EMDR IN PSYCHONCOLOGY

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Abstract

Objective: the article describes the state of the research on psychoncology with a focus on EMDR approach to this area of expertise.

Method: Qualitative analysis of the existing literature.

Results: Epidemiological data, together with ACEs studies, and the research on the psychological effects of cancer highlight the relevance of a supportive and/or therapeutical intervention for oncological patients. The field of psychoncology is defined as understanding and treating the traumatic effects of the oncological disease, whose symptomatology can be consistent with a diagnosis of clinical, or subclinical, PTSD. Evidence-based psychotherapies for oncological patients are CBT and EMDR. Four experimental studies on EMDR in psychoncology (Faretta 2013, Capezzani et al. 2013, Jarero et al. 2015, Faretta et al. 2016) support the aptness of AIP model in the conceptualization of cancer as a highly specific, traumatic event.

Conclusions: The review of the existing literature points out the efficacy of trauma-focused treatments in psychoncology and suggests crucial preliminary cues on EMDR application, even though further researches are needed to validate these results.

Key words: psychoncology, PTSD, EMDR, adaptive information processing

Declaration of interest: none

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Forward

Cancer is a set of diseases with different etiopathogenesis, clinic features, treatments and prognosis. Considering the great amount of advance in medicine, it is still one of the most widespread disease on the planet and one of the main causes of death. One in every three women and one in every two men are likely to have cancer in their lifetime (AIOM-AIRTUM 2014). In Europe, the incidence a year of the oncological diagnosis is of more than 3.4 millions of people (Ferlay et al. 2013). According to AIOM-AIRTUM (2017), 369,000 new cases of malignant tumor were diagnosed last year in Italy (they were 365,800 in 2016), with 52% of the subjects being men and 48% women. The overall number of people with an oncological diagnosis who live within the national borders are presently more than 3.3 million, that is to say 5.4% of Italian population, showing an increase of 27% in the last seven years. WHO estimates that by 2035 the raise of the average age in Italy will further increase the number of new cases up to nearly half a million oncological patients a year (Globocan 2012).

According to the last report provided by the Italian Institute of Statistic (ISTAT, 2014), 29% of the deceases are due to a tumor, making oncological disease the second cause of death after cardio-vascular pathologies (37%). During the same year (2014), the cost of anti-neoplastic medications went at the first rank for the first time (3.2 billions of euro) followed by antibiotics for systemic use (2.9 billions of euro) and by medicines for the cardiovascular system (2.7 billions). Oncological surgery is more than 12% of the total amount a year.

The average cost of oncological drugs for each patient raises from 1 billion euros in 2014 to more than 3 billion euro in 2017, with more than 15% increasing rate (Censis 2015). Similarly, the cost for advanced care in hospital (radiation therapy, nuclear medicine, transplants, etc.) and for palliative care (hospice, home care) has raised at least of 5% per patient/year (Processing IRST on health information flow and LEA costs, Emilia Romagna).

The first oncological cause of death for women in Italy is breast cancer (17%) whereas lung tumor is the first oncological cause of death for men (27%). Anyway, in the last decade (2007-2017) mortality decreased of 1.2% each year, for the men, and of 0.5% for the women, showing that the number of outliving is increasing (AIOM-AIRTUM 2017). Besides, if we define "healed" a person who had an oncological diagnosis and that shows a life expectancy of the same extent of a person who did not have such a diagnosis, then in Italy 27% of oncological patients can be described as "already healed" (with spikes of 94% in the case of thyroid cancer and 74% for Hodgkin's disease). Coherently, the 5 years outliving has also improved

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from 39% (1990-94) to 54% (2005-09) for the men and from 55% to 63% in the same period for the women; the increase of survival rate is particularly significant in case of prostatic (+26%) and rectum cancer (+15%) for the men and rectum (+14%) and colon cancer (+13%) for the women (AIOM-AIRTUM 2017). This positive trends are especially relevant in terms of healthcare planning, e.g. the managing of the follow-up and the rehabilitation needs (oncological, psychological, social and working recovery) expressed by these people.

Nowadays, cancer is seen as a genetic disease due partially to genetic mutations, partially to inherited components. The new discovery of oncogenes, proto-oncogenes and tumor suppressor genes, and the understanding of their role in some typologies of human tumors, have provided a view on the mechanisms of neoplastic growth. We assume that psychological factors and stress can affect the onset and the development of some neoplasia in three main ways: (1) behaviors that expose the subject straight to the cancer-causing substances (tobacco, alcohol); (2) the neuroendocrine and immune mediation at different levels and by different mechanism, like the fact that stress can affect the onset, the growth and how fast the tumor grows by the neuroendocrine peptidergic mediation (Thaker et al. 2006, Armaiz-Pena et al. 2009, Barrera 2012); (3) the connection between nervous system, stressors and the control of cell proliferation by the action of protoncongenes. The peptid CRF is the stress's core inside the Central Nervous System and it affects several psychoneuroendocrine events, such as the activation of the ACTH secreted by the pituitary gland, the adrenal glands and the Autonomic Nervous System; it induces the expression of the protoncogene c-fos in several brain sites correlated to the Stress response, such as the limbic system and the hypothalamus (Swanson and Sawchenko 1986, Turnbull and River 1997, Dautzenberg and Hauger 2002, Bale and Vale 2004, Reiche et al.2004).

The risk factors in the onset of cancer pathologies can be found inside the cells. When these proto-oncogenes undergo mutations, they become oncogenes, which are capable of turning normal cells into cancer cells. Scientific literature shows evidences of correlations between psychoemotional risk factors and cancer onset and development (Capezzani 2013). The main contributing factors are: the emotional distress before and after the cancer diagnosis, emotions suppression, high level of chronic anxiety, controlling coping style, learned helplessness, despair and denial.

Cancer psychological effects

Cancer is a threat for the sick subject, as well as for the whole psychological system (Borio and Torta 2007, Drageset et al. 2011, Granieri et al. 2013, O'Connor et al. 1990), affecting the psycho-physical integrity, the quality of life, survival (Holzner et al. 2014, Black and White 2005, Timko and Janoff-Bulman 1985) and perceived well-being (Hou and Lam 2014, Tessier et al. 2012). The cancer diagnosis can have a serious negative impact on patients and their families, affecting several different psychological, emotional, social and spiritual features of health (Grassi et al. 2009).

