

Mental adaptation to cancer diagnosis and the health locus of control in patients undergoing treatment

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Introduction. Cancer diagnosis and treatment perspectives pose a serious emotional and behavioral burden for the patient, and require adaptation strategies to be adapted.

Material and methods. The research consisted of 569 patients aged 19 to 91 undergoing oncological treatment. The study used the mini-MAC scale to measure mental adaptation to cancer and the MHLC scale to measure the health locus of control.

Results. The strategy of anxiety preoccupation was highest in breast cancer. The strategy of helplessness and hopelessness achieved the highest value in breast and reproductive organ cancers. The fighting spirit strategy showed the highest value in cancers of the digestive system. The positive re-evaluation strategy was the highest in cancers of the head and neck, and digestive system.

Conclusions. Patients with breast cancer and reproductive organ cancers seem to be at greater risk of developing destructive behavior, therefore extended psychological support has to be considered for these patients.

Key words: cancer, illness acceptance, quality of life, strategies for coping with the disease, pain management

Introduction

Cancer and the need for treatment are significant sources of stress for the patient and their family. The crisis of cancer and its treatment pose a serious emotional and behavioral burden for the patient, which may contribute to the development of anxiety-depressive disorders and the activation of destructive coping strategies. A patient with anxiety-depressive disorders and the feeling that they have no influence on their health often results in a lack of faith in the success of the therapy and low internal motivation for treatment; this

may translate into difficulties in the relationship with the doctor. In such situations, encouraging the patient to comply with medical recommendations and health education does not bring the expected effect because it does not address all the causes of the patient's difficulties [1]. Understanding how patient psychologically adapts to cancer and identification of the type of health locus of control in the patient enables for better planning of cooperation between doctor and patient. Simultaneous patient education and psychotherapy, which can develop constructive strategies for coping with the disease,

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help increase patient's adherence to recommended treatment regimens and ensure they maintain them in the long term [2].

The theory of adaptation to neoplastic disease is based on the concept of stress in the cognitive-transactional current, according to Lazarus and Folkman (1984) [3]. The theory assumes that stress experienced as a result of the assessment of a stimulus as threatening (cancer disease), entails the use of maladaptive methods of coping with stress, which in turn may lead to poorer mental adaptation to the disease. Greer (2008) [4] defined a model of coping with stress that includes five main attitudes of adaptation to cancer: fighting spirit, avoidance / denial, fatalism / stoic acceptance, helplessness / hopelessness, anxious preoccupation. The results of studies by Greer et al. (1989) [5] indicate that different types of adaptation to a disease are associated with positive or negative reactions, motivation to treatment, sense of health control, and compliance with medical recommendations. The fighting spirit stance is associated with low external and high internal locus of control and high social support. The attitude of fatalism / stoic acceptance is related to the internal and external locus of control which can affect compliance with medical recommendations and cooperation with the attending physician. In this attitude, emotional state should be monitored as depressive disorders with resignation and emotional indifference may develop, which may falsely give the image of stoic acceptance. The helplessness / hopelessness attitude manifests itself in a patient with a sense of hopelessness and helplessness, passivity, anxiety, and depression, and is associated with a high external locus of health control and low social support. The attitude of anxious concern is manifested in the patient with an anxious attitude towards diagnosis, the diagnostic and therapeutic process, and often in hypochondriacal behavior. The avoidance / denial attitude is often associated with high anxiety, ambivalent reactions, difficulties in adherence to medical recommendations, and low motivation for treatment. In terms of the type of coping strategy and the course of disease process, it was found that people adopting attitudes classified as fighting spirit showed a higher level of compliance with medical recommendations and a longer period of remission and survival than people using the strategy of stoic acceptance or a sense of helplessness / hopelessness [5, 6].

The health locus of control and self-efficacy beliefs in crisis situations are considered to be one of the most important predictors of coping with a chronic disease, including cancer. Measure of the sense of health control is indicated by three main cognitive beliefs: one's own actions, the actions of others in the environment, and chance. The type of beliefs about the sense of health control is one of the psychological factors determining the quality of coping with the disease, the choice of health behaviors, and translates into the patient's involvement in the therapeutic process [7]. Rotter (1954) classified the site of health control as internal and external. The inner locus of health control manifests itself in assigning more responsibility

