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The Quality of Life in Patients with Head Neoplasm Treated with Radiotherapy and the Incidence of Depression (a preliminary research report)

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Summary

Introduction. The diagnosis of a primary tumor of the central nervous system is a source of huge fear and anxiety for the patient, because the prognosis is usually unfavorable. Very often, cancer is accompanied by depression, which reduces the effectiveness of treatment and worsens the patient's functioning in everyday life.

The aim. The aim of the study is to determine the cause-and-effect relationship between the quality of life and the incidence of depression, as well as the side effects of treatment in people treated with radiation for head cancer.

Material and methods. The study group consisted of 103 patients during treatment in the Radiotherapy Ward of the Specialist Hospital in Nowy Sącz. The research tools were: the WHOQOL-Bref questionnaire, the Beck Depression Scale and a questionnaire of author’s own design regarding patients treated with radiation therapy for head cancer.

Results. The general perception of the quality of life in the studied group was 2.88 points, the general perception of patient’s own health was 1.88 points. The average quality of life was the highest in the environmental field: 62.50 ± 23.21, while the lowest in the physical field: 44.24 ± 28.65.

Conclusions. Both the overall assessment of the quality of life in the assessed areas and the perception of health by patients treated with radiation therapy for head cancer are low.

Key words: head cancer, depression, quality of life
Introduction
Radiation therapy is a very effective and most commonly used method of cancer treatment, and at the same time it is one of the factors that cause stress in the oncological patient. This is associated with anxiety and the occurrence of side effects that can significantly affect the quality of life [1]. Treatment methods used in oncology are usually very aggressive, which causes anxiety in patients. As Walden-Gałuszko emphasizes, not knowing the side effects and their consequences as well as the method of treatment is the most common reason for patient’s anxiety. The quality of life in patients treated with radiation therapy depends on many factors. Patient’s ability to quickly adapt mentally to the situation has a significant impact. The ability to deal with side effects of early and late treatment is also of great importance during the treatment [2].

Radiotherapy is usually a kind of treatment that requires the patient to stay in an oncological center for several weeks, which causes anxiety in the patient. For a long time of the treatment, the patient experiences discomfort in life caused by undesirable symptoms of the radiation therapy [3]. Irradiation treatment is associated with a reduced intensity of side effects compared to chemotherapy [4]. Diagnosis of cancer raises the patient’s fear, strong anxiety, a sense of danger, and uncertainty of further life. The idea of this disease, which is common in society, evokes negative emotions [2]. On the one hand, the quality of life of a cancer patient is determined through the prism of the ailments or fears that accompany the disease, on the other hand - faith in healing and reduction of the discomfort [5]. When diagnosing cancer, it seems necessary to start treatment as soon as possible.

For most patients, just staying in hospital is a big psychological problem and experience. Patient’s value system is often radically changed. The onset of the illness means that the person is at the level of basic needs such as health, life and psychosomatic comfort. Safety and physical comfort are usually provided by the hospital, but the need for mental comfort is often not met. This is usually caused by a lack of communication between the patient and the medical staff. Providing information on the state of health, the course of the disease, treatment and side effects, as well as establishing and maintaining the emotional contact are the factors responsible for the patient’s mental comfort. Another factor that reduces the quality of life of a hospitalized patient is the feeling of helplessness and passivity [2]. In scientific research, the basic and very often the only criteria assessing the effectiveness of oncological treatment were the survival time and remission period; currently attention is
paid to the impact of the disease and its treatment on the patient's functional and psychological condition and their place in society [5].

The assessment of the quality of life of patients treated oncologically is of great interest in recent years. Cancer and depression are the causes of patient’s suffering [6]. The concept of depression in the aspect of cancer is very important in many aspects. One of them is the occurrence of depression and mood disorders as a cause or factor of cancer [7,8]. In such patients there are disturbances and blockades regarding cooperation in the treatment process [6]. The incidence of depression in patients with cancer is 3.5 times higher than in patients with diabetes, hypertension, heart disease, rheumatic arthritis, chronic lung disease or stroke [9].

The aim of the study was to determine the cause-and-effect relationship between the quality of life and the frequency and severity of depression and the side effects of radiation therapy in people treated for head cancer.