The communication of an oncological diagnosis triggers a major emotional impact that makes the patient feeling confused, numbed and vulnerable. It also inflates the patient with feelings of despair, loss of control and of personal autonomy (Sarenmalm et al. 2013, Rodin et al. 2009), along with possible post-traumatic symptoms such as intrusive thoughts, avoidance and hyper-arousal (Baider and Kaplan De-Nour 1997; Matsuoka et al. 2006, Smith et al. 1999).

Oncological patients often show avoidant behaviors for places, events and people related to their cancer experience. They can also experience irritability, sleep disorders, restlessness and *fatigue* or asthenia. Any stage, from diagnosis to treatment and remission involves defense mechanisms and emotional responses that influence the personal decisions illness-related (Grassi et al. 2009). For the oncological patient, pain is one of the main symptoms, because of frequency as well as for the impact on the quality of life. It is noticeable at any stage of the illness, from 30% at the stage of the diagnosis to 85% at more advanced stages. On the psychological level, intrusive symptoms are the most common (Matsuoka et al. 2006) with a range of prevalence from 11% to 45% following the literature. Furthermore, patients also show fatigue or asthenia that affect the mind-body balance, dropping the ability of the immune system to react in a functional way. The most common psychological symptoms reported by oncological patients are: anxiety, depression, anger towards the social environment, along with beliefs of loosing control of life and mistrust for the future, not rarely leading to social and emotional isolation. The nature of the relationship among cancer patients, their families and the social environment changes, leading to a stress or even a break in the regular rules of mutuality and support (Bury 1982; Townsend et al. 2006). The load for patients is even heavier because of their needs of clear information and practical support (Harrison 2009, Howell et al. 2012). Psychosocial needs in oncological patients can lead to severe consequences impairing the level of personal activity with social and economic effects, and the ability to cope with the disease, shrinking the therapeutic compliance (Passalacqua et al. 2009).

Several researches have studied the psychosocial impact of neoplastic disease and the role of the psychological and behavioral factors in the prevention of the illness, in the early diagnosis and care of tumors. Italian and international scientific literature show that the comorbidity of psychiatric symptoms worsens the patient's quality of life (Surtees et al. 2003, Ganz et al. 2004, Zhou et al. 2005) and decreases the compliance to treatment and the perception of social support. In case of depression, it can impact on the illness development.

Many factors, such as the illness development, the impairment of the physical functioning, the pain, the chemotherapy side-effects, the adverse prognosis are all associated with increasing in the prevalence of psychiatric pathology (Spiegel and Bloom 1983, Love et al. 1989, Spiegel et al. 1994, Van Spijker et al. 1997, Chapman and Gavrin 1999, Foley 1999, Butler et al. 2003, Spiegel and Giese-Davis 2003, Francoeur 2005). These features are so important that several authors suggest to consider cancer as a biopsychosocial deasease (Bultz and Carlson 2006).

Anxiety and depression are common psychophysiological reactions to the neoplastic disease (Voogt et al. 2005) and scientific literature provides data showing that about 1/3 of oncological patients develop Anxiety, Mood or Cognitive disorders (Grassi et al. 2005, Voogt et al. 2005). The emotional effect of the diagnosis disclosure can be so overwhelming that it facilitates the onset of several psychological disorders such as Anxiety disorders, Mood disorders, Adjustment disorders, Post-traumatic Stress disorder, Depression or Psychosomatic disorders. During the last ten years, the neuroimaging techniques, at the beginning only

employed in the diagnosis of tumors and to detect the brain change due to the oncologic disease, have also had a crucial role in the assessment of psychological and psychiatric cancer-related disorders (Chiaravalloti et al. 2013, Tashiro 2004).

In detail, about 30% of oncological patients with a new diagnosis suffer from clinically significant anxiety and an amount up to 75% develop psychological distress (Spiegel andGiese-Davis 2003, Passalacqua et al. 2009; Galway et al. 2012). A percentage between 20% and 35% is prone to develop Depression; between 3% and 35% develop PTSD, that we can observe in the 80% of patients in relapse (Gurevich et al. 2002). Recent meta-analysis (Mitchell et al. 2011) involving 70 researches for a total sample of 10,071 oncological patients, show the incidence of Psychological disorders as follows: 19.4% Adjustment disorder; 16.3% Depression (DSM-IV-TR and ICD-10). Comorbid diagnosis are very common.

In 2004 Kissane et al. observed that patients in the early stage of disease, with an average age of 46, at 3 months follow-up after surgery, showed an overall prevalence of DSM-IV psychiatric diagnosis of 45%. Metastatic patients, with an average age of 51, have been assessed 63 months after the post-primary diagnosis showed an overall prevalence of DSM IV diagnosis of 42%. Women at the early stage of breast cancer showed Mood disorders in the 36,7% of case, with 9,6% of Major depression and 27.1% of Minor depression. In the metastatic sample, 31% of subjects showed Mood disorders, 6.5% Major depression and 24.5% Minor depression. Anxiety disorders have been observed in the 8.6% of the early stage sample and in the 6% of women in the advanced stage of illness. In both groups *fatigue*, past history of depression and cognitive signs of helplessness, despair or resignation showed significant correlation with depression. And finally, if the patient has received a previous diagnosis of Mood disorder, it seems he's prone to develop symptoms of PTSD. For instance, in a study of Ohio State University Medical about 16% of breast cancer patients in a sample of 74 developed PTSD 18 months after the cancer diagnosis. These patients were 3 times as likely to develop anxiety disorders.