for one's health as a result of one's own behavior and personal control over it. People with dominance of the internal sense of health control are more assertive in the doctor-patient relationship, autonomous in making decisions about their health, and have a higher sense of responsibility for their health condition. The internal locus of control is often associated with the pursuit of increasing the quality of life and health, as well as undertaking preventive behaviors aimed at maintaining health. The internal locus of control favors the initiation of pro-health behaviors by an individual and taking responsibility for their own health. The external locus of health control manifests itself in two attitudes: belief in the influence of others on one's health, and belief in the impact of an accident on one's health. The external locus of control favors the delegation of responsibility for one's health to others, which may lower one's own motivation to undertake preventive and pro-health behaviors. The external locus of health control is observed more frequently in chronically ill patients. The external locus of control may, however, positively affect the therapeutic process and compliance with medical recommendations by placing the responsibility for the health condition and all competences in this area onto the physician. From a therapeutic point of view, the best situation is when the patient shows an ambiguous locus of control, i.e. an undifferentiated type, because at the same time the patient has a strong conviction about the influence of others on his health (doctor, physiotherapist, nurse), which favors compliance with therapeutic recommendations and internal conviction, which mobilizes them to undertake effective pro-health activities and to remain in them [8, 9]. In Poland and around the world, the most frequently used tool for diagnosing the type of health locus of control is the MHLC Scale – Multidimensional Health Locus of Control Scale by Kenneth A. Wallston, Barbara S. Wallston, Robert DeVellis (1976; 1978) in the Polish adaptation of Zygfryd Juczyński (2012).

Many studies indicate that the emotional state of the patients and their way of coping with stress during the disease have a great influence on their engagement in therapy and the course of cancer treatment [10–14]. The assessment of depressive or anxiety disorders is insufficient in the psychological diagnosis of a patient, therefore, it was expanded to other dimensions. The aim of the study was to assess psychological adjustment to cancer in patients in the early stage of treatment, and to identify those who present maladaptive strategies and to provide them with psychological care. The screening assessment of the way of coping with stress and the type of localization of health control enables the selection of targeted psychotherapeutic methods. In turn, these translate into better cooperation between the patient and the medical staff and increases chances for the success of the oncological treatment. Therefore, the study used readily available standardized research questionnaires examining mental adaptation to neoplastic disease and the health locus of control. The universality of the selected questionnaires allows for future replication of the study and the creation of an

obligatory screening battery of tests to assess patient functioning in psycho-oncology clinics.

Material and methods

The study group

The study was carried out among 569 patients aged 19 to 91 undergoing oncological treatment. The study was conducted between January and December 2018. All patients included in the study received psychological support during their stay at the clinic. The study was voluntary, anonymous, and based on a one-time measurement.

Bioethics Committee

The research plan received a positive opinion from the Committee of the Science Department of the Maria Skłodowska-Curie National Research Institute of Oncology and was entered in the scientific plan, registration number 4.34/2018.

Variable measurement tools

The research questionnaire consisted of author-delivered sociodemographic survey questions and standardized tools. Mental adaptation to cancer was measured with the use of the Mini-Mental Adjustment to Cancer (mini-MAC) scale in the Polish adaptation of Z. Juczyński 2012.

The scale allows for a determination of what strategies the examined patient adopts in relation to cancer. The scale consists of 29 items including four scales:

- anxious preoccupation – perceiving the disease as something threatening, causing uncontrollable anxiety,
- fighting spirit – perceiving the disease as a challenge, which involves taking actions to combat the disease,
- helplessness / hopelessness – an attitude indicating passive surrender to the disease,
- positive reevaluation – a perception of the disease which, on the one hand, takes into account the seriousness of the situation, and on the other – allows one to find hope and appreciate past and present events in life.

The results of the mini-MAC strategy are in the range of 7–28 points, and the higher the score, the greater the intensity of a given cancer coping strategy. Using the mini-MAC scale, it is possible to also define two coping behaviors: constructive and destructive, resulting from a combination of the above. The constructive behavior includes the strategy of fighting spirit and positive re-evaluation, and the destructive behavior includes the strategy of helplessness / hopelessness and anxious preoccupation. The scale is used to assess adaptation to cancer, which translates into the behavior and emotions of the patient during the treatment and rehabilitation process.

The scale diagnoses adaptation strategies towards the disease: anxious preoccupation, helplessness / hopelessness, fighting spirit, positive re-evaluation. The results obtained from our research were referred to the mean results of analogous groups of patients included in the mini-MAC questionnaire

manual. The results after conversion to standardized scale can be interpreted in the sten scale values from 1–10 sten, where results in the range 1–4 sten are interpreted as low, 5–6 sten as average and results in the range 7–10 sten are considered high.

