contracting cancer vis a vis perception of one's illness, the coping strategy adopted, acceptance of the situation and the mental state of the patient

Experience of a previous serious disease					Inter-group. comparison	H Kruskala–Wallisa (df = 3)	p	ε ²
Average rank								
	Group I N=27	Group II N=10	Group III N=75	Group IV N=9				
Perception of the disease:								
Duration of the disease	66.63	56.80	59.89	58.06		0.99	0.81	–
Consequences of the disease	64.44	69.25	57.71	68.89		1.95	0.58	–
Freq. of the occur. of sympt.	69.22	49.35	59.45	62.22		2.80	0.42	–
Self-control	59.78	50.15	63.25	58.00		1.38	0.71	–
Monitoring of treatment	59.33	59.65	61.91	59.89		0.14	0.99	–
Feeling of cohesion	56.06	45.05	62.59	80.33		5.53	0.14	–
Emotional representation	59.96	70.90	60.43	57.89		0.92	0.82	–
The essence of the disease:								
No of sympt.since contraction	53.41	56.05	61.75	83.06		5.11	0.16	–
No of symp. related to it	52.17	53.35	63.53	74.89		4.03	0.26	–
Causes of the disease:								
Psychological explanation	57.80	81.05	58.87	66.06		3.98	0.26	–
Action of risk factors	58.83	63.25	61.92	57.33		0.30	0.96	–
Strategies of coping:								
Fear absorption	69.43	79.43	55.29	62.67		6.40	0.09	–
Fighting spirit	68.70	51.05	60.63	52.06		2.73	0.45	–
Hopelessness-Helplessness	66.17	80.20	55.59	69.22		5.92	0.12	–
Positive revaluation	68.54	58.20	58.07	65.94		2.04	0.57	–
Acceptance of the disease	56.20	59.25	63.70	54.83		1.26	0.74	–

Mental state:								
Fear	57.06	87.95	58.07	67.33		7.12	0.07	–
Depression	60.63	71.85	60.34	55.56		1.22	0.75	–
Irritation/aggression	48.50	78.50	64.44	50.78	I < II	7.72	0.05*	0.06

$p < 0,05$; Legend: group I — patients with no previous experience, group II — patients with experience of previous own disease, group III — patients with experience of the disease in a close family member, group IV — persons with experience of their own disease and a disease in a close family member

Table S4. Type of cancer and patients without previous experience of their own serious, chronic disease or a disease in a close family member and the perception of the contracted disease, coping strategies, acceptance of the disease and their mental state

	Average rank			
	Breast cancer	Colorectal cancer	<i>U</i>	<i>p</i>
Perception of the disease:				
Duration of the disease	11.23	15.91	57.50	0.13
Consequences of the disease	12.18	15.25	68	0.34
Freq. of the occur. of sympt.	12.14	15.28	67.50	0.32
Self-control	13.27	14.50	80	0.72
Monitoring of treatment	14.36	13.75	84	0.87
Feeling of cohesion	13.18	14.56	79	79
Emotional representation	14.27	13.81	85	0.90
The essence of the disease:				
No of sympt.since contraction	10.41	16.47	48.50	0.05*
No of symp. related to it	10.77	16.22	52.50	0.08
Causes of the disease:				
Psychological explanation	12.91	14.75	76	0.58
Action of risk factors	12.36	15.13	70	0.39
Strategies of coping:				
Fear absorption	15	13.31	77	0.61
Fighting spirit	13.50	14.34	82.50	0.79
Hopelessness-Helplessness	11.55	15.69	61	0.20
Positive revaluation	11.09	16	56	0.12
Acceptance of the disease	17.55	11.56	49	0.06
Mental state:				
Fear	13.27	14.50	80	0.72
Depression	12.36	15.13	70	0.39
Irritation/aggression	14.50	13.66	82.50	0.79

* $p < 0.05$

Table S5. Type of cancer and patients with previous experience of their own serious, chronic disease or a disease in a close family member and the perception of the contracted disease, coping strategies, acceptance of the disease and their mental state

	Average rank		<i>U</i>	<i>p</i>
	Breast cancer	Colorectal cancer		
Perception of the disease:				
Duration of the disease	44.85	51.97	876	0.22
Consequences of the disease	46.33	49.47	963.50	0.59
Freq. of the occur. of sympt.	45.69	50.54	926	0.40
Self-control	48.10	46.49	997	0.78
Monitoring of treatment	49.99	43.30	885	0.25
Feeling of cohesion	55.84	33.44	540.50	< 0.001*
Emotional representation	50.69	42.11	844	0.14
The essence of the disease:				
No of sympt.since contraction	46.89	48.53	996.50	0.78
No of symp. related to it	47.03	48.30	1004.50	0.83
Causes of the disease:				
Psychological explanation	48	46.66	1003	0.82
Action of risk factors	41.72	57.24	691.50	0.01*
Strategies of coping:				
Fear absorption	45.72	50.50	927.50	0.41
Fighting spirit	45.33	51.16	904	0.31
Hopelessness-Helplessness	45.25	51.29	900	0.30
Positive revaluation	45.10	51.54	891	0.27
Acceptance of the disease	47.96	46.73	1005.50	0.83
Mental state:				
Fear	46.75	48.77	988	0.73
Depression	45.80	50.37	932	0.43
Irritation/aggression	50.19	42.97	874	0.20

**p* < 0.05