

APPLYING DEEP BREATHING EXERCISES, RELAXATION TECHNIQUES, GUIDED IMAGERY AND MUSIC IN THE PREOPERATIVE PERIOD AND DURING RADIOTHERAPY IN UNIVERSITY HOSPITAL FOR TUMORS, SESTRE MILOSRDNICE UNIVERSITY HOSPITAL CENTER IN ZAGREB, CROATIA

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Summary

A comprehensive approach is essential in treating cancer patients, precisely because of the complexity and long duration of medical treatment, which involves lengthy and often painful and exhausting medical procedures that often cause different consequences. The diagnosis of cancer, surgery, and (neo)adjuvant therapies such as chemotherapy or radiotherapy also cause severe psychological and emotional distress. Psychosocial oncology provides the use of supportive-complementary as well as psychosocial interventions and methods as a form of a holistic approach during conventional medical treatment in cancer care, regardless of the stage of cancer or the current type of treatment. The apparent need for such type of cancer care also was demonstrated in University Hospital for Tumors, Sestre milosrdnice University Hospital Centre in Zagreb, in the preoperative period and during radiotherapy through applying deep breathing exercises, relaxation techniques, guided imagery and music. In addition to achieving relaxation and adopting stress management methods, an essential basis was a positive impact on the postoperative course as much as possible. The program included 315 hospitalized patients over the course of 8 months, and due to the possibility of repeated participation - with 478 patient sessions. The subjective participants' impression of the psychosocial oncology program was positive, with tendencies towards applying the adopted techniques even after hospitalization.

KEYWORDS: *deep breathing exercises, relaxation techniques, guided imagery and music, cancer care, surgery, radiotherapy, psychosocial oncology*

**PRIMJENA VJEŽBI PRAVILNOG DISANJA, TEHNIKA RELAKSACIJE I VOĐENE IMAGINACIJE
UZ GLAZBU U PREDOPERATIVNOM RAZDOBLJU I TIJEKOM LIJEČENJA RADIOTERAPIJOM
NA KLINICI ZA TUMORE KLINIČKOG BOLNIČKOG CENTRA SESTRE MILOSRDNICE U ZAGREBU, HRVATSKA**

Sažetak

Sveobuhvatni pristup nužan je u radu s onkološkim bolesnicima, upravo zbog kompleksnosti i dugotrajnosti onkološkog liječenja koje podrazumijeva dugotrajne i često bolne i iscrpljujuće medicinske postupke koji nerijetko izazivaju različite posljedice. Sama dijagnoza karcinoma, kirurški zahvat te (neo)adjuvantne terapije poput kemoterapije ili radioterapije prouzrokuju i snažni psihološki i emocionalni distres. Psihosocijalna onkologija predmnijeva primjenu suportivno-komple-

mentarnih, kao i psihosocijalnih intervencija i metoda kao vid holističkog pristupa u onkološkoj populaciji, a neovisno o stadiju karcinoma ili trenutnoj vrsti postupaka liječenja. Vidljiva potreba za navedenim pokazala se i u kliničkoj praksi Klinike za tumore Kliničkog bolničkog centra Sestre milosrdnice u Zagrebu, pri čemu je kreiran program vježbi dubokog disanja, tehnika relaksacije i vođene imaginacije uz glazbu za hospitalizirane onkološke pacijente u predoperativnom razdoblju abdominalnih kirurških zahvata ili operacija karcinoma dojke te tijekom primjene radioterapije. Osim postizanja relaksacije i usvajanja metoda *stress* managementa, cilj je bio utjecati na što povoljniji tijek postoperativnog razdoblja. U trajanju od 8 mjeseci program je obuhvatio 315 pacijenata, a zbog mogućnosti opetovanih dolazaka – ukupno 478 sudjelovanja. Subjektivni dojam sudionika polaznika navedenih programa pokazao se pozitivnim, s tendencijama ka primjenjivanju usvojenih tehnika i nakon hospitalizacije.

