

**THE HEALING EFFECT OF PSYCHOSOCIAL
INTERVENTIONS IN BREAST CANCER - FROM SURGICAL
FEAR TO ENHANCED LONG-TERM QUALITY OF LIFE**

PhD Thesis

Victoria Wittmann MA

Supervisors:

Prof. Dr. Márta Csabai MA, PhD

Prof. Dr. György Lázár MD, PhD, Dsc



Doctoral School of Clinical Medicine

Department of Surgery

University of Szeged, Hungary

2019

List of publications providing the basis and related to the topic of the thesis

- I. Wittmann, V., Latos, M., Horvath, Z., Simonka, Zs., Paszt, A., Lazar, Gy. & Csabai, M. (2017). What contributes to long-term quality of life in breast cancer patients who are undergoing surgery? Results of a multidimensional study. *Quality of Life Research*.

IF: 2.392*

- II. Wittmann, V., Drótos, G., Csabai, M. & Lazar, Gy. (2018). A Sebészeti Beavatkozástól Való Félelem Kérdőív magyar nyelvű változatának reliabilitás-és validitásvizsgálata sebészeti beavatkozáson átesett páciensek körében. *Orvosi Hetilap*, 159, 1988-1993.

IF: 0.322*

- III. Wittmann, V., Latos, M., Horvath, Z., Simonka, Zs., Paszt, A., Lazar, Gy. & Csabai, M. (2018). Emlődaganatos nőbetegek komplex támogató terápiája. Egy pszichológiai intervenció kutatás előzetes eredményei. *Orvosi Hetilap* (Excepted)

IF: 0.322*

Table of contents

1. Introduction	1
1.1. Psychological distress in cancer patients.....	1
1.2. Before surgery: surgical fear as a risk factor	1
1.3. Psychological issues in breast cancer.....	2
1.4. The importance of psychological interventions in breast cancer patients.....	4
1.5. Psychological preparation for surgery	5
1.6. Psychological interventions in breast cancer patients after surgery	5
2. Aims	6
3. The three studies of our research	7
3.1. The reliability and validity of the Hungarian version of the Surgical Fear Questionnaire.....	7
3.1.1. <i>Methods</i>	7
3.1.2. <i>Results</i>	11
3.2. The effect of pre- and post-operative psychological interventions on breast cancer patients - a preliminary study	13
3.2.1. <i>Methods</i>	13
3.2.2. <i>Results</i>	16
3.3. Long-term QoL in breast cancer patients	24
3.3.1. <i>Methods</i>	25
3.3.2. <i>Results</i>	27
4. Discussion	33
5. Conclusion and implications for practice.....	38
5.1. <i>Conclusion</i>	38
5.2. <i>Implications for practice</i>	39
6. Acknowledgements	40
7. References	41

1.Introduction

For psychologists treating breast cancer patients before and after surgery, a continuing need appears to provide appropriate and multidimensional psychological care for the patients. Given that psychosocial care still does not reach enough cancer patients who could benefit from it, we have found it essential to create a complex psychological intervention program for breast cancer patients at our clinic, this way applying research findings in clinical practice (1-2).

1.1.Psychological distress in cancer patients

Most cancer patients experience some level of distress associated with cancer and its treatment at all stages of the disease (3). Studies have found that 20%–40% of cancer patients report significant levels of distress (4-5). According to the National Comprehensive Cancer Network (NCCN) guidelines, distress in cancer patients is defined as “a multifactorial unpleasant emotional experience of a psychological, social, and/or spiritual nature that may interfere with the ability to cope effectively with cancer, its physical symptoms, and its treatment”. Distress, as defined by the NCCN, extends along a continuum, ranging from normal feelings of vulnerability, sadness, and fears to problems that can become disabling, such as depression, anxiety, panic, social isolation, and existential crisis (3). This way the recognition, monitoring and treatment of distress at all stages of cancer is essential and requires screening for distress from the first visit through the course of disease and beyond. According to Schwarz et al. (6) cancer can be also described as an „ongoing trauma” as the course of the disease is mostly unpredictable. During the course of the disease many major decision points and traumatic experiences (diagnoses of cancer, loss of hair and fatigue due to chemotherapy, stigmatization, fear of recurrence) can appear causing distress. The constant presence of fear and insecurity can lead to severe psychological problems. Many patients report experiencing an emotional crisis when struggling with cancer.

1.2. Before surgery: surgical fear as a risk factor

Interdisciplinary studies have shown that preoperative or surgical fear is a common emotional state for many patients waiting for surgery and it is a risk factor for impaired psychosocial and physical recovery and can even lead to acute or chronic postoperative pain (7-10). Besides anxiety other negative psychological factors such as depression and catastrophizing have been

found to predict postoperative pain as well (8, 11-12). Objects of surgical fear can be heterogeneous and they vary from fear of the anaesthesia to fear of the surgical procedure itself, undergoing blood transfusions, losing dignity or even dying (13-14).

In a meta-analysis scientists have found a range of psychological mechanisms that could affect recovery after surgery (15). Firstly, negative emotions can enhance pain sensations (16-17). Secondly, cognitions and emotions influence behaviour (for example doing physiotherapy exercises) and are likely to influence pain and return to usual activities. Thirdly, stress has been linked to the slower healing of wounds through psychoneuroimmunological mechanism (18-19). It is therefore likely that psychological interventions that reduce negative emotions such as anxiety, worrying about surgery and perceptions of stress or that change patients' recovery-related behaviour, may lead to positive postoperative outcomes. Psychological preparation for surgery has been demonstrated to improve outcomes. In a review psychological preparation was found to be beneficial for a range of outcome variables that included negative affect, pain, pain medication, length of hospital stay, behavioural recovery, clinical recovery, physiological indices and satisfaction (20).

As existing instruments for assessing surgical fear are either limited in scope or too general or too specific, the Surgical Fear Questionnaire (SFQ) has been developed (21). Regarding that the SFQ aims to be comprehensive enough to cover the most important targets of fear and concise enough for general use in clinical practice and research, we found it important to develop the Hungarian version of the SFQ applying reliability and validity analysis in our research.

1.3. Psychological issues in breast cancer

The traumatic nature of the diagnosis and the painful surgical procedures often lead to a series of psychological problems among cancer patients. An estimated 1.1 million women are diagnosed with breast cancer worldwide, and 410,000 die of the disease each year (22). Meta-analyses suggest that stress-related psychosocial factors and lower health-related quality of life (QoL) are associated with poorer survival among people with breast cancer (23). Depression and anxiety are typical responses after diagnosis and during the treatment phase, making psychological screening and intervention extremely relevant (24). Furthermore, the level of psychological distress is usually higher before surgery at the beginning of the disease (25-26). According to Ho et al. (27), patients who have already been treated report higher

depression and anxiety than patients who are in post-treatment, which supports the increased importance of psychological interventions not only after treatment but also at the early stage of treatment. QoL is an important outcome measure in all patients with breast cancer due to the complexity of the disease, with emotional, functional, physical, social and sexual factors all having an essential role (25, 28-30).

Regarding adaptation in breast cancer patient, (31) three broad psychosocial responses have been identified to breast cancer: (1) psychological discomfort (anxiety, depression, anger); (2) behavioral changes caused by physical discomfort, marital or sexual disruption and (3) fears and concerns related to body image, recurrence, or death. Although women today face very different treatment scenarios, the psychological concerns that affect adaptation remain the same. In addition to these variables, the age at which cancer occurs is of prime importance. Younger women frequently have different concerns regarding cancer than elder women (32-33). Concerns about future health as well as fears of potential disfigurement, loss of femininity and distress associated with treatment are common to all women diagnosed with breast cancer. These are often more pronounced, however, in younger women, who may perceive the cancer diagnosis as „off-timed” in the normal life course and they have more to lose due to the threat to their future (34). Feeling different or isolated is also a theme voiced by younger women. It has also been suggested that elder patients may experience less distress because of greater life experience, including familiarity with medical settings, but this has not been clearly established (35). In fact, women older than age 80 with breast cancer may struggle with concurrent major losses, particularly of a spouse. Elder women with breast cancer are at risk for experiencing greater decrements in their health-related QoL than healthy peers (35).

Other variables affecting long-term QoL in breast cancer patients include the experience of posttraumatic growth (PTG). PTG is defined as perceived positive changes in previous levels of functioning following a traumatic life event (36-37). Following a diagnosis of breast cancer, many women report PTG in a variety of life domains (e.g. recognition of new possibilities in one's life, a greater sense of personal strength, and spiritual development) (38-40). However, it is unclear whether PTG is associated with a higher level of distress or enhanced QoL among cancer survivors, as researchers have reported positive and negative associations and inconclusive result (41-48). The frequent traumatic and disfiguring nature of breast cancer surgery can also lead to a series of psychological problems relating to body image, sexuality and femininity (34, 49-50). Surgery can result in a sense of mutilation and diminished self-esteem, the loss of sense of femininity and sexual attractiveness, the loss of

sexual function, anxiety, depression, hopelessness, guilt, shame or fear of recurrence (32, 51). The type of surgery can also influence the psychological well-being of breast cancer patients. Early studies showed that women having breast-conserving therapy (BCT) manifest better overall adjustment than those having mastectomy (52). These studies indicated that women who selected BCT over mastectomy were more concerned about insulting to body image, were more dependent on their breasts for self-esteem.

Body change stress refers to subjective psychological stress that accompanies women's negative and distressing feelings, emotions, thoughts and behaviours originating from and connected to breast cancer and/or breast surgeries (49). Body change stress manifests as stress symptoms that are similar to those found in traumas, including re-experiencing (e.g. feeling upset with reminders of breast change), avoidance (e.g. attempts to limit the exposure of the body to oneself or others) and arousal symptoms (e.g. irritability) (49).

Whereas, many of the symptoms that are associated with breast cancer and its treatment can last for several months or even years after treatment is complete, studies have shown that regular physical activity is beneficial in reducing and relieving cancer-related symptoms and improving QoL in cancer patients (53-56). However, few studies have focused on the connection between QoL and PTG in relation to physical activity and body image using a longitudinal study design by observing changes in behaviour prior to and long after the operation (57-62).

Furthermore, many patients report high levels of perceived burden of suffering due to illness (63-65). The impact of illness on a person is a complex and a multifaceted question, which is worth measuring. The Pictorial Representation of Illness and Self Measure (PRISM) is regularly used to measure patients' perception of the intrusiveness and controllability of the illness or its symptoms (66-68).

1.4. The importance of psychological interventions in breast cancer patients

Psychosocial and behavioral intervention research in cancer has a long history, particularly that designed for and tested among breast cancer patients (69). Interventions used in the context of breast cancer vary greatly by orientation (e.g., behavioral vs. cognitive vs. supportive); type (e.g., individual vs. group); mode of delivery (e.g., in person vs. remote vs. internet); timing (e.g., before, during, or after treatment) and target population (e.g., early vs. advanced) (70-73). Nevertheless, the purpose of these intervention are the same: to provide each woman with the skills and resources necessary to cope with her illness and improve QoL.

1.5. Psychological preparation for surgery

Some evidence supports the role of preoperative psychological interventions in patients waiting for surgery, for example in decreased cortisol levels and enhanced wound healing (74, 75). According to the review of Tsimopoulou et al. (73) psychological interventions before surgery proved the most efficient if one of the following psychological methods were involved: training the patients (1) in relaxation techniques such as breathing, progressive muscle relaxation, and meditation; (2) in „guided imagery,” with participants asked to imagine stages before and after the operation to control anxiety; and (3) in problem-solving and coping strategies.

1.6. Psychological interventions in breast cancer patients after surgery

Early studies address the great importance of psychological intervention before and after surgery as well (4). Among breast cancer patients a major decrease in state anxiety can appear after surgery, which can be explained by the immediate relief and decrease in fear after surgery (76). However, after the operation, many patients have to understand that their cancer treatment is far from over. Increased fear and uncertainty about cancer and its therapy can remain making the assessment of psychological interventions after surgery extremely relevant (4, 77-79).

There are many types of psychological interventions to choose from. The appliance of relaxation methods, guided imagery (80-81), meditation and yoga (82-83), biofeedback therapy, hypnosis (84), cognitive therapy (38,85) and group psychotherapy (86-87) were found highly effective. Researchers have found several positive effects of psychological support in cancer patients (88), such as the decrease of stress (84, 89), the use of more adaptive coping strategies, better compliance and the overall increase of QoL (80, 90-91) and spiritual well-being (41, 92).

Art therapy can be another helpful intervention to support cancer patients (93). Art therapy has its root in art and psychoanalysis, and it is based on the notions that imagination is an essential part of mental functioning, and that individuals may project their internal world, both consciously and unconsciously, into visual images, this way promoting insight and facilitating change in the patients' inner world (94).

In our study the body sculpture technique was used, which is a procedure in which patients create a three-dimensional model of their own body with modelling clay (95). This technique offers a diagnostic approach to body image (96-97).

2. Aims

The main aim of our study was to gain a more complete understanding of the key determinants of QoL in cancer patients undergoing surgery taking into account psychological factors before surgery and later in the course of recovery as well. Given that little empirical research has been done to investigate this question using a multidimensional approach we developed a research design consisting of 3 studies and addressing questions of important matter regarding the psychological well-being of cancer patients undergoing surgery:

1. The reliability and validity of the Hungarian version of the Surgical Fear Questionnaire
2. The effect of pre- and post-operative psychological interventions on breast cancer patients undergoing surgery- a preliminary study
3. Pre- and post-operative psychological characteristics and long-term quality of life in breast cancer patients who are undergoing surgery (measuring anxiety, depression, posttraumatic growth, body image, and physical activity as well as medical parameters)

In this chapter I am describing the details of the aims of our 3 studies.

Regarding that many earlier studies highlighted the important role of surgical fear and its negative impact on recovery after surgery, the first study aimed to create a reliable and valid version of the Surgical Fear Questionnaire in Hungarian. This was an attempt not only to develop a measurement tool for breast cancer patients but providing the possibility of measuring surgical fear in Hungarian patient populations undergoing different surgical interventions.

In the second study we measured the effect of pre- and post-operative psychological interventions on breast cancer patients incorporating the results and experiences of the first and third part of our research. As this part of the research is still in progress we will be presenting preliminary results.

In our third study we surveyed a group of women who had been living with breast cancer for 18 months, measuring pre- and post-operative psychological characteristics such as anxiety, depression, posttraumatic growth, body image, and physical activity as well as medical parameters. The following served as research questions of the study:

- What are the characteristic correlational patterns of the contributing factors that influence the long-term QoL of breast cancer patients?

- Eighteen months after surgery, how do emotional factors and QoL change in breast cancer patients?

We expected the potentially positive results of this study to serve as a clear theoretical basis for our intervention study (that we conducted in the second part of our research).

3. The three studies of our research

3.1. The reliability and validity of the Hungarian version of the Surgical Fear Questionnaire

3.1.1. Methods

3.1.1.1. Study design and sample

All the materials that were used in this study were approved by the Regional and Institutional Human Medical Biological Research Ethics Committee. Prior to their surgery for cancer, the patients were assessed in the Department of Surgery at the University of Szeged. Each patient was provided with comprehensive information regarding the study and signed an informed consent form. Psychological assessments were conducted by a trained health psychologist one day prior to surgery, who did not have access to medical data about the patients. The final sample comprised 149 cancer patients waiting for surgery (47 male, mean age 62.74 years, SD = 12.30; 102 female, mean age 55.61 years, SD = 13,51). 63 patients had breast surgery (37 excision, 26 mastectomy), 38 patients had abdominal surgery (26 laparoscopy, 12 laporotomy), 36 patients had lung surgery (24 thorocscopy, 12 thorocotomy) and 12 patients had other types of surgery.

3.1.1.2. Study measures

The Spielberger State and Trait Anxiety Inventory (STAI-S; STAI-T) was administered to measure the level of anxiety before surgery (98-99). Both the scales comprise 20 items, with responses ranging from 1 (not at all) to 4 (very much so).

Beck's Depression Inventory (BDI) was used to assess the severity of depressive symptoms before surgery (100-101). Total scores range from 0 to 84, with a higher number indicating a higher level of depression. The responses range from 0 to 3. The lowest total score was 0, whereas the highest score was 84.

The Surgical Fear Questionnaire (SFQ) was used to measure fear regarding surgery and was used 1 day before surgery (21). The questionnaire comprises 10 items. All items are scored on

an eleven point numeric scale ranging from 0 (not at all afraid) to 10 (very afraid). This results in a total score of 0 to 100. The SFQ consists of two subscales: fear of the short-term consequences of surgery (SFQ-s) and fear of the long-term consequences of surgery (SFQ-l). To establish the reliability and validity of the Hungarian version of the SFQ, 3 independent translators translated the SFQ into Hungarian and a fourth translator translated the SFQ into English. After analyzing the original and translated version of the SFQ a final version of the Hungarian questionnaire was made (Supplement 1). The English version of the SFQ is also attached (Supplement 2).

The Visual Analog Scale (VAS) was used to measure expected postoperative pain and experienced pain after surgery using a 10 point Likert-scale (102).

Supplement 1. The Hungarian version of the Surgical Fear Questionnaire

A kérdőív segítségével szeretnénk felmérni, hogy milyen félelmei vannak az Ön előtt álló sebészeti beavatkozással kapcsolatban. Kérem karikázza be azt a számot, amely véleménye szerint a leginkább tükrözi jelenlegi érzéseit.

1. Félek a műtétől.

0	1	2	3	4	5	6	7	8	9	10
egyáltalán nem félek								nagyon félek		

2. Félek az érzéstelenítéstől.

0	1	2	3	4	5	6	7	8	9	10
egyáltalán nem félek								nagyon félek		

3. Félek a műtét utáni fájdalomtól.

0	1	2	3	4	5	6	7	8	9	10
egyáltalán nem félek								nagyon félek		

4. Félek a műtét utáni kellemetlen mellékhatásoktól (mint például a hányinger).

0	1	2	3	4	5	6	7	8	9	10
egyáltalán nem félek								nagyon félek		

5. Félek, hogy a műtét miatt romlani fog az egészségem.

0	1	2	3	4	5	6	7	8	9	10
egyáltalán nem félek								nagyon félek		

6. Félek, hogy a műtét nem sikerül.

0	1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	---	----

egyáltalán nem félek

nagyon félek

7. Félek a kórházi tartózkodástól.

0 1 2 3 4 5 6 7 8 9 10

egyáltalán nem félek

nagyon félek

8. Aggódom a családom miatt.

0 1 2 3 4 5 6 7 8 9 10

egyáltalán nem félek

nagyon félek

9. Félek, hogy nem fogok teljesen felépülni a műtét után.

0 1 2 3 4 5 6 7 8 9 10

egyáltalán nem félek

nagyon félek

10. Félek a műtétet követő hosszú rehabilitációtól.

0 1 2 3 4 5 6 7 8 9 10

egyáltalán nem félek

nagyon félek

Skálaképzési útmutató:

A skálaképzés az adott skálához tartozó tételek összeadásával történik.

Rövid távú félelmek skála: 1., 2., 3. és 4. tétel.

Hosszú távú félelmek skála: 5., 6., 9. és 10. tétel.

Supplement 2. The English version of the Surgical Fear Questionnaire

This questionnaire assesses how afraid you are for various aspects related to surgical procedure you are about to undergo. Please circle the number that best reflects how you feel right now.

1. I am afraid of the operation.

0 1 2 3 4 5 6 7 8 9 10

not at all afraid

very afraid

2. I am afraid of the anaesthesia

0 1 2 3 4 5 6 7 8 9 10

not at all afraid

very afraid

3. I am afraid of the pain after the operation.

0 1 2 3 4 5 6 7 8 9 10

not at all afraid

very afraid

4. I am afraid of the unpleasant side effects (like nausea) after the operation.

0 1 2 3 4 5 6 7 8 9 10

not at all afraid

very afraid

5. I am afraid my health will deteriorate because of the operation.

0 1 2 3 4 5 6 7 8 9 10

not at all afraid

very afraid

6. I am afraid the operation will fail.

0 1 2 3 4 5 6 7 8 9 10

not at all afraid

very afraid

7. I am afraid of staying in the hospital.

0 1 2 3 4 5 6 7 8 9 10

not at all afraid

very afraid

8. I worry about my family.

0 1 2 3 4 5 6 7 8 9 10

not at all afraid

very afraid

9. I am afraid that I won't recover completely after the operation.

0 1 2 3 4 5 6 7 8 9 10

not at all afraid

very afraid

10. I am afraid of the long duration of the rehabilitation after the operation.

0 1 2 3 4 5 6 7 8 9 10

not at all afraid

very afraid

Calculation:

For the calculation of the total score the following instructions are applicable: one missing item score at maximum is allowed, to be replaced by the subject's mean score. In the case of more than one missing, the SFQ should not be interpreted. For the calculation of the subscales (short-term fear item 1-4 and long-term fear item 5, 6, 9, 10) no missings are allowed. If a subject enters two scores for one item: if adjacent, choose the highest value, if non-adjacent (other values are in between) the item has to be considered as missing.

3.1.1.3. Statistical analysis

The data were analysed using IBM SPSS 23.0 for Windows and AMOS 21. A p-value <0.05 was considered statistically significant for all analysis except for correlational measurements. In our study a Bonferroni correction ($p < 0.005$) was applied. EFA (principal component analyses) was performed using oblique factor rotation (oblimin). Factor extraction was based of the scree plot and the Kaiser's criterion (factors with eigenvalues > 1 were retained). Item selection was based on evaluation of factor loadings (cut-off value > 0.40). Item selection was further confirmed by reliability analysis (evaluation of Cronbach's alpha, values ≥ 0.7 are considered fair and ≥ 0.8 good). Quantitative variables were described using mean and standard deviation. Spearman's correlation was used to reveal the pattern of the relationships among the variables. To measure differences among surgery groups the Mann-Whitney test was used.

3.1.2. Results

3.1.2.1. Factor analysis

The EFA identified two factors together explaining 75.3% of the total variance. One factor contained items related to fear of short-term consequences of surgery (items 1-4) with eigenvalue 4.98 and one factor contained items related to long-term consequences of surgery (items 5,6,9,10) with eigenvalue 1.043. However, two items (item 7 and 8) did not load above the cut-off of > 0.40 on either of the two factors. These were also the two items that had the lowest factor loading in the original study. Based on the factor loadings, the SFQ can be used best as an eight-item scale with two subscales, each consisting of four items (Table 1).

Table 1. Exploratory factor analysis

Items	Factors	
	SFQ-s	SFQ-l
4. I am afraid of the unpleasant side effects (like nausea) after the operation	0.903	
3. I am afraid of the pain after the operation	0.887	
2. I am afraid of the anaesthesia	0.808	
1. I am afraid of the operation	0.781	
9. I am afraid that I won't recover completely from the operation		0.939
6. I am afraid the operation will fail		0.924

10. I am afraid of the long duration of the rehabilitation after the operation	0.680
5. I am afraid my health will deteriorate because of the operation	0.506

3.1.2.2. Reliability analysis

The internal consistency of the two scales were appropriate. The Cronbach's alpha of the SFQ-s was 0.878 and Cronbach's alpha of the SFQ-1 was 0.885 (Table 2).

Table 2. Reliability analysis of the SFQ scales

	Cronbach-alfa (items)	Min.	Max.	M	SD
SFQ-s	0.878 (4)	0	40	18.8	10.69
SFQ-1	0.885 (4)	0	40	14.9	10.95

3.1.2.3. Convergent validation

In terms of convergent validity the STAI-S was significantly related to SFQ-s ($r = 0.49, p < 0.001$) and SFQ-1 ($r = 0.42, p < 0.001$). The correlation between STAI-T and SFQ-s ($r = 0.32, p < 0.001$) and SFQ-1 ($r = 0.39, p < 0.001$) was significant but weaker compared to state anxiety. The SFQ-s ($r = 0.35, p < 0.001$), and SFQ-1 ($r = 0.44, p < 0.001$) appeared to be significantly related to the BDI as well. Furthermore, the subscales of SFQ showed a significant correlation with expected pain before surgery (SFQ-s: $r = 0.52, p < 0.001$; SFQ-1: $r = 0.48, p < 0.001$), but not experienced pain after surgery ($p > 0.05$).

3.1.2.4. Connections between SFQ and sociodemographic factors

There were no significant differences between the SFQ subscales regarding gender ($p > 0.05$). There were no significant connections between SFQ-s and sociodemographic factors ($p > 0.05$). However, the SFQ-1 subscale had a significant but weak correlation with educational level ($r = -0.181, p = 0.029$). Marital status and age were not significantly correlated with SFQ ($p > 0.05$).

3.1.2.5. Connections between pain and type of surgery

In our research, there were no significant differences between type of surgery (excision or mastectomy) and expected pain (before surgery) or experienced pain (after surgery) among

patients undergoing breast surgery ($p > 0.05$). There were no significant differences between type of surgery (laparoscopy or laporotomy) and expected pain (before surgery) or experienced pain (after surgery) among patients undergoing abdominal surgery ($p > 0.05$). Furthermore, we did not find significant differences between type of surgery (thoracoscopy or thorocotomy) and expected pain (before surgery) or experienced pain (after surgery) among patients undergoing lung surgery ($p > 0.05$).

3.2. The effect of pre- and post-operative psychological interventions on breast cancer patients - a preliminary study

3.2.1. *Methods*

3.2.1.1. Study design and sample

All the materials that were used in this study were approved by the Regional and Institutional Human Medical Biological Research Ethics Committee. Prior to their surgery for breast cancer, the patients were assessed in the Department of Surgery at the University of Szeged. Each patient was provided with comprehensive information regarding the study and signed an informed consent form. The final sample comprised 50 female patients. The inclusion criteria were: (i) breast cancer that was confirmed by histological examination, (ii) ability to complete the necessary questionnaires, and (iii) ability to understand the objective of the study and provide informed consent. The exclusion criteria were: (i) secondary breast cancer, (ii) psychiatric disorder(s) and (iii) male sex. Psychological assessments were conducted by a trained health psychologist who did not have access to medical data about the patients. Patients were divided into 2 groups: (1) intervention group (IG) ($n=20$), (2) control group (CG) ($n=30$). The intervention group received psychological intervention once before the surgery and six times after the surgery. The intervention lasted 60 minutes each time. The control group did not receive any kind of psychological intervention. Every participant could decide freely on which group to join. The data were assessed at 3-time points: 1 day before surgery (T1), 3 days after surgery (T2) and 6 weeks after surgery (T3) (Table 3).

Table 3. Study design

	CG	IG
1 day before surgery	Sociodemographic factors Medical parameters Spielberger State and Trait Anxiety Inventory Beck's Depression Inventory Surgical Fear Questionnaire Functional Assessment of Cancer Therapy-Breast Visual Analog Scale	Sociodemographic factors Medical parameters Spielberger State and Trait Anxiety Inventory Beck's Depression Inventory Surgical Fear Questionnaire Functional Assessment of Cancer Therapy-Breast Visual Analog Scale Psychological preparation for the surgery PRISM-D
2 days after surgery	Spielberger State and Trait Anxiety Inventory Visual Analog Scale	Spielberger State and Trait Anxiety Inventory Visual Analog Scale
6 weeks after surgery	Spielberger State Anxiety Inventory Beck's Depression Inventory Functional Assessment of Cancer Therapy-Breast Breast Impact of Treatment Scale Visual Analog Scale	Spielberger State Anxiety Inventory Beck's Depression Inventory Functional Assessment of Cancer Therapy-Breast Breast Impact of Treatment Scale Visual Analog Scale PRISM-D Psychological Intervention (Week 1-6) Body sculpture technique (Week 4)

3.2.1.2. Study measures

The Spielberger State and Trait Anxiety Inventory (STAI-S; STAI-T) was administered to measure the level of anxiety before and after surgery (98-99). The STAI-S was administered 1 day before surgery and both 2 days and 6 weeks after surgery. The STAI-T was administered one day before surgery.

Beck's Depression Inventory (BDI) was used to assess the severity of depressive symptoms (100-101). The BDI was administered at 2-time points: before surgery and 6 weeks after surgery.

The FACT-Breast (FACT-B) was used to assess QoL, as it was designed specifically for breast cancer patients (103-104). Patients are asked to respond to statements regarding the status of their breast as well as their emotional, functional, physical and social well-being. The FACT-B was administered one day before and 6 weeks after surgery.

To measure stress from body change related to breast cancer surgery, the Breast Impact of Treatment Scale was used 6 weeks after surgery (105). The subscales evaluate *intrusive*

thoughts and level of avoidance. The higher the total score is, the higher the level of body change stress is.

The SFQ was used to measure fear regarding surgery and it was used 1 day before surgery. The SFQ consists of two subscales: *fear of the short-term consequences of surgery* and *fear of the long-term consequences of surgery*.

The Visual Analog Scale (VAS) was used to measure expected pain before surgery and experienced pain after surgery using a 10-point Likert-scale (102).

