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EMOTIONAL AND SOCIAL FUNCTIONING ASPECTS OF WOMEN UNDERGOING CHEMOTHERAPY AND MASTECTOMY WITH VARIED TIME ELAPSES FROM TREATMENT COMPLETION

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SUMMARY

Background: The aim of the study was a comparison of two groups of women who had suffered from breast cancer in the past, selected on the basis of the time that had elapsed since treatment completion (<7 and >7 years). The specific areas of interest were the quality of life, sense of control, and level of depression.

Material/ Methods: Results from 37 women were analysed. The average age in the research sample was 57. The study was conducted with the use of EORTC QLQ-C30, MHLC, and the Depression Assessment Questionnaire.

Results: Women for whom the time elapse since the completion of anticancer treatment was no more than 7 years have a more negative assessment of the quality of life aspects, that is physical and social functioning, in comparison to persons in whose case the adaptation time to changes, following cancer and treatment, was longer (more than 7 years). Those with a shorter period elapsed since the completion of anticancer therapy hold stronger beliefs concerning their own influence on their health in comparison to women who have not undergone oncological treatment for at least 7 years. The author's own research highlights a trend pertaining to differences in the intensity of experiencing guilt and anxiety between the groups. However, it requires further research involving a larger study group.

Conclusions: Despite the progress in the diagnostics and treatment of breast cancer, patients with this type of cancer still experience long-term subjective difficulties in areas making up their physical, mental, and social well-being. The research illustrates the differences in the functioning of women depending on the time that has elapsed since the completion of anticancer treatment.

Keywords: quality of life, depression, chemotherapy, mastectomy, breast cancer

INTRODUCTION

Breast cancer is the most commonly diagnosed cancer in women (Nourelhouda et al. 2021), detected in 22% of all registered new cases (Smagaet al., 2014; Wojciechowska et al., 2020). The 5-year survival rate among patients with malignant breast cancer has slightly increased in the first decade of the 21st century: from 75.0% in the years 2000-2002 to 77.2% in patients diagnosed in the years 2003-2005. There are almost 70 thousand people living with a diagnosis of breast cancer made within the last 5 years. The number of deaths resulting from breast cancer remains at the same level, which means that there is an increasing number of women in Poland living with this disease (Smaga et al., 2014; Wojciechowska et al., 2020).

The cured patients are divided into two groups: persons fully cured without any visible effects of cancer and persons who have become disabled as a result of the treatment. Cured cancer patients have to adjust to the new living conditions. They struggle with multiple physical, psychosocial, and existential consequences of the disease (de Walden-Gałuszko, 2012; Dorfmüller & Dietzfelbinger, 2011; Rogiewicz, 2015).

After the diagnosis and treatment commencement, numerous changes take place in a woman's life in a variety of its areas. The negative impact of cancer on physical attractiveness, disruption of partner relationship, and low self-esteem may in consequence lead to a lowered mood and depression (Pytka & Spych, 2012).

The surgery involving the removal of breasts and the connected lymphatic nodes may be the reason for lymphedema, decreased muscle strength, and motor disorders. It results in pain and difficulty with lifting objects, subsequently leading to limitations in everyday functioning (Jassem & Krzakowski, 2009; Pytka & Spych, 2012).

The cured cancer patients are characterised by long-term consequences of anticancer treatment in the form of fatigue, general weakness, and lower life forces in comparison to women who are at the diagnosis stage (Andrykowski et al., 1998). The treatment changes the perception of a woman's own body and self-esteem. There is also a decrease in general physical and mental well-being (Zegarski et al., 2010). Breast cancer care is increasingly more often targeted at the improvement of global quality of life and longevity extension (McNeely et al., 2006).

The number of years that elapsed since the moment of diagnosis can be an important factor determining the quality of life. In women with a longer survival time, it is possible to observe a better general well-being, especially mental and social, in comparison to women with a shorter period since the end of treatment (Cimprich et al., 2002). However, other studies do not corroborate this thesis (Ashing-Giwa et al., 1999). Other reports also indicate a twofold influence of the period required to adapt to the disease: on the one hand, a positive influence on the general physical well-being of the studied persons over the years, on the other hand, a negative impact on the perception of one's own body or on social functioning (Arora et al., 2001; Montazeri et al., 2008). Thus, it can be concluded that the image of cancer survivors' functioning is considerably diversified and ambiguous.