In order to achieve the aim of the work, the following research questions were asked:

1. How do patients treated with radiation for head cancer assess their quality of life?
2. What is the relationship between the assessment of the quality of life and the occurrence of depression in patients treated with radiation therapy for head cancer?
3. What is the relationship between the quality of life and the occurrence of side effects in the course of radiation therapy in patients treated for head cancer?
4. What is the relationship between the quality of life and the patient's attitude to the disease?

**Material and methods**

The research was conducted in the Radiotherapy Ward of the Specialist Hospital J. Śniadeckiego in Nowy Sącz. The diagnostic survey method was used. To assess the quality of life, the Polish version of the standardized WHOQOL-Bref questionnaire developed by Laura Wołowicka and Krystyna Jaracz, containing 26 questions, was used [10]. To assess the severity of depression, the Beck Depression Scale was used, consisting of 21 questions considering the most common symptoms of depression, whose translation and initial adaptation was undertaken by Parnowski and Jernajczyk [11]. The third tool was author’s own questionnaire focused on a group of patients treated with radiation for head cancers. The study group consisted of 103 adults - over 18 years of age, in whom radiotherapy was performed using an
accelerator emitting photon radiation with the following energies: X6MV, X15MV, and electrons: E6MeV, E9MeV, E12MeV, E15MeV, E18MeV, E22MeV. The accelerator was equipped with Multileaf Colimators enabling conformal therapies in any location and IMRT (Intensity Modulated Radiotherapy) therapies in step and shot and in sliding window technique [12]. In the case of multifocal metastases to the brain, the whole brain was irradiated. In primary lesions or single brain metastases, the area of the lesion was irradiated with a margin along with edema or the tumour bed. In the case of irradiation of the whole brain (palliative treatment), the hypothalamus was not protected. By contrast, in the case of irradiation of the primary tumor area (if possible), the minimum dose per hypothalamus was used.

The participation in the study was voluntary, the patients were informed about the purpose of the study, and they verbally agreed to take part in it.

The $\chi^2$ independence test, the Mann-Whitney test and the Kruskel-Wallis test were used in the statistical analysis of the results. The choice of nonparametric tests was dictated by the lack of normality of variables (verified with the Kolmogorov-Smirnov and Shapiro-Wilk tests) or by the lack of group equivalence (verified with the $\chi^2$ compliance test). The significance level of $p<0.05$ was adopted. The calculations were carried out using the IBM SPSS Statistics 20 program.

**Results**

103 people aged 20–70 were examined (53.4% men; 46.6% women). The largest group among all the respondents were patients between 41 and 50 years of age (34.0%). Over half of the respondents (55.3%) declared having secondary education. Few respondents (8.7%) had higher education. Analyzing the marital status of the respondents, it was found that 68.9% of them were married. Single people accounted for only 18.4% of the respondents, and widowed patients constituted 12.6% of the respondents. Most frequently, respondents were diagnosed with glioblastoma multiforme (ICD-O94) (34.0%) or metastatic tumor (ICD-O94) (31.1%) into the central nervous system. Less frequent was anaplastic astrocytoma (ICD-O94) (14.6%), anaplastic oligospermia (ICD-O94) (10.7%), germinal spinal cord (ICD-O94) (6.8%) or meningioma (ICD-O95) (2.9%).

Radiotherapy at a dose of 20 Gy in fractions of 4 Gy was used in 29.1% of patients and lasted 1 week. The most numerous group of 37.9% were patients treated for 2-3 weeks with 30 Gy of irradiation in 3 Gy fractions. 24.3% of patients diagnosed with meningioma and/or
patients who did not complete the treatment were treated for 4 to 5 weeks. Treatment with a dose of 60 Gy, in fractions of 2.0 Gy, which lasted 6 weeks, was used in 8.7% of the patients.

The most common effects of radiation were headaches (68.0%). Slightly less often, the subjects suffered from nausea (44.7%) or hair loss (42.7%). Vomiting occurred in 25.2% of the respondents, and 16.5% of the respondents did not experience radiation side effects. Few patients experienced balance disorders (14.6%) or blurred vision (5.8%). Only a few of the respondents (13.6%) used the help of a psychologist from the moment of diagnosis to the present. Most respondents (86.4%) did not benefit from such assistance.

The analysis of own research showed that the respondents rated their quality of life higher (2.88) than the quality of health (1.88). In both cases, the self-assessment of the quality of life and health was very low (1-5 points scale) (table I).