KLJUČNE RIJEČI: *vježbe dubokog disanja, tehnike relaksacije, vođena imaginacija uz glazbu, karcinom, kirurški zahvat, radioterapija, psihosocijalna onkologija*

INTRODUCTION

A cancer diagnosis affects the overall biopsychosocial structure of a person. Aside from physical health, mental well being is also afflicted. Incidence of psychological and emotional distress, anxiety, and depression symptomatology after cancer diagnosing, as well as during the process of medical treatment, leave a substantial impact on the person (1). Painful and exhausting procedures of cancer treatment also include surgical removal of malignant neoplasm, affecting the physiological and psychological status of cancer patients (2). Different psychological interventions and strategies for facing malignant diseases aim to relieve the emotional and psychological distress in the perioperative period of cancer surgery, such as applying relaxation techniques that include deep breathing exercises, progressive muscle relaxation, and guided imagery. Research shows that applying the aforementioned interventions in the preoperative period might have a positive impact on the postoperative process in cancer patients (1).

MATERIAL AND METHODS

A program started at the University Hospital for Tumors, Center for Arts and Medicine, Sestre milosrdnice University Hospital Centre in 2018 in form of music therapy in the background of rehabilitation unit. In 2019 the program included acquiring deep breathing exercises, relaxation techniques, guided imagery, and music for adult cancer patients hospitalized for breast or abdominal cancer surgery or radiotherapy treatment.

From March 18th to November 18th 2019, 315 hospitalized patients attended, with a total of 478 arrivals in the preoperative period or during radio-

therapy. The program is introduced in a group setting, lasting from 45 to 60 minutes. The size of the group is usually 4 to 5 patients and is scheduled once a week at three clinical departments: Department of Oncoplastic Surgery, Department of Surgical Oncology, and Department of Oncological Radiotherapy. In the surgical departments, the patients participated only once preoperatively, while the dynamics of the Radiotherapy department enabled multiple sessions for each patient.

After the session, participants were asked to fill out an evaluation questionnaire consisting of five questions (with possible answers on a scale of 1-5 (1 - not good enough, 2 – good enough, 3 – good, 4 – very good, 5 – excellent).

Deep breathing exercises

The importance of acquiring techniques for proper breathing in the perioperative period is stressed, particularly during the early postoperative period, as well as everyday living after recovery from surgery. During the program session, the effectiveness of deep breathing is stressed as a way of prevention of developing postoperative complications, especially pneumonia, as well as regulating physiological functions, blood pressure, heartbeat, possible effect in pain reduction, accomplishing a calming effect and easier falling asleep. The health professional who guides the program sessions demonstrates the process of proper diaphragmatic breathing using a couple of exercises, followed by the active involvement of participants through a controlled exchange of deep breathing cycle. Deep diaphragmatic breathing exercises are supported by silent, ambient music with slow-paced and gentle melody lines movement, which induces a sense of relaxation

Table 1.

APPLYING DEEP BREATHING EXERCISES, RELAXATION TECHNIQUES, GUIDED IMAGERY AND MUSIC IN UNIVERSITY HOSPITAL FOR TUMORS ZAGREB

Type of Interventions	Number of patients	Sex	Age	Departments (University Hospital for Tumors, Zagreb)
1) Deep breathing exercises 2) Progressive muscle relaxation 3) Guided Imagery and Music	112	62 women 50 men	21y-86y	Department of Surgical Oncology
	98	98 women	33y-82y	Department of Oncoplastic Surgery
	105 (268)	90 women 15 men	29y-86y	Department of Oncological Radiology
Total	315 (478)	250 women 65 men	21y-86y	

Table 2.

EVALUATION QUESTIONNAIRE

Scale 1-5	How do you rate the interest of the workshop?	Does the workshop allow the development of skills and applying knowledge in practice?	Rate the clarity and intelligibility of the guider's presentation in the workshop.	The final grade of the overall workshop	Comments (remarks, compliments, critics)
1-not good enough	0%	0%	0%	0%	63.83% (30)
2-good enough	0%	0%	0%	0%	
3-good	0%	2.13% (1)	0%	0%	
4-very good	10.64% (5)	25.53% (12)	0%	8.51% (4)	
5-excellent	89.36% (42)	72.34% (34)	100% (47)	91.49% (43)	

Progressive muscle relaxation

Deep breathing exercises are a base for the next activity in the program – progressive muscle relaxation technique (PMR). Progressive muscle relaxation as a method for relaxing and dealing with stress. It is suitable for the postoperative period when the patient can smoothly function in everyday activities. Exercises based on contracting different groups of muscles, as well as their intentional relaxation are conducted using the previously acquired proper diaphragmatic breathing techniques, where the voluntary contraction of muscles is followed by breathing in, and the relaxation of the contracted muscles is followed by breathing out. Patients with previously existing painful syndromes were not included in specific parts of PMR. Background music is also used during this technique.