To measure the patient's perceived burden of suffering due to their illness, the Pictorial Representation of Illness and Self-Measure D (PRISM-D) was used (68). The PRISM-D is a modified version of the PRISM instrument in everyday clinical practice (66). In the PRISM-D task, participants are shown a white A4-size (21x29.7 cm) paper with a printed yellow circle 7 cm in diameter in the bottom right-hand corner. The patient is asked to imagine that the paper represents his/her life as it is currently, and the yellow disk represents the patient's „self". The patient is asked to imagine that a red circle represents his/her illness and is asked: „where would you draw the red circle in your life at the moment?" After this patients are offered 8 felt pens in different colors (yellow, pink, red, purple, blue, green, brown, black) and are asked to draw a circle or more circles representing anything (e.g. work, family, life goals, health) that is important to him/her in life using any color. In our study the PRISM-D was applied not only for exploration but rather as an intervention tool, this way facilitating patients' involvement and communication in therapy settings. This measure was used one day before and 6 weeks after surgery among the IG.

In our study the *Body Sculpture Technique* was used which is a procedure in which patients create a three-dimensional model of their own body with modelling clay (95). This technique offers a diagnostic and also therapeutic approach to body image. Patients have the instruction to form a human figure with closed eyes in 12 minutes. According to evidence-based research from art therapists working with cancer patients we hypothesised 3 positive outcomes when working with the body sculpture technique: (1) cathartic release of emotional issues; (2) new insight into their own behavior; (3) increased ability to confront existential issues (96-97). This therapeutic tool was assessed among the participants of IG 4 weeks after surgery.

Patients in the IG were involved in psychological preparation one day before surgery during which patients had the opportunity of a psychosocial intervention, taking into account the personal needs of each participant. These interventions lasted approximately for one hour and included: (1) information about the availability of the psychologist leading the intervention;

(2) enhance trust and optimism (3) education about the importance of psychological preparation before the surgery; (4) education about the hospital environment and its distressing aspects; (5) education about ways of stress-reduction.

Patients in the IG took part in a 6-sessions psychological intervention during the course of the first 6 weeks after surgery. These interventions were 60-minute long, took place weekly and were conducted by the same psychologist. The interventions were semi-structured, consisting of the body sculpture technique (which was assessed at the 4. intervention session) and the PRISM-D (which was assessed at the 6. intervention session). Furthermore, patients had the opportunity to talk about their feelings and experience about their hospital stay. Education about the ways of stress-reduction were also included:

- talking about the daily routine and customs after surgery
- teaching relaxation techniques such as breathing and progressive muscle relaxation
- teaching adaptive coping strategies
- reframing of the situation

3.2.1.3. Sociodemographic factors and medical parameters of patients

The sociodemographic factors included age, marital status and level of education. The medical parameters that were examined in the study were the side, size and grade of the tumour; type of neoadjuvant therapy and type of surgery (excision/mastectomy).

3.2.1.4. Statistical analyses

The data were analysed using IBM SPSS 23.0 for Windows. Quantitative variables were described using the mean and standard deviation. Qualitative variables such as the sociodemographic characteristics were described using the percentage. To reveal the pattern of the relationships among the variables Pearson's correlations were used. The differences between the variables at different time points were calculated using the paired-samples *t*-test and repeated-measures analysis of variance (rANOVA). Group comparisons were performed with Chi-square test and the independent-samples *t*-test. The FACT-B and BITS subscale scores were compared in different subgroups of patients, depending on the sociodemographic, psychological and medical variables.

3.2.2. Results

3.2.2.1. Sociodemographic and medical characteristics in the IG and CG

Comparing the sociodemographic and medical characteristics of the two groups we found that women in the IG were significantly younger (48.3 vs. 58.03) than patients in the CG (Table 4). In both groups, half of the women had a university qualification, and most of them were married. More than 50% of them have an excision and the mean tumour size was 22 mm (SD =19,7) in the intervention group and 19.5 mm (SD = 19.3) in the control group. Only 8 of the patients received neoadjuvant treatment. Except mean age ($p < 0.05$), there were no significant differences between the two groups regarding sociodemographic and medical characteristics ($p > 0.05$).

Table 4. Sociodemographic and medical characteristics (N = 50)

Characteristics	IG (n = 20)	CG (n = 30)	p
Mean age (SD)	48.3 (10.22)	58.03 (14.05)	0.011*
Marital status (N,%)			
Married	13 (65)	21 (70)	0.7
Not married	7 (35)	9 (30)	
Educational level (N,%)			
Primary qualification	0	1 (3.3)	0.11
Higher secondary qualification	7 (35)	16 (53.3)	
University qualification	13 (65)	13 (43.4)	
Type of surgery (N,%)			
Excision	13 (65)	18 (60)	0.72
Mastectomy	7 (35)	12 (40)	
Grade (N,%)			
I.	3 (15)	2 (6)	0.11
II.	9 (45)	11 (36)	
III.	4 (20)	12 (40)	
Tumor size (Mean,SD)	22 (19.7)	19.50 (19.3)	0.7
Neoadjuvant treatment (N,%)			
Yes	5 (25)	3 (10)	0.16
No	15 (75)	27 (90)	
Side of tumor (N,%)			
Right	10 (50)	15 (50)	0.86
Left	10 (50)	15 (50)	

* $p < 0.05$

3.2.2.2. The influence of sociodemographic and medical factors

Significant differences were found in age among the two groups. As there were no other significant differences among the two groups regarding sociodemographic factors, we concentrated on the influence of age on psychological characteristics at all 3 time points.

Regarding the IG we found that age had a significant negative correlation with social, functional and overall well-being one day before surgery, and a positive correlation with SFQ-I one day before surgery (Table 5).

Table 5. Correlations between sociodemographic and psychological factors in the IG (N = 20)

Time point: Before surgery				
	FACT-B			SFQ
	Functional well-being	Social well-being	FACT-B total	Long-term consequences
	r	r	r	r
Age	-0.526*	-0.487*	-0.497*	0.456*

r = Pearson correlation coefficient; * p < 0.05

In the CG we found significant negative correlations between age and social, functional and overall well-being one day before surgery, and a positive correlation with SFQ-I one day before surgery (Table 6).

Table 6. Correlations between sociodemographic and psychological factors in the CG (N = 30)

Time point: Before surgery				
	FACT-B			SFQ
	Functional well-being	Social well-being	FACT-B total	Long-term consequences
	r	r	r	r
Age	-0.482*	-0.523*	-0.464*	0.396*

r = Pearson correlation coefficient; * p < 0.05

Significant associations were found between type of surgery and psychological factors in both groups (p < 0.05).

Table 7. Associations between type of surgery and psychological factors in the IG (N = 20)

	Before surgery (T1)		p	6 weeks after surgery (T3)		p
	Mastectomy	Excision		Mastectomy	Excision	
Stai-T	45.29	46.29	0.73			
Stai-S	54.43	56	0.74	46.43	38.31	0.08

BDI	10.4	10.1	0.92	14	7.6	0.09
Fact-B						
Emotional well-being	18.43	16.23	0.22	15.14	20.23	0.02*
Physical well-being	24.4	25	0.77	19.86	23.4	0.15
Functional well-being	17.8	16.7	0.65	16.43	18.69	0.46
Social well-being	21.8	21.9	0.97	22.43	21.38	0.6
Breast well-being	24.2	26.1	0.53	23	26.9	0.19
Fact-B total	106.8	106	0.92	96	110	0.2
VAS	6.1	3.5	0.02*	1.29	1.38	0.1
SFQ						
SFQ-s	23	14.5	0.08	13	19.43	0.33
SFQ-1	14	14.4	0.9	12.4	19.7	0.16
SFQ total	29	28.9	0.9	39.14	22.1	0.08
BITS						
Intrusive thoughts				30.57	17.7	0.09
Avoidance				12.29	7.4	0.09
BITS total				42.86	25.23	0.08

* p < 0.05

In the IG we found significant differences between expected pain before surgery and type of surgery, as well as SFQ-s before surgery and type of surgery (Table 7). Patients in the IG undergoing excision reported better emotional well-being 6 weeks after the surgery than patients undergoing mastectomy (Table 7). Furthermore, patients undergoing mastectomy in the IG reported tendentially higher levels of stress regarding changed body image than patients undergoing excision in the IG (Table 7).

Table 8. Associations between type of surgery and psychological factors in the CG (N = 30)

	Before surgery (T1)		p	6 weeks after surgery (T3)		p
	Mastectomy	Excision		Mastectomy	Excision	
Stai-T	46.5	44.72	0.63			
Stai-S	52.17	50.94	0.78	44.64	47.50	0.55
BDI	10.58	10.72	0.96	12.18	13.5	0.69
Fact-B						
Emotional well-being	18.36	17.17	0.40	18.8	18.1	0.7
Physical well-being	23.82	23.89	0.96	19.82	20.19	0.89
Functional well-being	17.5	17.2	0.92	16.2	15.9	0.89
Social well-being	19.91	21.83	0.35	20	21.38	0.52

Breast well-being	24	24.06	0.98	21	25	0.04*
Fact-B total	103.6	104.2	0.94	95.9	100.8	0.5
VAS	3.6	4.8	0.06	1.5	2.4	0.19
SFQ						
SFQ-s	26.83	31.06	0.47	23	29.36	0.6
SFQ-l	13.58	17.8	0.29	17.5	17.5	1
SFQ total	37.43	40.6	0.67	32.2	36.3	0.4
BITS						
Intrusive thoughts				37.5	16.69	0.00**
Avoidance				12.45	7.06	0.01*
BITS total				50	23.75	0.00**

IG = intervention group; CG = control group

* $p < 0.05$; ** $p < 0.01$

In the CG we found significant differences between type of surgery and breast well-being (Table 8). Patients undergoing mastectomy in the CG reported significantly higher levels of stress regarding changed body image than patients undergoing excision in the CG (Table 8).

3.2.2.3. Differences between intervention and control group at all 3 time points (T1, T2, T3)

Before the surgery, both the IG and the CG showed differences in scores regarding the SFQ total ($F(1, 43) = 3.699, p = 0.61$) and the SFQ short term consequences scale ($F(1, 43) = 7.446, p = 0.09$) (Table 9). The IG reported tendentially lower levels of overall surgical fear than the control group (28.95 vs. 39.37). Furthermore, the IG experienced lower levels of fear regarding short term consequences of the surgery than CG (17.63 vs. 29.37). Additionally, the groups significantly differed in the level of state anxiety at all 3 time points, suggesting that while the IG's state anxiety level decreased gradually, patients' state anxiety level in the CG decreased until the second day after surgery and started to increase again by the time of 6 weeks after surgery ($p = 0.02$) (Table 9).

No other significant differences were found between the IG and CG at any of the 3 time points ($p > 0.05$).

Table 9. Differences between intervention and control group at the 3 time points (T1, T2, T3)

	Before surgery (T1)		2 days after surgery (T2)		6 weeks after surgery (T3)		p
	IG	CG	IG	CG	IG	CG	
Stai-T	46.35	45.43					0.74

Stai-S	54.73	52.11	44.5	43.66	40.4	46.33	0.02*
BDI	10.25	11.2			9.8	12.96	0.26
Fact-B							
Emotional well-being	17	17.46			18.45	18.53	0.7
Physical well-being	24.8	23.5			22.2	20.34	0.7
Functional well-being	17.15	16.96			17.9	16.23	0.34
Social well-being	21.9	20.69			21.75	20.76	0.86
Breast well-being	25.55	25.11			25.5	23.46	0.59
Fact-B total	106.3	102.73			105.8	99.46	0.58
VAS	4.26	4.29	3.87	3.74	1.31	2.07	0.39
SFQ							
Short-term consequences	17.63	29.37					0.005**
Long-term consequences	13.53	16.16	14	15.75	14.8	17.5	0.91
SFQ total	28.95	39.37					0.06
BITS							
Intrusive thoughts					22.2	25.19	0.52
Avoidance					9.1	9.26	0.94
BITS total					31.4	34.44	0.61

IG = intervention group; CG = control group

* p < 0.05; ** p < 0.01

3.2.2.4. Experiences with the PRISM-D

Using the PRISM-D as an intervention tool turned out to be a really useful, quick and easy method for acquiring additional informations about the patients' illness perception, family background and emotional well-being. The test also helps patients in visualising their current life situation and becomes this way more approachable and understandable. A further advantage of this method is that it requires an active participation from the patient's side and it also facilitates communication throughout the therapy. With the following case study, our aim is to present the possible use and efficacy of this method.

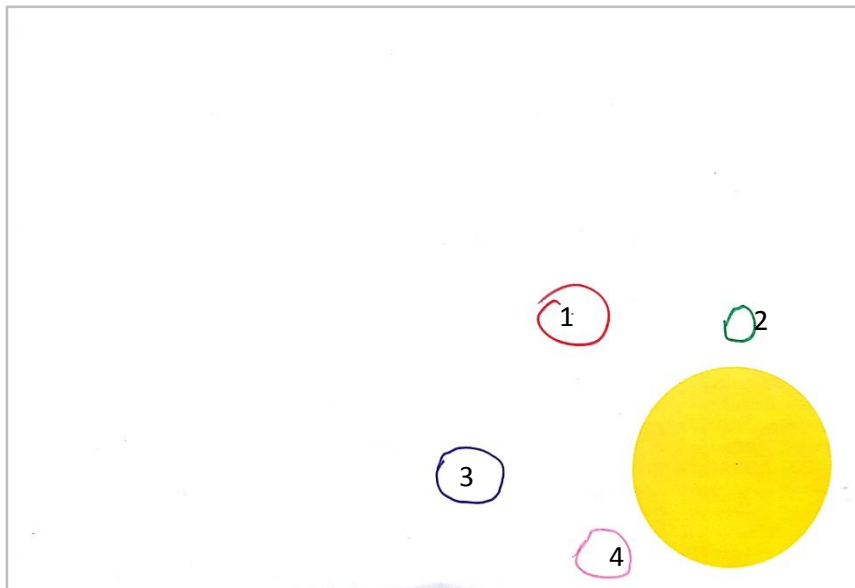
3.2.2.5. PRISM-D case study of an IG participant

During the first psychological assessment (one day before breast cancer surgery) of a 58-year-old female patient the PRISM-D test was used as a tool to facilitate the communication of the patient. As for the patient's family background, the woman revealed that she is single and that she has no children. She also reported that she felt very lonely most of the time and devoted most of her energy to her job. Moreover, she also felt overwhelmed by her cancer diagnosis

and felt very anxious about her surgery. The woman's main aim for participating in the intervention was to reduce her anxiety and fears in connection with the short-term and long-term consequences of the surgery, as well as to find possible coping strategies in connection with her illness.

On the STAI-S questionnaire she reached 48 points, which indicated minor state anxiety, and on the STAI-T she reached 36 points, which indicated no trait anxiety. The BDI scale with 15 points indicated mild depression one day before surgery. The PRISM-D test one day before surgery revealed that the woman perceived her illness really close to herself (Figure 1.). Her family, friends and her work are depicted as smaller than her illness and are scattered all over the paper, offering no protection, no social support. The large blank spaces on the paper may indicate the woman's fear and insecurities in connection with her current life situation.

Figure 1. The PRISM-D test 1 day before surgery (showing the orders, colors and meanings of the circles). 1. *red*: illness, 2. *green*: „my family”, 3. *purple*: „my work which is my life”, 4. *pink*: friends.

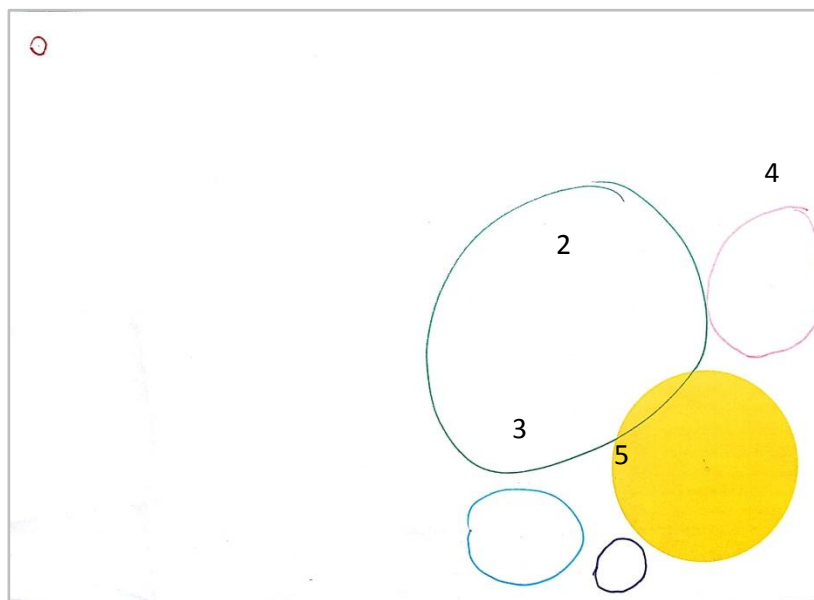


During the sixth intervention session the PRISM-D test was assessed again to acquire a more detailed picture about the changes in the participants' life and well-being. On the STAI-S she reached 23 points, which indicated a decrease of state anxiety compared to the initial assessment. The BDI with 5 points indicated a decrease in depressive symptoms compared to the initial assessment. The patient sensed a change in her emotions, reporting a moderation of anxiety and fears regarding the future; and experiencing greater social support due to the psychological intervention she received. The PRISM-D test six weeks after surgery revealed

that the woman now manages to perceive her illness further from herself and to pay more attention to her family, friends and relatives (Figure 2.). What is more, a new circle symbolising the intervention appeared on the PRISM-D test. The woman explained that the supportive therapy she had received had played an important part in her post-surgical recovery.

Figure 2. The PRISM-D test 6 weeks later after surgery (showing the orders, colors and meanings of the circles). 1. *red*: illness, 2. *green*: „my therapy”, 3. *blue*: work, 4. *pink*: family, 5. *purple*: friends.

1



3.2.2.6. Experiences with the Body Sculpture Technique

Using qualitative analysis we found that the sculptures created by the intervention group reflected the patient's attitude towards their illness and body image. The fragmentation of the ill body part on the statue can indicate that due to somatic illness the wholeness of the body is injured and sensations of the body can occur in a desintegrated way. The projective nature of the method helped patients to reveal individual contents of consciousness such as childhood memories (regression), sensations of grief (the loss of a body part, the loss of health), problems in connection with body image, coping strategies (acceptance) and positive changes due to illness. The individual contents of consciousness also helped to indicate in which level

and way patients managed to accept their illness. Working with the technique also helped patients to get new insight into their own behavior.

3.2.2.7. Body Sculpture Technique case study of an IG participant

During the fourth psychological assessment of a 30-year-old female patient the Body Sculpture Technique was used. As for the patient's family background, the woman revealed that she is single mother, raising her 3 year old daughter all alone. She also reported that she feels very depressed and anxious most of the time, being highly concerned about her recovery and her future prospects. Moreover, she also felt overwhelmed by her cancer diagnosis and felt a strong loss in her femininity due to losing her hair due to chemotherapy. The woman's main aim for participating in the intervention was to reduce her feeling of guilt and shame in connection with not being able to take care of her child properly in this situation.

The Body Sculpture Test of the patient showed the main problems concerning the patient which is grief in connection with the loss of her femininity (loss of hair on Figure 3.) and grief in connection with the loss of productivity (loss of limb on Figure 3.) Due to the creating process of this sculpture, cathartic release of emotional issues and increased ability to confront existential issues appeared, thus, reducing levels of distress in the patient (Figure 3).

Figure 3. The Body Sculpture Test of a 30-year-old mother.



3.3. Long-term QoL in breast cancer patients

3.3.1. *Methods*

3.3.1.1. Study design and sample

All the materials that were used in this study were approved by the Regional and Institutional Human Medical Biological Research Ethics Committee. Prior to their surgery for breast cancer, the patients were assessed in the Department of Surgery at the University of Szeged. Each patient was provided with comprehensive information regarding the study and signed an informed consent form. The final sample comprised 63 female patients. The inclusion criteria were: (i) breast cancer that was confirmed by histological examination, (ii) ability to complete the necessary questionnaires, and (iii) ability to understand the objective of the study and provide informed consent. The exclusion criteria were: (i) secondary breast cancer, (ii) psychiatric disorder(s) and (iii) male sex. Psychological assessments were conducted by a trained health psychologist who did not have access to medical data about the patients. The data were assessed at 3-time points: 1 day before surgery (T1), 3 days after surgery (T2) and 18 months after surgery (T3).

3.3.1.2. Study measures

Beck's Depression Inventory (BDI) was used to measure the severity of depressive symptoms (100-101). The BDI was assessed at 2-time points: before surgery and 18 months after surgery. Total scores range from 0 to 84, with a higher number indicating a higher level of depression. The responses range from 0 to 3. Using the standard cut-off scores, a score of 0–9 indicates minimal depression, 10–18 indicates mild depression, 19–25 indicates moderate depression and > 25 indicates severe depression (100-101). The reliability of the scale is adequate (Cronbach's alpha= 0.86) (103).

The Spielberger State and Trait Anxiety Inventory (STAI-S; STAI-T) was used to measure the level of anxiety before and after surgery (100-101). Both scales comprise 20 items, with responses ranging from 1 (not at all) to 4 (very much so). Total scores range from 20 to 80, with a higher number indicating a higher level of anxiety. In the STAI-S, a mean score above 50 indicates severe state anxiety. The STAI-S was administered 1 day before surgery and both 3 days and 18 months later after surgery. In the STAI-T, a mean score <48 indicates no trait anxiety, a mean score of 48 to 52 indicates minor trait anxiety, and a mean score >52 indicates severe trait anxiety (98). The STAI-T was administered one day before surgery. The Hungarian versions of the STAI-S and STAI-T have good reliability (99).

The FACT-Breast (FACT-B) was used to assess QoL, as it was designed specifically for breast cancer patients (103). Patients are asked to respond to statements regarding the status of their breast as well as their emotional, functional, social, and physical well-being. Answers are scored using a Likert-type scale. The FACT-B was assessed one day before and 18 months after surgery. The total FACT-B score (including all the subscales) ranges from 0 to 144, with a higher number indicating a more favourable QoL. The subscales evaluate *breast well-being* (score range: 0–36), *emotional well-being* (score range: 0–24), *functional well-being* (score range: 0–28), *social well-being* (score range: 0–28), and *physical well-being* (score range: 0–28). The reliability of the FACT-B in general is high (Cronbach's alpha= 0.9) (103). The Cronbach's alpha of the global QoL scale in this study was 0.73 before surgery and 0.79 after surgery.

To measure stress from body change related to breast cancer surgery, the Breast Impact of Treatment Scale was used (total score range: 0 to 75) 18 months after surgery (105). The subscales evaluate *intrusive thoughts* and *level of avoidance*. The higher the total score is, the higher the level of body change stress is. The BITS was found to be a good screening tool in general and has shown high reliability in measuring body change stress (Cronbach's alpha= 0.91) (104).

We administered the Posttraumatic Growth Inventory (PTGI) 18 months after surgery, which was designed to assess positive outcomes following a struggle with highly challenging life circumstances (105). The questionnaire is comprised of five subscales (*appreciation of life, relating to others, new possibilities, spiritual change* and *personal strength*) and yields a total post-traumatic growth score (ranging from 0 to 105). The higher the total score is, the greater the PTG is. The Hungarian version of the PTGI showed good reliability (Cronbach's alpha = 0.898) (105).

3.3.1.3. Sociodemographic factors and physical activity

The following sociodemographic background factors were included: age, marital status, number of children and level of education. Physical activity was also measured, with questions addressing the type and number of hours of physical activity per week. We measured physical activity using open-ended questions, similar to the study by Milne et al. (106).

The questions were:

1. Since your diagnosis, has exercise/sport been part of your life?

2. If so, what type of exercise/sport do you do?

3. How many hours of exercise/sport do you do weekly?

We considered patients' physically active if they are engaged in at least one hour of physical activity per week. In our study, physical activity was described as specific physical activities (e.g., running, yoga). Other physical activities (e.g., gardening) were not considered as specific physical activities.

3.3.1.4. Medical parameters of patients

The following medical parameters were examined in the study: side, size and grade of the tumour; type of neoadjuvant therapy; and type of surgery (excision/mastectomy).

3.3.1.5. Statistical analyses

The data were analysed using IBM SPSS 20.0 for Windows. Qualitative variables such as the sociodemographic characteristics were described using the percentage. Quantitative variables were described using the mean and standard deviation. Spearman's and Pearson's correlation were used to reveal the pattern of the relationships among the variables. The differences between the variables at different time points were calculated using the paired-samples *t*-test, Wilcoxon test and repeated-measures analysis of variance (rANOVA). Group comparisons were performed with the Mann-Whitney U test. The FACT-B, BITS, and PTGI subscale scores were compared in different subgroups of patients depending on the sociodemographic, psychological and medical variables. Physical activity was measured as a dichotomous variable (physically active/not physically active). We also asked the patients to report their mean number of hours of physical activity per week. Multiple linear regression (stepwise method) was used to identify the potential predictors of long-term QoL. The FACT-B scale (18 months after surgery) served as the dependent variable. The independent variables that were entered into the regression analysis were physical activity and all the psychological variables that were measured in our study, which had been found to have a long-term influence on QoL in breast cancer patients undergoing surgery in previous studies (53-57). These psychological variables were depression, state and trait anxiety, PTG and its subscales, stress relating to body change and its subscales. The results were considered statistically significant when the *p* value was less than 0.05.

3.3.2. Results

3.3.2.1. Sociodemographic and medical characteristics

The mean age of the 63 breast cancer patient was 56.1 years (SD = 11.92). 52.4% of the patients had a secondary school qualification, and 73% of them were married. Most of the patients had an excision (75%), and the mean tumour size was 21.61 mm (SD = 21). Only five of the patients received neoadjuvant treatment, and 59.7% of them were physically active (Table 10). No significant associations were found between the type of surgery and psychological factors ($p > 0.05$).

Table 10. Sociodemographic and medical characteristics of the sample (N = 63)

Characteristics	
Mean age (SD)	56.1 (11.92)
Marital status (N,%)	
Married	46 (73)
Not married	17 (27)
Educational level (N,%)	
Primary qualification	11 (17.5)
Higher secondary qualification	33 (52.4)
University qualification	19 (30.1)
Number of children (Mean,SD)	2.03 (0.96)
Physical activity	
Yes	37 (59.7)
No	25 (40.3)
Type of surgery (N,%)	
Excision	47 (74.6)
Mastectomy	16 (25.4)
Grade (N,%)	
I.	10 (19.2)
II.	26 (50)
III.	16 (30.8)
Side of tumor (N,%)	
Right	29 (46)
Left	33 (52.4)
Neoadjuvant treatment (N,%)	
Yes	5 (8.1)
No	57 (91.9)
Tumor size (Mean,SD)	21.61 (21)

3.3.2.2. The influence of sociodemographic factors

No significant correlations were found between the depression scales and marital status ($p > 0.05$), age ($p > 0.05$), education level ($p > 0.05$) and number of children ($p > 0.05$). No significant associations were found between trait and state anxiety before and after the

operation and marital status ($p > 0.05$), age ($p > 0.05$), education level ($p > 0.05$) and number of children ($p > 0.05$).

However, age was significantly correlated with the PTGI ($r = -0.275$, $p < 0.05$) and FACT-B ($r = -0.276$, $p < 0.05$) scores 18 months after the operation. Education level was significantly associated with the FACT-B ($H(2) = 8.175$, $p < 0.05$) and PTGI ($H(2) = 6.292$, $p < 0.05$) scores 18 months later after the operation. Patients with a lower education level had a lower FACT-B score (89 vs. 113.8) and PTGI score (54.6 vs. 74.8) than patients with high qualification 18 months later after the operation.

Marital status was associated with the FACT-B *social well-being* factor ($U = 184.5$, $Z = -2.167$, $p = 0.03$). Married patients had a higher social well-being factor score before the operation compared to not married patients (30.01 vs. 20.04). The number of children was not correlated with the PTGI and FACT-B scores ($p > 0.05$).

3.3.2.3. Depression, anxiety, QOL, PTG and body change stress

The mean scores on depression, anxiety, QoL, PTG and body change stress (at all 3 time points) can be seen in Table 11. Compared to the cut-off scores, the mean scores on depression and trait anxiety showed relatively low but stable levels of distress at all relevant time points. The BDI mean score did not change significantly over time (Table 11). However, state anxiety was significantly higher before the operation than 3 days later after the operation (Table 11). Furthermore, state anxiety was significantly higher 18 months later after the operation than 3 days after the operation (Table 11). The FACT-B mean score did not change significantly over time (Table 11). The patients reported better *functional well-being* and *physical well-being* 18 months after the operation compared to pre-operation (Table 11). *Functional well-being* and *physical well-being* changed significantly from their level pre-surgery to their level 18 months post-surgery (Table 11).