The aim of the study is to compare women diagnosed with breast cancer who completed anticancer treatment at least 7 years ago with women whose survival rate is shorter (less than 7 years) in terms of the quality of life indicators, health locus of control, and depression intensity. According to the National Cancer Institute and the National Comprehensive Cancer Network in the USA, a "cancer survivor" is an individual who survived cancer from the time of diagnosis and maintains the balance of his or her life (Denlinger et al., 2014). The definition does not provide a defined time criterion that would be decisive whether a given individual can be included in the group of cancer survivors.

MATERIAL AND METHODS

The study involved 37 women who were diagnosed with breast cancer in the past. The criterion decisive in the inclusion of a given individual in the study was a previous breast cancer diagnosis, past unilateral mastectomy and complementary systemic treatment in the form of chemotherapy, lack of recurrence and/or metastasis, and lack of neurological and psychiatric diseases. The research was conducted at the Amazon Women Associations and at patients' homes. The study participants were presented with the research aim and informed about their anonymity. The average age of the studied group was 57, whereas the standard deviation was 10.5. Approximately two-thirds of the studied women (62%) declared having university degree, 35% having secondary education, and almost 3% having primary education. The study involved two groups with regard to the median time that has elapsed since the completion of anticancer treatment. The first group included patients who completed the treatment within the past 7 years (N = 18), whereas the second group involved women who completed the oncological therapy 7 and more years ago (N = 19). When it comes to the time from the treatment completion, the average is 8.51 and the standard deviation is 4.93 within the whole group of the studied patients. The lower threshold of time that has elapsed from treatment completion is 3 years.

The research was conducted with the use of the following tools:

- *Quality of Life Questionnaire – EORTC QLQ-C30* (Aaronson et al., 1993; Fayers et al., 2002), assessing cancer patients' quality of life. It is a standardised international scientific tool incorporating 5 functional scales, 3 symptom scales, and global quality of life scale. Measuring patients' functioning involves the following scales: physical functioning, role functioning, emotional functioning, cognitive functioning, social functioning, and global quality of life. The scales involving the assessment and influence of symptoms are: fatigue, nausea and vomiting, pain, dyspnoea, insomnia, appetite loss, constipation, and diarrhoea. The influence of cancer on the financial situation is also assessed (Leppert et al., 2014). The study did not involve the BR-23 module, which is a breast cancer specific module, as the initial plan was to conduct studies comparing diverse groups of cancer patients (cervical cancer, renal cell carcinoma, multiple myeloma). Not all patient groups enumerated above have additional modules assessing the quality of life. Hence, the decision to exclude the additional scale dedicated to breast cancer patients. The analysis in question involved only women with a diagnosed breast cancer.

- *The Multidimensional Health Locus of Control – MHLC* (authors: Kenneth A. Wallston, Barbara S. Wallston, Robert DeVellis, Polish adaptation: Zygfryd Juczyński, 2001). It recognises beliefs connected with generalised expectations in 3 dimensions of health locus of control: internal (I) – one's own health is a results of one's own doing; powerful others (E) – one's own health is the outcome of others' influence, especially medical staff; chance (CH) – chance or other external variables are responsible for one's own health. The internal health locus of control aids health-promoting behaviour. The higher the score, the stronger the belief that a given factor has influence on the health state (Juczyński, 2001).
- *Depression Assessment Questionnaire (DAQ)* (authors: Emilia Łojek et al 2015), the completion is assessed on the basis of a score obtained in five subscales: Cognitive deficits and energy loss (CDEL), Thoughts about death, pessimism, and alienation (TDPA), Guilt and anxiety (GA), Psychosomatic symptoms and loss of interest (PSLI), Self-regulation (SR). Moreover, a composite score, which constitutes a general indicator of the depression symptoms intensity, is calculated.

Each time, the examination carried out was preceded by a conversation with the patients, description of the procedure process, and obtaining patients' written consent.

The answers provided by the studied individuals were subject to statistical analysis with the use of SPPSS Statistics - arithmetic mean and standard derivation were used. In order to assess the differences in the results obtained from the comparison of the two groups, a t-test for the independent samples was used. The t-test took into consideration the presence of non-homogeneous variances in case of some variables.