Cancer has been indicated as one of the first example of deadly disease that promote PTSD (APA 1994) but, according to the DSM-5 (APA 2013), a medical illness is only considered a traumatic event when it is "sudden" and "catastrophic". Nonetheless, researchers and physicians agree on the potentially traumatic effect of cancer disease and several studies showed how high levels of psychological distress correlate with cancer, even though only a minority of the patients develop a clinical or sub-clinical form of Post-traumatic Stress Disorder (PTSD) as defined by the newer DSM-5 criteria (Mehnert and Koch 2008, Mitchell et al. 2011, Pérez et al. 2016). Functional coping strategies allow a number of patients to cope even with an adverse prognosis (Kubler-Ross 1974, Spiegel 1999), although the need of health in neoplastic patients is higher than in general population, even after the eradication of the illness, and lasts longer. Due to the specific features of oncological diseases, the therapeutic response is affected by: high risk of relapse, comorbidity and distress, possible toxic effects of drugs treatment and radiotherapy in the long term, risk of second neoplasia onset and possible reduction in fertility rates. Particularly, an emerging literature demonstrates that fear of cancer recurrence (FCR) is a problematic long-term and late effect for cancer survivors (Simonelli et al. 2017). Several theories (e.g. self-regulation model of illness, a family-based model, uncertainty in illness theory, social-cognitive processing theory, terror management theory) directly or indirectly help conceptualize FCR and inform potential treatment options for those with clinically significant distress or impairment resulting from FCR. Anyway, further investigation is warranted to promote evidence-based care for this significant cancer survivorship concern.

Scientific literature (Bultz and Holland 2006) and international guidelines (National comprehensive Cancer Network 2013) focus on the importance of assessment and management of psychological distress in oncological disease, however the load on oncological patients is still often under assessed and underestimated (Fallowfield et al. 2001, Holland 2004, Söllner et al. 2001), and the advantages of psycho-oncological interventions in cancer patients are still not perfectly clear (Faller et al. 2013, Zimmermann et al. 2007).

PTSD and Cancer

A number of scientific studies report cancer patients developing PTSD related to their illness with percentages ranging from 3 to 35% (Kangas et al., 2002; National Cancer Institute, 2012). Because of the wide range of percentages in these studies, the issue is still being debated. At the present time, there is no diagnosis that reflects the connection between Cancer and PTSD, although there is research that supports it (Kangas et al., 2013; Posluszny et al., 2011), while other studies exclude this perspective (Phipps et al., 2014; Mehnert, Koch; 2007). A recent meta-analysis (Swartzman et al. 2017) conducted on eleven studies (twelve samples) that included a comparison group estimated the odds ratio as 1.66 (95% confidence interval: 1.09 to 2.53) for PTSD in cancer survivors compared to controls, indicating a higher likelihood of PTSD among cancer survivors. The same study points out that cancer survivors may still meet criteria for "Adjustment Disorder." In fact, Akechi et al. (2004) have shown that the prevalence of Adjustment Disorder among cancer survivors exceeds that of PTSD; Hund et al. (2016) estimate this prevalence at 12,4%. Therefore, it is a matter of ongoing controversy whether the category of Adjustment Disorder, rather than Post-traumatic Stress Disorder, better describes cancer survivors' experiences after their disease.

Independently of the outcomes, a cancer diagnosis is one of the main trigger of traumatic stress (Andrykowski and Kangas 2010). The experience for the subject can be associated with a broad set of adverse events, such as the assessment of the tumor, the diagnosis, the stage and the prognosis, the aggressive treatment, the side-effects of the treatment, the physical changes, the impairment of social and working functioning and sometimes the relapse and diagnosis of a deadly disease (Jarero et al. 2015). From this viewpoint, the experience of cancer illness is a long run of potentially traumatic events with unspecified and repetitive time instead of an acute discrete event (Borio and Torta 2007). This observation makes PTSD in cancer patients a different pathology than in other patients with a history of an isolated, discrete, traumatic event (Greimel et al. 2013).

A large part of the research on cancer patients confirm the existence of a specific form of PTSD or PTSD cancer-related (Cordova et al. 2000, Phipps et al. 2005, Shelby et al. 2008, Smith et al. 2011, Thompson et al. 2011). The body of research dedicated to the cancer as a traumatic event in oncological patients focuses on the prevalence and incidence of PTSD in oncological

population, on the incidence and/or the progress of intrusive and avoidant symptoms of PTSD, on the predictor factors of PTSD symptoms cancer-related (Baider and De-Nour 1997; Kangas et al. 2002) and on the contributing factors in the etiopathogenesis of the psychological distress (Kangas et al. 2013; Posluszny et al. 2011). Several studies focused on the PTSD features cancer-related, pointing out the risk factors for the onset of the PTSD such as: the cancer stage, the diagnosis early time, the possible adverse side-effects of treatments and the possible pain; even individual risk factors such as previous traumatic events and lack of social support can affect the onset of the PTSD.

Following the DSM-5 criteria, the incidence of PTSD in the oncological population ranges from 0% to 22%, achieving 55% if sub-clinical forms of post-traumatic distress are included. Particularly Gurevich et al. (2002) report that only 3 to 4% of the patients with a recent diagnosis of cancer presented a complete PTSD diagnosis, while 20% of the patients show sub-threshold PTSD symptoms. Furthermore, 35% of the patients showed a sub-threshold disorder after the treatment, while 80% did after the occurrence of a relapse. These outcomes suggest that the effects of trauma-related distress should be conceptualized along a continuum.

Several studies outline the similarity of the psychological features between a cancer diagnosis and PTSD at neurobiological level and brain modeling. In the last twenty years, the neuroimaging techniques (TAC, PET, RM) allowed us to study the brain changes in oncological patients, showing that the brain regions affected by post-traumatic symptoms in oncological patients are the same than people with different type of trauma, such as car-crash, war trauma, sexual abuse, etc., which are "specific" PTSD triggers (Hahn et al. 2015, Kangas et al. 2002, O'Connor et al. 2011, Servan-Schreiber 2008). Literature review on neurobiological feature of PTSD cancer-related suggest that the brain region affected by PTSD in cancer patients are the same than those highlighted in other studies on different psychological trauma and events of distress, usually evaluated as "classical" trauma in the nosological history of PTSD.