Table 11. Depression, anxiety, QoL, PTG and body change stress (N = 63)

	Baseline mean (sd)	3 days mean (sd)	18 months mean (s d)	Baseline – 18 months p value
BDI	8.36 (7.07)		8.81 (7.23)	0.589 ^c
STAI-T	44.90 (9.76)			
STAI-S	51.46 (12.08)	39.72 (9.55)	41.52 (12.25)	0.000^b
FACT-B				
Emotional well-being	18.35 (4.33)		19.22 (4.48)	0.265 ^a
Functional well-being	17.45 (6.02)		19.31 (5.44)	0.054^a

Physical well-being	20.33 (4.62)		23.87 (4.74)	0.000^a
Social well-being	20.39 (5.67)		20.11 (5.96)	0.563 ^a
Breast well-being	23.94 (5.84)		23.96 (7.33)	0.727 ^a
FACT-B total	99.30 (19.30)		104.57 (23.66)	0.067 ^a
PTGI				
Relating to others			20.26 (9.50)	
New possibilities			12.83 (7.40)	
Personal strength			12.21 (7.36)	
Spiritual change			4.27 (3.28)	
Appreciation of life			10 (4.38)	
PTGI total			59.5 (27.66)	
BITS				
Intrusive thoughts			13.52 (15.39)	
Level of avoidance			4.84 (4.83)	
BITS total			18.37 (19.84)	

sd = standard deviation; ^aWilcoxon test, ^bAnova, ^cpaired sample t-test

3.3.2.4. Correlations between QoL and depression, anxiety, PTG and body change stress

One day before and 18 months after surgery, depression had a significant positive correlation with state and trait anxiety (Table 12). QoL before surgery and the subscales of QoL (except social well-being) before surgery had a significant negative correlation with depression and anxiety (Table 12). QoL 18 months after surgery and the subscales of QoL 18 months after surgery had a significant negative correlation with depression and trait anxiety (Table 12). The statistical measures showed that PTG had a significant negative correlation with depression and trait anxiety 18 months after surgery (Table 12). A significant positive correlation was found between body change stress and both depression and trait anxiety 18 months after surgery (Table 12).

There was a significant association between QoL 18 months after surgery and PTG as well (Table 12). The statistical measures indicated significant positive correlations between QoL 18 months after surgery and the following PTG subscales: *relating to others*, *new possibilities*, *personal strength*, and *spiritual change* (Table 12). A negative association was found between body change stress and both QoL 18 months after surgery and the QoL subscales (*emotional well-being*, *physical well-being* and *breast well-being*) 18 months after the operation (Table 12). There was no significant association between body change stress and PTG (Table 12).

Table 12. Correlation between QoL and depression, anxiety, PTG and body change stress (N = 63)

Time point: Baseline										
	FACT-B									
	Emotional well-being	Functional well-being	Physical well-being	Social well-being	Breast well-being	FACT-B total	BDI	STAI-S	STAI-T	
	R	R	r	r	r	r	r	r	r	
BDI	-0.535**	-0.679**	-0.429**	-0.236	-0.444*	-0.612**	-	0.527**	0.644**	
STAI-S	-0.570**	-0.507**	-0.276	-0.166	-0.359*	-0.604**	0.527**	-	0.510**	
STAI-T	-0.499**	-0.528**^p	-0.286**^a	-0.229	-0.312**^a	-0.482**	0.644**	0.510**	-	
Time point: 18 months										
	Emotional well-being	Functional well-being	FACT-B							
	Emotional well-being	Functional well-being	Physical well-being	Social well-being	Breast well-being	FACT-B total	BDI	STAI-S	STAI-T	
BDI	-0.682**	-0.652**	-0.738**	-0.398**	-0.739**	-0.783**	-	0.584**	0.709**	
STAI-S	-0.632**	-0.524**	-0.536**	-0.291*	-0.491**	-0.593**	0.584**	-	0.781**^a	
STAI-T	-0.600**	-0.586**	-0.610**	-0.286*	-0.620**^a	-0.615**	0.709**	0.781**^a	-	
PTGI										
Relating to others	0.101	0.328*	0.074	0.433**	0.051	0.255*	-0.164	-0.092	-0.130	
New possibilities	0.204	0.301*	0.244	0.289*	0.225	0.311*	-0.260*	-0.238	-0.300*	
Personal strength	0.273*	0.359**	0.289*	0.247	0.263*	0.388**	- 0.339**	-0.250	-0.318*	
Spiritual change	0.137	0.145	0.212	0.182	0.297*	0.276*	-0.215	-0.234	- 0.375**	
Appreciation of life	0.092	0.340**	0.118	0.213	0.106	0.226	-0.091	-0.188	-0.269*	
PTGI total	0.157	0.356	0.203	0.344*	0.211	0.342**	-0.255*	-0.185	-0.288*	
BIT S										
Intrusive thoughts	-0.448**	-0.237	-0.388**	-0.070	-0.640**	-0.433**	0.561**	0.222	0.330*	
Level of avoidance	-0.357**	-0.168	-0.315*	-0.103	-0.522**	-0.391**	0.484**	0.096	0.237	
BIT total	-0.423**	-0.225	-0.381**	-0.095	-0.613**	-0.435**	0.556**	0.177	0.298*	

r = Spearman correlation coefficient except ^a; ^p Pearson correlation coefficient

* p<0.05; ** p<0.01

3.3.2.5. Associations between physical activity and psychological factors

In our study, mean number of hours of physical activity per week was measured (M = 3.02, SD = 2.19). Statistical analyses showed no significant association between physical activity and psychological distress or QoL before the operation (Table 13). However, there was a significant association between physical activity and both depression and state anxiety 18 months after the operation (Table 13). Patients who were engaged in physical activity had lower mean scores on depression and state anxiety 18 months after the surgery (Table 13).

There was a significant relationship between QoL 18 months after the operation and physical activity among the breast cancer patients (Table 13). Patients who were engaged in physical activity had higher scores on the FACT-B scale as well as the *functional well-being*, *physical well-being* and *breast well-being* subscales 18 months after the operation (Table 13).

There was a significant association between PTG and physical activity. Patients who were engaged in physical activity had higher scores on the *new possibilities* and *personal strength* subscales (Table 13). No significant association was found between body change stress and physical activity (Table 13).

Table 13. Associations between physical activity and psychological factors (N = 63)

Time point:	Physically active	Physically not active	Mann-Whitney Test Z	p
Baseline	(n = 37)	(n = 24)		
	m (sd)	m (sd)		
BDI	8.80 (1.35)	9.87 (2.28)	-0.611	0.541
STAI-S	50.50 (2.58)	49.56 (2.53)	-0.765	0.444
STAI-T	41.80 (2.04)	47.93 (3.06)	-1.580	0.114
FACT-B				
Emotional well-being	18.61 (0.76)	18.93 (0.78)	-0.293	0.770
Functional well-being	18.76 (1.01)	15.50 (1.62)	-1.113	0.266
Physical well-being	19.88 (0.92)	20.81 (1.04)	-0.765	0.444
Social well-being	21.03 (0.86)	21.68 (0.92)	-0.924	0.355
Breast well-being	24.26 (1.20)	24.87 (1.41)	-0.469	0.693
FACT-B total	102.57 (3.46)	101.81 (4.13)	-1.035	0.301
Time point: 18 months				
BDI	7.15 (1.22)	12.62 (2.25)	-2.546	0.01*
STAI-S	37 (1.89)	47.87 (3.73)	-2.327	0.02*
FACT-B				
Emotional well-being	20.07 (0.77)	17.43 (1.40)	-1.040	0.298
Functional well-being	21.15 (0.91)	16.00 (1.37)	-2.576	0.01*
Physical well-being	24.46 (0.91)	22.12 (1.32)	-2.288	0.022*
Social well-being	20.73 (1.21)	16.81 (1.57)	-1.702	0.089
Breast well-being	26.46 (1.26)	21.81 (1.93)	-2.670	0.008**
FACT-B total	112.8 (3.80)	94.18 (5.86)	-3.244	0.001**
PTGI				
Relating to others	20.46 (1.82)	17.81 (2.25)	-0.906	0.365
New possibilities	13.88 (1.42)	9.62 (1.66)	-2.187	0.029*
Personal strength	13.88 (1.61)	9.12 (1.72)	-2.367	0.018*
Spiritual change	4.84 (0.65)	3.75 (0.86)	-1.735	0.083
Appreciation of life	10.53 (0.78)	9.62 (1.17)	-0.941	0.347

PTGI total	63.61 (5.16)	49.93 (6.79)	-1.818	0.069
BITS				
Intrusive thoughts	11.38 (2.71)	16 (4.62)	-1.083	0.279
Level of avoidance	4.38 (0.91)	5.43 (1.36)	-1.353	0.176
BITS total	15.76 (3.56)	21.43 (5.89)	-1.206	0.228

* $p < 0.05$; ** $p < 0.01$

3.3.2.6. Possible predictive factors of QoL: linear regression analysis

A linear regression analysis was used to identify factors that contribute to better QoL (dependent variable). There were significant interactions with variables and QoL 18 months after the operation. The linear regression identified two main potential predictors. The resulting model was statistically significant ($p < 0.001$), and R^2 was 0.739. The BDI (18 months after the operation) variable (Beta = -0.75) and PTGI variable (Beta = 0.22) were identified as significant predictors of QoL 18 months after the operation (Table 14).

Table 14. Possible predictive factors of QoL: linear regression analysis (Method=stepwise; N=63)

	Beta	B	Standard Error B	T	F	R^2	Adjusted R^2
Model 1					76.643**	0.739	0.730
BDI (T3)	-0.759	-2.204	0.213	-10.356			
PTGI Total	0.229	0.179	0.057	3.131			

** $p < 0.0$; T3 =Time point 3 = 18 months after the operation

4. Discussion

Summarising the results of the PhD thesis it can be seen that a multidimensional and psychosocial approach has been made to identify and analyse the most important factors improving health-related QoL in breast cancer patients. With the three studies of our complex research, steps has been taken to create a useful and handy questionnaire measuring surgical fear, to initiate a practical intervention program for breast cancer patients waiting for surgery and to investigate the most essential aspects of long-term QoL in breast cancer patients.

The aim of our first study was to assess the reliability and validity of the Hungarian version of the SFQ in cancer patients. In our research psychological characteristics, expected and postoperative pain of cancer patients were measured. According to our results the

psychometric characteristics of the SFQ were appropriate, internal consistency and reliability of the scales have turned out to be excellent. The Hungarian version of the SFQ showed a similar internal structure as the original questionnaire, with two subscales measuring fear of the short-term and long-term consequences of surgery (107). Sociodemographic factors did not alter significantly the outcomes of the SFQ. The SFQ scores moderately correlated with anxiety, depression and expected pain, but not postoperative pain. These results indicate that patients' fear regarding short-term and long-term consequences of the surgery can have a massive effect on the emotional well-being of patients, but it does not necessarily forecast postoperative pain and it is rather a subjective matter. The type of surgery did not affect postoperative pain. The Hungarian version of the SFQ has turned out to be a useful psychometric tool in the measurement of surgical fear.

Finally, the first study had several limitations. The subjects were not representative of the general population in the country and the research had a cross-sectional study design. Nevertheless, despite these limitations, our results support the clinical relevance of patients' emotional support before surgery.

In the second study we measured the overall effect of a pre- and post-operative psychological intervention on breast cancer patients and which theoretical background was based on the second part of our study. As this part of the research is still in progress our results are considered preliminary.

Firstly, pre-surgery interventions revealed that age had a notable influence on overall quality of life and anticipations about the long-term consequences of surgery in our research (regardless of being in the IG or CG), indicating that elder patients experienced lower levels of QoL and greater fears in connection with the long-term consequences of the surgery than younger patients before surgery. These results can be partly explained by the natural phenomenon of aging leading to the decrease of perceived QoL over time, due to progressive decline in functional reserve of multiple organs and body systems (108). Moreover, anticipation of postoperative pain, incapacitation, loss of independence, separation from the family, fear of surgery, and death are factors that trigger symptoms of perioperative anxiety, especially at older age, where these fears may be even more evident (109).

Secondly, we have found that IG patients operated with excision or mastectomy differed in level of anticipated pain before surgery, as well as emotional well-being 6 weeks after surgery. What is more, type of surgery tendentially influenced perceived body change stress in patients involved in psychological interventions. This might suggest that patients in this group undergoing mastectomy anticipated higher levels of pain before surgery and lower

emotional well-being and possibly higher body change stress 6 weeks after surgery than patients undergoing excision. The level of body change stress was even higher in the CG among patients who underwent mastectomy, this way indicating that perceived body change stress is a wide-spread psychological problem among breast cancer patients worth in treatment and screening, especially in case of mastectomy. These results are in concordance with previous intervention studies highlighting the influence of type of surgery on psychological well-being (110-111).

Furthermore, comparing the psychological characteristics and analysing the changes of anxiety and surgical fear between the IG and CG we have found that psychological preparation before surgery had a beneficial effect on participants. Patients in the IG reported lower levels of fear in connection with surgery and experienced a decrease in state anxiety after the sixth week of taking part in our psychological intervention. However, this type of change did not occur in the CG indicating that our psychological intervention may have an instant stress-relieving and calming effect on our patients, this way providing social support before and 6 weeks after surgery. Similar to previous studies, our research highlights the importance of psychological preparation before surgery and immediate psychological guidance after breast cancer surgery as well (15, 20, 112-113). Moreover, the Body Sculpture Technique turned out to be a useful and practical tool, providing health care professionals additional information about the patients' mental state, and attitudes toward their illness and changed body image.

Finally, our study had several limitations. Firstly, the subjects were not representative of the general population in the country. Secondly, the average age of the two groups differed significantly. Thirdly, the number of participants is quite low in our preliminary study. This way the extension of the sample size and harmonising of the distribution of the IG and CG are essential goals of our ongoing study. One more additional future goal of our research, similar to the study of Kovács et al. (113), is to extend the length of our 6-week intervention program to 14 weeks as 6 weeks may not be long enough to achieve permanent changes in patients' QOL. Kovács et al. (113) found that their 14 weeks complex psycho-social intervention program for breast cancer patients helped in the improvement of overall QOL and encouraged psychological and spiritual growth as well.

The aim of the third study was to identify and interpret the interrelationships among the most important factors that influence long-term QoL in breast cancer patients who are undergoing surgery. The second study aimed to create a clear theoretical basis for our intervention study

that we conducted with breast cancer patients who are undergoing surgery and presented in the third part of the thesis.

Sociodemographic factors such as age, education level and marital status influenced QoL in our research. As other studies also suggested, married patients reported better social well-being than patients who were living on their own and patients with a higher level of education reported better QoL (114).

Patients reported relatively low levels of depression and trait and state anxiety as well as high QoL before surgery. No changes were found in the level of depression before the surgery and 18 months after it. In our study, state anxiety decreased from pre-surgery to 18 months post-surgery; however, there was a greater decrease immediately after surgery and then anxiety increased again 18 months later. The immediate relief and decrease in fear that patients experience after surgery can explain the major decrease in state anxiety after surgery. However, after the operation, many patients have to face the fact that their cancer treatment is far from over. Increased fear and uncertainties about cancer and its therapy may explain the increase in state anxiety 18 months after surgery. This is consistent with the results of previous studies which found that breast cancer patients have higher levels of psychological distress related to their fear of cancer (88, 115).

Furthermore, certain aspects of QoL changed over the 18-month period of our research. Patients reported better functional and physical well-being 18 months after the surgery. This change might be partially explained by the decrease in unpleasant physical symptoms and wound healing after surgery. Moreover, completing adjuvant therapy can also increase functional and physical well-being. Adjuvant therapies such as chemotherapy, radiotherapy and hormonal therapy often have severe physical side effects that influence patients' physical and functional well-being (41, 115). A negative relationship was also observed between QoL, depression and anxiety before surgery and 18 months after surgery. In our study, the patients who reported a higher level of psychological distress experienced lower QoL, which is in line with the results of previous studies (26, 116-118).

The patients in our sample who had difficulties with accepting their altered body image experienced higher levels of depression and trait anxiety 18 months after the surgery. Moreover, patients with severe body image problems experienced lower emotional and physical well-being in our research, highlighting that the trajectories of breast cancer surgery can lead to psychological problems regarding body image, sexuality and femininity. Our results indicate despite the decrease in psychological distress shortly (3 days) after surgery, problems regarding body image can appear and persist 18 months after surgery. An

exploration of social support and body image perception before surgery might help to identify vulnerable women who can benefit from additional psychological help (56, 118).

In our study, PTG was relatively high among the breast cancer patients. Patients with lower depression, lower trait anxiety and higher QoL reported greater PTG 18 months after the operation. One explanation for these results might be that a high level of psychological distress experienced before the surgery might have led to illusory instead of real PTG in our sample. Real PTG is a long-term constructive component of personality (perceived new possibilities and increased personal strength). However, for real PTG to appear, an emotional reassessment of the trauma (reduced level of depression and anxiety) is needed (119-120). In our study, only illusory PTG appeared, as the level of depression did not change over time and state anxiety increased 18 months after surgery. Consistent with previous research, our study highlights that for real PTG to appear, emotional reassessment of the trauma through psychological interventions might play a facilitating role (119). In our study, PTG as an illusory phenomenon served as a short-term coping strategy in reducing the distress produced by the traumatic experience of the operation. In this way, patients, therefore, are able to maintain or defend different aspects of their identity such as self-esteem, coherence and perceived control.

In our research, an association between regular physical activity and reduced psychological distress was found 18 months after surgery. In line with previous studies, physical activity can enhance physical and functional well-being as well as PTG 18 months after treatment (120). However, given that this was an observational study, cause and effect cannot be inferred. Although more physically active patients reported greater well-being and PTG 18 months after treatment, there could be many confounders including the factor that those who felt better were able to be involved in physical activity.

According to linear regression analyses depression and PTG were significant predictors of QoL 18 months after surgery. A lower level of depression and higher perceived PTG were associated with better QoL among the breast cancer patients. These results might have remarkable clinical relevance, as they indicate that psychological interventions following surgery should have a special focus on decreasing psychological distress and enhancing PTG. Finally, our study had several limitations. Firstly, the subjects were not representative of the general patient population in the country. Secondly, several factors that are potentially associated with depression, anxiety and QoL such as the type of anti-cancer treatment or religiosity were not measured in the study. Finally, the identification of permanent changes in psychological suffering might require a longer period of monitoring and assessment than 18

months. Nevertheless, despite these limitations, our results support the clinical relevance of patients' psychological support before and after breast cancer surgery.

All in all, the main aim of our research was to provide detailed and up-to-date information about the ways health care professionals can provide appropriate psychosocial support to breast cancer patients before and after surgery as well.

5. Conclusion and implications for practice

5.1. Conclusion

1. The reliable and valid version of the Surgical Fear Questionnaire in Hungarian was created.

In conclusion, the aim of the first study was **to create a reliable and valid version of the Surgical Fear Questionnaire in Hungarian**, this way providing the possibility of measuring surgical fear in breast cancer patients and Hungarian surgery patient population in general. As high levels of surgical fear are well-known to have a negative impact on the healing process after surgery, the availability of such a questionnaire in Hungarian is of high importance, **making psychological screening before surgery easier and quicker.**

2. Our intervention program proved helpful in early psychological screening among breast cancer patients.

The preliminary results of our intervention program highlight the importance of psychological intervention before surgery. Patients taking part in our program experienced **lower levels of fear** in connection with surgery and a **decrease in state anxiety six weeks after surgery** (15). We also found that the **type of surgery** also **influenced patients' psychological well-being**: patients undergoing **mastectomy anticipated higher levels of pain before surgery** and **lower emotional well-being** than patients undergoing excision. Our results highlight **the importance of early psychological screening** among breast cancer patients, with emphasis on body image, perceived surgical fear and type of breast surgery.

3. PTG and level of depression may influence long-term QoL in breast cancer patients.

The results for the third study have shown that **overall QoL in breast cancer patients** is a multidimensional phenomenon that is **influenced by several factors** such as psychological distress, PTG, and body image. **PTG and the level of depression** have been found to be

factors that potentially **contribute to increase in long-term QoL**. In our study, both state and trait anxiety influenced the psychological well-being of the breast cancer patients.

4. A focus on the nature of anxiety (current or permanent) may help in the proper management of distress in interventions.

We have also found that a **focus on the nature of anxiety** (current or permanent) and its dynamic changes during the course of an illness might **help in the proper management of distress** in psychological interventions. Furthermore, we emphasize the great importance of psychological intervention before and after surgery.

5. Psychosocial assessment among breast cancer patients who are undergoing surgery should be multidimensional.

Psychosocial assessment among breast cancer patients who are undergoing surgery should be **multidimensional and simultaneously include an evaluation of long-term QoL, reduction in emotional distress and negative body image and the facilitation of PTG**. The overall facilitation of these factors could have a cumulative effect on the healing process in breast cancer patients who are undergoing surgery. Based on our results a **theoretical basis for our third study** (pre- and post-operative psychological interventions on breast cancer patients) has been created.

5.2 Implications for practice

The growing need to include psychosocial care in quality cancer care protocols represents an important step toward its greater availability and routine use.

Based on our research, a complex, evidence-based **psychological intervention programme was created**, highlighting the importance of **psychological care before and long after breast cancer surgery**. Surgical fear correlated with many aspects of emotional well-being, therefore the measurement of this construct proved to be useful for examining health behaviors before surgery.

Our pre- and postoperative intervention used in the second study could **be an effective method in programs facilitating QoL enhancement** among breast cancer patients. Further expansion of this study is planned in the near future. Our third research underlines the importance of **long-term psychological monitoring of breast cancer patients**, placing special emphasis on body change stress and PTG.

6.Acknowledgements

I would like to express my sincere gratitude to my supervisors. Firstly, I wish to thank Prof. Dr. Lázár György and Prof. Dr. Csabai Márta for their continuous support of my Ph.D study and related research, for their patience, motivation, and immense knowledge. Their guidance helped me in all the time of research and writing of this thesis.

I also wish to thank my psychologist colleague Dr. Látos Melinda for her insightful comments and encouragement, which incited me to widen my research from various perspectives.

Furthermore, I would like to thank the community of the Department of Surgery of the University of Szeged that they gave motivation to my work tasks. I wish to express my sincere appreciation to the surgeons and patients who participated in our studies.

Last but not the least, I would like to thank my family for supporting me throughout the course of my PhD studies.

7. References

1. Andrykowski, M. A., & Manne, S. L. (2006). Are psychological interventions effective and accepted by cancer patients? I. Standards and levels of evidence. *Annals of Behavioral Medicine*, 32(2), 93-97.
2. Gorin, S. S., Krebs, P., Badr, H., Janke, E. A., Jim, H. S., Spring, B., & Jacobsen, P. B. (2012). Meta-analysis of psychosocial interventions to reduce pain in patients with cancer. *J Clin Oncol*, 30(5), 539-547.
3. National Comprehensive Cancer Network Clinical Practice Guidelines in Oncology, Distress Management, Version 1. (2016). Page 7. Available from: https://www.nccn.org/professionals/physician_gls/pdf/distress.pdf.
4. Derogatis LR, Morrow GR, Fetting J, et al. The prevalence of psychiatric disorders among cancer patients. *JAMA* 1983;249:751-757.[6823028]
5. Fernández Rodríguez, C., Padierna Sánchez, C., Villoria Fernández, E., Amigo Vázquez, I., Fernández Martínez, R., Peláez Fernández, I., 2011. Impact of anxiety and depression on the physical status and daily routines of cancer patients during chemotherapy. *Psicothema* 23, 374e381
6. Schwarz, L.A., DeRosa, B. W., Kazak, A. E. (2010). Adult Survivors of Childhood Cancer in Holland, J.C. et al (Eds.) *Psycho-Oncology*. 2nd edition, Oxford University Press, NY.
7. Ali, A., Altun, D., Oguz, B. H., Ilhan, M., Demircan, F., & Koltka, K. (2014). The effect of preoperative anxiety on postoperative analgesia and anesthesia recovery in patients undergoing laparoscopic cholecystectomy. *Journal of anesthesia*, 28(2), 222-227.
8. Munafò, M. R., & Stevenson, J. (2001). Anxiety and surgical recovery: Reinterpreting the literature. *Journal of psychosomatic research*, 51(4), 589-596.
9. Theunissen, M., Peters, M. L., Bruce, J., Gramke, H. F., & Marcus, M. A. (2012). Preoperative anxiety and catastrophizing: a systematic review and meta-analysis of the association with chronic postsurgical pain. *The Clinical journal of pain*, 28(9), 819-841.

10. Zieger, M., Schwarz, R., König, H. H., Härter, M., & Riedel-Heller, S. G. (2010). Depression and anxiety in patients undergoing herniated disc surgery: relevant but underresearched—a systematic review. *Central European Neurosurgery*, *71*(01), 26-34.
11. Arpino, L., Iavarone, A., Parlato, C., & Moraci, A. (2004). Prognostic role of depression after lumbar disc surgery. *Neurological Sciences*, *25*(3), 145-147.
12. Granot, M., & Ferber, S. G. (2005). The roles of pain catastrophizing and anxiety in the prediction of postoperative pain intensity: a prospective study. *The Clinical journal of pain*, *21*(5), 439-445.
13. Koivula, M., Tarkka, M. T., Tarkka, M., Laippala, P., & Paunonen-Ilmonen, M. (2002). Fear and in-hospital social support for coronary artery bypass grafting patients on the day before surgery. *International journal of nursing studies*, *39*(4), 415-427.
14. Shafer, A., Fish, M. P., Gregg, K. M., Seavello, J., & Kosek, P. (1996). Preoperative anxiety and fear: a comparison of assessments by patients and anesthesia and surgery residents. *Anesthesia & Analgesia*, *83*(6), 1285-1291.
15. Powell, R., Scott, N. W., Manyande, A., Bruce, J., Vögele, C., Byrne- Davis, L. M., ... & Johnston, M. (2016). Psychological preparation and postoperative outcomes for adults undergoing surgery under general anaesthesia. *The Cochrane Library*.
16. Rainville, P., Bao, Q. V. H., & Chrétien, P. (2005). Pain-related emotions modulate experimental pain perception and autonomic responses. *Pain*, *118*(3), 306-318.
17. Middendorp, H., Lumley, M. A., Moerbeek, M., Jacobs, J. W., Bijlsma, J. W., & Geenen, R. (2010). Effects of anger and anger regulation styles on pain in daily life of women with fibromyalgia: a diary study. *European Journal of Pain*, *14*(2), 176-182.
18. Marucha, P. T., Kiecolt-Glaser, J. K., & Favagehi, M. (1998). Mucosal wound healing is impaired by examination stress. *Psychosomatic medicine*, *60*(3), 362-365.

19. Walburn, J., Vedhara, K., Hankins, M., Rixon, L., & Weinman, J. (2009). Psychological stress and wound healing in humans: a systematic review and meta-analysis. *Journal of psychosomatic research*, 67(3), 253-271.
20. Johnston, M., & Vögele, C. (1993). Benefits of psychological preparation for surgery: a meta-analysis. *Annals of Behavioral Medicine*, 15(4), 245-256.
21. Theunissen, M., Peters, M. L., Schouten, E. G., Fiddelaers, A. A., Willemsen, M. G., Pinto, P. R., ... & Marcus, M. A. (2014). Validation of the surgical fear questionnaire in adult patients waiting for elective surgery. *PloS one*, 9(6), e100225.
22. Stewart, B. W., & Kleihues, P. (2003). *World Cancer Report*. Lyon: International Agency Research on Cancer.
23. Chida, Y., Hamer, M., Wardle, J., & Steptoe, A. (2008). Do stress-related psychosocial factors contribute to cancer incidence and survival? *Nature Reviews Clinical Oncology*, 5, 466–475.
24. Enache, R. G. (2012). The relationship between anxiety, depression and self esteem in women with breast cancer after surgery. *Procedia—Social and Behavioral Sciences*, 33, 124–127.
25. Schwarz, R., Krauss, O., Hockel, M., Meyer, A., & Zenger, M. (2008). The course of anxiety and depression in patients with breast cancer and gynecological cancer. *Breast Care*, 3, 417–422.
26. Vahdaninia, M., Omidvari, S., & Montazeri, A. (2010). What do predict anxiety and depression in breast cancer patients? A follow-up study. *Social Psychiatry and Psychiatric Epidemiology*, 45(3), 355–361.
27. Ho, S. S. M., Winnie, K. W. S., Doris, Y. P. L., Eve, T.L. L. & Carmen, W. H. C. (2013). Anxiety, depression and quality of life in Chinese women with breast cancer during and after treatment: A comparative evaluation. *European Journal of Oncology Nursing* 1–6.