The health locus of control was measured by the Multidimensional Health Locus of Control Scale (MHLC) by Kenneth A. Wallston, Barbara S. Wallston, Robert DeVellis (1976; 1978) in the Polish adaptation of Zygryd Juczyński (2012), which measures 3 dimensions of the health locus of control: internal, external, i.e., the influence of others, and chance. The value of each of the dimensions is within 6–36 points, and the higher the score, the stronger the belief to which the analysis relates.

Statistical analysis

The study population was divided into subgroups according to the differentiation criteria based on the type of cancer. The obtained results were analyzed statistically with the use of statistical tests (t-student, single factor analysis of variance).

Results

569 patients (346 women and 223 men) aged 19 to 91 (mean age 54) were examined. The most numerous group of studied patients were those with breast cancer (30.05%) (fig. 1), then: patients with cancers of the head and neck (12.48%), reproductive organs (12.48%), the digestive system (12.13%), and male genital (9.84%). The smallest groups were patients with lymphatic system neoplasms (6.68%) and bone neoplasms (2.28%).

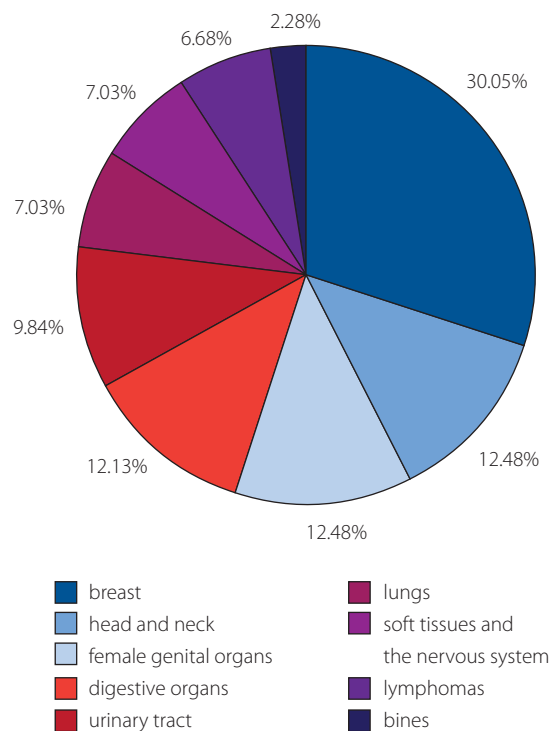


Figure 1. Tumor location

sms (2.28%). Almost 60% of patients (335 people) came for oncological treatment for the first time, while the remaining patients were re-exposed due to recurrence of the cancer. 167 patients (29.35%) were economically active during oncological treatment, 116 patients (20.39%) were on sick leave due to illness, 87 patients (15.29%) were on a disability pension due to disease, and 199 patients were retired (34.97%).

Figure 2 shows the mean intensity of stress coping styles in subgroups based on cancer type. The analysis of the adopted strategies as part of mental adaptation to neoplastic disease in the studied population of patients (fig. 2.) showed the mean value of fighting spirit rated as high, positive reevaluation was also rated high (21.6), anxious preoccupation rated medium (16.02) and helplessness / hopelessness rated low (12.67). The mean result in constructive strategies was 44.31 which corresponds to 7th sten (high intensity) and mean result in destructive strategies was 28.69 which corresponds to 4th sten (low intensity) (confidence level 0.01). Analysis of the level of coping strategies in relation to the treatment stage (fig. 2) showed that the anxious preoccupation was significantly (t-student $p = 0.014$) higher during the first treatment (19.4) than the next (15.41). No statistically significant differences were observed in the level of remaining strategies. The strategy of helplessness and hopelessness achieved a higher value during the next treatment due to recurrence of the tumor and was 12.70, while during the first treatment it was 12.65. The fighting spirit strategy was comparable during the first (22.86) and subsequent oncological treatment (22.5), and the positive reevaluation strategy was similar in the first treatment (21.58) as the subsequent treatment (21.68). Constructive strategies during the first treatment reached 44.63 and during the next treatment 44.14, which translates into 7th sten. The destructive strategies reached a value of 29.10 during the first treatment, and a value of 28.11 during the next treatment, which translates into 4th sten.