The main findings are that, both oncological patients and PTSD patients show a significant reduction in the volume of the Hippocampus, a brain structure involved in the episodic and semantic autobiographical memory. Furthermore, oncological patients affected by intrusive memories show a significant reduction in the volume of the amygdala, a structure involved in the processing of the emotional states. These intrusive symptoms, e.g. disturbing memories and the experience of reliving the memory of the past trauma, are related to the diagnosis of cancer and seem to be very common, as much as they can be observed in 11% up to 45% of the oncological population. Manifestations of these symptoms can be pervasive worry, fear of relapse, nightmares, flashbacks, poor future expectations. The intrusive symptoms of recursive, disturbing illness-related memories are one of the main signs in post-traumatic cancer-related stress disorder and can be present in comorbility with depression.

The intrusive memories are associated with dysfunctional coping behaviors, avoidance behaviors and deficits in the autobiographical memory that are crucial for the adaptive functioning of the patient and his/her ability to process and to accept the disease.

ACEs Effects

Adverse life events can lead to cellular dis-regulation of the immune system and of the autonomic responses along with the stress-induced increase of cortisol level. The activation of the HPA axis and the related hypercortisolism often works as a negative mechanism of reaction, leading to an amplification of the immune or inflammatory responses by the cytokine chain. Chronic or acute stressors highly affect the Nervous system: the Sympathetic Nervous System, the HPA axis and the adrenergic system are the main three systems involved in the neurobiological stress response. Arousal, stress response, behavior, emotions and the regulation of neurological development are all connected to these main pathways. Consequently, factors such as overwhelming emotions or psychosocial distress can negatively affect the balance of this brain mechanism. Furthermore, immunological stress-related changes can impair the natural killer cells' ability to respond to cancer or to virus infections (Leonard and Song 1996, Laudenslager et al. 1998, Kiecolt-Glaser and Glaser 1999, Kawamura et al. 2001, Nunes et al. 2002).

In 2010 Felitti and Anda hypothesize that ACEs (Adverse Childhood Experiences) have an impact straight on the onset of cancer and other severe diseases. Children victim of traumatic events can develop risky health behaviors, physical disease (such as ischemic heart disease, mellitus diabetes, cancer, chronic lung disease, bone fractures, liver disease) and impairment in social, emotional and cognitive skills during the life-span. The traumatic experiences tend to reveal the subject's attachment style through the reactivation of the behavioral models learned during the developmental age. These models involve several skills such as: seeking help skills, development and maintenance of social support, positive mirroring. Cancer can dramatically change not only the patient psychophysiological dimension but also the family and social ones.

The HPA Axis develops in the first 5 years of the child's life (Sapolsky and Meaney 1986) suggesting that the effects of traumatic events in this crucial stage of development can affect the child's growth. The effects on the long run can have epigenetic consequences, with possible permanent stress-related changes in the genes expression inside the neural system (Meaney and Szyf 2005). One of the most recent review in literature (Shapiro 2014), along with the studies on ACEs (Felitti et al. 1998) and a large number of scientific researches in Psychology and Biomedicine show that life adverse experiences can contribute to the development of some diseases. For instance, the outcomes of the longitudinal study by Gloden-Kreurz (2005) point out that the number of stressors prior to the illness can be a predictor risk factor of the quality of life and of the psychophysiological distress among oncological patients 12 months after the end of the follow-up process. The stressors are therefore predictors of the late distress *after* cancer, whereas high levels of trauma-related stress during the assessment and treatment stages negatively correlate with the quality of the psychological life *during* the initial hospital admission and the adjunct therapies.

In the meta-analysis review by Wegman e Stetler (2009) on medical tests in a population of young adults show a significant association between abuse during childhood and poor medical tests during the adult life. Considered as a whole, the state of the research indicates that ACEs can affect a large spectrum

of somatic disease during the adult life, including cancer (Brown et al. 2010, Brown et al. 2013, Fuller-Thomson and Brennenstuhl 2009); specifically, these early experiences seem to produce a sort of vicious autonomic cycle between psychosocial features and physical health.

Evidence-based psychotherapeutic approaches to oncological patients

Several studies outline the efficacy of different kind of psychological support for cancer patients, such as psychotherapy, stress management intervention, counseling.

Psychotherapy, included CBT and supportive expressive methods, cover a large amount of scientific literature on clinical interventions (see Traeger et al. 2012 for a review). Psychoeducation for patients, families and care-givers at all the stages of the illness is one of the most important supportive intervention in psycho-oncology. Adequate information help to reduce uncertainty and to empower feelings of control, helping the patient in his decision making process (Faller and Brähler 2016).

The scientific literature (Bultz and Holland 2006) and the guideline of the National Comprehensive Cancer Network (2013) show the importance of the assessment and treatment of the tumor-related psychological distress (Chambers et al. 2014). The patient's emotional condition affects the healing process: psychological variables can modulate the illness process either in indirect ways, e.g. improving or worsening the compliance, or in more direct ones, affecting the regulatory mechanism of the neuroendocrine stress response (Swanson and Sawchenko 1986, Turnbull and Rivier 1997, Dautzenberg and Hauger 2002, Bale and Vale 2004). In the field of Psycho-oncology the benchmark for the research is the Biopsychosocial Model (Engel 1977) stating that either a healthy or sick condition is the outcome of the interplay of multiple biological, psychological and social factors. Since then, the more appropriate model to treat and cope with neoplastic pathologies is an Integrative Model that involves integrative care: a global approach delivered by interdisciplinary teamwork (Grassi et al. 2003) aimed to the empowerment of the patient's coping strategies and to the distress relief. Self-help and counseling interventions for the cancer survivors can also improve the psychological health condition (Matcham et al. 2014, Wenzel et al. 2015).

The main goal for psychosocial care is to assess and treat the effects of the cancer diagnosis and related treatments on the mental state and emotional well-being of patients, families and care-givers. The specificity of Psycho-oncology is therefore not to treat a psychopathological disorder but to treat the stressful and/or traumatic effects of the illness (Morasso et al. 2002). The promotion of narrative methods to elicit and to process the personal history in oncological contexts allows patients and health care professionals to manage and process thoughts and experiences, to assess problems, to communicate information, to explore possible choices, to take space and settle the timeline, to evaluate their own values, to build up a working therapeutic alliance and to settle the most efficient care pathways (Carlick and Biley 2004, Esterling et al. 1999).