28. Holzner, B., Kemmler, G., Kopp, M., Moschen, R., Schweigkofler, H., Dunser, M., et al. (2001). Quality of life in breast cancer patients—not enough attention for long-term survivors? *Psychosomatics*, *42*, 117–123.
29. Dow, K. H., Ferrell, B. R., Leigh, S., et al. (1996). An evaluation of the quality of life among long-term survivors of breast cancer. *Breast Cancer Research and Treatment*, *39*, 261–273.
30. Ganz, P. A., Coscarelli, A., & Fred, C. (1996). Breast cancer survivors: Psychosocial concerns and quality of life. *Breast Cancer Research and Treatment*, *38*, 183–199.
31. Meyerowitz, B. E. (1980). Psychosocial correlates of breast cancer and its treatments. *Psychological Bulletin*, *87*(1), 108.
32. Mosher, C. E., & Danoff-Burg, S. (2006). A review of age differences in psychological adjustment to breast cancer. *Journal of psychosocial oncology*, *23*(2-3), 101-114.
33. Vinokur, A. D., Threatt, B. A., Caplan, R. D., & Zimmerman, B. L. (1989). Physical and psychosocial functioning and adjustment to breast cancer. Long-term follow-up of a screening population. *Cancer*, *63*(2), 394-405.
34. Avis, N. E., Crawford, S., & Manuel, J. (2004). Psychosocial problems among younger women with breast cancer. *Psycho-Oncology*, *13*, 295–308.
35. Robb, C., Haley, W. E., Balducci, L., Extermann, M., Perkins, E. A., Small, B. J., & Mortimer, J. (2007). Impact of breast cancer survivorship on quality of life in older women. *Critical reviews in oncology/hematology*, *62*(1), 84-91.
36. Tedeschi, R. G., & Calhoun, L. G. (1995). *Trauma & transformation: Growing in the aftermath of suffering*. Los Angeles, CA: SAGE.
37. Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological Inquiry*, *15*, 1–18.

38. Antoni, M. H., Lehman, J. M., Kilbourn, K. M., Boyers, A. E., Culver, J. L., Alferi, S. M., & Carver, C. S. (2001). Cognitive behavioral stress management intervention decreases the prevalence of depression and enhances benefit finding among women under treatment for early stage breast cancer. *Health Psychology, 20*, 20–32.
39. Bellizzi, K. M. (2004). Expressions of generativity and posttraumatic growth in adult cancer survivors. *International Journal of Aging and Human Development, 58*, 247–267.
40. Bellizzi, K. M., & Blank, T. O. (2006). Predicting posttraumatic growth in breast cancer survivors. *Health Psychology, 25*, 47–56.
41. Cordova, M. J., Cunningham, L.L.C., Carlson, C. R., & Andrykowski, M. A. (2001). Posttraumatic growth following breast cancer: A controlled comparison study. *Health Psychology, 20*, 176–185.
42. Bower, J. E., Meyerowitz, B. E., Desmond, K. A., Bernards, C. A., Rowland, J. H., & Ganz, P. A. (2005). Perceptions of positive meaning and vulnerability following breast cancer: Predictors and outcomes among long-term breast cancer survivors. *Annals of Behavioral Medicine, 29*, 236–245. *Author's personal copy Qual Life Res 13*
43. Carver, C. S., & Antoni, M. H. (2004). Finding benefit in breast cancer during the year after diagnosis predicts better adjustment 5–8 years after diagnosis. *Health Psychology, 23*, 595–598.
44. Tomich, P. L., & Helgeson, V. S. (2002). Five years later: A cross-sectional comparison of breast cancer survivors with healthy women. *Psycho-Oncology, 11*, 154–169.
45. Tomich, P. L., & Helgeson, V. S. (2004). Is finding something good in the bad always good? Benefit finding among women with breast cancer. *Health Psychology, 23*, 16–23.
46. Park, C. L., Cohen, L. H., & Murch, R. (1996). Assessment and prediction of stress-related growth. *Journal of Personality, 64*, 71–105.

47. Updegraff, J. A., & Taylor, S. E. (2000). From vulnerability to growth: Positive and negative effects of stressful life events. In J. H. Harvey & E. D. Miller (Eds.), *Loss and trauma: General and close relationship perspectives* (pp. 3–28). New York: Brunner-Routledge.
48. Bellizzi, K. M., Miller, M. F., Arora, N. K., & Rowland, J. H. (2007). Positive and negative life changes experienced by survivors of non-Hodgkin's Lymphoma. *Annals of Behavioral Medicine*, *34*, 188–199.
49. Frierson, G.M., Thiel, D.M. & Andersen, B.L. (2006). Body change stress for women with breast cancer: The Breast-Impact of Treatment Scale. *Annals of Behavioral Medicine*, *32*(1), 77–81.
50. Shimozuma, K., Ganz, P. A., Petersen, L., & Hirji, K. (1999). Quality of life in the first year after breast cancer surgery: Rehabilitation needs and patterns of recovery. *Breast Cancer Research and Treatment*, *56*, 45–57.
51. Rowland, J. H., & Massie, M. J. (2009). Psychosocial adaptation during and after breast cancer. *Diseases of the breast. Philadelphia: Lippincott, Williams & Wilkins*, 1103-23.
52. Moyer, A. (1997). Psychosocial outcomes of breast-conserving surgery versus mastectomy: a meta-analytic review. *Health psychology*, *16*(3), 284.
53. Hong, S., Bardwell, W. A., Natarajan, L., Flatt, S. W., Rock, C. L., Newman, V. A., et al. (2007). Correlates of physical activity level in breast cancer survivors participating in the women's healthy eating and living (WHEL) study. *Breast Cancer Research and Treatment*, *101*(2), 225–232.
54. Dimeo, F. C. (2001). Effects of exercise on cancer-related fatigue. *Cancer*, *92*(6), 1689–1693.

55. Battaglini, C. L., Dennehy, C. A., Groff, D., Kirk, D., & Anton, P. M. (2006). Complementary therapies in the management of cancer treatment-related symptoms: The individualized prescriptive exercise intervention approach. *Medicina Sportiva, 10*(2), 49–57.
56. Courneya, K. S., Friedenreich, C. M., Sela, R. A., Quinney, H. A., Rhodes, R. E., & Handman, M. (2003). The group psychotherapy and home-based physical exercise (group-hope) trial in cancer survivors: Physical fitness and quality of life outcomes *Psycho-Oncology, 12*(4), 357–374.
57. Sabiston, C. M., McDonough, M., & Crocker, P.R.E. (2007). Psychosocial experiences of breast cancer survivors involved in a dragon boat program: Exploring links to positive psychological growth. *Journal of Sport and Exercise Psychology, 29*, 419–438.
58. Den Heijer, M., Seynaeve, C., Timman, R., Duivenvoorden, H. J., Vanheusden, K., Tilanus-Linthorst, M., Menke-Pluijmers, M.B.E., & Tibben, A. (2012). Body image and psychological distress after prophylactic mastectomy and breast reconstruction in genetically predisposed women: A prospective long-term follow-up study. *European Journal of Cancer, 48*(9), 1263–1268.
59. Alfano, C. M., Smith, A. W., Irwin, M. L., Bowen, D. J., Sorensen, B., Reeve, B. B., et al. (2007). Physical activity, longterm symptoms, and physical health-related quality of life among breast cancer survivors: A prospective analysis. *Journal of Cancer Survivorship, 1*(2), 116–128.
60. Meisel, J. L., Domchek, S. M., Vonderheide, R. H., Giobbie-Hurder, A., Lin, N. U., Winer, E. P., & Partridge, A. H. (2012). Quality of life in long-term survivors of metastatic breast cancer. *Clinical Breast Cancer, 12*(2), 119–126.
61. Love, C., & Sabiston, C. M. (2011). Exploring the links between physical activity and posttraumatic growth in young adult cancer survivors. *Psycho-Oncology, 20*(3), 278–286.
62. Sackey, H., Sandelin, K., Frisell, J., Wickman, M., & Brandberg, Y. (2010). Ductal carcinoma in situ of the breast. Longterm follow-up of health-related quality of life, emotional reactions and body image. *European Journal of Surgical Oncology (EJSO), 36*(8), 756–762.

63. Kassardjian, C. D., Gardner-Nix, J., Dupak, K., Barbati, J., & Lam-McCulloch, J. (2008). Validating PRISM (Pictorial Representation of Illness and Self Measure) as a measure of suffering in chronic non-cancer pain patients. *The Journal of Pain*, 9(12), 1135-1143.
64. Látos, M., Barabás, K., Lázár, G., Szederkényi, E., Szenohradszky, P., Marofka, F., & Csabai, M. (2012, September). Mental representations of the new organ and posttransplant patients' anxiety as related to kidney function. In *Transplantation proceedings* (Vol. 44, No. 7, pp. 2143-2146). Elsevier.
65. Lehmann, V., Oerlemans, S., van de Poll-Franse, L. V., Vingerhoets, A. J., & Mols, F. (2011). Suffering in long-term cancer survivors: An evaluation of the PRISM-R2 in a population-based cohort. *Quality of Life Research*, 20(10), 1645-1654.
66. Büchi, S., & Sensky, T. (1999). PRISM: Pictorial Representation of Illness and Self Measure: A brief nonverbal measure of illness impact and therapeutic aid in psychosomatic medicine. *Psychosomatics*, 40(4), 314-320.
67. Büchi, S., Buddeberg, C., Klaghofer, R., Russi, E. W., Brändli, O., Schlösser, C., ... & Sensky, T. (2002). Preliminary validation of PRISM (Pictorial Representation of Illness and Self Measure)—A brief method to assess suffering. *Psychotherapy and Psychosomatics*, 71(6), 333-341.
68. Havancsák, R., Pócza-Véger, P., Látos, M. & Csabai, M. (2013). A PRISM-D rajzeszt kórházi betegek vizsgálatában és kezelésében. In Csabai, M. (szerk): *Pszichológia a gyógyításban. Fenomenológiai, művészetpszichológiai és testkép-központú megközelítések* (83-107). Oriold és Társai, Budapest.
69. Stanton, A. L. (2006). Psychosocial concerns and interventions for cancer survivors. *Journal of Clinical Oncology*, 24(32), 5132-5137.
70. Savard, J., Simard, S., Giguere, I., Ivers, H., Morin, C. M., Maunsell, E., ... & Marceau, D. (2006). Randomized clinical trial on cognitive therapy for depression in women with

metastatic breast cancer: psychological and immunological effects. *Palliative & supportive care*, 4(3), 219-237.

71. Spiegel, D., Bloom, J. R., & Yalom, I. (1981). Group support for patients with metastatic cancer: A randomized prospective outcome study. *Archives of general psychiatry*, 38(5), 527-533.

72. Waller, A., Forshaw, K., Bryant, J., Carey, M., Boyes, A., & Sanson-Fisher, R. (2015). Preparatory education for cancer patients undergoing surgery: a systematic review of volume and quality of research output over time. *Patient education and counseling*, 98(12), 1540-1549.

73. Tsimopoulou, I., Pasquali, S., Howard, R., Desai, A., Gourevitch, D., Tolosa, I., & Vohra, R. (2015). Psychological prehabilitation before cancer surgery: a systematic review. *Annals of surgical oncology*, 22(13), 4117-4123.

74. Manyande, A., Berg, S., Gettins, D., Stanford, S. C., Mazhero, S., Marks, D. F., & Salmon, P. (1995). Preoperative rehearsal of active coping imagery influences subjective and hormonal responses to abdominal surgery. *Psychosomatic Medicine*, 57(2), 177-182.

75. Broadbent, E., Kahokehr, A., Booth, R. J., Thomas, J., Windsor, J. A., Buchanan, C. M., ... & Hill, A. G. (2012). A brief relaxation intervention reduces stress and improves surgical wound healing response: a randomised trial. *Brain, Behavior, and Immunity*, 26(2), 212-217.

76. Wittmann, V., Látos, M., Horváth, Z., Simonka, Z., Paszt, A., Lázár, G., & Csabai, M. (2017). What contributes to long-term quality of life in breast cancer patients who are undergoing surgery? Results of a multidimensional study. *Quality of Life Research*, 26(8), 2189-2199.

77. Jadoulle, V., Rokbani, L., Ogez, D., Maccioni, J., Lories, G., Bruchon-Schweitzer, M., & Constant, A. (2006). Coping and adapting to breast cancer: a six-month prospective study. *Bulletin du cancer*, 93(7), 10067-10072.

78. Bárez, M., Blasco, T., Fernández-Castro, J., & Viladrich, C. (2009). Perceived control and psychological distress in women with breast cancer: a longitudinal study. *Journal of Behavioral Medicine, 32*(2), 187.
79. Taira, N., Shimosuma, K., Shiroya, T., Ohsumi, S., Kuroi, K., Saji, S., ... & Katsumata, N. (2011). Associations among baseline variables, treatment-related factors and health-related quality of life 2 years after breast cancer surgery. *Breast cancer research and treatment, 128*(3), 735-747.
80. Charalambous, A. (2011). The effect of progressive muscle relaxation and guided imagery in improving psychological well-being and quality-of-life for breast and prostate cancer patients: Initial report. *European Journal of Integrative Medicine, 3*(3), e125.
81. Eremin, O., Walker, M. B., Simpson, E., Heys, S. D., Ah-See, A. K., Hutcheon, A. W., ... & Walker, L. G. (2009). Immuno-modulatory effects of relaxation training and guided imagery in women with locally advanced breast cancer undergoing multimodality therapy: a randomised controlled trial. *The Breast, 18*(1), 17-25.
82. Hebert, J. R., Ebbeling, C. B., Olendzki, B. C., Hurley, T. G., Ma, Y., Saal, N., ... & Clemow, L. (2001). Change in women's diet and body mass following intensive intervention for early-stage breast cancer. *Journal of the American Dietetic Association, 101*(4), 421-431.
83. Cohen, L., Warneke, C., Fouladi, R. T., Rodriguez, M., & Chaoul- Reich, A. (2004). Psychological adjustment and sleep quality in a randomized trial of the effects of a Tibetan yoga intervention in patients with lymphoma. *Cancer, 100*(10), 2253-2260.
84. Speca, M., Carlson, L. E., Goodey, E., & Angen, M. (2000). A randomized, wait-list controlled clinical trial: the effect of a mindfulness meditation-based stress reduction program on mood and symptoms of stress in cancer outpatients. *Psychosomatic medicine, 62*(5), 613-622.
85. Savard, J., Simard, S., Ivers, H., & Morin, C. M. (2005). Randomized study on the efficacy of cognitive-behavioral therapy for insomnia secondary to breast cancer, part I: Sleep and psychological effects. *Journal of Clinical Oncology, 23*(25), 6083-6096.

86. Classen, C., Butler, L. D., Koopman, C., Miller, E., DiMiceli, S., Giese-Davis, J., ... & Spiegel, D. (2001). Supportive-expressive group therapy and distress in patients with metastatic breast cancer: a randomized clinical intervention trial. *Archives of general psychiatry*, 58(5), 494-501.
87. Lemieux, J., Topp, A., Chappell, H., Ennis, M., & Goodwin, P. J. (2006). Economic analysis of psychosocial group therapy in women with metastatic breast cancer. *Breast cancer research and treatment*, 100(2), 183-190.
88. Riskó Á. A test, a lélek és a daganat. Bevezetés az onkopszichológiába. Animula. Budapest 1999, pp. 34–48
89. McGregor, B. A., & Antoni, M. H. (2009). Psychological intervention and health outcomes among women treated for breast cancer: a review of stress pathways and biological mediators. *Brain, behavior, and immunity*, 23(2), 159-166.
90. Jacobsen, P. B., Holland, J. C., & Steensma, D. P. (2012). Caring for the whole patient: the science of psychosocial care. *Journal of Clinical Oncology*, 30(11), 1151-1153.
91. McCain, N. L. (2005). Psychoneuroimmunology, spirituality, and cancer. *Gynecologic oncology*, 99(3), S121.
92. Rippentrop, A. E., Altmaier, E. M., & Burns, C. P. (2006). The relationship of religiosity and spirituality to quality of life among cancer patients. *Journal of Clinical Psychology in Medical Settings*, 13(1), 29.
93. Öster, I., Svensk, A. C., Magnusson, E., Thyme, K. E., Sjödin, M., Åström, S., & Lindh, J. (2006). Art therapy improves coping resources: a randomized, controlled study among women with breast cancer. *Palliative & supportive care*, 4(1), 57-64.
94. Waller, D. (1991). Becoming a profession. *The History of Art Therapy in Britain*, Tavistock/Routledge, Lon-don.

95. Wadepuhl, B., & Wadepuhl, M. (1994). Der Körperbildtest—ein dreidimensionaler Nachweis von Körperbildstörungen. In: Hahn, P., Werner, A. (szerk.): Modell und Methode in der Psychosomatik. Weinheim, Deutscher Studien Verlag.
96. Waller, D., & Sibbett, C. (2005). *Art therapy and cancer care*. McGraw-Hill Education (UK).
97. Butchers, A., Dobbs, S., Sands, M., Tasker, M., Hearth, V., Harmer, L., & Gill, A. (2008). *The creative arts in palliative care*. Jessica Kingsley Publishers.
98. Spielberger, C.D., Gorsuch, R.L. & Lushene, R.E. (1970). *Manual for the state-trait anxiety inventory*. Palo Alto: Consulting Psychologists Press.
99. Sipos, K., Sipos, M. (1978). The development and validation of the hungarian form of the STAI. In: Spielberger, C.D., DiazGuerrero (szerk.): Cross-Cultural Anxiety, 2, Hemisphere Publishing Corporation, Washington-London, 51-61.
100. Beck, A.T., Ward, C.H., Mendelson, M. et al. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, 4, 561–71.
101. Rózsa, S., Szádóczky, E., Füredi, J. (2001) A Depresszió Kérdőív rövidített változatának jellemzői a hazai mintán. *Psychiatria Hungarica*, 16(4), 379-397
102. Wong, D. L., & Baker, C. M. (2001). Smiling face as anchor for pain intensity scales. *Pain*, 89(2-3), 295-297.
103. Brady, M.J., Cella, D.F., Mo, F., et al. (1997). Reliability and validity of the functional assessment of cancer therapy-breast quality-of-life instrument. *J Clin Oncol*, 15, 974-86.
104. Frierson, G.M. (2003). The Breast Impact of Treatment Scale: The Assessment of Body Image Distress for Breast Cancer Patients. Ohio University.
105. Kovács, É., Balog, P., & Preisz, L. (2012). A Poszttraumás Növekedésérzés Kérdőív pszichometriai mutatói hazai mintán. *Mentálhigiéné és Pszichoszomatika*, 13(1), 57-84.

106. Milne, H. M., Gordon, S., Guilfoyle, A., Wallman, K. E., & Courneya, K. S. (2007). Association between physical activity and quality of life among Western Australian breast cancer survivors. *Psycho- Oncology: Journal of the Psychological, Social and Behavioral Dimensions of Cancer*, 16(12), 1059-1068.
107. Wittmann V., Csabai M., Drótos G. & Lázár Gy. (2018). A Sebészeti Beavatkozástól Való Félelem Kérdőív magyar nyelvű változatának reliabilitás-és validitásvizsgálata sebészeti beavatkozáson átesett páciensek körében. *Orvosi Hetilap (megjelenés alatt)*
108. Bowling, A., & Windsor, J. (2001). Towards the good life: A population survey of dimensions of quality of life. *Journal of Happiness Studies*, 2(1), 55-82.
109. Egan, K. J., Ready, L. B., Nessly, M., & Greer, B. E. (1992). Self-administration of midazolam for postoperative anxiety: a double blinded study. *Pain*, 49(1), 3-8.
110. Yurek, D., Farrar, W., & Andersen, B. L. (2000). Breast cancer surgery: Comparing surgical groups and determining individual differences in postoperative sexuality and body change stress. *Journal of consulting and clinical psychology*, 68(4), 697.
111. Alicikus, Z. A., Gorken, I. B., Sen, R. C., Kentli, S., Kinay, M., Alanyali, H., & Harmancioglu, O. (2009). Psychosexual and body image aspects of quality of life in Turkish breast cancer patients: a comparison of breast conserving treatment and mastectomy. *Tumori Journal*, 95(2), 212-218.
112. Andersen, B. L., Farrar, W. B., Golden-Kreutz, D. M., Glaser, R., Emery, C. F., Crespín, T. R., ... & Carson III, W. E. (2004). Psychological, behavioral, and immune changes after a psychological intervention: a clinical trial. *Journal of clinical oncology: official journal of the American Society of Clinical Oncology*, 22(17), 3570.
113. Kovacs, Z., Rigo, A., Kökönyei, G., Szabó, E., Kovács, D., Sebestyén, A., ... & Nagy, M. (2012). Complex psycho-social intervention program complementing conventional antitumor therapy--promising results. *Magyar onkologia*, 56(4), 247-257.

114. King, M. T., Kenny, P., Shiell, A., Hall, J., & Boyages, J. (2000). Quality of life three months and one year after first treatment for early stage breast cancer: influence of treatment and patient characteristics. *Quality of Life Research*, 9 (7), 789-800.
115. Ng, C.G., Mohamed, S., See, M.H., Harun, F., Dahlui, M., Sulaiman, A.H., Zainal, N.Z., Taib, N.A. (2015). Anxiety, depression, perceived social support and quality of life in Malaysian breast cancer patients: a 1-year prospective study. *Health and Quality of Life Outcomes*, 13:205.
116. Lidgren, M., Wilking, N., Jönsson, B., & Rehnberg, C. (2007). Health related quality of life in different states of breast cancer. *Quality of Life Research*, 16(6), 1073-1081.
117. Tominaga, K., Andow, J., Koyama, Y., Numao, S., Kurokawa, E., Ojima, M., & Nagai, M. (1998). Family environment, hobbies and habits as psychosocial predictors of survival for surgically treated patients with breast cancer. *Japanese journal of clinical oncology*, 28(1), 36-41.
118. Lloyd, S.M., Watson, M., Oaker, G., et al. (2000). Understanding the experience of prophylactic bilateral mastectomy: a qualitative study of ten women. *Psychooncology*, 9(6), 473-85
119. Wagner, B., Forstmeier, S., & Maercker, A. (2007). Posttraumatic growth as a cognitive process with behavioral components: A commentary on Hobfoll et al. (2007). *Applied Psychology*, 56, 407-416
120. Hatcher, M.B., Fallowfield, L., A'Hern, R. (2001). The psychosocial impact of bilateral prophylactic mastectomy: prospective study using questionnaires and semistructured interviews. *BMJ*, 322(7278), 76.

Publications providing the basis and related to the topic of the thesis

I.

What contributes to long-term quality of life in breast cancer patients who are undergoing surgery? Results of a multidimensional study

**Victoria Wittmann, Melinda Látos,
Zoltán Horváth, Zsolt Simonka, Attila
Paszt, György Lázár & Márta Csabai**

Quality of Life Research

An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation - Official Journal of the International Society of Quality of Life Research

ISSN 0962-9343


Qual Life Res

DOI 10.1007/s11136-017-1563-z



Your article is protected by copyright and all rights are held exclusively by Springer International Publishing Switzerland. This e-offprint is for personal use only and shall not be self-archived in electronic repositories. If you wish to self-archive your article, please use the accepted manuscript version for posting on your own website. You may further deposit the accepted manuscript version in any repository, provided it is only made publicly available 12 months after official publication or later and provided acknowledgement is given to the original source of publication and a link is inserted to the published article on Springer's website. The link must be accompanied by the following text: "The final publication is available at link.springer.com".

What contributes to long-term quality of life in breast cancer patients who are undergoing surgery? Results of a multidimensional study

Victoria Wittmann¹  · Melinda Látos¹ · Zoltán Horváth¹ · Zsolt Simonka¹ · Attila Paszt¹ · György Lázár¹ · Márta Csabai²

Accepted: 24 March 2017
© Springer International Publishing Switzerland 2017

Abstract

Purpose This study aims to examine the key determinants of long-term quality of life in breast cancer patients who are undergoing surgery using a multidimensional approach and taking into account preoperative and post-operative psychological characteristics such as anxiety, depression, posttraumatic growth, body image, and physical activity as well as medical parameters.

Methods The study involved 63 breast cancer patients from the Department of Surgery at the University of Szeged. Assessments occurred 1 day before surgery as well as 3 days and 18 months after surgery using the Spielberger State and Trait Anxiety Inventory (STAI), Beck's Depression Inventory (BDI), Functional Assessment of Cancer Therapy–Breast Cancer Scale (FACT-B), Posttraumatic Growth Inventory (PTGI) and Breast Impact of Treatment Scale (BITS). Data relating to physical activity, medical parameters and sociodemographic characteristics were also collected.

Results The level of depression did not change over time. State anxiety decreased 18 months after the surgery compared to before the surgery; however, there was a greater decrease immediately after the surgery and then anxiety increased again 18 months later. Trait anxiety was associated with quality of life, posttraumatic growth and body image. Posttraumatic growth and the level of depression

were found to be possible contributing factors to the increase in long-term quality of life.

Conclusions The results show that the timely detection and proper management of psychological distress and the enhancement of posttraumatic growth are of great value, as they might be important contributing factors to long-term quality of life in breast cancer patients.

Keywords Breast cancer · Psychological distress · Quality of life · Body image · Posttraumatic growth

Introduction

The traumatic nature of the diagnosis and the painful surgical procedures often lead to a series of psychological problems among cancer patients. An estimated 1.1 million women are diagnosed with breast cancer worldwide, and 410,000 die of the disease each year [1]. Meta-analyses suggest that stress-related psychosocial factors and lower health-related quality of life (QoL) are associated with poorer survival among people with breast cancer [2]. Depression and anxiety are typical responses after diagnosis and during the treatment phase, making psychological screening and intervention extremely relevant [3].

Furthermore, the level of psychological distress is usually higher before surgery at the beginning of the disease [4, 5]. According to Ho et al. [6], patients who are in treatment report higher depression and anxiety than patients who are in post-treatment, which supports the increased importance of psychological interventions not only after treatment but also in the early stage of treatment. QoL is an important outcome measure in all patients with breast cancer due to the complexity of the disease, with emotional,

✉ Victoria Wittmann
victoriawittmann1@gmail.com

¹ Department of Surgery, Faculty of Medicine, University of Szeged, Szőkefalvi-Nagy B. Street 6, Szeged H 6720, Hungary

² Psychology Institute, University of Szeged, Egyetem Street 22, Szeged H 6722, Hungary

functional, physical, social and sexual factors all playing a role [3, 7–9].

Posttraumatic growth (PTG) is defined as perceived positive changes in previous levels of functioning following a traumatic life event [10, 11]. Following a diagnosis of breast cancer, many women report PTG in a variety of life domains (e.g. recognition of new possibilities in one's life, a greater sense of personal strength, and spiritual development) [12–15]. However, it is unclear whether PTG is associated with a higher level of distress or enhanced QoL among cancer survivors, as researchers have reported positive and negative associations and inconclusive results [15–22].

The often traumatic and disfiguring nature of breast cancer surgery can also lead to a series of psychological problems relating to body image, sexuality and femininity [23–25]. Body change stress refers to subjective psychological stress that accompanies women's negative and distressing feelings, emotions, thoughts and behaviours originating from and connected to breast cancer and/or breast surgeries [23]. Body change stress manifests as stress symptoms that are similar to those found in traumas, including re-experiencing (e.g. feeling upset with reminders of breast change), avoidance (e.g. attempts to limit the exposure of the body to oneself or others) and arousal symptoms (e.g. irritability) [23].

Whereas many of the symptoms that are associated with breast cancer and its treatment can last for several months or even years after treatment is complete, studies have shown that regular physical activity is beneficial in reducing and relieving cancer-related symptoms and improving QoL in cancer patients [26–29]. However, few studies have focused on the connection between QoL and PTG in relation to physical activity and body image using a longitudinal study design by observing changes in behaviour prior to and long after the operation [30–35].

Aims and research questions

Our primary goal was to gain a more complete understanding of the key determinants of long-term QoL in breast cancer patients who are undergoing surgery. Given that little empirical research has been done to investigate this question using a multidimensional approach, we surveyed a group of women who had been living with this disease for 18 months using a prospective, multidimensional study design, taking into account pre- and post-operative psychological characteristics such as anxiety, depression, post-traumatic growth, body image, and physical activity as well as medical parameters. An additional goal was for the potentially positive results of this study to serve as a clear theoretical basis for our intervention studies that we plan

to conduct with breast cancer patients who are undergoing surgery.

The following served as the research questions of the study:

1. What are the characteristic correlational patterns of the contributing factors that influence the long-term QoL of breast cancer patients?
2. Eighteen months after surgery, how do emotional factors and QoL change in breast cancer patients?

We hypothesized that an enhanced QoL would be associated with positive mood factors, greater PTG and a higher level of physical activity.