Figure 3 presents the coping strategies in subgroups based on cancer type. The analysis of coping strategies in relation to the type of neoplasms (fig. 3) showed that anxious preoccupation was highest in breast cancer (18.1) and lowest in lymphatic system neoplasms (ANOVA $p = 0.003$). The strategy of helplessness and hopelessness achieved the highest value in breast (13.8) and reproductive organ cancers (13.74) (ANOVA $p = 0.003$). The fighting spirit strategy showed the highest value in cancers of the digestive system (23.86) and the lowest value in lung cancers (21.1), however, the observed differences were not statistically significant. The positive re-evaluation strategy was the highest in cancers of the head and neck (22.27), and digestive system (22.06), and the lowest value was found in cancers of the lung (20.85) and the lymphatic system (20.91). The differences were not statistically significant.

Constructive strategies (fig. 3) showed the highest levels in tumors of the digestive system (45.60) and the lowest in lung tumors (42.9). No statistically significant differences between

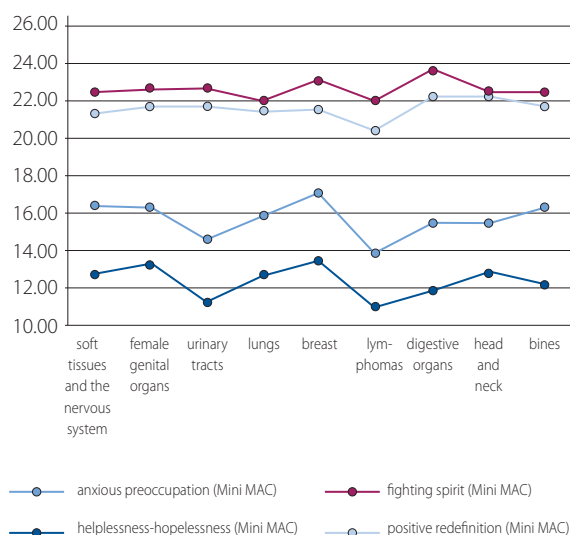


Figure 2. Cognitive coping responses by cancer type

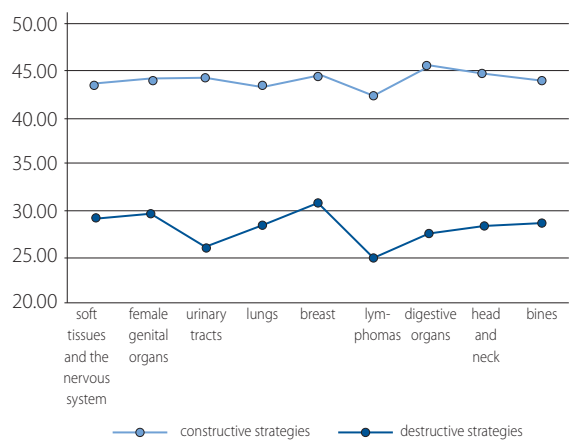


Figure 3. Coping strategies by cancer type

en the groups were present. The highest levels of destructive strategies were achieved in breast cancers (30.68) and cancers of the reproductive organs (29.76), and the lowest values were found in cancers of the lymphatic system (24.92) (ANOVA $p = 0.001$).

Figure 4 shows the health locus of control in subgroups based on cancer type. The analysis of the locus of health control (fig. 4) showed that the mean severity of the internal sense of health control was 24.83 and that the external locus of health control was 26.92, while the belief that health control depends on the influence of chance reached a mean value of 24.17 in the study population. The conviction about internal control (fig. 4) was highest in patients with head and neck (26.8) and lung cancer (25.9), and lowest in patients with cancer of the lymphatic system (23.16) (ANOVA $p = 0.014$).

The belief about external control (fig. 4) was highest in patients with head and neck cancers (28.9) and lowest in patients with lymphatic system tumors (24.55) (ANOVA $p = 0.033$). The belief that health control (fig. 4) depends on chance was