RESULTS

The results of the statistical analyses are presented below. T-test of difference significance for particular scales of QLQ-C30 Questionnaire is presented in Table 1. The analyses allowed to observe a statistically significant difference between women who finished the treatment within the last 7 years and patients who finished it earlier within the scope of the QLQ Physical Functioning scale ($t_{(28,13)}=2.32$; $p<0.05$). It means that women who finished the treatment within the last 7 years experience a significantly greater number of problems when fulfilling everyday tasks, such as: shopping, walks, self-care activities (M=9.8; SD=3.2) in comparison to patients who finished the treatment in the previous years (M=7.8; SD=2.0). Cohen's d value of 0.79 indicates a large effect size.

Another indicator – Social Functioning also differentiates the group of survivors. The *t*-test value ($t_{(35)}=2.58$; $p<0.05$) proves the differences between the analysed women with breast cancer. It transpires that the studied patients who finished their treatment no longer than 7 years ago currently experience more problems in their family and social life (*M*=4.1; *SD*=1.6) in comparison to women who are characterised by a longer period of time from the end of the treatment (*M*=2.8; *SD*=1.2). Cohen’s *d* value (0.87) proves a large effect size.

T-test of difference significance for particular scales of Multidimensional Health Locus of Control – MHLC is presented in Table 2. The *t*-test value ($t_{(35)}$

Table 1. T-test of difference significance for particular scales of QLQ-C30 Questionnaire

	Scales	**Studied groups**	***N***	***M***	***SD***	***t***	***df***	***p***	**Cohen’s*d* value**
Functional scales	Physical	< 7 years	18	9.8	3.2	2.32	28.13	0.028	0.79
		≥ 7 years	19	7.8	2.0				
	In social roles and at work	< 7 years	18	3.4	1.6	0.95	22.97	0.354	-
		≥ 7 years	19	3.1	0.7				
	Cognitive	< 7 years	18	4.1	2.7	0.89	35	0.380	-
		≥ 7 years	19	3.5	1.5				
	Emotional	< 7 years	18	7.6	2.6	0.20	35	0.844	-
		≥ 7 years	19	7.4	3.1				
	Social	< 7 years	18	4.1	1.6	2.58	35	0.014	0.87
		≥ 7 years	19	2.8	1.2				
	Global quality of life	< 7 years	18	9.5	1.3	-0.14	35	0.891	-
		≥ 7 years	19	9.6	2.1				
Symptom scales	Fatigue	< 7 years	18	6.9	2.3	0.88	22.34	0.387	-
		≥ 7 years	19	6.4	0.1				
	Nausea and vomiting	< 7 years	18	2.1	0.2	1.00	17	0.331	-
		≥ 7 years	19	2.0	0.1				
	Pain	< 7 years	18	3.5	1.5	0.87	35	0.389	-
		≥ 7 years	19	3.1	1.2				
	Dyspnoea	< 7 years	18	1.6	0.6	1.23	35	0.229	-
		≥ 7 years	19	1.4	0.6				
	Insomnia	< 7 years	18	2.4	1.2	1.03	27.97	0.312	-
		≥ 7 years	19	2.1	0.7				
	Appetiteloss	< 7 years	18	1.6	0.1	0.94	24.30	0.359	-
		≥ 7 years	19	1.3	0.5				
	Constipations	< 7 years	18	1.5	0.8	-0.52	35	0.608	-
		≥ 7 years	19	1.6	0.8				
	Diarrhoea	< 7 years	18	1.1	0.2	-0.54	35	0.592	-
		≥ 7 years	19	1.1	0.3				
	Financial situation	< 7 years	18	1.8	0.8	0.34	35	0.737	-
		≥ 7 years	19	1.7	0.9				

Table 2. T-test of difference significance for particular scales of Multidimensional Health Locus of Control – MHLC

	Scales	**Studied groups**	***N***	***M***	***SD***	***t***	***df***	***p***	**Cohen’s *d* value**
Dimension – control	Internal	< 7 years	18	25.8	4.9	2.96	35	0.006	1
		≥ 7 years	19	21.2	4.8				
	Others’ influence	< 7 years	18	23.1	4.4	-0.03	35	0.975	-
		≥ 7 years	19	23.1	5.3				
	Chance	< 7 years	18	22.4	4.3	0.94	35	0.353	-
		≥ 7 years	19	20.9	5.6				