Methods

Study design and sample

All the materials that were used in this study were approved by the Regional and Institutional Human Medical Biological Research Ethics Committee. Prior to their surgery for breast cancer, the patients were assessed in the Department of Surgery at the University of Szeged. Each patient was provided with comprehensive information regarding the study and signed an informed consent form. The final sample comprised 63 female patients. The inclusion criteria were: (i) breast cancer that was confirmed by histological examination, (ii) ability to complete the necessary questionnaires, and (iii) ability to understand the objective of the study and provide informed consent. The exclusion criteria were (i) secondary breast cancer, (ii) psychiatric disorder(s) and (iii) male sex. Psychological assessments were conducted by a trained health psychologist who did not have access to medical data about the patients. The data were assessed at three time points: 1 day before surgery (T1), 3 days after surgery (T2) and 18 months after surgery (T3).

Study measures

The Spielberger State and Trait Anxiety Inventory (STAI-S; STAI-T) was administered to measure the level of anxiety before and after surgery [36]. Both the scales comprise 20 items, with responses ranging from 1 (not at all) to 4 (very much so). Total scores range from 20 to 80, with a higher number indicating a higher level of anxiety. In the STAI-S, a mean score above 50 indicates severe state anxiety. The STAI-S was administered 1 day before surgery and both 3 days and 18 months after surgery. In the STAI-T, a mean score <48 indicates no trait anxiety, a mean score of 48–52 indicates minor trait anxiety, and

a mean score >52 indicates severe trait anxiety [37]. The STAI-T was administered 1 day before surgery. The Hungarian versions of the STAI-S and STAI-T have good reliability [38].

Beck's Depression Inventory (BDI) was used to assess the severity of depressive symptoms [39]. The BDI was administered at two time points: before surgery and 18 months after surgery. All the parts include four statements that describe feelings in recent weeks. The responses range from 0 to 3. Total scores range from 0 to 84, with a higher number indicating a higher level of depression. The lowest total score was 0, whereas the highest score was 84.

Using the standard cut-off scores, a score of 0–9 indicates minimal depression; 10–18 indicates mild depression; 19–25 indicates moderate depression and >25 indicates severe depression [39, 40]. The reliability of the scale is adequate (Cronbach's $\alpha=0.86$) [41].

The FACT-Breast (FACT-B) was used to assess QoL, as it was designed specifically for breast cancer patients [42]. Patients are asked to respond to statements regarding the status of their breast as well as their emotional, functional, physical, and social well-being. Patients choose the number that corresponds with how true each statement has been for them during the past 7 days. Answers are scored using a Likert-type scale. The FACT-B was administered 1 day before and 18 months after surgery. The total FACT-B score (including all the subscales) ranges from 0 to 144, with a higher number indicating a more favourable QoL. The subscales evaluate *breast well-being* (score range 0–36), *emotional well-being* (score range 0–24), *functional well-being* (score range 0–28), *physical well-being* (score range 0–28), and *social well-being* (score range 0–28). The reliability of the FACT-B in general is high (Cronbach's $\alpha=0.9$) [42]. The Cronbach's α of the global QoL scale in this study was 0.73 before surgery and 0.79 after surgery.

We employed the Posttraumatic Growth Inventory (PTGI) 18 months after surgery, which was designed to assess positive outcomes following a struggle with highly challenging life circumstances [43]. The questionnaire comprises five subscales (*relating to others*, *new possibilities*, *personal strength*, *spiritual change*, and *appreciation of life*) and yields a total posttraumatic growth score (range 0–105). The higher the total score is, the greater the PTG is. The Hungarian version of the PTGI showed good reliability (Cronbach's $\alpha=0.898$) [43].

To measure stress from body change related to breast cancer surgery, the Breast Impact of Treatment Scale was used (total score range 0–75) 18 months after surgery [44]. The subscales evaluate *intrusive thoughts* and *level of avoidance*. The higher the total score is, the higher the level of body change stress is. The BITS was found to be a good screening tool in general and has shown high reliability in

measuring body change stress (Cronbach's $\alpha=0.91$) [44].

Sociodemographic factors and physical activity

The sociodemographic background factors included age, marital status, number of children and level of education. Physical activity was also measured, with questions addressing the type and number of hours of physical activity per week. Similar to the study by [45], we measured physical activity using open-ended questions [45].

The questions were as follows:

1. Since your diagnosis, has exercise/sport been part of your life?
2. If so, what type of exercise/sport do you do?
3. How many hours of exercise/sport do you do weekly?

We considered patients' physically active if they engaged in at least 1 h of physical activity per week. In our study, physical activity was described as specific physical activities (e.g. running, yoga). Other physical activities (e.g. gardening) were not counted as specific physical activities.

Medical parameters of patients

The medical parameters that were examined in the study were the side, size and grade of the tumour; type of neoadjuvant therapy; and type of surgery (excision/mastectomy).

Statistical analyses

The data were analysed using IBM SPSS 20.0 for Windows. Quantitative variables were described using the mean and standard deviation. Qualitative variables such as the sociodemographic characteristics were described using the percentage. To reveal the pattern of the relationships among the variables, Spearman's and Pearson's correlations were used. The differences between the variables at different time points were calculated using the paired-samples *t* test, Wilcoxon test and repeated-measures analysis of variance (rANOVA). Group comparisons were performed with the Mann–Whitney U test. Physical activity was measured as a dichotomous variable (physically active/not physically active). We also asked the patients to report their mean number of hours of physical activity per week. The FACT-B, BITS, and PTGI subscale scores were compared in different subgroups of patients, depending on the sociodemographic, psychological and medical variables. Multiple linear regression (stepwise method) was performed to identify the potential predictors of long-term QoL. The FACT-B scale (18 months after surgery) served as the dependent

variable. The independent variables that were entered into the regression analysis were physical activity, and all the psychological variables were measured in our study, which had been found to have a long-term influence on QoL in breast cancer patients undergoing surgery in previous studies [30–35]. These psychological variables were depression, state and trait anxiety, PTG and its subscales, stress relating to body change and its subscales. The results were considered statistically significant when the p value was less than 0.05.

Results

Sociodemographic and medical characteristics

The 63 breast cancer patients' mean age was 56.1 years (SD=11.92). In addition, 52.4% of them had a secondary school qualification, and most of them were married (73%). Nearly 75% of them had an excision, and the mean tumour size was 21.61 mm (SD=21). Only five of the patients received neoadjuvant treatment, and 59.7% of them were physically active (Table 1). No significant associations were found between the type of surgery and psychological factors ($p > 0.05$).

The influence of sociodemographic factors

No significant associations were found between trait and state anxiety before and after the operation and marital status ($p > 0.05$), age ($p > 0.05$), number of children ($p > 0.05$) and education level ($p > 0.05$). No significant correlations were found between the depression scales and marital status ($p > 0.05$), age ($p > 0.05$), number of children ($p > 0.05$) and education level ($p > 0.05$).

However, age was significantly correlated with the PTGI ($r = -0.275$, $p < 0.05$) and FACT-B ($r = -0.276$, $p < 0.05$) scores 18 months after the operation. Education level was significantly associated with the FACT-B [$H(2) = 8.175$, $p < 0.05$] and PTGI [$H(2) = 6.292$, $p < 0.05$] scores 18 months after the operation. Patients with a lower education level had a lower FACT-B score (89 vs. 113.8) and PTGI score (54.6 vs. 74.8) than patients with a university qualification 18 months after the operation.

Marital status was associated with the FACT-B *social well-being* factor ($U = 184.5$, $Z = -2.167$, $p = 0.03$). Married patients had a higher social well-being factor score before the operation compared to unmarried patients (30.01 vs. 20.04). The number of children was not correlated with the PTGI and FACT-B scores ($p > 0.05$).

Table 1 Sociodemographic and medical characteristics ($N = 63$)

Characteristics	
Mean age (SD)	56.1 (11.92)
Marital status N (%)	
Married	46 (73)
Not married	17 (27)
Educational level N (%)	
Primary qualification	11 (17.5)
Higher secondary qualification	33 (52.4)
University qualification	19 (30.1)
Number of children (Mean, SD)	2.03 (0.96)
Type of surgery N (%)	
Excision	47 (74.6)
Mastectomy	16 (25.4)
Grade N (%)	
I	10 (19.2)
II	26 (50)
III	16 (30.8)
Tumour size (Mean, SD)	21.61 (21)
Neoadjuvant treatment N (%)	
Yes	5 (8.1)
No	57 (91.9)
Side of tumour N (%)	
Right	29 (46)
Left	33 (52.4)
Physical activity	
Yes	37 (59.7)
No	25 (40.3)

QoL, anxiety, depression, PTG and body change stress

The mean scores on QoL, anxiety, depression, PTG and body change stress (at all three time points) are listed in Table 2. Compared to the cut-off scores, the mean scores on trait anxiety and depression indicated relatively low but stable levels of distress at all relevant time points. The BDI mean score did not change significantly over time (Table 2). State anxiety was significantly higher before the operation than 3 days after the operation (Table 2). Furthermore, state anxiety was significantly higher 18 months after the operation than 3 days after the operation (Table 2). The FACT-B mean score did not change significantly over time (Table 2). *Functional well-being* and *physical well-being* changed significantly from their level pre-surgery to their level 18 months post-surgery (Table 2). The patients reported better *functional well-being* and *physical well-being* 18 months after the operation compared to pre-operation (Table 2).

Table 2 QoL, anxiety, depression, PTG and body change stress in the study sample ($N=63$)

	Baseline mean (SD)	3 days mean (SD)	18 months mean (SD)	Baseline–18 months p value
FACT-B				
Emotional well-being	18.35 (4.33)		19.22 (4.48)	0.265 ^a
Functional well-being	17.45 (6.02)		19.31 (5.44)	0.054^a
Physical well-being	20.33 (4.62)		23.87 (4.74)	0.000^a
Social well-being	20.39 (5.67)		20.11 (5.96)	0.563 ^a
Breast well-being	23.94 (5.84)		23.96 (7.33)	0.727 ^a
FACT-B total	99.30 (19.30)		104.57 (23.66)	0.067 ^a
BDI				
BDI	8.36 (7.07)		8.81 (7.23)	0.589 ^c
STAI-T				
STAI-T	44.90 (9.76)			
STAI-S				
STAI-S	51.46 (12.08)	39.72 (9.55)	41.52 (12.25)	0.000^b
PTGI				
Relating to others			20.26 (9.50)	
New possibilities			12.83 (7.40)	
Personal strength			12.21 (7.36)	
Spiritual change			4.27 (3.28)	
Appreciation of life			10 (4.38)	
PTGI total			59.5 (27.66)	
BITS				
Intrusive thoughts			8.81 (7.23)	
Level of avoidance			13.52 (15.39)	
Level of avoidance			4.84 (4.83)	
BITS total			18.37 (19.84)	

Bold values indicate the significant p values between ($p = 0.00$ and $p = 0.05$)

SD standard deviation

^aWilcoxon test

^brAnova

^cPaired sample t test

Correlations between QoL and anxiety, depression, PTG and body change stress

Depression 1 day before and 18 months after surgery had a significant positive correlation with state and trait anxiety (Table 3). QoL before surgery and the subscales of QoL (except social well-being) before surgery had a significant negative correlation with depression and anxiety (Table 3). QoL 18 months after surgery and the subscales of QoL 18 months after surgery had a significant negative correlation with depression and trait anxiety (Table 3). The statistical measures indicated that PTG had a significant negative correlation with depression and trait anxiety 18 months after surgery (Table 3). A significant positive correlation was found between body change stress and both depression and trait anxiety 18 months after surgery (Table 3).

There was a significant association between QoL 18 months after surgery and PTG (Table 3). The statistical measures indicated significant positive correlations between QoL 18 months after surgery and the following PTG subscales: *relating to others*, *new possibilities*,

personal strength, and *spiritual change* (Table 3). A negative association was found between body change stress and both QoL 18 months after surgery and the QoL subscales (*emotional well-being*, *physical well-being* and *breast well-being*) 18 months after the operation (Table 3). There was no significant association between body change stress and PTG (Table 3).

Associations between physical activity and mood factors, QoL, PTG and body change stress

In our study, mean number of hours of physical activity per week was measured ($M = 3.02$, $SD = 2.19$). The results of statistical analyses showed no significant association between physical activity and psychological distress or QoL before the operation (Table 4). However, there was a significant association between physical activity and both depression and state anxiety 18 months after the operation (Table 4). Patients who engaged in physical activity had lower mean scores on depression and state anxiety 18 months after the surgery (Table 4).

Table 3 Correlation between QoL and anxiety, depression, PTG and body change stress (N= 63)

	FACT-B					FACT-B total	BDI	STAI-S	STAI-T
	Emotional well-being	Functional well-being	Physical well-being	Social well-being	Breast well-being				
	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
Time point: baseline									
BDI	-0.535**	-0.679**	-0.429**	-0.236	-0.444*	-0.612**	-	0.527**	0.644**
STAI-S	-0.570**	-0.507**	-0.276	-0.166	-0.359*	-0.604**	0.527**	-	0.510**
STAI-T	-0.499**	-0.528**^p	-0.286**^a	-0.229	-0.312**^a	-0.482**	0.644**	0.510**	-
	FACT-B					FACT-B total	BDI	STAI-S	STAI-T
	Emotional well-being	Functional well-being	Physical well-being	Social well-being	Breast well-being				
Time point: 18 months									
BDI	-0.682**	-0.652**	-0.738**	-0.398**	-0.739**	-0.783**	-	0.584**	0.709**
STAI-S	-0.632**	-0.524**	-0.536**	-0.291*	-0.491**	-0.593**	0.584**	-	0.781**^a
STAI-T	-0.600**	-0.586**	-0.610**	-0.286*	-0.620**^a	-0.615**	0.709**	0.781**^a	-
PTGI									
Relating to others	0.101	0.328*	0.074	0.433**	0.051	0.255*	-0.164	-0.092	-0.130
New possibilities	0.204	0.301*	0.244	0.289*	0.225	0.311*	-0.260*	-0.238	-0.300*
Personal strength	0.273*	0.359**	0.289*	0.247	0.263*	0.388**	-0.339**	-0.250	-0.318*
Spiritual change	0.137	0.145	0.212	0.182	0.297*	0.276*	-0.215	-0.234	-0.375**
Appreciation of life	0.092	0.340**	0.118	0.213	0.106	0.226	-0.091	-0.188	-0.269*
PTGI total	0.157	0.356	0.203	0.344*	0.211	0.342**	-0.255*	-0.185	-0.288*
BITS									
Intrusive thoughts	-0.448**	-0.237	-0.388**	-0.070	-0.640**	-0.433**	0.561**	0.222	0.330*
Level of avoidance	-0.357**	-0.168	-0.315*	-0.103	-0.522**	-0.391**	0.484**	0.096	0.237
BITS total	-0.423**	-0.225	-0.381**	-0.095	-0.613**	-0.435**	0.556**	0.177	0.298*

Bold values indicate the significant *p* values between (*p* = 0.00 and *p* = 0.05)

r = Spearman correlation coefficient except

p* < 0.05, *p* < 0.01

^aPearson correlation coefficient

There was a significant relationship between QoL 18 months after the operation and physical activity among the breast cancer patients (Table 4). Patients who engaged in physical activity had higher scores on the FACT-B scale as well as the *functional well-being*, *physical well-being* and *breast well-being* subscales 18 months after the operation (Table 4).

There was a significant association between PTG and physical activity. Patients who engaged in physical activity had higher scores on the *new possibilities* and *personal strength* subscales (Table 4). No significant association was

found between body change stress and physical activity (Table 4).

Possible predictive factors of QoL: linear regression analysis

In the further investigation, a linear regression analysis was used to identify factors that contribute to better QoL (dependent variable). There were significant interactions with variables and QoL 18 months after the operation. The linear regression identified two main potential

Table 4 Associations between physical activity and mood factors, QoL, PTG and body change stress (N=63)

	Time point: baseline	Physically active (N=37)	Physically not active (N=24)	Mann-Whitney Test Z	p
		M (SD)	M (SD)		
BDI		8.80 (1.35)	9.87 (2.28)	-0.611	0.541
STAI-S		50.50 (2.58)	49.56 (2.53)	-0.765	0.444
STAI-T		41.80 (2.04)	47.93 (3.06)	-1.580	0.114
FACT-B					
Emotional well-being		18.61 (0.76)	18.93 (0.78)	-0.293	0.770
Functional well-being		18.76 (1.01)	15.50 (1.62)	-1.113	0.266
Physical well-being		19.88 (0.92)	20.81 (1.04)	-0.765	0.444
Social well-being		21.03 (0.86)	21.68 (0.92)	-0.924	0.355
Breast well-being		24.26 (1.20)	24.87 (1.41)	-0.469	0.693
FACT-B total		102.57 (3.46)	101.81 (4.13)	-1.035	0.301
Time point: 18 months					
BDI		7.15 (1.22)	12.62 (2.25)	-2.546	0.010
STAI-S		37 (1.89)	47.87 (3.73)	-2.327	0.020
FACT-B					
Emotional well-being		20.07 (0.77)	17.43 (1.40)	-1.040	0.298
Functional well-being		21.15 (0.91)	16.00 (1.37)	-2.576	0.010
Physical well-being		24.46 (0.91)	22.12 (1.32)	-2.288	0.022
Social well-being		20.73 (1.21)	16.81 (1.57)	-1.702	0.089
Breast well-being		26.46 (1.26)	21.81 (1.93)	-2.670	0.008
FACT-B total		112.8 (3.80)	94.18 (5.86)	-3.244	0.001
PTGI					
Relating to others		20.46 (1.82)	17.81 (2.25)	-0.906	0.365
New possibilities		13.88 (1.42)	9.62 (1.66)	-2.187	0.029
Personal strength		13.88 (1.61)	9.12 (1.72)	-2.367	0.018
Spiritual change		4.84 (0.65)	3.75 (0.86)	-1.735	0.083
Appreciation of life		10.53 (0.78)	9.62 (1.17)	-0.941	0.347
PTGI total		63.61 (5.16)	49.93 (6.79)	-1.818	0.069
BITS					
Intrusive thoughts		11.38 (2.71)	16 (4.62)	-1.083	0.279
Level of avoidance		4.38 (0.91)	5.43 (1.36)	-1.353	0.176
BITS total		15.76 (3.56)	21.43 (5.89)	-1.206	0.228

Bold values indicate the significant p values between (p = 0.00 and p = 0.05)

predictors. The resulting model was statistically significant (p < 0.001), and R² was 0.739. The BDI (18 months after the operation) variable (β = -0.75) and PTGI variable (β = 0.22) were identified as significant predictors of QoL 18 months after the operation (Table 5).

Discussion

The aim of this study was to identify and interpret the interrelationships among the most important factors that influence long-term QoL in breast cancer patients who are undergoing surgery and to create a clear theoretical basis

Table 5 Possible predictive factors of QoL: linear regression analysis (method = stepwise; N = 63)

	β	B	Standard error B	t	F	R ²	Adjusted R ²
Model 1					76.643**	0.739	0.730
BDI (T3)	-0.759	-2.204	0.213	-10.356			
PTGI total	0.229	0.179	0.057	3.131			

Bold values indicate the significant p values between (p = 0.00 and p = 0.05)

**p < 0.0; T3 time point 3 = 18 months after the operation

for our intervention studies that we plan to conduct with breast cancer patients who are undergoing surgery.

This study showed that patients had relatively low levels of depression and trait and state anxiety as well as high QoL before the surgery. There was no change in the level of depression before the surgery and 18 months after it. In our study, state anxiety decreased from pre-surgery to 18 months post-surgery; however, there was a greater decrease immediately after surgery and then anxiety increased again 18 months later.

The major decrease in state anxiety after surgery can be explained with the immediate relief and decrease in fear after surgery. However, after the operation, many patients have to understand that their cancer treatment is far from over. Increased fear and uncertainties about cancer and its therapy can remain, which explains the increase in state anxiety 18 months after surgery. This is in line with the results of previous studies that found that breast cancer patients have higher levels of psychological distress related to their fear of cancer and its treatment [4, 46–48].

Furthermore, certain aspects of QoL changed over the 18-month period of our study. The patients reported better physical and functional well-being 18 months after the surgery. This change might be partially explained by the decrease in unpleasant physical symptoms and wound healing after surgery and upon completing adjuvant therapy. Adjuvant therapies such as chemotherapy, radiotherapy and hormonal therapy often have severe physical side effects that influence patients' physical and functional well-being [46, 49]. However, a negative relationship was also observed between QoL, depression and anxiety before surgery and 18 months after surgery. In our study, the patients who reported a higher level of psychological distress experienced lower QoL, which is consistent with previous research [6, 50, 51].

Sociodemographic factors such as age, education level and marital status also influenced QoL. As other studies have suggested, married patients reported better social well-being than patients who were living on their own and patients with a higher level of education reported better QoL [52–56].

In our study, PTG was relatively high among the breast cancer patients. Additionally, age was inversely related to the perception of positive change following cancer. As other researchers have suggested, this type of inverse relationship can be explained by younger patients' potentially experiencing cancer as being more disruptive in their daily life, given that this serious illness is less consistent with their phase of life compared to what it might be like for an older patient [16, 57, 58].

In our study, patients with lower depression, lower trait anxiety and higher QoL 18 months after the operation reported greater PTG. One explanation for these

results might be that a high level of psychological distress experienced before the surgery might have led to illusory instead of real PTG in our sample. Real PTG is a long-term constructive component of personality (perceived new possibilities and increased personal strength). However, for real PTG to appear, an emotional reassessment of the trauma (reduced level of depression and anxiety) is needed [59–61]. In our study, only illusory PTG appeared, as the level of depression did not change over time and state anxiety increased 18 months after surgery. Consistent with previous research, our study highlights that for real PTG to appear, emotional reassessment of the trauma through psychological interventions might play a facilitating role [59–61]. In our study, PTG as an illusory phenomenon served as a short-term coping strategy in reducing the distress produced by the traumatic experience of the operation. In this way, patients, therefore, are able to maintain or defend different aspects of their identity such as self-esteem, coherence and perceived control.

The patients in our sample who had difficulties in association with accepting their changed body image experienced higher levels of depression and trait anxiety 18 months after the surgery. Moreover, patients with severe body image problems experienced lower emotional and physical well-being in our research, highlighting that the trajectories of breast cancer surgery can lead to psychological problems regarding body image, sexuality and femininity. Our findings indicate that, despite the decrease in psychological distress shortly (3 days) after surgery, problems regarding body image can appear and persist 18 months after surgery. An exploration of coping styles, body image perception and social support before surgery might help to identify vulnerable women who can benefit from additional support [31, 62, 63].

In our study, an association between regular physical activity and reduced psychological distress was found 18 months after surgery. As previous research suggested, physical activity can enhance physical and functional well-being as well as PTG 18 months after treatment [64, 65]. However, given that this was an observational study, cause and effect cannot be inferred. Although more physically active patients reported greater well-being and PTG 18 months after treatment, there could be many confounders including that those who felt better were able to engage in physical activity.

Linear regression analyses showed that depression and PTG were significant predictors of QoL 18 months after surgery. That is, a lower level of depression and higher perceived PTG were associated with better QoL among the breast cancer patients. These results might have remarkable clinical relevance, as they indicate that psychological interventions following surgery should have a special focus on decreasing psychological distress and enhancing PTG.

Finally, our study had several limitations. First, the subjects were not representative of the general population in the country. Second, several factors that are potentially associated with depression, anxiety and QoL such as the type of anti-cancer treatment or religiosity were not measured in the study. Awareness of the diagnosis is a factor that is worth investigating in future research, as previous researchers found that it can reduce anxiety and depression [66]. Referring to recent literature, another important factor that affects QoL is family sharing, which has not been evaluated [67]. Finally, the identification of permanent changes in psychological suffering might require a longer period of monitoring and assessment than 18 months. Nevertheless, despite these limitations, our results support the medical relevance of patients' psychological support before and continuously after breast cancer surgery.

Conclusion

This study showed that overall QoL in breast cancer patients is a multidimensional domain that is influenced by several factors such as psychological distress, PTG, and body image. PTG and the level of depression were found to be factors that potentially contribute to an increase in long-term QoL. In our study, both state and trait anxiety influenced the psychological well-being of the breast cancer patients. Based on our results, a theoretical basis for a future intervention study with breast cancer patients who are undergoing surgery has been created. A focus on the nature of anxiety (current or permanent) and its dynamic changes during the course of an illness might help in the proper management of distress in psychological interventions. Furthermore, we aim to address the great importance of psychological intervention before and after surgery. Psychosocial assessment among breast cancer patients who are undergoing surgery should be multidimensional and simultaneously include an evaluation of long-term QoL, reduction in emotional distress and negative body image and the facilitation of PTG. The overall facilitation of these factors could have a cumulative effect on the healing process in breast cancer patients who are undergoing surgery.

Compliance with Ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study.

References

1. Stewart, B. W., & Kleihues, P. (2003). *World Cancer Report*. Lyon: International Agency Research on Cancer.
2. Chida, Y., Hamer, M., Wardle, J., & Steptoe, A. (2008). Do stress-related psychosocial factors contribute to cancer incidence and survival? *Nature Reviews Clinical Oncology*, 5, 466–475.
3. Enache, R. G. (2012). The relationship between anxiety, depression and self esteem in women with breast cancer after surgery. *Procedia—Social and Behavioral Sciences*, 33, 124–127.
4. Schwarz, R., Krauss, O., Hockel, M., Meyer, A., & Zenger, M. (2008). The course of anxiety and depression in patients with breast cancer and gynecological cancer. *Breast Care*, 3, 417–422.
5. Vahdaninia, M., Omidvari, S., & Montazeri, A. (2010). What do predict anxiety and depression in breast cancer patients? A follow-up study. *Social Psychiatry and Psychiatric Epidemiology*, 45(3), 355–361.
6. Ho, S. S. M., Winnie, K. W. S., Doris, Y. P. L., Eve, T. L. L. & Carmen, W. H. C. (2013). Anxiety, depression and quality of life in Chinese women with breast cancer during and after treatment: A comparative evaluation. *European Journal of Oncology Nursing*, 1–6.
7. Holzner, B., Kemmler, G., Kopp, M., Moschen, R., Schweigkofler, H., Dunser, M., et al. (2001). Quality of life in breast cancer patients—not enough attention for long-term survivors? *Psychosomatics*, 42, 117–123.
8. Dow, K. H., Ferrell, B. R., Leigh, S., et al. (1996). An evaluation of the quality of life among long-term survivors of breast cancer. *Breast Cancer Research and Treatment*, 39, 261–273.
9. Ganz, P. A., Coscarelli, A., & Fred, C. (1996). Breast cancer survivors: Psychosocial concerns and quality of life. *Breast Cancer Research and Treatment*, 38, 183–199.
10. Tedeschi, R. G., & Calhoun, L. G. (1995). *Trauma & transformation: Growing in the aftermath of suffering*. Los Angeles, CA: SAGE.
11. Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological Inquiry*, 15, 1–18.
12. Antoni, M. H., Lehman, J. M., Kilbourn, K. M., Boyers, A. E., Culver, J. L., Alferi, S. M., & Carver, C. S. (2001). Cognitive-behavioral stress management intervention decreases the prevalence of depression and enhances benefit finding among women under treatment for early stage breast cancer. *Health Psychology*, 20, 20–32.
13. Bellizzi, K. M. (2004). Expressions of generativity and posttraumatic growth in adult cancer survivors. *International Journal of Aging and Human Development*, 58, 247–267.
14. Bellizzi, K. M., & Blank, T. O. (2006). Predicting posttraumatic growth in breast cancer survivors. *Health Psychology*, 25, 47–56.
15. Cordova, M. J., Cunningham, L.L.C., Carlson, C. R., & Andrykowski, M. A. (2001). Posttraumatic growth following breast cancer: A controlled comparison study. *Health Psychology*, 20, 176–185.
16. Bower, J. E., Meyerowitz, B. E., Desmond, K. A., Bornaards, C. A., Rowland, J. H., & Ganz, P. A. (2005). Perceptions of positive meaning and vulnerability following breast cancer: Predictors and outcomes among long-term breast cancer survivors. *Annals of Behavioral Medicine*, 29, 236–245.