The highest quality of life was observed in the environment field (62.50±23.21), a lower one in the social field (50.16±31.35). The lowest indicator of the quality of life was observed in the psychological field (46.93±31.73) and the physical field (44.24±28.65) (table II).

On the basis of the Beck scale it was found that 32.0% of people did not have symptoms of depression. Mild depression was observed in the group of 20.4% of respondents. Moderately severe depression was found in 34.0% of respondents, and very severe depression occurred in 13.6% of the respondents. It was shown that the lack of depression in 44.2% of the respondents or mild depression in 27.9% of the respondents was significantly more common in patients aged 20-40 years. In 48.6% of people aged 41-50 and 40.0% of people over 51 years of age, moderate depression was more frequent than in the rest of the respondents.

The analysis of author’s own research shows that respondents without depression rated their overall quality of life the highest (4.30), slightly lower did the respondents with mild depression (3.67), the lowest – the respondents with moderately severe (1.57) or very severe depression (1.64). The respondents rated their quality of health in a similar way. The respondents without depression rated their quality of life the highest (2.88), lower (1.81) – the respondents with mild depression, and those with moderately severe (1.34) or severe depression (1.00) rated their quality of health the lowest. Statistical analysis showed a relationship between depression and satisfaction with one's life and health (p < 0.0001). In this respect, people without depression showed a statistically significantly higher level of overall perception of quality of life and health than people with depression (table III).
It was shown that the lower was the severity of depression, the higher was the quality of life in individual subscales. Author’s own research shows that the quality of life in each of the assessed fields was significantly better in people without depression than in those with depression. As a result of the analysis, the differences found were statistically significant (p < 0.0001) (table IV).

The analysis of own research showed that respondents who had headaches as a side effect of radiation therapy rated higher their overall quality of life (3.10) and their quality of health (2.10) than respondents who did not have headaches. Those showed lower overall quality of life (2.42) and quality of health (1.42). Relationships were observed in each of the fields of the quality of life. People with headaches obtained average values of the quality of life in individual subscales at the level: in physical field – 47.50, in the psychological field – 50.24, in the social field – 55.24, in the environmental field – 65.67; and these values were higher than in people who did not have headaches. In the case of other side effects: vomiting, nausea, hair loss, and vision and balance disorders in patients treated with radiation for head tumors, similar relationships were observed as in the case of the previously described symptom, which was the headache. Both the respondents who did not have side effects of the radiation therapy and those who did, assessed their overall quality of life and health in a similar way. A statistically significant dependence on all analyzed side effects of radiotherapy was found in the general perception of the quality of life and health as well as in the social and environmental field. The obtained results concerning the most statistically significant relationships between variables at the significance level of p < 0.0001 revealed a relationship between hair loss and balance disorders and the subjective assessment of the quality of life and health, and the quality of life for individual subscales (table V).

It was shown that respondents who had accepted their illness perceived their quality of life the highest (4.33), which was higher than in respondents who somehow got used to it (2.85) or did not accept it (1.39). When analyzing the results of own research, the overall perception of the quality of health was similar. Those who had accepted their disease had a higher score (2.64) than those who were used to the disease (1.85). The overall perception of the quality of health was rated the lowest by respondents who had not accepted their disease (1.13). The differences were statistically significant (table VI).

It was found that the patients who had fully accepted their illness had the highest quality of life in each of the fields, a lower quality of life had the respondents who had got
used to the disease, and the lowest one had the patients who had not accepted their disease. Higher quality of life in particular fields was demonstrated by people accepting their illness: in the physical field: 72.75, in the psychological field: 80.18, in the social field: 79.55, and in the environmental field: 84.28. The respondents who had not accepted their disease had the lowest quality of life in all field: in the physical field: 17.51, in the psychological field: 15.86, in the social field: 20.97, and in the environmental field: 40.83. In terms of the acceptance of the disease, the compared groups are the most diverse in the psychological field. While analyzing the obtained test results, there was a statistically significant relationship between the acceptance of the disease and the individual fields, which was p < 0.0001 (table VII).

Discussion

The Scientific Council of the National Cancer Registry informs that in 2016 there was an increase in cancer incidence by about one thousand cases compared to 2015. This number also systematically increases in relation to cases of cancers of the central nervous system [13]. One of the methods of treating cancers of the central nervous system is the use of radiation therapy [14]. Very often, along with the occurrence of cancer, patients at various stages of the disease are accompanied by anxiety, anger and depression, which negatively affects the healing process and affects the quality of life [15].