Table 3. T-test of difference significance for particular scales and for general result of Depression Assessment Questionnaire – DAQ

Scales	Studied groups	*N*	*M*	*SD*	*t*	*df*	*p*
Cognitive deficits and loss of energy	< 7 years	18	36.2	9.9	1.15	35	0.259
	≥ 7 years	19	32.9	7.3			
Thinking about death, pessimism, and alienation	< 7 years	18	23.2	6.5	0.86	35	0.394
	≥ 7 years	19	21.6	4.6			
Guilt and anxiety	< 7 years	18	32.0	7.6	1.91	35	0.064
	≥ 7 years	19	27.6	6.2			
Psychosomatic symptoms and loss of interests	< 7 years	18	20.9	4.6	1.13	35	0.267
	≥ 7 years	19	19.3	4.2			
Self-regulation	< 7 years	18	41.1	6.2	0.08	35	0.936
	≥ 7 years	19	40.9	5.9			
General result	< 7 years	18	126.7	32.7	0.39	35	0.699
	≥ 7 years	19	122.6	30.3			

=2.96; $p<0.01$) proves the existence of differences within the scope of the Internal Health Locus of Control. Patients in whose case the period of time from the oncological treatment is shorter (up to 7 years) are experiencing a higher level of control over their own health (M=25.8;SD=4.9) in comparison to patients whose treatment ended in previous years (M=21.2; SD=4.8). Cohen's d value of 1 indicates a large effect size.

T-test of difference significance for particular scales and for general result of Depression Assessment Questionnaire – DAQ is presented in Table 3. The *t*-test value for Guilt and Anxiety ($t_{(35)}$=1.91; p=0.066) means that the compared groups of women are characterised by the occurrence of differences in the levels of emotions that the survivors experience, mostly guilt and anxiety. A result oscillating at the level of statistical significance means that most likely there is a significant difference present between the groups that could be fully detected and analysed with the use of an improved methodology of the author's research, e. g. through the inclusion of a greater number of patients in the researched group.

In order to determine the factors conditioning the quality of life in particular groups of researched patients, correlations between the Physical and Social Functioning (variables differentiating the quality of life in the group with a shorter and longer period from the end of the treatment) and other variables from the QLQ-C30, MHLC, and DAQ tools were analysed. The results are presented in Table 4.

The correlation indicators presented in the table above allow to notice certain relationship between Physical and Social Functioning and particular quality of life parameters, health locus of control, and depression intensity in the group of women with a shorter and longer period of time from the end of anticancer treatment.

In patients with a shorter disease adaptation period, it is possible to notice a relationship at the level of statistical significance or tendency between Physical Functioning and General Physical and Psychosocial Well-Being Assessment

(r=-0.43; p=0.07), Fatigue (r=0.70; p<0.01), Pain (r=0.49; p<0.05), Dyspnoea (r=0.69; p<0.01), Insomnia (r=0.65; p<0.01), Appetite Loss (r=0.63, p<0.01), Constipations (r=0.46, p=0.057), and Guilt and Anxiety (r=0.46, p=0.058). Referring to the correlation between the second scale of QLQ-C30 – Social Functioning – and the remaining variables analysed in this research, it is possible to state that there is a relationship at the level of statistical significance or tendency with Cognitive Functioning (r=0.47; p<0.05), Global Quality of Life (r=-0.54; p< 0.05),

Table 4. Pearson's r correlation between physical and social functioning and particular variables of quality of life, health locus of control, and depression