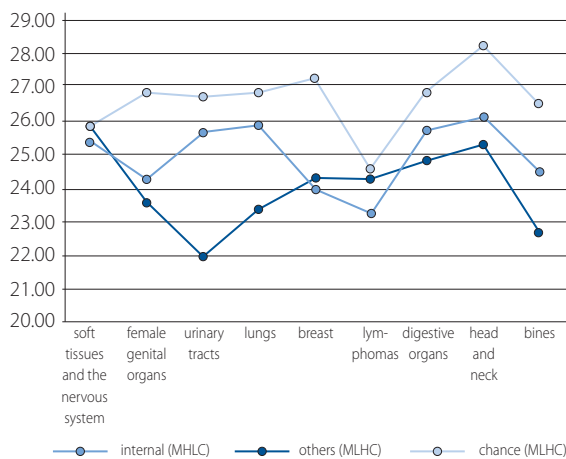


Figure 4. Health locus of control by cancer type

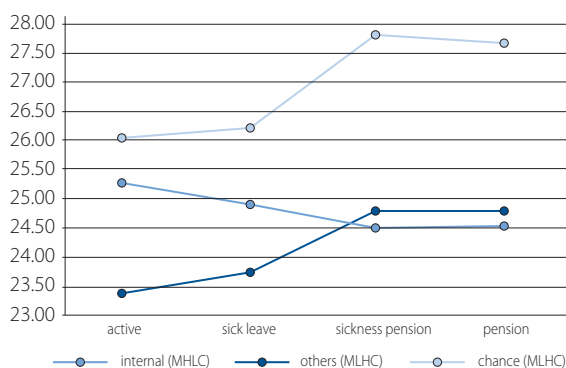


Figure 5. Health locus of control by professional activity

highest in patients with neoplasms of soft tissues and the nervous system (25.98), and the lowest level was achieved in patients with neoplasms of the urinary system (21.8) (ANOVA $p = 0.039$).

Figure 5 shows the dimensions of health locus of control in subgroups based on professional activity. The conviction about internal control (fig. 5) was highest in professionally active patients (25.31) and the lowest in patients who were on a pension (24.51) or retired (24.53) (no statistical significance). Belief about an external control (fig. 5) was highest in patients on a pension (27.78) and the lowest in professionally active patients (26.04) (ANOVA $p = 0.002$). The belief that health control (fig. 5) depends on the case was the highest in patients on disability (24.80) or retired (24.78), and the lowest level was achieved in professionally active patients (23.41) (no statistical significance).

Discussion

Cancer diagnosis and the prospect of oncological treatment have a negative impact on a patient's emotional state, causing an increase of anxiety. The stress associated with the disease requires developing adaptation strategies [15]. Most often, patients run two extreme strategies: constructive and destructive. Patients with a constructive strategy are positive, fight the disease, and are oriented towards a cure. Roesch et al. (2005) [16] found that better mental adaptation to cancer is associated with the use of task-oriented strategies. This result

is analogous to those obtained in the presented study, which shows that the use of adaptive strategies such as focusing on planning or focusing on the positives are associated with a positive attitude towards the disease and, at the same time, with a lower intensity of negative emotions. In the study, the attitude of the fighting spirit was highest in patients with diagnosed cancers of the digestive system, while the attitude of positive re-evaluation was achieved in patients with head and neck neoplasms.

The second, destructive attitude is characterized by anxiety, a sense of helplessness / hopelessness, which translates into a lack of faith in recovery and low involvement in the therapeutic process. A study by Wootten et al. (2007) [17] indicates that focusing on emotions is associated with poorer mental adaptation. A similar result was obtained in the presented study – the use of strategies such as catastrophizing, rumination, and blaming oneself and others is associated with a higher severity of anxiety and a greater tendency to perceive the situation as threatening, and thus with poorer adaptation to the disease. The passive strategy was related to the external locus of the sense of control, which means that the patient has a low sense of their own influence on the situation, and expects that the medical staff will be directive and will take care of them. On the other hand, in the case of failure of oncological treatment, patients hold third parties responsible. In the study, the attitude of helplessness / hopelessness was highest in breast and reproductive organ cancers, and anxious preoccupation was also the highest among breast cancer patients.

High anxious preoccupation and a sense of helplessness / hopelessness in the case of cancers related to female sexual characteristics can have multiple causes. The disease strictly affects the perception of a woman's body, her attractiveness, physicality, quality of life in a sexual sense, and the possibility of having children, as well as disturbing the hormonal balance. It should also be taken into account that cancers related to female characteristics also affect intimate relationships, which may translate into a fear of rejection and loneliness.