Cancers of the central nervous system are not very common. However, the most common ones are usually of low favorable prognosis. According to the Scientific Council of the National Cancer Registry in Warsaw, cancer occurrence is estimated at 2% per annum [16]. Dziadziuszek and Fjuth indicate that the incidence of glioblastoma multiforme is as much as 40%, while metastatic tumors account for 15–20% in patients with all cancers [15]. Own research conducted in the radiotherapy ward confirms the fact that the most common cancers of the central nervous system are glioblastoma multiforme 34.0% and metastatic tumors to the central nervous system 31.1%.

Kowalska and Szemik’s research conducted among 225 people aged 25–44 using the WHOQOL-BREF questionnaire showed that the average values of the quality of life for individual subscales were at the level: for the physical field – 53.5, for the psychological field - 62.8, for social relations - 70.0, and for the environmental field – 57.3 [17]. Kowalska et al. also assessed the quality of life of 746 healthy, professionally active people aged 45–60. The
average of the individual fields was: somatic – 54.4, psychological – 60.8, social – 68.3 and environmental – 57.6 [18]. Patients’ quality of life deteriorates after the start of radiation and this condition persists up to three months after the end of the treatment, as reported by Kozak et al. [19].

The analysis of the results of own research showed that cancer and the treatment that is used significantly affect the quality of life of respondents in the physical, psychological and social field. The quality of life in the individual fields was as follows: the best results were obtained in the field of social relations – the average: 62.50; in the social field – the average: 50.16; in the environmental field – the average: 46.93; in the physical field – the average: 44.24.

The occurrence of depression during cancer is a fairly common phenomenon. Studies by Mitchell et al. on the occurrence of depression during cancer show that the co-occurrence of cancer and depression exceeds 50% in many cases [20]. Onitilo et al. note in their publication that regardless of the etiology, the occurrence of depression in cancer patients has an additional impact on the results of the treatment. Patients with depression who are diagnosed with cancer experience a lower quality of life, their cooperation with medical staff is worse and the patients are hospitalized longer [6]. The incidence of depression in patients treated with irradiation of the central nervous system is confirmed by author’s own research. Based on the Beck Depression Scale, it was found that 32.0% of the respondents had no symptoms of depression. One in five patients 20.4% had mild depression. Moderately severe depression was found in 34.0% of the people, and 13.6% of the respondents had very severe depression. The results of research by Mitchell et al. conducted in a group of 279 oncological patients revealed the occurrence of major depression in 12.7%, and depressive disorders in 29.6% of the subjects [21]. According to the authors, the diagnosis of depression in cancer patients should be more frequently analyzed, as depression in cancer patients can undoubtedly have a negative impact on the treatment process as well as on their cooperation with the medical staff.

Treating the central nervous system with irradiation is very often associated with the occurrence of various types of side effects. Ionizing radiation affects both cancerous and healthy tissues. Author’s own research carried out in the radiotherapy ward indicates that the most common effects of radiation were headaches 68.0%. Slightly less frequently, the respondents had nausea 44.7% or hair loss 42.7%. In the study of Kapela et al., 20.7% of
respondents experienced pain during chemotherapy [22]. A cancer patient undergoing ionizing radiation treatment is an extremely suffering person. Nowak et al. show that pain management results in better psychological adaptation to the disease, which means coping with its strict effects, and in looking at the future – dealing with changes in the quality of life [23]. Author’s own research has shown that the side effects of radiation therapy: headache, vomiting, nausea, hair loss, vision and balance disorders significantly affect the overall perception of the quality of life and health.

Assessing the quality of life, and especially its psychological sphere, it is important to adapt to the disease, i.e. the level of its acceptance, which is emphasized by Kurpas et al. [24]. In the studies by Smoleń et al., the adaptation to the disease in the studied group of cancer patients was at a medium level, however, better adaptation was demonstrated by people who did not experience pain and assessed their health well [25]. Szczepańska-Gieracha et al. indicate that among 71 patients with malignant neoplasms, strategies of coping with neoplastic disease may change with the time that elapses since the start of the treatment [26]. Research on the acceptance of cancer was carried out by Smoleń et al. on a group of 229 randomly selected respondents. It was demonstrated that the higher is the degree of cancer acceptance, the lower is the severity of the helplessness-hopelessness relationship [27]. Ślusarska et al. assessed the level of the acceptance of the disease and quality of life during treatment of patients with lymphoma using the WHOQOL-BREF questionnaire. Among 105 respondents, 7.6% of them showed a very low level of the acceptance, and 15.2% – a high level. The higher was the level of acceptance, the better was the quality of life of patients [28].