In other words, the goals of the psychotherapeutic intervention cancer-patient-centered (Faretta 2014, Varetto et al. 2007) are:

- Decreasing the suffering, encouraging the patient to verbally express thoughts and negative feelings;
- Helping patients to develop more functional behaviors, regaining feelings of control on their own life;
- Promoting communication among the patient, the medical staff and the family, reinforcing the problem solving process for the practical features of the medical treatment;
- Clearly explain to the patient the effects of the psychological factors on the oncological disease;
- Giving back to the patient and the family possible, new meanings of the future.

Beside the improvement of the emotional well-being and mental health, the psychosocial care supports a better management of the disease-related symptoms and of the adverse side-effects of treatments, such as pain and fatigue (Andrykowaki and Manne 2006, Jacobsen et al. 2012). The psychosocial intervention is a crucial component of the optimal oncological care, setting the goals of decreasing the emotional distress and promoting the well-being: it is thus a key component of any strategy aimed to improve the patients's quality of life (Jacobsen and Lee 2015).

In case of comorbidity with psychopathological conditions such as major depressive disorders, psycho-organic or psychotic disorders, severe anxiety disorders pharmacotherapy is usually the best choice of treatment. With other diagnostic categories such as Adjustment Disorder and Personality disorders, characterized by a less severe anxiety and depression symptoms, specific or integrate (pharmacotherapy and psychotherapy) interventions show better outcomes, improving the quality of life and self-perception. Different models have a few therapeutic features in common such as: encouraging the patient to put in words thoughts and negative illness-related feelings, enlightening the effects of previous experiences on the patient present response to the cancer diagnosis, assessing the possible additional psychological load and the need to treat further, co-occurrent stressors not related to the disease (i.e. loss of job) helping the patient to cope with the future uncertainty and with the existential themes usually associated with the diagnosis of a malignant neoplasia, processing dysfunctional behaviors and cancer-related emotions, improving communication among the family members, helping patients and families to find alternative solutions to the practical problems of the disease and the treatment.

The neurobiological process that underlies the cancer diagnosis-related trauma and other type of trauma seems to be similar (Hahn et al. 2015, Kangas et al. 2002, O'Connor et al. 2011, Servan-Schreiber 2008). Therefore, the psychotherapies that have demonstrated efficacy in the treatment of PTSD among patients with a history of "classical" traumatic events, have demonstrated the same efficacy in the treatment of post-traumatic symptoms due to a physical pathology such as carcinoma. Since now, the Trauma-Focused Cognitive Therapy (CBT), EMDR, and Stress Management are considered the most effective treatments in PTSD symptoms reduction (Bradley et al. 2005, Bisson and Andrew 2007, Tol et al. 2013, Faretta 2014, 2015). These approaches are also ranked as elective treatments for children, adolescent and adult with Post Traumatic Stress Disorder in many international guidelines (National Institute for Health and Clinical Excellence 2005, American Psychiatric Association 2006, World Health Organization 2013, Tol et al. 2013).

According to National Cancer Institute's

recommendations (2015), oncological patients should be treated with the same psychotherapies that have been demonstrated to be effective in PTSD population with other kinds of trauma. EMDR Protocol for Oncological patients (Faretta et al. 2013, Faretta 2014, 2015, Faretta and Sacchezin 2015, Faretta and Borsato 2016) focuses on all the cancer-related memories, since the communication of the diagnosis to the present moment, covering the three time dimensions of the patient: past, present and future.

Cognitive-Behavioral Therapy (CBT)

CBT is an effective treatment for Anxiety disorders in the general population (Otto et al. 2004). Several clinical handbooks have been tailored for subjects who cope with specific diseases, including cancer (Moorey and Greer 2012, Tylor 2006, Bianchi 2001). Trauma-focused Cognitive-behavioral Therapy (TCC) is effective in reducing distress in breast cancer patients (Tatrow and Montgomery 2006) as well as in treating anxiety and improving the quality of life in cancer survivor patients (Osborn et al. 2006). More recently, a piece of research has studied the possible adaptation of cognitive-behavioral therapy in the treatment of anxiety in the advanced stages of cancer (Greer et al. 2010). Trauma-focused Cognitive-behavioral Therapy is usually provided in treatment periods of 8-12 weekly sessions and should be delivered by the same therapist (National Institute for Health and Clinical Excellence 2005).

Different researches have studied the neurobiological effects of psychotherapies such as CBT and the Brief Integrated Psychotherapy (Pagani and Cavallo 2014, Pagani et al. 2013.). One of these studies focused on the CBT treatment of the Adjustment Disorder in oncological patients. In 1998, Moorey et al. randomly assigned a sample of 57 patients with dysfunctional adjustment to the disease either to a CBT Protocol or to a Supportive Psychotherapy, both lasting 8 weeks. The CBT group showed "a significant change in feelings, coping strategies, anxiety level and self-report problems" after the intervention and at 4 months follow-up.

The CBT efficacy has also been studied by Rabe et al. (2008) using EEG: they detected a decreasing activation of the right frontal region of the brain associated with a decrease in post-traumatic symptoms, thus showing that CBT treatment correlates with adaptive changes in the brain functioning. The efficacy of an Exposure-based Treatment for patients with PTSD has also been studied in a SPECT research (Peres et al. 2007) which suggests that psychotherapy can affect the development of narrative memories, overlapping the neural substrates of previous traumatic memories. Another study (Felmingham et al. 2007) explored the CBT efficacy in treating PTSD using fMRI and noticing positive correlations between the reduction of PTSD symptoms and the activation of cingulate frontal cortex; they also detected a negative correlation between symptoms reduction and the activation of the right portion of the Amygdala.

In a literature review, Nenova et al. (2013) found 19 randomized clinical trials that studied the effects of CBT on Stress Traumatic symptoms in undiagnosed patients: among these, 6 have reported a partial decreasing of Traumatic Stress and just 3 showed improvements in 2 or more clusters of symptoms. The Authors suggested that the favorable outcomes could be due to non trauma-focused treatments.