Guided imagery and music

The last activity in every group encounter of the program includes guided imagery and music. The essence of this activity is music that encourages emotional responses. Given that the deep

breathing exercises and muscle relaxation techniques are conducted using ambient, relaxation music, the careful selection of musical pieces during guided imagery is of great importance. During the active listening of music and focusing on the emotions induced by music, the health professional gives the participants instructions for guided imagery which includes making mental images, for instance imagining a happy event from the future they are eagerly expecting or a happy memory from the past which left a strong impression on them. In a safe environment, with affectively intense music, focus on themselves and exploration of the subconscious, emotions. The encounter is rounded up with a brief reflection on the acquired methods and techniques of breathing and relaxation.

RESULTS

During the eight months, the program of deep breathing exercises, relaxation techniques, guided imagery, and music included 315 hospitalized patients with a total of 478 arrivals. The age span of the patients was 21 to 86 years of age. Two

hundred fifty women and 65 men participated. One hundred twelve patients underwent abdominal surgical procedures at the Department of Surgical Oncology, 98 patients underwent breast cancer surgery (segmentectomy or mastectomy with lymph node biopsies or axillary lymph nodes dissection and/or breast reconstruction) at the Department of Oncoplastic Surgery and 105 patients with 268 arrivals at the Department of Oncological Radiology. The minimum number of participants during the application of the program was 2, and the maximum was 17, with an average of 9.5.

Fortyseven participants filled out the questionnaire (15%). All 47 participants answered all four questions (100%), while 30 participants (63.83%) answered the final, descriptive question. Most patients expressed their satisfaction with the workshop, with one participant being concerned about the practical application of acquired skills (Table 2).

DISCUSSION

Psychosocial oncology aims to study and affect psychological, social, behavioral, and ethical determinants in the treatment of cancer patients (3). Earlier clinical picture of an individual's mental health, reactions to the diagnosis of a life-threatening malignancy, exhaustive medical treatment of the disease, presence of unpleasant symptoms such as pain, fatigue, nausea, fear of progression or cancer recurrence, impact on former life plans, diminishing quality of life – are factors that can cause anxiety, depression, emotional and psychological distress in a cancer patient. Although, a person suffering from a malignant disease requires a spectrum of interventions considering the medical care and a complementary-supportive approach in psycho-emotional and existential areas should not be disregarded (4). The quality and effectiveness of psychosocial interventions are increasingly recognized in clinical cancer care as part of the comprehensive treatment of patients. Psychosocial interventions can alleviate emotional distress and improve the well-being of the cancer patient to ensure the best possible quality of life (5).

Brief psychosocial interventions such as relaxation techniques, music, or suggestions can improve postoperative outcomes in patients. Ac-

cording to Hasse et al., these interventions can have a potential effect in reducing the duration of hospitalization as well as analgesics intake after abdominal surgery (6). Also, the education of patients in the preoperative period is a firm basis for surgery preparation. Extending perioperative education through psychosocial interventions can improve psychological, physical, and social outcomes in patients with colorectal problems, including anxiety and depression, quality of life, length of hospitalization, and days to stoma proficiency (7).

In addition to educational interventions, a similar effect can be gained by using relaxation techniques, deep breathing exercises, participating in supportive-expressive group therapy and cognitive behavioral therapy (7), guided imagery, music therapy, and stress management training techniques (5).