17. Carver, C. S., & Antoni, M. H. (2004). Finding benefit in breast cancer during the year after diagnosis predicts better adjustment 5–8 years after diagnosis. *Health Psychology, 23*, 595–598.
18. Tomich, P. L., & Helgeson, V. S. (2002). Five years later: A cross-sectional comparison of breast cancer survivors with healthy women. *Psycho-Oncology, 11*, 154–169.
19. Tomich, P. L., & Helgeson, V. S. (2004). Is finding something good in the bad always good? Benefit finding among women with breast cancer. *Health Psychology, 23*, 16–23.
20. Park, C. L., Cohen, L. H., & Murch, R. (1996). Assessment and prediction of stress-related growth. *Journal of Personality, 64*, 71–105.
21. Updegraff, J. A., & Taylor, S. E. (2000). From vulnerability to growth: Positive and negative effects of stressful life events. In J. H. Harvey & E. D. Miller (Eds.), *Loss and trauma: General and close relationship perspectives* (pp. 3–28). New York: Brunner-Routledge.
22. Bellizzi, K. M., Miller, M. F., Arora, N. K., & Rowland, J. H. (2007). Positive and negative life changes experienced by survivors of non-Hodgkin's Lymphoma. *Annals of Behavioral Medicine, 34*, 188–199.
23. Frierson, G.M., Thiel, D.M. & Andersen, B.L. (2006). Body change stress for women with breast cancer: The Breast-Impact of Treatment Scale. *Annals of Behavioral Medicine, 32*(1), 77–81.
24. Shimozuma, K., Ganz, P. A., Petersen, L., & Hirji, K. (1999). Quality of life in the first year after breast cancer surgery: Rehabilitation needs and patterns of recovery. *Breast Cancer Research and Treatment, 56*, 45–57.
25. Avis, N. E., Crawford, S., & Manuel, J. (2004). Psychosocial problems among younger women with breast cancer. *Psycho-Oncology, 13*, 295–308.
26. Hong, S., Bardwell, W. A., Natarajan, L., Flatt, S. W., Rock, C. L., Newman, V. A., et al. (2007). Correlates of physical activity level in breast cancer survivors participating in the women's healthy eating and living (WHEL) study. *Breast Cancer Research and Treatment, 101*(2), 225–232.
27. Dimeo, F. C. (2001). Effects of exercise on cancer-related fatigue. *Cancer, 92*(6), 1689–1693.
28. Battaglini, C. L., Dennehy, C. A., Groff, D., Kirk, D., & Anton, P. M. (2006). Complementary therapies in the management of cancer treatment-related symptoms: The individualized prescriptive exercise intervention approach. *Medicina Sportiva, 10*(2), 49–57.
29. Courneya, K. S., Friedenreich, C. M., Sela, R. A., Quinney, H. A., Rhodes, R. E., & Handman, M. (2003). The group psychotherapy and home-based physical exercise (group-hope) trial in cancer survivors: Physical fitness and quality of life outcomes. *Psycho-Oncology, 12*(4), 357–374.
30. Sabiston, C. M., McDonough, M., & Crocker, P.R.E. (2007). Psychosocial experiences of breast cancer survivors involved in a dragon boat program: Exploring links to positive psychological growth. *Journal of Sport and Exercise Psychology, 29*, 419–438.
31. Den Heijer, M., Seynaeve, C., Timman, R., Duivenvoorden, H. J., Vanheusden, K., Tilanus-Linthorst, M., Menke-Pluijmers, M.B.E., & Tibben, A. (2012). Body image and psychological distress after prophylactic mastectomy and breast reconstruction in genetically predisposed women: A prospective long-term follow-up study. *European Journal of Cancer, 48*(9), 1263–1268.
32. Alfano, C. M., Smith, A. W., Irwin, M. L., Bowen, D. J., Sorensen, B., Reeve, B. B., et al. (2007). Physical activity, long-term symptoms, and physical health-related quality of life among breast cancer survivors: A prospective analysis. *Journal of Cancer Survivorship, 1*(2), 116–128.
33. Meisel, J. L., Domchek, S. M., Vonderheide, R. H., Giobbie-Hurder, A., Lin, N. U., Winer, E. P., & Partridge, A. H. (2012). Quality of life in long-term survivors of metastatic breast cancer. *Clinical Breast Cancer, 12*(2), 119–126.
34. Love, C., & Sabiston, C. M. (2011). Exploring the links between physical activity and posttraumatic growth in young adult cancer survivors. *Psycho-Oncology, 20*(3), 278–286.
35. Sackey, H., Sandelin, K., Frisell, J., Wickman, M., & Brandberg, Y. (2010). Ductal carcinoma in situ of the breast. Long-term follow-up of health-related quality of life, emotional reactions and body image. *European Journal of Surgical Oncology (EJSO), 36*(8), 756–762.
36. Spielberger, C. D., Gorsuch, R. L., & Lushene, R. E. (1970). *Manual for the state-trait anxiety inventory*. Palo Alto: Consulting Psychologists Press.
37. Kopp, M., & Fóris, N. (1993) *A szorongás kognitív viselkedésterápiája*. Végeken Sorozat, Budapest.
38. Sipos, K., & Sipos, M. (1978). The development and validation of the hungarian form of the STAI. In *Spielberger, C.D., DiazGuerrero (szerk.): Cross-Cultural Anxiety, 2* (pp. 51–61). Washington-London: Hemisphere Publishing Corporation.
39. Beck, A. T., Ward, C. H., Mendelson, M., et al. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*, 561–571.
40. Eaves, G., & Rush, A. J. (1984). Cognitive patterns in symptomatic and remitted unipolar major depression. *Journal of Abnormal Psychology, 93*(1), 31.
41. Rózsa, S., Szádóczky, E., & Füredi, J. (2001). A Beck Depresszió Kérdőív rövidített változatának jellemzői a hazai mintán. *Psychiatria Hungarica, 16*(4), 379–397.
42. Brady, M. J., Cella, D. F., Mo, F., et al. (1997). Reliability and validity of the functional assessment of cancer therapy-breast quality-of-life instrument. *Journal of Clinical Oncology, 15*, 974–986.
43. Kovács, É., Balog, P., & Preisz, L. (2012). A Poszttraumás Növekedésérzés Kérdőív pszichometriai mutatói hazai mintán. *Mentálhigiéné és Pszichoszomatika, 13*(1), 57–84.
44. Frierson, G. M. (2003). *The Breast Impact of Treatment Scale: The assessment of body image distress for breast cancer patients*. Ohio University.
45. Milne, H. M., Guilfoyle, A., Gordon, S., Wallman, K. E., & Courneya, K. S. (2007). Personal accounts of exercise and quality of life from the perspective of breast cancer survivors. *Quality of Life Research, 16*(9), 1473–1481.
46. Taira, N., Shimozuma, K., Shiroiwa, T., Ohsumi, S., Kuroi, K., Saji, S., et al. (2011). Associations among baseline variables, treatment-related factors and healthrelated quality of life 2 years after breast cancer surgery. *Breast Cancer Research and Treatment, 128*, 735–747.
47. Jadouille, V., Rokbani, L., Ogez, D., Maccioni, J., Lories, G., Bruchon-Schweitzer, M., et al. (2006). Coping and adapting to breast cancer: A six-month prospective study. *Bulletin du Cancer, 93*, 67–72.
48. Báez, M., Blasco, T., Fernández-Castro, J., & Viladrich, C. (2009). Perceived control and psychological distress in women with breast cancer: A longitudinal study. *Journal of Behavioral Medicine, 32*, 187–196.
49. Ganz, P. A., Guadagnoli, E., Landrum, M. B., Lash, T. L., Rakowski, W., & Silliman, R. A. (2003). Breast cancer in older women: Quality of life and psychosocial adjustment in the 15 months after diagnosis. *Journal of Clinical Oncology, 21*(21), 4027–4033.
50. Ng, C. G., Mohamed, S., See, M. H., Harun, F., Dahlui, M., Sulaiman, A. H., Zainal, N. Z., Taib, N. A. (2015). Anxiety, depression, perceived social support and quality of life in Malaysian breast cancer patients: A 1-year prospective study. *Health and Quality of Life Outcomes, 13*, 205.

51. Lidgren, M., Wilking, N., Jönsson, B., & Rehnberg, C. (2007). Health related quality of life in different states of breast cancer. *Quality of Life Research*, *16*(6), 1073–1081.
52. Tominaga, K., Andow, J., Koyama, Y., Numao, S., Kurokawa, E., Ojima, M., & Nagai, M. (1998). Family environment, hobbies and habits as psychosocial predictors of survival for surgically treated patients with breast cancer. *Japanese Journal of Clinical Oncology*, *28*(1), 36–41.
53. Cordova, M. J., Giese-Davis, J., Golant, M., Kronenwetter, C., Chang, V., & Spiegel, D. (2007). Breast cancer as trauma: post-traumatic stress and posttraumatic growth. *Psychological Medicine*, *14*, 308–319.
54. Brix, S. A., Bidstrup, P. E., Christensen, J., Rottmann, N., Olsen, A., Tjønneland, A., Johansen, C., & Dalton, S. O. (2013). Post-traumatic growth among elderly women with breast cancer compared to breast cancer-free women. *Acta Oncologica*, *52*(2), 345–354.
55. Kucukkaya, P. G. (2010). An exploratory study of positive life changes in Turkish women diagnosed with breast cancer. *European Journal of Oncology Nursing*, *14*, 166–173.
56. King, M. T., Kenny, P., Shiell, A., Hall, J., & Boyages, J. (2000). Quality of life three months and one year after first treatment for early stage breast cancer: influence of treatment and patient characteristics. *Quality of Life Research*, *9*(7), 789–800.
57. Lechner, S. C., Zakowski, S. G., Antoni, M. H., Greenhawt, M., Block, K., & Block, P. (2003). Do sociodemographic and disease-related variables influence benefit-finding in cancer patients? *Psycho-Oncology*, *12*, 491–499.
58. Manne, S., Ostroff, J., & Winkel, G. (2004). Posttraumatic growth after breast cancer: Patient, partner, and couple perspectives. *Psychosomatic Medicine*, *66*, 442–454.
59. Sumalla, E. C., Ochoa, C., Blanco, I. (2009). Posttraumatic growth in cancer: Reality or illusion? *Clinical Psychology Review*, *29*(1), 24–33.
60. Tedeschi, R. G., Park, C. L., & Calhoun, L. G. (1998). *Post-traumatic growth: Positive changes in the aftermath of crisis*. Mahwah, NJ: Lawrence Erlbaum.
61. Wagner, B., Forstmeier, S., & Maercker, A. (2007). Posttraumatic growth as a cognitive process with behavioral components: A commentary on Hobfoll et al. (2007). *Applied Psychology*, *56*, 407–416.
62. Lloyd, S. M., Watson, M., Oaker, G., et al. (2000). Understanding the experience of prophylactic bilateral mastectomy: A qualitative study of ten women. *Psycho-oncology*, *9*(6), 473–485.
63. Hatcher, M. B., Fallowfield, L., & A'Hern, R. (2001). The psychosocial impact of bilateral prophylactic mastectomy: prospective study using questionnaires and semistructured interviews. *British Medical Journal*, *322*(7278), 76.
64. Cheema, B. S., & Gaul, C. A. (2006). Full-body exercise training improves fitness and quality of life in survivors of breast cancer. *The Journal of Strength and Conditioning Research*, *20*(1), 14–21.
65. Hefferon, K., Grealy, M., & Mutrie, N. (2008). The perceived influence of an exercise class intervention on the process and outcomes of post-traumatic growth. *Mental Health and Physical Activity*, *1*, 32–39.
66. Lai, C., Luciani, M., Galli, F., Morelli, E., Del Prete, F., Ginobbi, P., Penco, I., Aceto, P. & Lombardo, L. (2016). Spirituality and awareness of diagnoses in terminally ill patients with cancer. *The American Journal of Hospice and Palliative Care*. doi:10.1177/1049909116630985
67. Lai, C., Borrelli, B., Ciurluini, P., & Aceto, P. (2016). Sharing information about cancer with one's family is associated with improved quality of life. *Psycho-Oncology*. doi:10.1002/pon.4334

II.

A Sebészeti Beavatkozástól Való Félelem Kérdőív magyar nyelvű változatának reliabilitás- és validitásvizsgálata sebészeti beavatkozáson átesett páciensek körében

Wittmann Victoria¹ ■ Csabai Márta dr.² ■ Drótos Gergely² ■ Lázár György dr.¹

Szegedi Tudományegyetem, ¹Általános Orvostudományi Kar, Sebészeti Klinika,
²Bölcsészettudományi Kar, Pszichológiai Intézet, Szeged

Bevezetés: Interdiszciplináris kutatásokkal igazolták, hogy a betegek sebészeti beavatkozással kapcsolatos félelmei és szorongásai meghatározó szerepet játszanak a műtét és a műtét utáni felépülés sikerességében.

Célkitűzés: Vizsgálatunk célja az ezen félelmek felmérésére kifejlesztett Sebészeti Beavatkozástól Való Félelem Kérdőív magyar változatának validitás- és reliabilitásvizsgálata volt daganatos megbetegedésben szenvedő személyek körében.

Módszer: Keresztmetszeti vizsgálatunkban 149, sebészeti beavatkozáson átesett páciens vett részt. A skála validitásának vizsgálatára a Spielberger-féle Állapot- és Vonásszorongás Kérdőívet, a Beck Depresszió Kérdőívet és a Vizuális Analóg Skálát használtuk.

Eredmények: A kérdőív belső megbízhatósága (Cronbach-alfa = 0,878; 0,885) kiváló. A konstruktváliditás vizsgálatok közepesen szoros összefüggést találtak a szorongás, a depresszió, a műtét utáni vélt fájdalom és a Sebészeti Beavatkozástól Való Félelem Kérdőív között.

Következtetések: A Sebészeti Beavatkozástól Való Félelem Kérdőív magyar verziójának reliabilitása és validitása a vizsgált populáción jónak mutatkozott. A kérdőív megbízható információt ad a műtét előtt álló páciensek műtéttel kapcsolatos rövid távú és hosszú távú félelmeiről.

Orv Hetil. 2018; 159(47): 1988–1993.

Kulcsszavak: szorongás, fájdalom, félelem, sebészeti beavatkozás

The reliability and validity of the Hungarian version of the Surgical Fear Questionnaire

Introduction: Interdisciplinary studies confirm that surgical fear experienced by patients can have a substantial effect on the outcome of the surgery and the healing process after surgery.

Aim: The aim of this study was to assess the reliability and validity of the Hungarian version of the Surgical Fear Questionnaire in cancer patients.

Method: 149 patients were assessed using the Spielberger Anxiety Inventory, the Beck Depression Inventory, the Visual Analogue Scale and the Surgical Fear Questionnaire.

Results: The scale showed excellent internal consistency (Cronbach-alfa = 0.878; 0.885). The Surgical Fear Questionnaire scores moderately correlated with anxiety, depression and anticipated pain after surgery.

Conclusion: The reliability and validity of the Hungarian version of the Surgical Fear Questionnaire in the sample were excellent. The questionnaire turned out to be a useful psychometric tool in the measurement of surgical fear.

Keywords: anxiety, pain, fear, operative surgical procedure

Wittmann V, Csabai M, Drótos G, Lázár Gy. [The reliability and validity of the Hungarian version of the Surgical Fear Questionnaire]. Orv Hetil. 2018; 159(47): 1988–1993.

(Beérkezett: 2018. június 1.; elfogadva: 2018. június 18.)

Rövidítések

BDI = (Beck Depression Inventory) Beck Depresszió Kérdőív; FKA = főkomponens-analízis; KMO = Kaiser–Meyer–Olkin-mérőszám; SD = standard deviáció (szórás); SFQ = (Surgical Fear Questionnaire) Sebészeti Beavatkozástól Való Félelem Kérdőív; SFQ-h = hosszú távú félelmek; SFQ-r = rövid távú félelmek; STAI-S = (State-Trait Anxiety Inventory) Spielberger-féle Állapotszorongás Kérdőív; STAI-T = (State-Trait Anxiety Inventory) Spielberger-féle Vonásszorongás Kérdőív; VAS = (Visual Analogue Scale) Vizuális Analóg Skála

Interdiszciplináris kutatások igazolták, hogy a páciensek sebészeti beavatkozással kapcsolatos félelmek és szorongásai mint rizikófaktorok olyan negatív és megterhelő érzelmi állapotot hozhatnak létre, amely hátráltathatja a páciens fizikai és pszichoszociális felépülését. Mindez összefüggésben állhat az akut és krónikus posztoperatív fájdalom megjelenésével is [1–4].

Számos különbség figyelhető meg abban a tekintetben, hogy a sebészeti beavatkozással kapcsolatos félelmek mire irányulnak. Korábbi kutatások szerint a félelem tárgya az eljövendő műtéttel kapcsolatosan sokféle lehet, mint például: magától a sebészeti eljárástól való félelem, az altatástól való félelem, a vértranszfúziótól való félelem, a tűszúrástól való félelem, a kiszolgáltatottságtól való félelem, a méltóság elvesztésétől való félelem és a haláltól való félelem [5, 6]. A páciens fájdalommal kapcsolatos elvárásai is kiemelt jelentőségűek lehetnek. *Montgomery és mtsai* emlődaganatos páciensek körében végzett kutatásukban bebizonyították (2010), hogy a műtét utáni fájdalom mértékével kapcsolatos elvárások sok esetben megjósolták a műtét után ténylegesen megélt fájdalom mértékét [7]. A műtéttől való félelem mértékét a következő tényezők is befolyásolhatják: a műtét típusa, a műtéti hátralévő idő hossza, a műtéttel kapcsolatos előzetes tapasztalatok, az informáltság mértéke a műtéttel kapcsolatosan, kor és nem [4, 8–10].

A Sebészeti Beavatkozástól Való Félelem Kérdőív kidolgozása

Habár a műtéttel kapcsolatos félelmek mérésére korábban már megjelentek kérdőívek, többségük egy betegségre specifikus, mint például a Bypass Grafting Fear Scale [10] vagy a Surgery Stress Scale [11]. Ezért *Theunissen és mtsai* (2014) kifejlesztették a Sebészeti Beavatkozástól Való Félelem Kérdőívet (Surgical Fear Questionnaire, a továbbiakban SFQ) amely tágabb sebészeti betegpopuláció alkalmazható, és amelynek célja, hogy felmérje a páciens műtéttől való félelmének a mértékét [12]. A szerzők 5 különböző prospektív kutatás eredményeinek összevonásával és elemzésével validálták a Sebészeti Beavatkozástól Való Félelem Kérdőívet (3233 fő). A kutatásban részt vevő betegek Hollandiából vagy Portugáliából származtak, és a következő osztályok egyikén estek át sebészeti beavatkozáson: általános sebészet, plasztikai se-

bészet, ortopédia, nőgyógyászat, fül-orr-gégészet, urológia, idegsebészet. A mérőeszköz megbízhatóságát a Cronbach-alfa mutató segítségével ellenőrizték.

A vizsgálat célja

A jelen kutatásban az SFQ magyar változatát és a kérdőív pszichometriai jellemzőit mutatjuk be daganatos megbetegedésben szenvedő személyek mintáján. Felmérjük az SFQ faktorszerkezetét, validitását és megbízhatósági mutatóit. A megbízhatóság és a konkurens validitás ellenőrzése céljából felmértük a páciensek érzelmi és hargulati állapotát, illetve a várt és a ténylegesen észlelt fájdalom mértékét.

Módszer*Résztevők és a vizsgálat körülményei*

A vizsgálati mintába a Szegedi Tudományegyetem Sebészeti Osztályának műtét előtt álló, 18 évnél idősebb, daganatos megbetegedéssel diagnosztizált fekvő betegek kerültek beválasztásra. A vizsgálat 2017. január és április között zajlott. A tesztsomag kitöltése műtét előtt 1 nappal és műtét után 2 nappal, önkéntes alapon történt a klinika fekvőbeteg-osztályán. A kutatást a Regionális Humán Orvosbiológiai Kutatásaitikai Bizottság engedélyezte (protokollszám: SURG-PSZI-001). Összesen 149, sebészeti műtetre váró daganatos páciens került a mintába (47 férfi, átlagéletkoruk 62,74 év; SD = 12,30; illetve 102 nő, átlagéletkoruk 55,61 év; SD = 13,51). A páciensek közül 63 fő emlőműtéten (37 fő excisio, 26 fő mastectomia), 38 fő hasi műtéten (26 fő laparoscopia, 12 fő laparotomia), 36 fő tüdőműtéten (24 fő thoracosopia, 12 fő thoracotomia) és 12 fő egyéb műtéten esett át.

Pszichológiai mérőeszközök

Beck Depresszió Kérdőív (BDI) – A 21 tételes kérdőív 4 fokú Likert-skálán a depresszió egyes tüneteire kérdez rá, úgymint fáradékonyság, alvászavar, döntésképtelenség, túlzott aggodás, az elégedettség hiánya, önmagunk vádolása [13, 14].

Spielberger-féle Vonás- és Állapotszorongás Skála (STAI-T és STAI-S) – Ezt a 40 tételes kérdőívet a szorongás szintjének mérésére alkalmaztuk, amelynél a vonásszorongás kérdőív a szorongás általános szintjét méri, míg az állapotszorongás az éppen aktuális szorongást jelzi. A kérdőív 4 fokú Likert-skálán mér [15, 16].

Sebészeti Beavatkozástól Való Félelem Kérdőív (SFQ) – A kérdőív kifejezetten sebészeti beavatkozáson átesett betegek műtéttől való félelmét méri [12]. A kérdőív 10 itemből áll, és 10 fokú Likert-skálán értékelhető. A kérdőív 2 alszkalát tartalmaz. A „Rövid távú félelmek” skála (a továbbiakban: SFQ-r) a műtét kimenetelével kapcsol-

latos rövid távú félelmekre kérdez rá, mint a fájdalomtól és az altatástól való félelem. A „Hosszú távú félelmek” skála (a továbbiakban: SFQ-h) a műtét kimenetelével kapcsolatos hosszú távú félelmekre kérdez rá, mint a hosszú rehabilitációtól való félelem. A szemantikai és tartalmi azonosság elérése érdekében a kérdőívet három független fordító magyarra fordította, majd a fordítók megállapodtak egy közös változatban, amelyet egy negyedik fordító visszafordított angolra. A visszafordított és az eredeti kérdőíveket a fordítók összevetették, és a javaslatok alapján megalkották a végleges verziót.

Vizuális Analóg Skála (VAS) – A fájdalom mérésére szolgáló kérdőív, 10 fokú Likert-skálával [17]. A műtét előtt a műtét utáni vélt fájdalom mértékére kérdeztünk rá, míg a műtét után 2 nappal a ténylegesen megélt fájdalom mértékét mértük fel.

Statisztikai eljárások

Az adatbevitelt és a statisztikai elemzést az SPSS 23-as és az AMOS 21-es verziójával végeztük (IBM Corp., Armonk, NY, Amerikai Egyesült Államok). A statisztikai szignifikancia határát a korrelációs vizsgálatok kivételével $p < 0,05$ -ös szinten határoztuk meg, az együttjárások esetében az első fajú hiba alacsonyán tartásának érdekében Bonferroni-korrekción alkalmaztunk (a szigorított szint: $p < 0,005$). A kérdőív validálásának érdekében főkomponens-analízis (FKA) segítségével vizsgáltuk, hogy a teszt kidolgozása során kialakított skálák a magyar minta esetében is azonosíthatók-e. A szakirodalomban meghatározott irányelvek szerint azokat az itemeket tartottuk meg az FKA során, amelyek közös faktorsúlyának hatása 0,25-nél magasabb volt, illetve az egynél magasabb sajátértékű főkomponenseket tekintettük megfelelőnek. A FKA megbízhatóságának alátámasztásához az itemek egymás közötti korrelációit és a Kaiser–Meyer–Olkin-mérőszám (KMO) értékét, valamint a Bartlett-teszt

eredményét vizsgáltuk. Az itemek főkomponensekhez tartozásának könnyebb értelmezése érdekében pedig ferde forogtatást (direct oblimin) választottunk, és a 0,4-nél magasabb súlyokat tekintettük megfelelően magasnak. Az adatok elemzéséhez megvizsgáltuk a STAI, BDI kérdőívek és az SFQ skáláinak normális eloszlását Shapiro–Wilk-féle normalitásvizsgálattal, valamint a ferdeségi és csúcossági mutatókat is áttekintettük. Az eloszlásvizsgálatok alapján a vizsgálati személyek kérdőívei közötti kapcsolat elemzéséhez nemparaméteres eljárásokat használtunk. A skálák belső megbízhatóságát Cronbach-alfa mérőszámmal jellemeztük. A konkurens validitás megállapítása érdekében Spearman-féle rangkorrelációt számítottunk. A műteti csoportok összehasonlítására Mann–Whitney-tesztet alkalmaztunk.

Eredmények

Faktorelemzés

Az SFQ-FKA során kezdeti lépésben mind a tíz kérdés alapján próbáltuk meghatározni a skálákat, azonban a hetedik és a nyolcadik kérdés esetében a faktorsúlyok alapján nem volt egyértelműen eldönthető, hogy a rövid távú vagy a hosszú távú következményekkel kapcsolatos félelmekhez tartoznak-e, ezért a teszt kidolgozó által is javasolt 8 itemes kérdőív bizonyult jól használhatónak. Az elemzés alapján nincsenek redundáns kérdések a kérdőívben, az egyes itemek közötti korreláció nem haladta meg az $r = 0,9$ -es értéket, a KMO = 0,86 alapján megfelelő az itemek közös információtartalma és a mintanagyság, továbbá a Bartlett-teszt szignifikáns eredménye alapján (khi-négyzet (28) = 798,274, $p < 0,001$) is alkalmas az adatbázis FKA-ra. A kérdések közös faktorsúlyainak hatásai megfelelőek ($> 0,65$), a feltárt főkomponensek pedig egynél magasabb sajátértékkel rendelkeztek. A rövid távú következményekkel kapcsolatos félelmek sajátértéke 4,98, míg a hosszú távú következményekkel kapcsolatos félelmeké 1,043, a megmagyarázott variancia pedig 75,3%. A főkomponenssúlyok alapján jól azonosíthatók a rövid távú és a hosszú távú következményektől való félelmek (1. táblázat), az egyes kérdések súlyai az elvárt 0,4-es szint fölött voltak.

A megbízhatóság vizsgálata

A két skála megbízhatóságát a belső konzisztencia megállapítására legelfogadottabb mérőszámmal, a Cronbach-féle alfa-együttható meghatározásával ellenőriztük [18]. A két skála belső megbízhatóságának vizsgálata alapján az SFQ-r Cronbach-alfa-értéke 0,878, míg az SFQ-h esetében 0,885 volt; mindkét érték megfelelően magasnak számít, belső megbízhatóságot jelez (2. táblázat). A kérdőív gyakorlati felhasználásához igazodva nem a főkomponensek értékeit, hanem a megfigyelt struktúra alapján számított összegeket használtuk a további elemzésekben.

1. táblázat | A Sebészeti Beavatkozástól Való Félelem Kérdőív (SFQ) főkomponenssúlyai

Állítások	Főkomponens	
	SFQ-r	SFQ-h
4. Félek a műtét utáni kellemetlen mellékhatásoktól (mint például a hányinger).	0,903	
3. Félek a műtét utáni fájdalomtól.	0,887	
2. Félek az érzéstelenítéstől.	0,808	
1. Félek a műtétől.	0,781	
9. Félek, hogy nem fogok teljesen felépülni a műtét után.		0,939
6. Félek, hogy a műtét nem sikerül.		0,924
10. Félek a műtétet követő hosszú rehabilitációtól.		0,680
5. Félek, hogy a műtét miatt romlani fog az egészségem.		0,506

SFQ-h = hosszú távú félelmek; SFQ-r = rövid távú félelmek

2. táblázat | A Sebészeti Beavatkozástól Való Félelem Kérdőív (SFQ) főkomponenseinek belső megbízhatósági mutatói és leíró statisztikája

	Cronbach-alfa (tételszám)	Minimum	Maximum	M	SD
SFQ-r	0,878 (4)	0	40	18,8	10,69
SFQ-h	0,885 (4)	0	40	14,9	10,95

M = átlag; SD = standard deviáció (szórás); SFQ-h = hosszú távú félelmek; SFQ-r = rövid távú félelmek

Validitásvizsgálat

A validitásvizsgálatba bevont skálák között szerepel az Állapot- és Vonásszorongás Kérdőív, a Beck Depresszió Kérdőív és a Vizuális Analóg Skála.

A konvergens validitás esetében a STAI állapotszorongás skálájával az SFQ-r ($r_s(147) = 0,49$, $p < 0,001$) és az SFQ-h ($r_s(147) = 0,42$, $p < 0,001$) közepes erősségű együttjárást mutatott, a vonásszorongással pedig gyenge korreláció mutatkozott mindkét érték esetében (SFQ-r: $r_s(147) = 0,32$, $p < 0,001$; SFQ-h: $r_s(147) = 0,39$, $p < 0,001$). A szorongáshoz hasonlóan a depressziós tünetek súlyosságával (BDI) az SFQ-r gyengén ($r_s(146) = 0,35$, $p < 0,001$), az SFQ-h közepesen erősen ($r_s(146) = 0,44$, $p < 0,001$) járt együtt.