Eye Movement Desensitization and Reprocessing (EMDR)

EMDR therapy has shown its efficacy for several different psychological disorders (de Roos et al. 2010, Fernandez and Faretta 2007, Gauvreau and Bouchard 2008) as well as in the treatment of distress related to a physical disease (Arabia et al. 2011, Konuk et al. 2011). Many studies in the last 20 years have acknowledged EMDR as an effective, evidence-based trauma treatment in the programs of professional organizations and health care national systems. In 2000, EMDR had recognition by International Society for Traumatic Stress Studies as an efficient and empirical-based treatment for PTSD (Foa et al. 2008), while the Agency for Healthcare Policy and Research (AHCPR) has given the A mark to EMDR as PTSD treatment for adults and a B mark for children (Foa et al. 2009). Different researches validated EMDR as an effective method, suitable in the treatment of psychological results of trauma, and in 2004 APA included EMDR in the guidelines for the clinical practice (Faretta 2014, 2015).

In Italy, several neuroimaging researches have shown the neurobiological effects of EMDR on brain functions. The most evident outcome is the significant change in the activation of multiple brain regions at post-treatment, including limbic areas with high emotional function and cortex regions with associative function. Other studies have used SPECT to compare the brain activation before and after EMDR intervention, outlining significant changes in the blood flow especially in limbic regions and in pre-frontal cortex. This normalization has been associated with symptoms remission, in terms of a decrease of flashbacks and intrusive memories, and an improved self-perception; the change also smoothed the somatic features of the disturbance (Lansing et al. 2005, Oh and Choi 2007, Pagani et al. 2007). Other MRI and fMRI studies detected the reduction of hippocampus volume in association with the improvement of post-traumatic symptoms. EMDR therapy has also been evaluated using EEG (Harper et al. 2009, Lamprecht et al. 2004, Propper and Christman 2008, Propper et al. 2007).

A recent study by Pagani and colleagues (2012) showed that during EMDR sessions the disturbing components of a memory in subjects with PTSD were associated with further adaptive information and remission. Researchers have employed EEG with the aim to obtain a global understanding of the neuronal activation during a session of EMDR and in a session of autobiographical writing. Subjects have been assessed during the first and the last sessions after the trauma processing. Neurobiological data show a significant movement in the activation after EMDR therapy: from the limbic and pre-frontal regions involved in the processing of the emotional components to the posterior associative areas, mainly involved in cognitive-associative processes. During the BLS (bi-lateral stimulation) in the first EMDR session (T0) the cingulate orbit-frontal cortex developed a significant activation; during the last session (T1) the activity involved temporal-occipital left areas. Increasing activation during the autobiographical writing has been detected in frontal limbic temporal regions at T0 and in temporal occipital right region at T1. Furthermore, patients showed the strongest limbic cortex activation before the trauma resolution, compared with the control group.

Several studies (Shapiro 2001) highlighted EMDR's efficacy with oncological patients, in terms of a significant symptoms reduction for any PTSD cluster.

Specifically, two studies (Capezzani et al. 2013, Faretta et al. 2016) compared EMDR therapy to, respectively a CBT intervention and to the treatments examined in Nenova et al. (2013). Capezzani et al. observed that patients randomly assigned either to EMDR or CBT, at 1 month follow up were less affected by post-traumatic symptoms if they had received EMDR Therapy.

In 2014 Faretta et al. presented a pilot clinical study on a sample of 18 subjects with different kind of tumors. After 12 EMDR sessions, preliminary results showed a reduction in the amount of psychological complications due to the cancer diagnosis, and particularly a reduction of PTSD symptoms, anxiety levels, depression and perceived pain.

Compared to CBT intervention, Capezzani et al. (2013) and Faretta et al. (2016) observed that EMDR therapy produces significant reduction in Traumatic Stress scales and in other post-traumatic symptoms measures.

A pilot study by Jarero et al. (2015) evaluated the efficacy of the Integrative Group Treatment EMDR Protocol (EMDR-IGTP) specifically for women with different kind of cancer and PTSD symptoms cancer-related. Statistical outcomes have shown a significant improvement either during the active stages of the cancer and at the follow-up stage. Furthermore, patients reported a subjective overall improvement after the EMDR-IGTP treatment. A comparative study on a population of patients under radiotherapy, recently conducted in Iran by Majidzadeh and Sediq (2015A, 2015b) with a simple research design pre test-post test, seems to validate the efficacy of EMDR in stress management, anxiety and depression in oncological patients.

In 2002 Peters et al. highlighted a more descriptive case study: three cancer patients have been treated with EMDR and three other patients with Supportive Psychotherapy. Data have been collected in terms of clinical quantitative outcomes using a semi-structured questionnaire and an interview given by an external researcher. The outcomes confirm the efficacy of EMDR in both subjective and objective points of view.

In 2002, Grant and Threlfo tested the efficacy of EMDR protocol for the chronic pain in reducing the pain levels and negative effects pain-related. Another study (Mazzola et al. 2009, Tesarz et al. 2014) showed the efficacy of EMDR in treating chronic pain: being chronic pain a common condition in cancer (Green et al. 2011), this feature alone could represent a good reason to employ EMDR as a useful intervention with oncological patients.

CBT and AIP: symptoms conceptualization in oncological patients

CBT

First of all, CBT sessions provide an assessment stage and psychoeducation on the emotional cancer-related effects. CBT therapists treat anxiety and hyper-arousal symptoms by teaching patients progressive relaxation techniques with specific instruction on diaphragmatic breathing, imagery exposure and *in-vivo* exposure. CBT approach pays specific attention to negative beliefs and cognitive distortions disease-related because it postulates that anxious people tent to over-estimate negative factors (Beck et al. 1985) and that this tendency leads to avoidance and other dysfunctional coping strategies. In order to provide cognitive restructuring for the negative thoughts, therapists provide Rational-Emotive-Behavior Therapy (REBT, Abrams and Ellis 1994) along with techniques to switch the attention focus. To generalize and stabilize the new, adaptive behaviors and to decrease the risk of relapse, anxious and depressed patients are given homework and diary exercises.