Music therapy involves the use of music for inducing relaxation, arousing memories and expressing emotions, while stress management training techniques may include relaxation training and breathing exercises (5). The latter may prevent the development of postoperative complications, such as possible pulmonary complications (8), associated with prolonged hospitalization, morbidity, and mortality (8,9), with an incidence between 2 and 40% (8). The reduction of the incidence and severity of pulmonary complications are related to correctly performed deep breathing exercises (8). In addition to enhanced oxygenation, deep diaphragmatic breathing exercises influence a sense of calmness and comfort, reduce physical tension, and support the effectiveness of stress management (10). Respectively, deep breathing exercises in the postoperative period are also used to prevent or reduce postoperative pulmonary complications affecting lung function and volume and preventing the restrictive breathing pattern inherent in the postoperative period. It also has a positive effect on the prevention of pneumonia and some other disorders in the lung functions, increasing thoracic mobility, regulating the sensation of breathlessness, and facilitating secretion removal. The reduction of pulmonary complications was even more evident in combination with conventional physio-postoperative therapy after major abdominal surgery (11). Atelectasis occurred less and oxygenation increased after only one session of deep breathing

exercises in patients undergoing coronary artery bypass grafting surgery (11).

One of the prominent techniques of practical stress management training, which also includes deep breathing exercises, is progressive muscle relaxation (PMR). Progressive muscle relaxation method was developed according to Jacobsen in 1929, to reduce stress and achieve relaxation and comfort based on the thesis of the reflex contraction of muscles in stressful situations. Besides, PMR affects reducing anxiety, improving quality of life, and creating appropriate coping mechanisms in problem-solving situations (12). Performing PMR consists of a 20-minute systematic relaxation of ten different muscle groups accompanied by deep breathing exercises (12,13). PMR is proven to be an easily applicable method with no side effects while successfully reducing the side-effects of medical treatments in cancer patients, affecting hemodynamic profile, reducing stress, and anxiety, thus improving the quality of life (13). Cheung et al. have shown the statistically significant effect of PMR on reducing anxiety in postoperative patients with colorectal cancer after stoma surgery (12). According to the research, the possible impact of PMR applied in the preoperative period may cause a reduction in anxiety symptoms related to the surgery itself. Respectively, Zhou et al. showed a significant positive effect of progressive upper limb exercises and muscle relaxation in women after breast cancer surgery on the shoulder and arm functionality, as well as in improving quality of life, thereby making PMR an effective rehabilitation intervention in the early postoperative period (14). Also, the use of PMR guided imagery and deep breathing exercises have the effect of improving the quality of life in patients with breast or prostate cancer (10). Also, patients can apply PMR at any stage of cancer as a combination of behavioral and body-mind interventions (10).

In guided imagery, the body-mind technique, the primary goal is to induce the essential imagery that provides a sense of comfort, security, protection, and support, as a method of reducing anxiety and finding emotional resources in oneself (6). As a complementary technique, it can be used in clinical practice for cancer patients, especially for reducing pain or improving quality of life. The release of endorphins aroused by guided imagery can lead to the elimination of negative and stress-

ful thoughts, inducing a sense of peace and ultimately creating a state of the euphoria (10). Applying a guided imagery technique for 20 minutes daily in 7 days periods has been effective in reducing symptoms of distress, bloating, insomnia, anxiety, and depression in women with breast cancer who have undergone chemotherapy (15). Guided imagery has also is effective in reducing postoperative pain and improving sleep quality in patients with anorectal surgery (12). Music has the power to evoke different emotional responses: joy, sadness, anger, hope, peace, and relief; it can capture the mind of the listener, while in the background the rhythm and tempo of the music influence the physiological responses of the organism such as heart rate, breathing, blood pressure, stress and perception of pain (16). Music therapy is a non-invasive, cost-effective, and useful complementary intervention in reducing pain, anxiety, and distress and achieving relaxation (17). Also, in addition to affecting anxiety, music can reduce feelings of discomfort, induce a positive view of hospitalization, as well as be the distraction from unpleasant sounds in the hospital wards (18).

There is a growing number of scientific publications recognizing the positive impact of applying psychosocial interventions in perioperative cancer care. This program left an excellent impression on hospitalized patients and the health professional who participated in the program. We used the evaluation questionnaire as a sentinel for the program and its content.

The next step is to assess the impact of the intervention on the psychosocial and emotional wellbeing of patients through validated questionnaires, including pain perception and data on treatment such as length of hospitalization and the development of postoperative complications.

CONCLUSION

The use of relaxation techniques, deep and diaphragmatic breathing exercises, guided imagery, and music can influence psychological and emotional distress, reduce anxiety and depression symptomatology, and improve quality of life in cancer patients. The participants' impression of the psychosocial oncology program seems to be positive, with tendencies towards applying the adopted techniques even during aftercare.

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