Variables	**Pearson's *r* correlation coefficient**	**Time from the end of the treatment**			
		< 7 years		≥ 7 years	
		Physical functioning	Social functioning	Physical functioning	Social functioning
In social roles and at work (QLQ-C30 Functional Scale)	*r*	0.74	0.84	0.37	0.40
	p	0.001	0.001	0.124	0.090
	N	18	18	19	19
Cognitive (QLQ-C30 Functional Scale)	*r*	0.34	0.47	-0.04	0.36
	p	0.171	0.047	0.874	0.134
	N	18	18	19	19
Emotional (QLQ-C30 Functional Scale)	*r*	-0.02	0.12	0.06	0.48
	p	0.949	0.645	0.797	0.04
	N	18	18	19	19
Global quality of life (QLQ-C30 Functional Scale)	*r*	-0.43	-0.54	0.21	0.04
	p	0.072	0.022	0.4	0.877
	N	18	18	19	19
Fatigue (QLQ-C30 Symptom Scale)	*r*	0.70	0.41	0.24	0.39
	p	0.001	0.094	0.314	0.1
	N	18	18	19	19
Nausea and vomiting (QLQ-C30 Symptom Scale)	*r*	-0.14	-0.01	-0.25	N/A
	p	0.572	0.973	0.3	N/A
	N	18	18	19	19
Pain (QLQ-C30 Symptom Scale)	*r*	0.49	0.32	-0.05	0.20
	p	0.037	0.201	0.847	0.404
	N	18	18	19	19
Dyspnoea (QLQ-C30 Symptom Scale)	*r*	0.69	0.50	0.37	0.39
	p	0.002	0.035	0.124	0.098
	N	18	18	19	19
Insomnia (QLQ-C30 Symptom Scale)	*r*	0.65	0.62	-0.17	0.45
	p	0.004	0.006	0.478	0.051
	N	18	18	19	19
Appetite loss (QLQ-C30 Symptom Scale)	*r*	0.63	0.61	0.19	0.19
	p	0.005	0.008	0.449	0.444
	N	18	18	19	19
Constipations (QLQ-C30 Symptom Scale)	*r*	0.46	0.21	-0.58	0.36
	p	0.057	0.41	0.009	0.136
	N	18	18	19	19
Diarrhoea (QLQ-C30 Symptom Scale)	*r*	0.33	0.45	-0.13	0.05
	p	0.189	0.06	0.589	0.852
	N	18	18	19	19
Financial situation (QLQ-C30 Symptom Scale)	*r*	0.13	0.38	-0.01	0.55
	p	0.611	0.124	0.995	0.015
	N	18	18	19	19
Internal (MHLC)	*r*	0.03	0.08	-0.44	0.23
	p	0.911	0.765	0.058	0.353
	N	18	18	19	19

Others' influence (MHLC)	***r***	**0.32**	**0.24**	**0.12**	**-0.15**
	p	0.202	0.338	0.615	0.533
	N	18	18	19	19
Chance (MHLC)	*r*	0.33	0.47	0.43	0.28
	p	0.179	0.050	0.068	0.239
	N	18	18	19	19
Cognitive deficits and loss of energy (DAQ)	*r*	0.35	0.22	-0.04	-0.12
	p	0.158	0.385	0.874	0.624
	N	18	18	19	19
Thinking about death, pessimism, and alienation (DAQ)	*r*	0.19	0.33	0.06	0.08
	p	0.45	0.186	0.797	0.752
	N	18	18	19	19
Guilt and anxiety (DAQ)	*r*	0.46	0.49	0.21	0.31
	p	0.058	0.04	0.4	0.198
	N	18	18	19	19
Psychosomatic symptoms and loss of interests (DAQ)	*r*	0.31	0.30	0.24	0.07
	p	0.207	0.231	0.314	0.79
	N	18	18	19	19
Self-regulation (DAQ)	*r*	-0.30	-0.12	-0.25	-0.09
	p	0.231	0.625	0.3	0.723
	N	18	18	19	19
General result (DAQ)	*r*	0.39	0.36	-0.05	0.21
	p	0.109	0.146	0.847	0.381
	N	18	18	19	19

Dyspnoea (r=0.50; p<0.05), Insomnia (r=0.62;p<0.01), Appetite Loss (r=0.61; p< 0.01), Diarrhoea (r=0.45; p=0.06), Chance Health Locus of Control (r=0.47; p< 0.05), and Guilt and Anxiety (r = 0.49; p< 0.05).In case of the indicators presented above, the strength of correlation oscillates at a level ranging from moderate to very strong which proves a satisfying relationship between physical and social functioning of women after oncological treatment and selected parameters of the quality of life, health locus of control, and depression intensity.