Az SFQ skálái közepesen erős korrelációt mutattak a fájdalom vizuális skálájának operáció előtti értékével (SFQ-r: $r_s(134) = 0,52$, $p < 0,001$; SFQ-h: $r_s(134) = 0,48$, $p < 0,001$), azonban nem jártak együtt az operáció után tapasztalt fájdalommal.

Összefüggés a szociodemográfiai változókkal

A kérdőív skáláin mért értékek nem különböztek jelentősen a férfiak és a nők között (p minden esetben $> 0,05$). Az SFQ-h skála gyenge korrelációt mutatott az iskolai végzettséggel ($r_s = -0,181$, $p = 0,029$). Az SFQ-r és a szociodemográfiai változók között nem találtunk szignifikáns összefüggést (p minden esetben $> 0,05$). A családi állapot és az életkor egyik skálával sem mutatott szignifikáns korrelációt (p minden esetben $> 0,05$).

Összefüggés a műtét típusa és a fájdalom között

Eredményeink alapján az emlőműtéten átesett pácienseknél a műtét típusa (excisio vagy mastectomia) nem befolyásolta szignifikánsan a műtét előtti vélt fájdalom, valamint a műtét utáni fájdalom mértékét (p minden esetben $> 0,05$). A hasi műtéten átesett pácienseknél a műtét típusa (laparoscopia vagy laparotomia) szintén nem befolyásolta szignifikánsan a műtét előtti vélt fájdalom, valamint a műtét utáni fájdalom mértékét (p minden esetben $> 0,05$). Az előző eredményekhez hasonlóan nem találtunk szignifikáns különbséget a tüdőműtéten

átesett pácienseknél a műtét típusa (thoracosopia vagy thoracotomia) és a fájdalom között (p minden esetben $> 0,05$).

Megbeszélés

Tanulmányunkban a sebészeti beavatkozással kapcsolatos félelmek mérésére alkalmazható Sebészeti Beavatkozástól Való Félelem Kérdőív magyar változatát ismertettük (*Melléklet*). A kutatás során felmértük a daganatos páciensek érzelmi és hangulati állapotát és a műtét előtti vélt fájdalom és a műtét utáni megélt fájdalom mértékét.

Az eredményekből megállapítható, hogy a kérdőív pszichometriai mutatói megfelelőek, az általunk mért belső konzisztenciája és a skálák megbízhatósága egyaránt jónak mondható. Az elemzések alapján az SFQ magyar változatának struktúrája nagyon hasonló képet mutat, mint az eredeti angol nyelvű kérdőív; eredményeink szerint két skála, a műtét rövid távú és hosszú távú következményeitől való félelem mérésére szolgáló két dimenzió hozható létre nyolc kérdés alapján [12]. Kutatásunkban az SFQ-értékeket a nem, a kor, az iskolai végzettség és a családi állapot nem befolyásolta szignifikánsan. A validitás vizsgálatok több gyenge és közepes mértékű korrelációt találtunk a kérdőív és az érzelmi-hangulati állapot, illetve a műtét utáni vélt fájdalom között. A konvergens validitás mérésekor tehát bizonyítást nyert, hogy a kérdőívek hasonló fogalmi konstrukciókat mérnek, de nem teljesen ugyanazt.

Az SFQ kérdőív „Rövid távú félelmek” skálája közepes összefüggést mutatott az állapotszorongás és a műtét előtti vélt fájdalom mértékével. A kérdőív „Hosszú távú félelmek” skálája szintén közepes összefüggést mutatott az állapotszorongás és a műtét előtti vélt fájdalom mértékével, továbbá a depresszió mértékével is. Nem találtunk azonban kapcsolatot a sebészeti beavatkozással kapcsolatos félelmek és a műtét utáni fájdalom között. Eredményeink szerint tehát a páciens műtét előtt megélt félelmei a műtét rövid távú és hosszú távú következményeivel kapcsolatban kihatással vannak a beteg érzelmi jóllétére, azonban nem jelzik előre a műtét utáni fájdalmat, inkább a személy szubjektív viszonyát jellemzik a műtét beavatkozással kapcsolatban. Jelen mintákban a műtét típusa nem befolyásolta a műtét utáni fájdalom mértékét.

Következtetések

A kutatócsoportunk által magyar nyelvre adaptált Sebészeti Beavatkozástól Való Félelem Kérdőív segítségével alátámasztást nyert, hogy a műtéttel kapcsolatos félelmek, fantáziák befolyásolják a páciens érzelmi állapotát. A kutatás korlátai a hozzáférhetőségi mintavétel, a viszonylag alacsony mintaelemszám, a műtét csoportok közötti egyenlőtlen eloszlás és a keresztmetszeti kutatási elrendezés.

Melléklet | A Sebészeti Beavatkozástól Való Félelem Kérdőív magyar változata

A kérdőív segítségével szeretnénk felmérni, hogy milyen félelmei vannak az Ön előtt álló sebészeti beavatkozással kapcsolatban. Kérem, karikázza be azt a számot, amely véleménye szerint a leginkább tükrözi jelenlegi érzéseit.

1. Félek a műtétől.

0 1 2 3 4 5 6 7 8 9 10
Egyáltalán nem félek. Nagyon félek.

2. Félek az érzéstelenítéstől.

0 1 2 3 4 5 6 7 8 9 10
Egyáltalán nem félek. Nagyon félek.

3. Félek a műtét utáni fájdalomtól.

0 1 2 3 4 5 6 7 8 9 10
Egyáltalán nem félek. Nagyon félek.

4. Félek a műtét utáni kellemetlen mellékhatásoktól (mint például a hányinger).

0 1 2 3 4 5 6 7 8 9 10
Egyáltalán nem félek. Nagyon félek.

5. Félek, hogy a műtét miatt romlani fog az egészségem.

0 1 2 3 4 5 6 7 8 9 10
Egyáltalán nem félek. Nagyon félek.

6. Félek, hogy a műtét nem sikerül.

0 1 2 3 4 5 6 7 8 9 10
Egyáltalán nem félek. Nagyon félek.

7. Félek a kórházi tartózkodástól.

0 1 2 3 4 5 6 7 8 9 10
Egyáltalán nem félek. Nagyon félek.

8. Aggódom a családom miatt.

0 1 2 3 4 5 6 7 8 9 10
Egyáltalán nem félek. Nagyon félek.

9. Félek, hogy nem fogok teljesen felépülni a műtét után.

0 1 2 3 4 5 6 7 8 9 10
Egyáltalán nem félek. Nagyon félek.

10. Félek a műtétet követő hosszú rehabilitációtól.

0 1 2 3 4 5 6 7 8 9 10
Egyáltalán nem félek. Nagyon félek.

Skálaképzési útmutató:

A skálaképzés az adott skálához tartozó tételek összeadásával történik.

Rövid távú félelmek skála: 1., 2., 3. és 4. tétel

Hosszú távú félelmek skála: 5., 6., 9. és 10. tétel

A mindennapos sebészeti gyakorlatban ritkán van lehetőség arra, hogy részletesen felmérésre kerüljön a páciens műtét előtti aktuális pszichés állapota. Kérdőívünk segítségével könnyebben és gyorsabban felmérhetővé válhat, hogy mik azok a legfőbb félelmek a sebészeti beavatkozással kapcsolatban, amelyek szorongással töltik el a páciens, és amelyek átbeszélése segítheti a páciens re-

ális vagy irreális félelmeinek csökkentésében. A páciens műtéttel kapcsolatos rövid és hosszú távú félelmeinek mérséklése pozitív irányba hangolhatja a beteg együttműködését, beleegyezését, és javíthatja az orvos–beteg kommunikációt is, amely daganatos betegségek esetén különösen nehezített lehet [19]. Ezenkívül érdemes lehet a páciensek egészségműveltségét is felmérni, hiszen

az orvosi információk megértésének mértéke is jelentősen meghatározhatja a gyógyítás sikerességét [20]. Kutatásunk a műtét előtti pszichológiai intervenció és szorongáscsökkentés fontosságára hívja fel a figyelmet, amelyek a műtét előtt álló páciens minél teljesebb pszichés felkészülését szolgálják a műtéti beavatkozásra [21–23].

Anyagi támogatás: A közlemény megírása, illetve a kapcsolódó kutatómunka anyagi támogatásban nem részesült.

Szerzői munkamegosztás: W. V.: A kutatás megtervezéséért, az adatgyűjtésért, az adatok statisztikai értelmezéséért és a publikáció megírásáért volt felelős. Cs. M.: A kutatási terv kidolgozásában, az eredmények értelmezésében és a kézirat megírásában nyújtott segítséget. D. G.: Az adatok statisztikai értelmezésében és a publikáció megírásában nyújtott segítséget. L. Gy.: A kutatási kérdés megfogalmazásában és az adatgyűjtés lefolytatásában vett részt. A cikk végleges változatát valamennyi szerző elolvasta és jóváhagyta.

Érdekeltségek: A szerzőknek nincsenek érdekeltségeik.

Irodalom

- [1] Ali A, Altun D, Oguz BH, et al. The effect of preoperative anxiety on postoperative analgesia and anesthesia recovery in patients undergoing laparoscopic cholecystectomy. *J Anesth.* 2014; 28: 222–227.
- [2] Munafo MR, Stevenson J. Anxiety and surgical recovery: Reinterpreting the literature. *J Psychosom Res.* 2001; 51: 589–596.
- [3] Theunissen M, Peters ML, Bruce J, et al. Preoperative anxiety and catastrophizing: a systematic review and meta-analysis of the association with chronic postsurgical pain. *Clin J Pain* 2012; 28: 819–841.
- [4] Zieger M, Schwarz R, König HH, et al. Depression and anxiety in patients undergoing herniated disc surgery: relevant but underresearched – a systematic review. *Cent Eur Neurosurg.* 2010; 71: 26–34.
- [5] Koivula M, Tarkka MT, Tarkka M, et al. Fear and anxiety in patients at different time-points in the coronary artery bypass process. *Int J Nurs Stud.* 2002; 39: 811–822.
- [6] Shafer A, Fish MP, Gregg KM, et al. Preoperative anxiety and fear: a comparison of assessments by patients and anesthesia and surgery residents. *Anesth Analg.* 1996; 83: 1285–1291.
- [7] Montgomery M, McCrone SH. Psychological distress associated with the diagnostic phase for suspected breast cancer: systematic review. *J Adv Nurs.* 2010; 66: 2372–2390.
- [8] Carr E, Brockbank K, Allen S, et al. Patterns and frequency of anxiety in women undergoing gynaecological surgery. *J Clin Nurs.* 2006; 15: 341–352.
- [9] Caumo W, Schmidt AP, Schneider CN, et al. Risk factors for preoperative anxiety in adults. *Acta Anaesthesiol Scand.* 2001; 45: 298–307.
- [10] Koivula M, Tarkka MT, Tarkka M, et al. Fear and in-hospital social support for coronary artery bypass grafting patients in the day before surgery. *Int J Nurs Stud.* 2002; 39: 415–427.
- [11] Rosenberger PH, Kerns R, Jokl P, et al. Mood and attitude predict pain outcomes following arthroscopic knee surgery. *Ann Behav Med.* 2009; 37: 70–76.
- [12] Theunissen M, Peters ML, Schouten EG, et al. Validation of the Surgical Fear Questionnaire in adult patients waiting for elective surgery. *PLoS ONE* 2014; 9: e100225.
- [13] Beck AT, Ward CH, Mendelson M, et al. An inventory for measuring depression. *Arch Gen Psychiatry* 1961; 4: 561–571.
- [14] Rózsa S, Szádóczky E, Füredi J. Characteristics of the Beck Depression Scale in Hungarian sample. [A Beck Depresszió Kérdőív rövidített változatának jellemzői hazai mintán.] *Psychiatr Hung.* 2001; 16: 384–402. [Hungarian]
- [15] Sipos K, Sipos M, Spielberger CD. Hungarian version of the State-Trait Anxiety Inventory (STAI). In: Mérei F, Szakács F. (eds.) *Psychodiagnosztikai Vademecum, I. Explorációs és biográfiai módszerek, tünetbecslő skálák, kérdőívek 2.* [A State-Trait Anxiety Inventory (STAI) magyar változata. In: Mérei F, Szakács F. (szerk.) *Pszichodiagnosztikai Vademecum I. Explorációs és biográfiai módszerek, tünetbecslő skálák, kérdőívek 2.*] Tankönyvkiadó, Budapest, 1988; pp. 123–136. [Hungarian]
- [16] Spielberger CD, Gorsuch RL, Lushene RE. *Manual for the State-Trait Anxiety Inventory.* Consulting Psychologists Press, Palo Alto, CA, 1970.
- [17] Wong DL, Baker CM. Smiling face as anchor for pain intensity scales. *Pain* 2001; 89: 295–297.
- [18] Cronbach LJ. *Essentials of psychological testing* (5th edn.). Harper & Row, New York, NY, 1990.
- [19] Muszbek K, Gaal I. Pitfalls within the cancer-related doctor-patient communication. [Az orvos-beteg kommunikáció csapdái daganatos betegség esetén.] *Orv Hetil.* 2016; 157: 649–653. [Hungarian]
- [20] Papp-Zipernovszky O, Náfrádi L, Schulz PJ, et al. “So each patient comprehends”: measuring health literacy in Hungary. [„Hogy minden beteg megértse!” – Az egészségműveltség (health literacy) mérése Magyarországon.] *Orv Hetil.* 2016; 157: 905–915. [Hungarian]
- [21] Tsimopoulou I, Pasquali S, Howard R, et al. Psychological prehabilitation before cancer surgery: a systematic review. *Ann Surg Oncol.* 2015; 22: 4117–4123.
- [22] Nelson EA, Dowsey MM, Knowles SR, et al. Systematic review of the efficacy of pre-surgical mind-body based therapies on postoperative outcome measures. *Complement Ther Med.* 2013; 21: 697–711.
- [23] Silver JK, Baima, J. Cancer prehabilitation: an opportunity to decrease treatment-related morbidity, increase cancer treatment options, and improve physical and psychological health outcomes. *Am J Phys Med Rehabil.* 2013; 92: 715–727.

Wittmann Victoria,
Szeged, Semmelweis u. 8., 6720
e-mail: victoriawittmann1@gmail.com)

III.

Emlődaganatos nőbetegek komplex támogató terápiája. Egy pszichológiai intervenció kutatás előzetes eredményei.

A complex psychological intervention among breast cancer patients - a preliminary study

Wittmann Victoria¹, Látos Melinda dr.¹, Horváth Zoltán dr.¹, Simonka Zsolt dr.¹, Paszt Attila dr.¹, Lázár György dr.¹, Csabai Márta dr.²

¹Szegedi Tudományegyetem, Általános Orvostudományi Kar, Sebészeti Klinika,
²Bölcsészettudományi Kar, Pszichológiai Intézet, Szeged

Kapcsolattartó személy:

Wittmann Victoria

victoriawittmann1@gmail.com

+36304901410

6720, Szeged, Semmelweis u. 8

Interdiszciplináris kutatások igazolták, hogy a daganatdiagnózis és a diagnózist követő hosszú terápiás folyamat olyan negatív és megterhelő érzelmi állapotot hozhatnak létre, amely hátráltathatja a páciensek fizikai és pszichés felépülését és pszichotraumát jelenthet a legtöbb ember számára [1-8].

Az emlődaganatos nőbetegek számára tervezett pszichológiai intervenciók különbözhetnek irányzatukban (például kognitív vagy egzisztencialista); típusukban (például egyéni vagy csoportos) és időzítésükben (például kezelés előtt, alatt vagy után) [9-12]. Azonban minden intervenció célja közös abban a tekintetben, hogy támogatást kíván biztosítani az érintett személyeknek, lehetővé téve így a betegséggel való hatékony megküzdést és az életminőség fejlesztését. [12]

Műtét előtti pszichés felkészítés fontossága

A daganatdiagnózis felforgathatja a megbetegedett személy életét, átalakíthatja terveit, gondolatait és jövőképebe bizonytalanság szövődhet, amely bizonytalanságot fokozhatja a sebészeti beavatkozással kapcsolatos félelmek is [12]. Korábbi kutatások szerint a félelem tárgya az eljövendő műtéttel kapcsolatosan sokféle lehet, mint például: a sebészeti eljárástól való félelem, az altatástól való félelem, a kiszolgáltatottságtól való félelem és a haláltól való félelem [13-14]. Mivel mindezen félelmek jelenléte és mértéke, valamint a műtét előtti szorongás összefüggésben állhat a páciensek testi és lelki felépülésével, kiemelt jelentőségűnek tartottuk, hogy pácienseink műtét előtti pszichológiai intervencióban is részesüljenek [13-14]. Továbbá, számos kutatás alátámasztotta a műtét előtti pszichológiai intervenció fontosságát és jótékony hatásait, mint például a fokozott sebgyógyulást [15-16].

Műtét utáni pszichológiai intervenciók fontossága

A daganatos megbetegedés, mint trauma sajátos jellegzetessége, hogy nem egy egyszeri eseményről van szó, hanem egy folyamatosan változó, számos megrázkódtatást és kihívást rejtő betegségfolyamatról beszélünk, amely során állandósulhat a bizonytalanság és a félelem érzete [17-19]. Schwartz és munkatársai (2010) ebben az értelemben nevezik a rákbetegséget „ongoing trauma”-nak, azaz folyamatosan zajló traumának [17]. A folyamatosan zajló trauma a pácienseket a betegség minden szakaszában fokozottan sérülékennyé teszi [17]. Így már korai kutatások is felhívták a figyelmet mind a műtét előtti, mind a műtét utáni pszichológiai intervenció fontosságára és számos terápiás módszert felsorolnak [20]. Az intervenciók, amelyek relaxációt, meditációt, jógát, hipnózist vagy csoportos pszichoterápiát alkalmaztak,

kifejezetten hatásosnak bizonyultak emlődaganatos nőbetegek esetében [21-24]. A daganatos páciensek pszichológiai támogatása elősegítheti a stressz csökkenését, az adaptív megküzdési stratégiák elsajátítását, javítja az orvos-beteg kommunikációt és javíthatja a páciensek együttműködését is [21,23,25].

A művészetterápiás elemek alkalmazása a pszichológiai intervenciók során további hatékony módja lehet a daganatos páciensek pszichés támogatásának [26]. Kutatásunk során a Testkép-Szobor Tesztet alkalmaztuk, amely egy olyan nonverbális eljárás, mely képet ad az énkonzisztencia mértékéről és alkalmas a tudattalan testélmények felszínre hozására és kifejezésére is [27-28]. Jelen kutatásunkban célunk a Testkép-Szobor Teszt, mint terápiás eszköz mellődaganatos betegpopuláción való alkalmazásának tesztelése volt a betegség feldolgozásának elősegítése érdekében.

Jelen vizsgálat célja

Jelen kutatásunk célja egy komplex pszichológiai intervenció program kidolgozása és előzetes eredményeinek a bemutatása, figyelembe véve mind a műtét előtti, mind a műtét utáni pszichoszociális támogatás fontosságát. Intervenció programunk elméleti alapjául korábbi kutatási eredményeinket használtuk fel [29-30].

Módszer

Részvevők és vizsgálat körülményei

A vizsgálati mintába a Szegedi Tudományegyetem Sebészeti Osztály műtét előtt álló, 18 évnél idősebb, emlődaganatos nőbetegei kerültek beválasztásra. A tesztcsomag kitöltése műtét előtt 1 nappal (1. mérési időpont, T1), műtét után 2 nappal (2. mérési időpont, T2) és műtét után 6 héttel (3. mérési időpont, T3) önkéntes alapon történt (*1. táblázat*). A kutatást a Regionális Humán Orvosbiológiai Kutatásetikai Bizottság engedélyezte (protokollszám: SDM-IQOLR-001). Összesen 50 sebészeti műtétre váró emlődaganatos páciens került a mintába. Kizáró kritérium volt a kóros depresszió, kóros szorongás, egyéb pszichiátriai zavar. Minden páciens részletes szóbeli és írásbeli tájékoztatást kapott a kutatás menetéről, felépítéséről és a pszichológiai intervenció fontosságáról. Ezen információk birtokában a kutatás résztvevői szabadon dönthettek arról, hogy melyik csoportba szeretnének kerülni, így a páciensek közül 20 fő az intervenció csoportba (továbbiakban ICS) került, 30 fő pedig a kontroll csoportba (továbbiakban KCS) került.

Az ICS pszichológiai intervencióban vett részt 1 alkalommal műtét előtt és 6 alkalommal műtét után, heti lebontásban. Minden egyes alkalom 60 percet vett igénybe. A KCS a műtét előtt egy általános, pszichológiai segítséggel kapcsolatos, rövid tájékoztatásban részesült, melyben lehetővé tettük számukra az egyéni segítségkérést, de nem részesültek a 6 alkalmas műtét utáni pszichológiai intervencióban. Minden páciens részletes szóbeli és írásbeli tájékoztatást kapott a kutatás menetéről, felépítéséről és a pszichológiai intervenció fontosságáról. Ezen információk birtokában dönthették el a kutatás résztvevői, hogy melyik csoportba szeretnének kerülni.

1. táblázat: Kutatási elrendezés

	Kontroll csoport	Intervenciós csoport
T1	Spielberger féle Vonás- és Állapotszorongás Skála Beck Depresszió Kérdőív A Sebészeti Beavatkozástól Való Félelem Kérdőív Emlődaganatos Betegekre Kifejlesztett Életminőség Skála Vizuális Analóg Skála	Spielberger féle Vonás- és Állapotszorongás Skála Beck Depresszió Kérdőív A Sebészeti Beavatkozástól Való Félelem Kérdőív Emlődaganatos Betegekre Kifejlesztett Életminőség Skála A Vizuális Analóg Skála Műtét előtti pszichológiai felkészítés PRISM-D rajzteszt
T2	Spielberger féle Állapotszorongás Skála Vizuális Analóg Skála	Spielberger féle Állapotszorongás Skála Vizuális Analóg Skála
T3	Spielberger féle Állapotszorongás Skála Beck Depresszió Kérdőív Emlődaganatos Betegekre Kifejlesztett Életminőség Skála Emlőrák Kezelés Hatását Mérő Skála Vizuális Analóg Skála	Spielberger féle Állapotszorongás Skála Beck Depresszió Kérdőív Emlődaganatos Betegekre Kifejlesztett Életminőség Skála Emlőrák Kezelés Hatását Mérő Skála Vizuális Analóg Skála PRISM-D rajzteszt Pszichológiai intervenciók 6 héten keresztül Testkép-szobor teszt (4.hét)

Pszichológiai mérőeszközök

Beck Depresszió Kérdőív (BDI) – A 21 tételes kérdőív 4 fokú Likert-skálán a depresszió egyes tüneteire kérdez rá úgymint fáradékonyság, alvászavar, döntésképtelenség, túlzott aggodás, elégedettség hiánya [31-32].

Spielberger féle Vonás- és Állapotszorongás Skála (STAI-T és STAI-S) – Ezt a 40 tételes kérdőívet a szorongás szintjének mérésére alkalmaztuk, amelynél a vonásszorongás kérdőív a szorongás általános szintjét méri, míg az állapotszorongás az éppen aktuális szorongást jelzi. A kérdőív 4 fokú Likert-skálán mér [33-34].

A Sebészeti Beavatkozástól Való Félelem Kérdőív (SFQ) – A kérdőív kifejezetten sebészeti beavatkozáson átesett betegek műtétől való félelmét méri [35-36]. A kérdőív 10 itemből áll és 10 fokú Likert-skálán értékelhető. A kérdőív 2 alskálát tartalmaz. A „Rövid távú félelmek” skála (továbbiakban SFQ-r) a műtét kimenetével kapcsolatos rövid távú félelmekre kérdez rá, mint a fájdalomtól való félelem. A „Hosszú távú félelmek” skála (továbbiakban SFQ-h) a műtét kimenetével kapcsolatos hosszú távú félelmekre kérdez rá, mint a hosszú rehabilitációtól való félelem.

A Vizuális Analóg Skála (VAS) – A fájdalom mérésére szolgáló kérdőív, 10 fokú Likert-skálával [37]. A műtét előtt a műtét utáni várt fájdalom mértékére kérdeztünk rá, míg műtét után 2 nappal a ténylegesen megélt fájdalom mértékét mértük fel.

Emlődaganatos Betegekre Kifejlesztett Életminőség skála (FACT-B) – Emlődaganatos nőbetegek életminőségét mérő kérdőív, 5 fokú Likert-skálával [38]. A kérdőív az érzelmi és funkcionális jólétre, a társas támasz mértékére, a fizikai közérzetre és egyéb emlővel és testtel kapcsolatos aggályokra kérdez rá. Példa az egyéb aggályok alskálára – „*Szexuálisan vonzónak érzem magam*”. Ez a vizsgálat a mérőeszköz előzetes tesztelését tartalmazza, a validálás és az elemszám bővítése folyamatban van.

Emlőrák Kezelés Hatását Mérő Skála (BITS) – A testkép változásával járó tapasztalat, szubjektív pszichológiai stressz mérésére használtuk a kérdőívet, amely emlőműtéten átesett nők negatív gondolatait, érzelmeit méri fel [39]. A BITS traumatikus stressz tüneteire, mint például az elkerülésre (a test takarása bő ruhákkal) és a testkép megváltozásával kapcsolatos elégedetlenségre kérdez rá. A magasabb pontérték magasabb testkép változásával kapcsolatos stresszre utal. A szemantikai és tartalmi azonosság elérése érdekében a kérdőívet három független fordító magyarra fordította, majd a fordítók megállapodtak egy közös változatban, amelyet egy negyedik fordító visszafordított angolra. A visszafordított és az eredeti kérdőíveket a fordítók összevetették, és a javaslatok alapján megalkották a végleges verziót. A BITS Cronbach alpha értéke jelen mintán 0,94. Ez a vizsgálat a mérőeszköz előzetes tesztelését tartalmazza, a validálás és az elemszám bővítése folyamatban van.

Terápiás eszközök

PRISM-D rajzteszt (PRISM-D) – A betegségrepresentációk vizsgálatára használt rajzteszt [40-41]. Az eredeti PRISM teszt során egy A/4-es lap méretének megfelelő mágnestáblát használtak, amely a páciens jelenlegi életét jelképezi, a sárga kör a beteg személyt, a piros kör pedig a betegségét, amit neki kell elhelyezni a táblán. A sárga és a piros kör középpontjának a távolsága azt jelképezi, hogy a személy mennyire érzi nehéznek a betegségét. Az általunk használt PRISM-D teszt során a mágnestáblát egy A/4-es papírlap helyettesíti, melyre már rá van nyomtatva az Ént szimbolizáló sárga kör. A betegségét szimbolizáló piros kört, illetve a további köröket, amelyek a beteg életének egyéb aspektusait jelölik, a beteg rajzolja fel a rendelkezésére álló filctollakkal. A PRISM-D tesztet terápiás eszközként alkalmaztuk a kutatás során. A teszt módszer vizuálisan jeleníti meg a beteg aktuális élethelyzetét, segíti annak kézzelfoghatóvá tételében és lehetővé teszi a helyzetre való könnyebb rátekintést. A PRISM-D teszt előnye, hogy aktív részvételt igényel a páciens től és használatával sikeresebben tud reflektálni önmagára.

Testkép-Szobor Teszt – A teszt egy háromdimenziós projektív eljárás, amely során a páciensek agyaggal dolgozva alkotják meg saját testkép szobrukat [27-28]. A páciensek azt az instrukciót kapják, hogy csukott szemmel formáljanak bármilyen emberi alakot a rendelkezésükre álló agyagból és erre 12 percet kapnak. A teszt előnye, hogy háromdimenziós jellegű (így a testrajzokhoz képest kiszélesíti a testkép vizsgálatának lehetőségét) és lehetővé teszi a vizuális kontroll kiiktatását, amely a procedurális emlékezet hozzáférését teszi lehetővé [28]. Azzal, hogy a páciens csukott szemmel formál, egy projektív tér nyílik meg az alkotás folyamatában [28]. A teszt képet ad az énkonzisztencia mértékéről és, mivel alkalmas a tudattalan testélmények felszínre hozására és kifejezésére, a jelen intervenciós programban terápiás eszközként alkalmaztuk. Korábbi kutatási eredmények alapján feltételezzük, hogy a testkép-szobor technika alkalmas lehet (1) az érzelmek katartikus átélésére, (2) a szelf-koherencia és az erőforrások feltárására és (3) a betegséggel kapcsolatos egzisztenciális szorongások és asszociációk megragadására és integrálására [42].