In author’s own research, correlations were found between the level of the acceptance of the disease and the individual general perception of the quality of life and health and its individual areas.

Cancer puts people in a difficult position. Physicality, mentality, community and human spirituality are burdened. The reason for this can be any changes that occur in the patient’s body, as well as social factors. Very often, oncological diseases are accompanied by depression and anxiety, which significantly reduces the patient’s quality of life and may affect the course of the treatment. Having the necessary knowledge about all stages of the treatment and recovery, in both the physical and mental context, as well as possible actions of the patient and their family, can significantly affect the patient’s higher self-esteem. The state of health of the patient treated with head irradiation for metastatic tumors often
deteriorates rapidly, which is why J. Zapała et al. drew attention to the importance of health education that is not only the transfer of knowledge and skills, but also the creation of motivation to change behavior in order to have more effective treatment [29]. At present, there are few publications regarding the quality of life of patients undergoing radiation therapy for cancers of the central nervous system.

Results

1. Respondents treated with radiation for head cancers rated their quality of life higher than their quality of health. In both cases, the self-assessment of the quality of life and health was very low.

2. Patients who did not have symptoms of depression rated their quality of life higher. Similarly, the higher was the assessment of the quality of health, the lower was the level of depression. It was shown that the higher was the quality of life in specific fields, the lower was the severity of depression in patients.

3. The intensity of side effects of radiation therapy for head tumors affects the assessment of the quality of life in specific fields. The greater was the intensity of side effects of radiation therapy, the lower was the quality of life in all fields. Patient education carried out by a radiotherapy nurse referring to how to deal with radiation reactions may significantly affect the assessment of the quality of life.

4. The acceptance of the disease affects the perception of the quality of life. Patients accepting their disease assessed their quality of life and health the highest, and those who did not accept the disease – the lowest. It was shown that the highest quality of life in every field had the patients who fully accepted their disease, a lower one those who got used to the disease, and the lowest one the patients who did not accept the disease.