In the second group of analysed patients, with a longer disease adaptation period, there is a relationship between the subjective assessment of one's own Physical Functioning and the experienced Constipations (r=-0.58; p<0.01), Internal Health Locus of Control (r=-0.44; p=0.058), and Chance Health Locus of Control (r=0.43; p=0.068). Within the scope of Social Functioning, a relationship at the level of statistical significance or tendency can be observed with the following variables: Emotional Functioning (r=0.48; p<0.05), Insomnia (r=0.45; p= 0.051), and Financial Situation (r=0.55; p<0.05). The strength of particular correlations in the group of patients with the longer period of time elapsed from the end of the treatment is moderate.

DISCUSSION

The author's own research proves that women in whose case the time elapsed since the completion of anticancer treatment is no more than 7 years have a more negative assessment of the quality of life aspects, such as physical and social functioning, in comparison to patients in whose case the adaptation time to changes following cancer and treatment is longer (more than 7 years).

In Zegarski's research conducted in 2010, it was proved that women at the early treatment stages, that is after the surgical treatment, were characterised by the greatest extent of imbalance in the field of social and physical functioning of all the life areas (Zegarski et al., 2010). A similar result proving the presence of subjectively experienced issues within the somatic and social areas in women with a shorter period of time elapsed from the end of anticancer treatment was attained in author's own research. Subjective assessment, negative changes in physical functioning after mastectomy, that is at the early treatment stages, were also observed in the research carried out by Chwałyczyńska et al. (2004). The physical aspect of the quality of life is a problematic area also in case of survivors with a longer survival period (Amir & Ramati, 2002; Tomich & Helgeson, 2002; Weitzner et al., 1997). An improvement in the area of physical activity with, in turn, a more negative assessment of the social area over time elapsed from the breast cancer diagnosis is noticeable in Iranian longitudinal studies (Montazeri et al., 2008). A worse social and cognitive functioning of patients with breast cancer, both during the diagnosis and a year after, is corroborated by German and Norwegian longitudinal research based on EORTC QLQ-C30 questionnaire (Arndt et al., 2004; Schou et al., 2005).

Referring to the longer disease adaptation period studied by Barnaś et al (2009), there were no differences observed in the analysis of particular functional scales of the QLQ-C30 questionnaire at the later stages of recovery, that is more or less 5 years after a surgical treatment in women with breast cancer. The best scores were reported in the areas of physical functioning and fulfilment of social roles. These reports seem to corroborate the results of the author's own research connected with the positive influence of the passage of time since the completion of the treatment on the patients' quality of life. The variables that impact the quality of life (physical and social functioning) in patients with a longer period of time elapsed from the end of the treatment are: constipations, emotional state, and financial situations (see: Table 4). Moreover, the least frequently occurring conditions were: nausea, vomiting, diarrhoea, and appetite loss. The most frequently appearing symptoms were: insomnia, financial difficulties, and fatigue. In the scales assessing the quality of life connected with breast cancer, the highest score was obtained by the image of one's own body, whereas the lowest score was obtained by sexual pleasure (Barnaś et al., 2009). A similar situation can be noticed in the longitudinal studies conducted by Ganz et al. (2002). The study involved a group of women with a previously diagnosed breast cancer, in whose case the average survival time was 6.3 years, showing a better physical and mental well-being in comparison to the first examination (at the beginning of the treatment). The level of life energy and social functioning did not differ in the two measurements. The occurrence of certain somatic symptoms, such as e. g. urinary incontinence, increased which may be connected with the natural process of ageing. When it comes to sexual activity, there was a significant decrease between the two scores. It is worth adding that patients who underwent only chemotherapy in the past had a more positive assessment of their quality of life in comparison to patients who were subject to a complementary systemic therapy (Ganz et al., 2002).

Another significant result from the perspective of author's own research proves that the studied patients with a shorter period elapsed from the completion of anticancer therapy hold stronger beliefs concerning their own influence on their health in comparison to women who have not undergone oncological treatment for at least 7 years.