A terápiás eszközök indikációját és kontraindikációját tekintve elmondható, hogy az alkalmazott nonverbális tesztek tág indikációs körben használhatók, de nem alkalmaztuk olyan résztvevőknél, akiknél a teszt instrukció megértése, vagy a tesztfelvétel bármely szempontból akadályozott, továbbá az utóteszt felvételekor kiemelten figyelünk megjelenő

tartalmakra, és azokat a biztonságos kereteket megtartva, az intervenció célját szem előtt tartva, kontrolláltan kezeltük

Az ICS páciensei *műtét előtti pszichológiai felkészítésben* is részesültek, ahol megoszthatták (1) félelmeiket és szorongásaikat a műtéttel kapcsolatban, (2) információt kaptak a pszichológus elérhetőségéről, (3) a kórház működéséről és felépítéséről, (4) a műtét utáni rehabilitáció folyamatáról és (5) hatékony stresszkezelési stratégiákról.

Az ICS páciensei egy 6 alkalmas műtét utáni egyéni pszichológiai intervencióban is részt vettek, amely hetente ismétlődött és alkalmanként 60 percet vett igénybe. Az intervenciók félig strukturáltak voltak és tartalmazták a Testkép-Szobor Teszt (4. héten) és a PRISM-D teszt (6. héten) elvégzését. A terápia során a pácienseknek alkalmuk nyílt arra, hogy szabadon ventilálják érzelmeiket és megosszák kórházi tapasztalataikat. Ezen kívül több stresszkezelési módszerrel is megismerkedhettek a betegek, így például a progresszív izomrelaxáció alapjaival és a pozitív átkeretezés technikájával.

Statisztikai eljárások

Az adatbevitelt és a statisztikai elemzést az SPSS 23-as verziójával végeztük (IBM Corp., Armonk, N.Y., USA). A változók normalitását Shapiro-Wilk teszttel vizsgáltuk. A szóráshomogenitást Levene próbával teszteltük. A változók közötti kapcsolatok feltárására Pearson korrelációt használtunk. A különböző időpontban felvett tesztek összehasonlítását ismételt méréses ANOVA-val végeztük. A csoportok összehasonlításánál Khi-négyzet tesztet és a független mintás t-próbát alkalmaztuk. Statisztikailag szignifikánsnak tekintettük, ahol a p-érték kisebb volt, mint 0,05.

Eredmények

Szociodemográfiai és orvosi adatok a két csoportban

A KCS és az ICS demográfiai és orvosi adatait összehasonlítva azt találtuk, hogy az ICS tagjai szignifikánsan fiatalabbak voltak, mint a KCS tagjai (2. táblázat). A páciensek fele mindkét csoportban, felsőfokú iskolai végzettséggel rendelkezett és többségük házas volt. A páciensek több mint fele excízió esett át és az átlagos tumor méret 22 mm volt (SD = 19,7) az ICS-ban (2. táblázat). Egyéb szignifikáns különbséget a két csoport között nem találtunk ($p > 0,05$).

2. táblázat: A két csoport szociodemográfiai és orvosi adatai (N = 50)

	Intervenció csoport (n = 20)	Kontroll csoport (n = 30)	P
Átlag életkor (Szórás)	48,3 (10,22)	58,03 (14,05)	0,01*
Családi állapot (N, %)			
Házás	13 (65)	21 (70)	0,7
Nem házas	7 (35)	9 (30)	
Iskolai végzettség (N, %)			
Általános iskola	0	1 (3,3)	0,11
Középfokú	7 (35)	16 (53,3)	
Felsőfokú	13 (65)	13 (43,4)	
Műtét típusa (N, %)			
Excisio	13 (65)	18 (60)	0,72
Mastectomia	7 (35)	12 (40)	
Grade (N, %)			
I.	3 (15)	2 (6)	0,11
II.	9 (45)	11 (36)	
III.	4 (20)	12 (40)	
Tumor méret (Átlag, Szórás)	22 (19,7)	19,5 (19,3)	0,7
Neoadjuváns kezelés (N, %)			
Igen	5 (25)	3 (10)	0,16
Nem	15 (75)	27 (90)	
Tumor oldalisága (N, %)			
Jobb	10 (50)	15 (50)	0,86
Bal	10 (50)	15 (50)	

* p < 0.05

Műtét típusa és pszichológiai állapot az ICS-ban és a KCS-ban

Szignifikáns összefüggéseket találtunk a műtét típusa és a pszichológiai tényezők között mind két csoportban (p < 0,05).

Az ICS tagjai között szignifikáns és tendenciaszerű összefüggéseket találtunk a műtét előtt várt fájdalom és a műtét típusa között (6,1 vs. 3,5; p = 0,02) (3. táblázat). Az excisió átesett ICS csoport tagjai jobb érzelmi jóllétről (20,23 vs. 15,14; p = 0,02) és a testkép változásával kapcsolatos alacsonyabb stresszről számoltak be (25,23 vs. 42,86; p = 0,08), mint a mastectomián átesett csoporttagok (T3) (3. táblázat).

3. Táblázat: Asszociációk a műtét típusa és a pszichológiai állapot között az intervenció csoportban (N = 20)

	Műtét előtt (T1)	P	Műtét után 6 héttel (T3)	P

	Mastectomia	Excisio		Mastectomia	Excisio	
Stai-T	45,29	46,29	0,73			
Stai-S	54,43	56	0,74	46,43	38,31	0,08
BDI	10,4	10,1	0,92	14	7,6	0,09
Fact-B						
Érzelmi jóllét	18,43	16,23	0,22	15,14	20,23	0,02*
Fizikai közérzet	24,4	25	0,77	19,86	23,4	0,15
Funkcionális jóllét	17,8	16,7	0,65	16,43	18,69	0,46
Társas támasz	21,8	21,9	0,97	22,43	21,38	0,6
Egyéb aggályok	24,2	26,1	0,53	23	26,9	0,19
Fact-B total	106,8	106	0,92	96	110	0,2
VAS	6,1	3,5	0,02*	1,29	1,38	0,1
SFQ						
SFQ-r	23	14,5	0,08	13	19,43	0,33
SFQ-h	14	14,4	0,9	12,4	19,7	0,16
SFQ total	29	28,9	0,9	39,14	22,1	0,08
BITS						
Zavaró gondolatok				30,57	17,7	0,09
Elkerülés				12,29	7,4	0,09
BITS total				42,86	25,23	0,08

* p < 0.05

A KCS tagjai között tendenciaszerű összefüggéseket találtunk a műtét előtt várt fájdalom és a műtét típusa között (4,8 vs. 3,6; p = 0,06) (4. táblázat). A KCS tagjai között szignifikáns összefüggéseket találtunk a műtét típusa és a FACT-B egyéb aggályok alszáma között (T3) (4. táblázat). A mastectomián átesett KCS csoport tagjai magasabb a testkép változásával kapcsolatos stresszről számoltak be, mint az excisió átesett csoporttagok (50 vs. 23,75; p < 0,01) (T3) (4. táblázat).

4. Táblázat: Asszociációk a műtét típusa és a pszichológiai állapot között a kontroll csoportban (N = 30)

	Műtét előtt (T1)		P	Műtét után 6 héttel (T3)		P
	Mastectomia	Excisio		Mastectomia	Excisio	
Stai-T	46,5	44,72	0,63			
Stai-S	52,17	50,94	0,78	44,64	47,5	0,55
BDI	10,58	10,72	0,96	12,18	13,5	0,69

Fact-B						
Érzelmi jóllét	18,36	17,17	0,40	18,8	18,1	0,7
Fizikai közérzet	23,82	23,89	0,96	19,82	20,19	0,89
Funkcionális jóllét	17,5	17,2	0,92	16,2	15,9	0,89
Társas támasz	19,91	21,83	0,35	20	21,38	0,52
Egyéb aggályok	24	24,06	0,98	21	25	0,04*
Fact-B total	103,6	104,2	0,94	95,9	100,8	0,5
VAS	3,6	4,8	0,06	1,5	2,4	0,19
SFQ						
SFQ-r	26,83	31,06	0,47	23	29,36	0,6
SFQ-h	13,58	17,8	0,29	17,5	17,5	1
SFQ total	37,43	40,6	0,67	32,3,	36,3	0,4
BITS						
Zavaró gondolatok				37,5	16,69	0,00**
Elkerülés				12,45	7,06	0,01*
BITS total				50	23,75	0,00**

* p < 0.05; ** p < 0.01

Az ICS és a KCS közötti különbségek a kutatás ideje alatt (T1, T2, T3)

Szignifikáns és tendenciaszerű különbségeket találtunk a két csoport között (T1) az SFQ total és az SFQ-r skála pontszámainak tekintetében (5. táblázat). A műtét előtt az ICS tagjai kisebb mértékű műtétől való félelemtől (28,95 vs. 39,37; p = 0,05) és műtéttel kapcsolatos rövid távú félelmekről (17,63 vs. 29,37; p = 0,06) számoltak be, mint a KCS tagjai (5. táblázat). Továbbá, a csoportok szignifikánsan különböztek az állapotszorongás tekintetében (mind 3 időpontban). Míg az ICS tagjainak az állapotszorongása fokozatosan csökkent a 6 hét alatt, a KCS tagjainak az állapotszorongása csökkenést mutatott 2 nappal a műtét után, majd ismét emelkedésnek indult a műtétet követő hetekben (p = 0,02) (5. táblázat).

5. Táblázat: Az intervenciós csoport és a kontroll csoport közötti különbségek a kutatás ideje alatt (T1, T2, T3)

	Műtét előtt (T1)		2 nappal műtét után (T2)		6 héttel műtét után (T3)		P
	ICS	KCS	ICS	KCS	ICS	KCS	
Stai-T	46,35	45,43					0,74
Stai-S	54,73	52,11	44,5	43,66	40,4	46,33	0,02*

BDI	10,25	11,2			9,8	12,96	0,26
Fact-B							
Érzelmi jóllét	17	17,46			18,45	18,53	0,7
Fizikai közérzet	24,8	23,5			22,2	20,34	0,7
Funkcionális jóllét	17,15	16,96			17,9	16,23	0,34
Társas támasz	21,9	20,69			21,75	20,76	0,86
Egyéb aggályok	25,55	25,11			25,5	23,46	0,59
Fact-B total	106,3	102,7			105,8	99,46	0,58
VAS	4,26	4,29	3,87	3,74	1,31	2,07	0,39
SFQ							
SFQ-r	17,63	29,37					0,05**
SFQ-h	13,53	16,16	14	15,75	14,8	17,5	0,91
SFQ total	28,95	39,37					0,06
BITS							
Zavaró gondolatok					22,2	25,19	0,52
Elkerülés					9,1	9,26	0,94
BITS total					31,4	34,44	0,61

* p < 0.05; ** p < 0.01

Tapasztalatok a PRISM-D teszttel

A PRISM-D egy gyorsan és egyszerűen alkalmazható terápiás eszköznek bizonyult a páciensek betegségrepresentációjának és a megküzdést segítő erőforrások feltárásában. A teszt vizuálisan jeleníti meg a páciens aktuális élethelyzetét, érzelmi jóllétét és segít annak kézzelfoghatóvá tételében, valamint aktív részvételt igényel a páciens-től, így facilitálva a kommunikációt a terápiás helyzetben. Ezt az alábbiakban egy esetbemutatóval illusztráljuk.

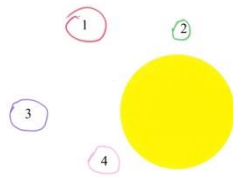
Esetbemutató a PRISM-D alapján

Az 58 éves emlődaganatos nőbeteg a műtét előtti napon vett részt először az intervencióban, ahol a PRISM-D tesztet is alkalmazva kívántunk rálátást szerezni aktuális élethelyzetére. A közös munka során a páciens kiemelte, hogy egyedül él, nincsenek gyermekei és gyakran magányos. A daganatdiagnózis miatt most még inkább egyedül érzi magát, szorong a műtét miatt és igyekszik a munkájával lekötöni magát. A hölgy legfőbb célja a terápia során az volt, hogy csökkentse szorongását és félelmeit a műtét kimenetelével kapcsolatban.

A BDI-n 15 pontot ért el, ami megemelkedett depressziós tendenciákra utal, valamint a STAI-S eredménye is megemelkedett szorongás-értéket mutatott (48 pont). A PRISM-D teszt alapján tisztán látszik, hogy a páciens (T1) a betegségét önmagához nagyon közelinek és

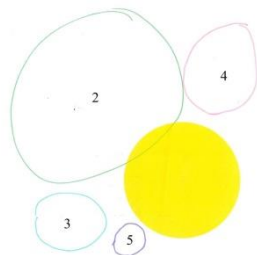
nagynak, míg a családját és barátait kisebbnek érzékelték és a periférián helyezte el, a társas támogatás hiányát sugallva. Az üresen hagyott, nagy fehér felület a páciens szorongásairól árulkodik (1. ábra).

1. ábra: A páciens PRISM-D rajztesztjének körei, jelentésük és sorrendjük (T1). 1. piros: betegség, 2. zöld: család, 3. lila: „a munka az életem”, 4. rózsaszín: barátok



6 héttel a műtét után a páciens 5 pontot ért el a BDI-n és 23 pontot a STAI-S skálán. A pontszámok a depressziós tendenciák és az állapotszorongás csökkenésére utalnak. A rajzteszt ismételt felvételénél (T3) jelentős változásokra lehetünk figyelmesek: a páciens most már képes betegségét távolabbról érzékelni és nagyobb figyelmet szentelni a családjára és a barátaira (2. ábra). Értékrendje megváltozott, érzelmei pozitív irányba változtak, szorongása csökkent, rájött a társas támogatás fontosságára és egy új kör is megjelent a lapon, ami a terápiás munkát szimbolizálja. Számára a terápiás munka egy fontos támaszt jelentett a műtét utáni rehabilitáció időszakában.

2. ábra: A páciens PRISM-D rajztesztjének körei, jelentésük és sorrendjük (T3). 1. piros: betegség, 2. zöld: a terápiás ülések, 3. kék: munka, 4. rózsaszín: család, 5. lila: barátok



Megbeszélés

Kutatásunkban egy átfogó, a lelki működés több síkján ható, emlődaganatos nők számára kidolgozott pszichoszociális intervenciós program előzetes eredményeit mutattuk be. Általános célkitűzésünk a műtét előtti és utáni szorongás csökkentése, a megküzdés elősegítése és az életminőség javítása volt olyan újszerű, nonverbális alapú teszteljárások terápiás célú alkalmazásával, mint a PRISM-D rajzteszt és a Testkép Szobor Teszt. Előző kutatásokhoz hasonlóan [43-45], eredményeink a műtét előtti és műtét utáni pszichológiai intervenció fontosságára hívják fel a figyelmet.

Előzetes kutatási eredményeink alapján az intervenciós program ígéretesnek mutatkozik, a programba bevont személyek számos területen mutattak pozitív változást a kontroll csoport tagjaihoz képest. Azonban, szignifikáns életkorbeli különbség állt fenn a két összehasonlított csoport között, amely különbségek befolyásolhatják a kutatás eredményeit és értelmezését. Mivel a kutatás résztvevői önként jelentkeztek az ICS-ba, és fiatalabbak voltak, mint a KCS tagjai, így valószínű, hogy az összes eredmény az inkább motivált, pszichés támogatás iránt nyitott személyekre vonatkozik. Ez egyfajta korlátja is a kutatásnak. Másfelől viszont fontos eredménye is a vizsgálatnak, hiszen felhívja a figyelmet arra, hogy a támogató csoportot önként inkább a fiatalabb betegek veszik igénybe, így a csoportok szervezésekor a jövőben külön figyelmet érdemes fordítani az idősebb korosztály motiválására.

Az intervencióban részt vevő páciensek alacsonyabb műtéttel kapcsolatos félelmekről és állapotszorongásról számoltak be 6 héttel a műtét után, mint a KCS tagjai. A két csoport közötti különbségek arra engednek következtetni, hogy az intervenció, társas támogató funkciójával, segítette a páciensek szorongásának az oldását. Továbbá, a Testkép-Szobor teszt hatékony terápiás eszköznek bizonyult, segítve a páciensek betegséggel kapcsolatos szorongásainak és emlékeinek a megragadását és pozitív integrálását a testhez való viszony tudatosítása által.

A mastectómián átesett ICS tagjai magasabb műtét utáni fájdalmat vártak a műtét előtt és alacsonyabb érzelmi jóllétről számoltak be 6 héttel a műtét után, mint az excisió átesett ICS tagok. Ezen kívül, az excisió átesett KCS tagjai magasabb műtét utáni fájdalmat vártak a műtét előtt, mint a mastectómiára váró csoporttagok. Eredményeink a műtéttől való félelem és műtét utáni vélt fájdalom szubjektív természetére hívja fel a figyelmet, a sebészeti

beavatkozás kiterjedtségétől (excisio vagy mastectomia) függetlenül, amelyet műtét előtti egyénre szabott intervencióval célszerű felmérni és kezelni.

Továbbá, az ICS mastectómián átesett tagjai magasabb stresszt éltek meg a testkép változásával kapcsolatosan. A testkép változásával kapcsolatos stressz mértéke még magasabb volt a mastectómián átesett KCS tagjai között, amely eredmény arra enged következtetni, hogy testkép változásával kapcsolatos stressz mértéke egy kiterjedt és szerteágazó pszichológiai probléma, amelynek szűrése és kezelése kiemelt figyelmet érdemel [45-47]. Amint saját vizsgálatunk eredményei – az intervenció és a kontroll csoport közötti különbségek – mutatják, ez a probléma célzott intervenciókkal kezelhető.

A kutatás korlátai a hozzáférhetőségi mintavétel, az életkori egyenlőtlenségek a két csoport között és a viszonylag alacsony mintaelemszám. Jövőbeli kutatási céljaink a minta elemszámának a növelése és a csoport eloszlás kiegyenlítése. Ezen kívül célunk a 6 hetes intervenció program 14 hétre való meghosszabbítása, mivel elképzelhető, hogy 6 hét nem elég hosszú idő, hogy tartós pozitív változásokat idézzünk elő a páciensek pszichológiai jólléte tekintetében [45].

Felhasznált Irodalom

[1] Rigó A, Zsigmond O. Somatic illness as a trauma. In: Kiss ECs, Makó Sz. (ed.) The psychology of grief, crisis, trauma and coping. [A szomatikus betegség, mint trauma In: Kiss ECs, Makó Sz. (szerk.) Gyász, krízis, trauma és a megküzdés lélektana.] Pannónia Könyvek, Pécs, 2015; pp. 291-312. [Hungarian]

[2] Andrykowski MA, Manne SL. Are psychological interventions effective and accepted by cancer patients? I. Standards and levels of evidence. *Ann Behav Med.* 2006; 32: 93-97.

[3] Chida Y, Hamer M, Wardle J, et al. Do stress-related psychosocial factors contribute to cancer incidence and survival? *Nat Rev Clin Oncol.* 2008; 5: 466–475.

[4] Schwarz R, Krauss O, Hockel M, et al. The course of anxiety and depression in patients with breast cancer and gynecological cancer. *Breast Care.* 2008; 3: 417–422.

[5] Vahdaninia M, Omidvari S, Montazeri A. What do predict anxiety and depression in breast cancer patients? A follow-up study. *Soc Psychiatry Psychiatr Epidemiol.* 2010; 45: 355–361.

[6] Ho SSM, Winnie KWS, Doris YPL, et al. Anxiety, depression and quality of life in Chinese women with breast cancer during and after treatment: A comparative evaluation. *Eur J Oncol Nurs.* 2013; 17: 877-882.

[7] Rohánszky M, Kegye A, Molnár M, et al. (ed.) Psychosocial Oncology [Pszichoszociális onkológia.] Zafir Press Könyvkiadó, Budapest, 2014. [Hungarian]

[8] Gerlinger L, Kovács P. (ed.) In the same boat... Honorary handbook for Riskó Ágnes's birthday [Tisztelgő tanulmánykötet Riskó Ágnes születésnapjára.] Medicina Könyvkiadó, Budapest, 2018. [Hungarian]

[9] Savard J, Simard S, Giguere I, et al. Randomized clinical trial on cognitive therapy for depression in women with metastatic breast cancer: psychological and immunological effects. *Palliat Support Care.* 2003; 4: 219-237.

- [10] Spiegel D, Bloom JR, Yalom I. Group support for patients with metastatic cancer: A randomized prospective outcome study. *Arch Gen Psychiatry*. 1981; 38: 527-533.
- [11] Waller A, Forshaw K, Bryant J, et al. Preparatory education for cancer patients undergoing surgery: a systematic review of volume and quality of research output over time. *Patient Educ Couns*. 2015; 98: 1540-1549.
- [12] Tsimopoulou I, Pasquali S, Howard R, et al. Psychological prehabilitation before cancer surgery: a systematic review. *Ann Surg Oncol*. 2015; 22: 4117-4123.
- [13] Koivula M, Tarkka MT, Tarkka M, et al. Fear and in-hospital social support for coronary artery bypass grafting patients in the day before surgery. *Int J Nurs Stud*. 2002; 39: 415-427.
- [14] Shafer A, Fish MP, Gregg KM, et al. Preoperative anxiety and fear: a comparison of assessments by patients and anesthesia and surgery residents. *Anesth Analg*. 1996; 83: 1285-1291.
- [15] Manyande A, Berg S, Gettins D, et al. Preoperative rehearsal of active coping imagery influences subjective and hormonal responses to abdominal surgery. *Psychosom Med*. 1995; 57: 177-182.
- [16] Broadbent E, Kahokehr A, Booth RJ, et al. A brief relaxation intervention reduces stress and improves surgical wound healing response: a randomised trial. *Brain Behav Immun*. 2012; 26: 212-217.
- [17] Schwarz LA, DeRosa BW, Kazak AE. Adult Survivors of Childhood Cancer. In: Holland JC, et al. (Ed.) *Psycho-Oncology*. 2nd edition, Oxford University Press, NY, 2010.
- [18] Báñez M, Blasco T, Fernández-Castro J, et al. Perceived control and psychological distress in women with breast cancer: a longitudinal study. *J Behav Med*. 2009; 32: 187.

- [19] Taira N, Shimozuma K, Shiroiwa T, et al. Associations among baseline variables, treatment-related factors and health-related quality of life 2 years after breast cancer surgery. *Breast Cancer Res Treat.* 2011; 128: 735-747.
- [20] Derogatis LR, Morrow GR, Fetting J, et al. The prevalence of psychiatric disorders among cancer patients. *JAMA.* 1983; 249:751–757.
- [21] Charalambous A. The effect of progressive muscle relaxation and guided imagery in improving psychological well-being and quality-of-life for breast and prostate cancer patients: Initial report. *Eur J Integr Med.* 2015; 3: 125.
- [22] Cohen L, Warneke C, Fouladi RT, et al. Psychological adjustment and sleep quality in a randomized trial of the effects of a Tibetan yoga intervention in patients with lymphoma. *Cancer.* 2004; 100: 2253-2260.
- [23] Speca M, Carlson LE, Goodey E, et al. A randomized, wait-list controlled clinical trial: the effect of a mindfulness meditation-based stress reduction program on mood and symptoms of stress in cancer outpatients. *Psychosom Med.* 2000; 62: 613-622.
- [24] Lemieux J, Topp A, Chappell H, et al. Economic analysis of psychosocial group therapy in women with metastatic breast cancer. *Breast Cancer Res Treat.* 2006; 100: 183-190.
- [25] Muszbek K, Gaal I. Pitfalls within the cancer-related doctor-patient communication. [Az orvos–beteg kommunikáció csapdái daganatos betegség esetén.] *Orv hetil.* 2016; 157: 649-653. [Hungarian]
- [26] Öster I, Svensk AC, Magnusson E, et al. Art therapy improves coping resources: a randomized, controlled study among women with breast cancer. *Palliat Support Care.* 2006; 4: 57-64.
- [27] Wadepuhl B, Wadepuhl M. Der Körperbildtest–ein dreidimensionaler Nachweis von Körperbildstörungen. In: Hahn P, Werner A. (ed.) *Modell und Methode in der Psychosomatik.* Weinheim, Deutscher Studien Verlag, 1994.

- [28] Fehér PV. The method of the Body-Sculpture Test. In: Csabai M., Pintér JN. (ed.) Psychology in healing. [A testkép-szobor teszt módszere. In: Csabai M., Pintér JN. (szerk.) Pszichológia a gyógyításban. Fenomenológiai, művészetpszichológiai és testkép-központú megközelítések.] Oriold és Társai Kft., Budapest, 2013; pp. 67-82. [Hungarian].
- [29] Látos M, Sándor Z, Kriston P, et al. Associations Between a Sedentary Lifestyle and Negative Mood State and the Risk of Breast Cancer. In: Benkő Zs, Modi I, Tarkó K. (ed.) Leisure, Health and Well-Being: A Holistic Approach. Palgrave Macmillan, Cham , 2017; pp. 99-114.
- [30] Wittmann V, Látos M, Horváth Z. What contributes to long-term quality of life in breast cancer patients who are undergoing surgery? Results of a multidimensional study. Qual Life Res. 2017; 26: 2189-2199.
- [31] Beck AT, Ward CH, Mendelson M, et al. An inventory for measuring depression. **Arch Gen Psychiatry**. 1961; 4: 561–71.
- [32] Rózsa S, Szádóczky E, Füredi J. Characteristics of the Beck Depression Scale in Hungarian Sample. [A Beck Depresszió Kérdőív rövidített változatának jellemzői hazai mintán.] **Psychiatr Hung**. 2001; 16: 384-402. [Hungarian]
- [33] Sipos K, Sipos M, Spielberger CD. Hungarian version of the State-Trait Anxiety Inventory (STAI). In: Mérei F, Szakács F. (eds.) [A State-Trait Anxiety Inventory (STAI) magyar változata. In: Mérei F, Szakács F. (szerk.) Pszichodiagnosztikai Vademecum I. Explorációs és biográfiai módszerek, tünetbecslő skálák, kérdőívek 2.] Tankönyvkiadó, Budapest, 1988; 123–136. [Hungarian]
- [34] Spielberger CD, Gorsuch RL, Lushene RE. Manual for the state-trait anxiety inventory. Palo Alto: Consulting Psychologists Press, 1970.
- [35] Theunissen M, Peters ML, Schouten EG, et al. Validation of the surgical fear questionnaire in adult patients waiting for elective surgery. PloS one. 2014; 9: 100225.
- [36] Wittmann V, Drótos G, Csabai M, et al. The reliability and validity of the Hungarian version of the Surgical Fear Questionnaire. [A Sebészeti Beavatkozástól Való Félelem

Kérdőív magyar nyelvű változatának reliabilitás-és validitásvizsgálata sebészeti beavatkozáson átesett páciensek körében.] Orv Hetil. 2018; 159: 1988-1993.

[37] Wong DL, Baker CM. Smiling face as anchor for pain intensity scales. Pain. 2001; 89: 295-297.

[38] Brady MJ, Cella DF, Mo F, et al. Reliability and validity of the functional assessment of cancer therapy-breast quality-of-life instrument. J Clin Oncol. 1997; 15: 947-986.

[39] Frierson GM, Thiel DM, Andersen BL. Body Change Stress for Women With Breast Cancer: The Breast-Impact of Treatment Scale. Ann Behav Med. 2006; 32: 77–81.

[40] Büchi S, Sensky T. PRISM: Pictorial Representation of Illness and Self Measure: A brief nonverbal measure of illness impact and therapeutic aid in psychosomatic medicine. Psychosomatics. 1999; 40: 314-320.

[41] Havancsák R, Pócza-Véger P, Látos M, et al. A PRISM-D rajzteszt kórházi betegek vizsgálatában és kezelésében. In: Csabai M. (ed): Pszichológia a gyógyításban. Fenomenológiai, művészetpszichológiai és testkép-központú megközelítések. Oriold és Társai, Budapest, 2013; pp. 83-107.

[42] Waller D, Sibbett C. Art therapy and cancer care. McGraw-Hill Education, UK, 2005.

[43] Yurek D, Farrar W, Andersen BL. Breast cancer surgery: Comparing surgical groups and determining individual differences in postoperative sexuality and body change stress. J Consult Clin Psychol. 2000; 68: 697.

[44] Alicikus ZA, Gorken IB, Sen RC. Psychosexual and body image aspects of quality of life in Turkish breast cancer patients: a comparison of breast conserving treatment and mastectomy. Tumori Journal. 2009; 95: 212-218.

[45] Kovacs Z, Rigo A, Kökönyei G. Complex psycho-social intervention program complementing conventional antitumor therapy - promising results. [A hagyományos

daganatterápiát kiegészítő komplex életmód és pszichoszociális intervenciós program igen biztató eredményekkel.] *Magy Onkol.* 2012; 56: 247-257.

[46] Powell R, Scott NW, Manyande A. Psychological preparation and postoperative outcomes for adults undergoing surgery under general anaesthesia (Protocol). *Cochrane Database of Syst Rev.* 2010; 8.

[47] Johnston M, Vögele C. Benefits of psychological preparation for surgery: a meta-analysis. *Ann of Behav Med.* 1993; 15: 245-256.