A study by Chojnacka-Szawłowska (2012) [3] confirmed that patients initiating constructive strategies of coping with cancer were characterized by a higher quality of life and a better prognosis in terms of both survival and remission periods. These studies also confirmed that active and confrontational strategies have a greater impact on increasing the quality of life than strategies with a predominance of passivity and resignation. The research by Watson (1999) [18] showed that the type of attitude taken by patients towards the disease, as well as the rates of depression, correlate with the survival of patients with neoplastic diseases. Breast cancer patients adopting an attitude of helplessness / hopelessness or showing a high level of depression have a significantly lower quality of life and have a significantly lower chance of 5-year survival. A study by Ośmiałowska (2021) also shows that breast cancer patients choosing constructive strategies of coping with the disease

achieve a higher quality of life score compared to those who chose destructive coping strategies [19].

It was found in the study that professionally active people show the highest sense of internal locus of control and agency, and achieve the lowest values of external sense of health control and the influence of chance. This result indicates that patients working professionally during treatment function better emotionally and have a better network of social support, which ultimately translates into belief in their own agency. This group of patients also shows a lower preoccupation with anxiety and a sense of helplessness / hopelessness compared to patients who are not professionally active for various reasons.

During the first treatment, patients were most often anxious, while during the second treatment, the helplessness / hopelessness strategy was most often presented. Clinically, this translates into the fact that when confronted with a cancer diagnosis, patients need psychological support and education, while during recurrence, therapy very often requires psychiatric treatment due to the development of a depressive syndrome.

The obtained results indicate the good mental adaptation of patients to the disease, especially in its first stage. Thus, the results provide guidance on what actions should be taken into account when planning medical and psychological interventions to support the process of treatment. First, it is worth encouraging patients to deal with the disease in a constructive way – planning further actions, learning about the course of the disease, and the treatment process. It is also worth encouraging patients to look at current events in a broader context, not to treat the current disease as a situation in which they are helpless. When patients are willing to blame themselves or others for the situation, it is worth redirecting their attention to other less stressful events, reevaluating and looking for positives despite the disease. Patients are recommended to join associations of cancer patients, where they will receive support, a corrective positive experience of functioning with the disease, and with others whom they co-create a support group. However, the relationship between acceptance of illness, quality of life, and pain still needs further investigation. It has been constantly confirmed that patients with breast cancer and female and male genital cancers who have a high level of illness acceptance and a positive illness perception display a better quality of life and overall functioning [20–22].

A study by Kulpa et al. (2019) [23] indicates that constructive coping strategies translate into the ability to better coping with illness-related stress, internal locus of health control, higher quality of life, and greater patient confidence in treatment success. Patients with low self-efficacy often have comorbid anxiety and depressive disorders. Anxiety strategies are associated with an external locus of health control, anxiety disorders, and depressive disorders, as well as greater sensitivity to pain and more frequent episodes of intractable pain. The internal locus of control is associated with a sense of empowerment and higher decision-making; this is important because during

treatment, patients often have to make what is referred to as an “informed consent” decision about medical and therapeutic procedures. Patients with an internal locus of control over their health and a high sense of self-efficacy make decisions faster and are consistent in those decisions. Self-efficacy is associated with an internal locus of control and intrinsic motivation, which translates into higher patient engagement in the treatment process and a positive attitude toward it; moreover, it is also associated with lower rates of treatment interruptions or treatment withdrawal due to patient decisions. Analysis of the results from our research shows that the assessment of the type of coping strategies and the health locus of control in cancer patients are important factors influencing their functioning. The finding of maladaptive strategies and the external sense of health control in the patient should be an indication for psychological care because the consequences of such strategies are reactive and anxiety-depressive disorders. This will enable the patient to be provided with clinical assistance before major depressive disorders develop. The possibility of modulating the onset of depressive symptoms, especially in high-risk oncology patients, has been previously noted by Ghanem et al. (2020) [24]. Screening patients with the mini-MAC and MHLC tests should be one of the most important elements in the prevention of depression and anxiety disorders in patients.

Conclusions

- Patients with breast cancer and reproductive organs cancers seem to be at greater risk of developing destructive copying strategies, therefore, extended psychological support has to be considered for those patients.
- Because professionally active patients use more constructive coping strategies, it would probably be beneficial to support oncological patients in staying occupationally active, at least partially.
- Education and psychological support during first treatment should focus on interventions addressing anxiety, while during next treatments coping with helplessness / hopelessness should be taken in account.
- The type of implemented coping strategy and the health locus of control in cancer patients are important factors influencing their functioning during the treatment of the disease.
- Screening patients with the mini-MAC and MHLC tests should be one of the most important elements in the prevention of depression and anxiety disorders in patients.

Conflict of interest: none declared

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