Adaptive Information Processing (AIP) model

The EMDR Therapy is a therapeutic approach to reprocess dysfunctional traumatic memories within the neurophysiological understanding provided by the Adaptive Information Processing model (Shapiro 1995, 2001). AIP postulates the existence of an innate information processing system that can be disrupted when traumatic experiences overwhelm the ability of the subject to cope with them. This can happen in case of very intense, negative emotions or disorganized physiological responses that prevent the subject to modulate his/her physical reactions and the ability to give the experience an adaptive meaning, thus available for the future. The AIP Model provides a theoretical framework for the EMDR efficacy in repairing the dysfunctional cycle (Faretta 2014, Schubert et al. 2011, Shapiro 1995, 2001).

The AIP model posits the existence of an information processing system that assimilates new experiences into already existing memory networks. These memory networks are the basis of perception, attitudes, and behavior. Perceptions of current situations are automatically linked with associated memory networks. When working appropriately, the innate information processing system "metabolizes" or "digests" new experiences. Incoming sensory perceptions are integrated and connected to related information that is already stored in memory networks, allowing us to make sense of our experience. What is useful get learned, stored in memory networks with appropriate emotions, then made available to guide the person in the future (Solomon and Shapiro 2008).

Dysfunctionally stored memories are understood to lay the foundation for future maladaptive responses, because perceptions of current situations are automatically linked with associated memory networks. Neuroimaging studies show the difference in the way traumatic and ordinary memories are stored and recalled. Traumatic informations are stored as dissociative sensorial and perceptive fragments that cause psychophysiological, neuroendocrine and immune change. Amygdala and Hippocampus are the two main brain structures involved in the blockage of the associative process. A persistent inhibition of the regular functioning of frontal cortex prevent the natural inhibitory control over the amygdala, that gets hyper-stimulated by unprocessed information. AIP states the existence of a natural information processing and emotional discharge system modulated by the management of conscious meanings and patterns of automatic response (Shapiro 1995, 2001, Solomon and Shapiro 2008).

EMDR works with somatic memories and images, emotions and trauma-related cognitions by its multiple integration with different level of functioning of the mind-body network. From a holistic perspective, the AIP model (Shapiro 1995, 2001, 2002, 2007, Solomon and Shapiro 2008, Shapiro and Laliotis 2011) and the EMDR Protocol are useful tools for processing problematic features of the emotional, disease-related experiences (diagnosis, surgery, chemotherapy, etc.) in addition to provide intervention for the traumatic events

of the past personal history of the patient (e.g. ACEs).

In psycho-oncology, EMDR therapy focuses on all the dysfunctional cancer-related memories, from diagnosis to the present moment and on all the three perspectives of the patient life (past, present and future) building up resilience, improving emotional regulation and strengthening the patient coping strategies (Faretta 2014, 2015, Faretta et al. 2013).

The EMDR intervention for oncological patients is articulated into 7 stages, according with the experiences that the patients have to deal with, and is aimed to help them getting more resilient, to empower their self-regulatory emotional ability and their coping skills.

The treatment stages for cancer (Murray 2010) are: screening, diagnosis and treatment plan, surgery, adjuvant therapies (radiation/chemotherapy/hormonal therapy), remission/follow up, possible relapse, death or re-evaluation. Assessment of vulnerability to trauma and the presence of risk factors is required at each stage. The therapist also addresses trigger factors, either cancer-related or associated with previous, disturbing experiences that precipitate the re-experience of trauma or other stressful events. Context requests which are relevant for EMDR treatment, such as crucial relationships that can affect the patient experience, are also considered. EMDR intervention facilitates the healing process of the ACEs related psychological wounds and provides the patient with the help he/she needs to cope with physical change and the unpredictable timeline of the disease, thus working on the past, the present and the future dimensions.

EMDR treatment in psychoncology: a review of the existing literature

The first pilot study by E. Faretta (2013)

Faretta et al. (2013) carried out a pilot study on 18 patients with mixed oncological diagnosis as a pilot stage for a wider research project held at the Centro Studi P.I.I.E.C per la Psicoterapia Integrata Immaginativa ad Espressione Corporea in Milan (Agazzi et al. 2013). The study was aimed to evaluate the suitability and efficacy of the EMDR Protocol guidelines for intervention in psycho-oncology. The research compared the rates of anxiety, distress, depression, emotional balance, and adaptive adjustment strategies in oncological patients before, during and after the treatment.

Patients have been given the following self-report questionnaires: Karnofsky Performance Status scale (T0) (Karnofsky and Burchenal 1949); SCL-90 Symptom CheckList (T0, T1, T2) (Derogatis et al. 1973, Italian adjustment by Sarno et al. 2011); Cope Inventory (T0, T1,T2) (Sica et al. 2008); Davidson Trauma Scale-DTS (T0,T1,T2) (Davidson et al. 1997); Post-Traumatic Grow Index - PTGI (T1, T2) (Tedeschi and Calhoun 1995, Italian adjustment by Prati and Pietrantoni 2006).

Changes in the outcome from T0 (0 sessions) to T1 (6 sessions) and to T2 (12 sessions) were analyzed using the non-parametric Fisher test supported by the IBM software SPSS Statistics 21. The results showed a clear reduction of post-traumatic cancer-related symptoms in all the patients: at T0, 16 patients on 18 reported on the DTS clinical levels of post-traumatic symptoms; at T1, only 3 subjects responded to the criteria for a PTSD diagnosis. At the end of the EMDR treatment (T2), none of the patients have been assessed with clinically significant scores. The decrease of the dysfunctional avoidant coping style, along with the increase of strategies of positive stance and problem-oriented coping, outlined the efficacy of EMDR treatment, even for the management of experiential components of emotional and behavioral regulation illness-related.