Conflict of interest: none declared

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References

1. Kozakiewicz B. Nowotwory złośliwe narządu rodnego. Nowa Med. 2003, 122-127.
2. Walden-Gałuszkó K. Psychoonkologia. Polskie Towarzystwo Psychiatryczne. Kraków 2000, wyd. 1, s.23-43.
3. Faller H, Olshausen B, Flentje M. Emotional distress and Leeds for psychosocial support among breast cancer patients at start of radiotherapy. Psychother Psychosom Med Psychol 2003, 53: 229-235.
4. Jacobsen P, Andrykowski MA, Thors CL. Relationship of catastrophizing to fatigue among women receiving treatment for breast cancer. J Consult Clin Psychol 2004, 72: 355-361.
5. Jassem J. Paliatywna radioterapia, chemioterapia i leczenie hormonalne. [w:] Leczenie objawowe w chorobie nowotworowej – w okresie daleko zaawansowanym i terminalnym. Zapaśnik A, Żylicz Z. (red). Akademia Medyczna w Gdańsku, Gdańsk 1993.
6. Onitilo AA, Nietert PJ, Egede LE. Effect of depression on All-cause mortality In adults with cancer and differentia effects by cancer site. Gen. Hosp. Psychiatr. 2006, 28: 396-402.
7. Jabłoński M, Furgał M, Dudek D, Zięba A. The position of psychooncology in contemporary psychiatry. Psychiatria Pol. 2008, 42(5):749-765.
8. Possel P, Adams E, Valentine JC. Depression as risk factor for Breast cancer: investigating limitations In the literature. Cances Causes Control 2012, 23: 1223-1229.
9. Polsky D, Doshi JA, Marcus S, et al. Long-term risk for depressive symptoms after a medical diagnosis. Arch. Intern. Med. 2005, 165: 1260-1266.
10. Wołowicka L, Jaracz K. Wybrane problemy metodologii badań jakości życia związane ze stanem zdrowia. [w:] Jakość życia w naukach medycznych. Wołowicka L (red). Wyd. Ucz. AM im. Karola Marcinkowskiego w Poznaniu, Poznań 2001: 233-258.
11. Zawadzki B, Popiel A, Pragłowska E. Psychometric Properties of the Polish Version of the Aaron T. Beck’s Depression Inventory BDI-II. Psychologia-Etologia-Genetyka. 2009, 19: 71-95.
12. Oficjalna strona internetowa Szpitala Specjalistycznego im. J. Śniadeckiego w Nowym Sączu. http://www.szpitalnowysacz.pl/zaklad-radioterapii (dostęp 06.05.2018).
13. Wojciechowska U, Didkowska J. Zachorowania i zgony na nowotwory złośliwe w Polsce. Krajowy Rejestr Nowotworów, Centrum Onkologii - Instytut im. Marii Skłodowskiej – Curie. http://onkologia.org.pl/raporty (1.03.2019).
14. Tao Y, Daly-Schweitzer N, Lusinchi A, Bourhis J. Advances in radiotherapy of head and neck cancers. Current Opinion in Oncology 2010, 22: 194-199.
15. Szatkowska K, Dreger E, Basińska MA. The sense of coherence and the attachment to God among oncological patients and their quality of life. Psychoonkologia 2016, 20 (1): 37–46.
16. Dziaduszko R, Fijuth J. Epidemiologia i etiologii. [w:] Nowotwory ośrodkowego układu nerwowego. Dziaduszko R, Fijuth J. (red.) 2013, 1: 36–37. http://onkologia.zalecenia.med.pl (27.02.2019)
17. Kowalska M, Humeniuk M, Danso F et al. Quality of life of occupationally active people, aged 45–60, living in the polish industrial region (silesian agglomeration). Med Pr 2011, 62(5): 455-463.
18. Kowalska M, Szemik S. Quality of life in adult inhabitants of Silesian voivodeship, aged 25-44 years – preliminary results. Probl Hig Epidemiol 2016, 97(2): 172-176.
19. Kozaka J, Senkus-Konefka E, Kowalczyk A. et al. Wpływ amifostyny na jakość życia chorych na nowotwory głowy i szyi otrzymujących radioterapię. Reports of Practical Oncology and Radiotherapy 2003, vol.8, 2: 345-346.
20. Mitchell AJ, Lord K, Symonds P. Which depressive symptoms are indicative of DSMIV depression In cancer settings? An analysis of the diagnostic significance of somatic and non-somatic symptoms. J. Affect. Disord. 2012, 138: 137-148.
21. Mitchell AJ, Chan M, Bhatti H, et al. Prevalence of depression, anxiety and adjustment disorders In oncological, haematological and palliative care settings: a meta-analysis of 94 interview-based studies, Lancet Oncology 2011, 12: 160-174.
22. Kapela I, Bąk E, Krzemińska SA, 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, 26(1): 53-61.
23. Nowak A, Babiarczyk B, Skoczylas K. The effect of pain control and management strategies on psychological adaptation to cancer. Journal of Public Health, Nursing and Medical Rescue 2018, 16, 2: 120–123.
24. Kurpas D, Bąk E, Seń M. et al. Quality of life in patients of the interventional cardiology unit. Family Medicine and Primary Care Review 2014, 16, 2: 120–123.
25. Smoleń E, Słysz M, Jarema M. i wsp. Czynniki warunkujące styl przystosowania do choroby u pacjentów leczonych onkologicznie. Journal of Education, Health and Sport. 2017, 7(08):1715-1732.
26. Szczepańska-Gieracha J, Malicka I, Rymaszewska J, Woźniowski MP. Psychological adjustment of women after oncological surgery and at the end of treatment. Contemporary Oncology 2010, 14 (6): 403–410.
27. Smoleń E, Jarema M. Hombek K. i wsp. Acceptance and adaptation to the disease in patients treated oncologically. Problemy Pielegnjarstwa 2018, 26 (1): 37–43.
28. Ślusarska B, Nowicki GJ, Serwata M. Level of disease acceptance and quality of life in people with lymphoma. Palliative Medicine . 2016, Vol. 8 Issue 2, pp. 88-95.
29. Zapala J, Zawadzka B, Pyk M. Cancer and diabetes – similarities and differences in prevention. Probl Hig Epidemiol 2018, 99 (3): 205-210.
**Table I.** Individual overall perception of the quality of life and health

|        | Individual overall perception of the quality of life | Individual overall perception of the quality of health |
|--------|------------------------------------------------------|-------------------------------------------------------|
| Average| 2.88                                                 | 1.88                                                  |
| Me     | 3.00                                                 | 2.00                                                  |
| SD     | 1.41                                                 | 0.97                                                  |