In women with a shorter adaptation period to cancer (up to 7 years) the internal health locus of control is dependent on the level of fatigue. In the same group of patients, the perception of physical and mental well-being as being conditioned by others' influence correlated with the level of fatigue as well. Both relationships are characterised by a moderate strength. There is a noticeable trend: the higher the level of fatigue, the more frequent the perception that one's health is dependent on one's own actions or dependent on others' influence. In patients who suffered from breast cancer within the previous 7 years, it is possible to observe a relationship between the perception of health as being dependent on chance and the perception of problems in professional life, difficulties in social functioning, insomnia, and financial problems. It is possible to state that the greater the number of difficulties at work experienced by patients suffering from breast cancer for less than 7 years, the more frequent the belief in a chance locus of control. Similarly, the greater the number of financial problems, the more eager the patient to hold a belief that their health is dependent on fate. Also, a more intense insomnia co-exists with the belief that health is dependent on coincidence. If the patient experiences impaired social functioning, they have a tendency to perceive their life as being dependent on chance. The worse the quality of life, the greater the probability to see patient's health as independent of their own actions and of others' influence.

In patients with breast cancer with at least 7 years from the end of anticancer treatment, it is possible to notice that the internal health locus of control significantly correlates at the level of statistical significance or tendency with physical activity, global quality of life and dyspnoea. The more severe the dyspnoea, the more frequent the belief that patients' health is dependent on their own actions. Also in the same group of studied women – with a longer disease adaptation time, it is possible to observe that the perception of health as dependent on chance correlates with physical functioning, professional functioning, and the occurrence of constipations. The higher the level of difficulty at work experienced by patients, the more frequent the belief that the health locus of control is dependent on fate. A similar situation can be observed in terms of gastric problems – the greater the number of constipations in women suffering from cancer in the past, the more frequent the belief that their health is being determined by chance.

The research within the scope of health locus of control conducted on a group of women after mastectomy prove that the highest scores were obtained within the dimension of chance, moderate scores within the dimension of others' influence, whereas the lowest scores within the dimension of internal control. However, the differences between particular scales vary up to 7 percentage points. It corroborates the fact that women after mastectomy hold a belief that their health is influenced by external factors, internal factors, and chance to an equal extent. The belief about the internal health locus of control combined with the beliefs concerning the influence of others (especially doctors') may result in an increase of one's own activity in restoring health as well as an improved and more accurate following doctors' recommendations (Kurowska & Kalawska, 2013).

The author's own research also highlights the trend pertaining to the differences in the intensity of experiencing the feeling of guilt and anxiety between the studied groups. However, it requires further analyses in research taking a larger group of studied patients into consideration.

STUDY LIMITATIONS

The presented research has a few limitations that ought to be mentioned. The analysed group of patients (*N*=37) is too small to make generalised assumptions about the obtained results in reference to the population of women after mastectomy and chemotherapeutic treatment in Poland. As a result of the following research results, the study can be considered an initial solution, requiring confirmation in a larger research group.

The analysis concerning the quality of life did not involve the BR-23 module, which is a breast cancer specific module, as the initial plan was to conduct studies comparing diverse groups of cancer patients in terms of the quality of life, health locus of control, and intensity of depression symptoms. Not all groups of oncological patients have additional modules assessing quality of life. Hence, the decision to implement only the QLQ-C30 core questionnaire. Due to the small number of patients in the researched groups with a diversified cancer diagnosis, the studies were not continued. The analysis in question involved only women with a diagnosed breast cancer.

The conducted research did not include such aspects as: undergoing breast reconstruction surgery (Szadowska-Szlachetka et al., 2013), the level of sexual satisfaction (Białek et al., 2015), or the presence of lymphedema (Cachaj et al., 2007), which may have a significant influence on the lives of women with breast cancer.

The limitations of the research process also include lack of a comparative control group. In consequence, it is impossible to definitely establish the extent to which the author's own research results are specific to patients with breast cancer and the extent to which they are a manifestation of general social tendencies among individuals without oncological diseases with a similar demographic character.

Despite the presented limitations, the results of the research bear scientific significance in terms of the patients' functioning within the scope of quality of life (physical and social) and the health locus of control, depending on the time that elapsed from the completion of anticancer treatment.

CONCLUSIONS

The obtained results allow to draw the following conclusions:

- A longer period of time (>7 years) that elapsed from the anticancer treatment in women with a previous breast cancer diagnosis correlates with a better assessment of physical and social functioning within the scope of quality of life in comparison to patients who are <7 years after the treatment.
- A greater belief in the influence on one's own health correlates positively with a shorter period of time elapsed from anticancer treatment.

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