**Table II.** The quality of life of patients treated for head cancer with radiation therapy

|                        | Physical field | Psychological field | Social field | Environment |
|------------------------|----------------|--------------------|--------------|-------------|
| Average                | 44.24          | 46.93              | 50.16        | 62.50       |
| Me                     | 39.29          | 41.67              | 41.67        | 59.38       |
| SD                     | 28.65          | 31.73              | 31.35        | 23.21       |
| Min.                   | 0              | 4                  | 0            | 16          |
| Max.                   | 89             | 96                 | 100          | 94          |

**Table III.** Individual perception of the quality of life and health

| Depression (Beck scale) | Individual overall perception of the quality of life | Individual overall perception of the quality of health |
|-------------------------|------------------------------------------------------|-------------------------------------------------------|
| Without depression      | Average 4.30                                          | 2.88                                                  |
|                         | SD 0.47                                              | 0.86                                                  |
| Mild depression         | Average 3.67                                          | 1.81                                                  |
|                         | SD 0.86                                              | 0.40                                                  |
| Moderately severe       | Average 1.57                                          | 1.34                                                  |
| depression              | SD 0.70                                              | 0.68                                                  |
| Very severe depression  | Average 1.64                                          | 1.00                                                  |
|                         | SD 0.50                                              | 0.00                                                  |
|                |                |                |                |
|----------------|----------------|----------------|----------------|
| In total       | Average        | 2.88           | 1.88           |
|                | SD             | 1.41           | 0.97           |
| <p>            |                | <0.0001        | <0.0001        |

**Table IV.** The quality of life and depression in patients treated for head cancer

| Depression (Beck scale) | Physical field | Psychological field | Social field | Environment |
|-------------------------|----------------|---------------------|--------------|-------------|
| Without depression      |                |                     |              |             |
| Average                 | 78.03          | 84.97               | 87.37        | 88.45       |
| SD                      | 7.37           | 8.59                | 7.55         | 6.42        |
| Mild depression         |                |                     |              |             |
| Average                 | 52.21          | 54.56               | 58.73        | 69.35       |
| SD                      | 10.13          | 14.90               | 11.92        | 9.04        |
| Moderately severe       |                |                     |              |             |
| depression              |                |                     |              |             |
| Average                 | 21.22          | 21.79               | 23.81        | 43.21       |
| SD                      | 12.49          | 10.98               | 11.81        | 10.21       |
| Very severe depression  |                |                     |              |             |
| Average                 | 10.20          | 8.63                | 15.48        | 39.29       |
| SD                      | 8.03           | 3.45                | 13.81        | 19.02       |
| In total                |                |                     |              |             |
| Average                 | 44.24          | 46.93               | 50.16        | 62.50       |
| SD                      | 28.65          | 31.73               | 31.35        | 23.21       |
| <p>                     |                | <0.0001             | <0.0001      | <0.0001     | <0.0001     |

**Table V.** The relationship between the quality of life and the side effects of radiation treatment

| Side effects | Occurrence | Average and deviation | Individual overall perception of the quality of life | Individual overall perception of the quality of health | Physical field | Psychological field | Social field | Environment |
|--------------|------------|-----------------------|-----------------------------------------------------|------------------------------------------------------|----------------|---------------------|--------------|-------------|
| Head-        | No         | Average               | 2.42                                                | 1.42                                                 | 37.34          | 39.90               | 39.39        | 55.78       |
|                  | SD   | 0.50 | 28.19 | 29.57 | 30.64 | 26.68 |
|------------------|------|------|-------|-------|-------|-------|
| **Ache**         |      |      |       |       |       |       |
| Yes              | 1.56 | 0.50 | 28.19 | 29.57 | 30.64 | 26.68 |
| Average          | 3.10 | 2.10 | 47.50 | 50.24 | 55.24 | 65.67 |
| SD               | 1.29 | 1.07 | 28.48 | 32.38 | 30.60 | 20.85 |
| **p**            | 0.0208 | 0.0027 | 0.0877 | 0.0714 | 0.0168 | 0.0422 |
| **Vomiting**     |      |      |       |       |       |       |
| No               |      |      |       |       |       |       |
| Average          | 3.19 | 1.99 | 51.02 | 52.44 | 57.03 | 68.63 |
| SD               | 1.21 | 0.87 | 24.17 | 29.52 | 28.20 | 18.77 |
| Yes              | 1.96 | 1.58 | 24.18 | 30.61 | 29.81 | 44.35 |
| Average          | 1.56 | 1.21 | 31.82 | 33.00 | 31.90 | 25.88 |
| SD               | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  |
| **p**            | 0.0001 | 0.0022 | <0.0001 | 0.0001 | <0.0001 | 0.0001 |
| **Nausea**       |      |      |       |       |       |       |
| Yes              | 3.33 | 2.05 | 56.39 | 58.85 | 62.43 | 71.44 |
| Average          | 2.33 | 1.67 | 29.19 | 32.16 | 34.96 | 51.43 |
| SD               | 1.33 | 1.03 | 25.23 | 27.01 | 27.14 | 21.17 |
| **Vision disorder** |    |      |       |       |       |       |
| Yes              | 3.00 | 1.94 | 45.66 | 48.28 | 51.72 | 63.66 |
| Average          | 1.00 | 1.00 | 21.43 | 25.00 | 25.00 | 43.75 |
| SD               | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  |
| **p**            | 0.0006 | 0.0088 | 0.0686 | 0.2520 | 0.0460 | 0.0157 |
| **Balance disorder** | |      |       |       |       |       |
| Yes              | 3.20 | 2.03 | 49.84 | 51.94 | 55.30 | 67.05 |
| Average          | 1.00 | 1.00 | 11.43 | 17.50 | 20.00 | 35.83 |
| SD               | 0.00 | 0.00 | 9.47  | 6.34  | 4.23  | 8.34  |
| **p**            | <0.0001 | <0.0001 | <0.0001 | 0.0006 | <0.0001 | <0.0001 |
| **Hair loss**    |      |      |       |       |       |       |
| Yes              | 2.24 | 1.47 | 29.72 | 31.78 | 34.04 | 51.64 |
| Average          | 3.75 | 2.43 | 63.72 | 67.23 | 71.78 | 77.06 |
| SD               | 0.78 | 0.82 | 18.90 | 23.08 | 23.86 | 16.08 |
Table VI. Individual perception of the quality of life and the acceptance of the disease

| The acceptance of the disease | Average | SD | Average | SD | Average | SD | Average | SD | Average | SD | Average | SD | p     | p     |
|-------------------------------|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|-------|-------|
| I accept the disease          | 4.33    | 0.69 | 2.64    | 1.06 |        |    |        |    |        |    |        |    | <0.0001 | <0.0001 |
| I do not accept the disease   | 1.39    | 0.50 | 1.13    | 0.34 |        |    |        |    |        |    |        |    |        |    |
| I feel accustomed to the     | 2.85    | 1.04 | 1.85    | 0.74 |        |    |        |    |        |    |        |    |        |    |
| disease                      |         |     |         |    |        |    |        |    |        |    |        |    |        |    |
| In total                     | 2.88    | 1.41 | 1.88    | 0.97 |        |    |        |    |        |    |        |    |        |    |
| p                            |        |     | <0.0001 |   |        |    | <0.0001 |   |        |    |        |    |        |    |

Table VII. The quality of life and the acceptance of the disease

| The acceptance of the disease | Physical field | Psychological field | Social field | Environment |
|-------------------------------|----------------|---------------------|--------------|-------------|
| I accept the disease          | 72.51          | 80.18               | 79.55        | 84.28       |
| SD                            | 14.87          | 16.24               | 17.32        | 9.49        |
| I do not accept the disease   | 17.51          | 15.86               | 20.97        | 40.83       |
I feel accustomed to the disease.

|       | SD       | 10.65 | 8.96 | 15.35 | 13.33 |
|-------|----------|-------|------|-------|-------|
| Average |          | 41.58 | 43.48 | 48.50 | 61.30 |
| SD    |          | 25.35 | 25.65 | 27.43 | 20.82 |

In total

|       | SD       | 28.65 | 31.73 | 31.35 | 23.21 |
|-------|----------|-------|-------|-------|-------|
| Average |          | 44.24 | 46.93 | 50.16 | 62.50 |
| p     |          | <0.0001 | <0.0001 | <0.0001 | <0.0001 |