The analysis of the scores on the subscales "intrusive symptoms", "avoidance" and "hyper-arousal" indicates a clear reduction of the spectrum of symptoms of post-traumatic disorders. Post hoc analysis have shown significant difference already between the pre-treatment stage (T0) and the session n.6 (T1), with positive outcomes even on the short-term. These outcomes are specifically significant in the oncological field because of the low intensity of treatments in public health services and hospitals. EMDR treatment also has proved to be effective in other common cluster of cancer-related symptoms. E.g. outcomes on the SCL-90 showed a significant reduction in all the sub-scale, such as "somatic disorders", "obsessive-compulsive disorders", "sensitivity", "hostility", "anxiety", "depression", "phobic anxiety", "sleep disorders", "paranoia", "psychoticism". Except for the "phobic anxiety" sub-scale, the reduction in all of the dimensions was significant within 6 sessions.

After 12 EMDR sessions, the outcomes showed a further reduction in different kind of psychological complication: particularly, remission of PTSD symptoms, reduction in the anxiety and depression levels, reduction in the intensity of the perception of physical pain. This pilot study highlight that EMDR intervention can contribute along with other methods or integrative techniques (i.e. psychoeducation and cognitive restructuring) to promote the reactivation of the adaptive information processing system, empowering the patient's resources and potentialities in order to regain a psycho-physiological well-being (Faretta and Parietti 2012).

These encouraging but preliminary results cannot be generalized because of the small size of the sample, that is also biased by the heterogeneity of the type and stage of cancer that affected the subjects. The outcomes of the pilot study should therefore be used to orient future and more substantial research.

EMDR and CBT for Oncological Patients: a Comparative Study of Effects on PTSD, Anxiety and Depression by Capezzani et al. (2013)

The first RCT study on EMDR treatment in the oncological field for tumor patients was conducted by Capezzani et al. (2013). The research was run on a population of 31 subjects with different cancer types (breast, colon, melanoma, lung, stomach) assigned to 3 groups: the first group of 10 patients in medical treatment received an EMDR therapy; the second group of 11 patients at follow-up stage received an EMDR therapy; the third group of 10 patients at follow-up stage received a CBT intervention. Different tumor types have been balanced among the three groups.

Symptoms scores were evaluated using the following questionnaires: Clinical Administered PTSD Scale (CAPS) for the PTSD diagnosis following the DSM-IV-R criteria; the Impact of Event Scale-Revised for the evaluation of the perceived distress due to traumatic events; the Psychophysiological Questionnaire Brief Version (QPF-R) for the evaluation of the psychophysiological reactions; the State-Trait-Anxiety Inventory (STAI-Y) for the evaluation of the presence and severity of Anxiety. Data have been collected before the psychotherapy began and then at one month follow-up after the conclusion. Patients have been referred to the intervention by psychiatrists, psychologists and physicians inside the Regina Elena National Cancer Institute in Rome, Italy. When the

clinical interview detected signs of a possible traumatic disorder, the patient was given the questionnaires by an independent interviewer.

If PTSD diagnostic criteria were met, patients were referred to the psychotherapeutic intervention, signing up for therapy. Both of the treatments, either EMDR or CBT, have been delivered in 8 sessions.

The EMDR intervention followed the Standard Protocol (Shapiro 2001) in 8 stages aimed to:

- Stabilization by psychoeducation, resources installation (Shapiro 2001) and Safe Place installation;
- Targeting and Processing of the disturbing memories cancer-related and not related to other previous traumatic events;
- Integration, decreasing of distress, enhancement of resources for daily life to improve the adjustment and the patient quality of life.

The CBT intervention provided therapeutic techniques and approaches depending on the symptoms and the stage of the illness:

- For the stabilization of the hyper-arousal symptoms: psychoeducational approach, Rational Emotive Imagery (REBT, Ellis 1994) and progressive relaxation techniques. For the hypo-arousal symptoms: psychoeducational approach, homework to target, recognize and activate the somatic resources;
- For the intrusive symptoms and flashback: attentional orienting techniques;
- For the avoidant and numbing symptoms: systematic desensitization and progressive exposure in imagery or *in vivo*;
- For cognitive restructuring of negative thoughts: ABCDE forms of Rational Behavioral Therapy (REBT, Ellis 1994) and socratic dialectic techniques;
- For monitoring psychophysiological and behavioral changes: homework and daily records;
- For enhancing the therapeutic compliance: monitoring techniques and reframing.

Either EMDR or CBT treatments have been delivered by the same clinical psychologist with more than 10 years of EMDR training.

Outcomes show a better effectiveness of EMDR compared to Cognitive Behavioral Therapy at the follow-up stage of the disease on variables of psychophysiological distress (anxiety, depression, psychophysiological dysregulation) and PTSD.

Scores on Impact of Event Scale-Revised (IES-R) and Clinician Administered PTSD Scale (CAPS) also showed a significant reduction in the EMDR group compared to CBT group.

Both treatments had similar scores in avoidance and numbing symptoms (C criterion of PTSD), social dysfunctioning (D criterion of PTSD), depression, anxiety and psychophysiological responses. EMDR was effective both during the stage of active disease of cancer and at the stage of follow-up of the disease.

At one month follow-up after the completion of the treatment in 8 sessions, the EMDR group didn't meet the criteria for PTSD diagnosis anymore, while CBT group still met the diagnosis criteria or for a sub-clinic form of PTSD. Furthermore, EMDR showed to be significantly more effective in reducing the IES-R scores and the scores of the "intrusive symptoms" sub-scale of CAPS. Both treatments seemed to be effective in the scores of trait-anxiety, depression and psychophysiological responses and both proved to be effective in a limited number of sessions. These outcomes point out the crucial role of psychological treatment for oncological patients either during the active stages of the cancer disease and the medical follow-up stage in order to enhance resilience resources, adjustment and positive management of the disease.

This pilot study also has several limitations. The number of included patients treated with CBT or EMDR is not large. Another limitation is that there were no fidelity checks on the treatment sessions. Furthermore, all patients in each group received their treatment from only one therapist giving rise to the possibility that the differences could be because of differences in clinical skills with non-specific treatment variables such as the development of therapeutic alliance or other factors. Coherently, future research should include a greater number of patients treated and should involve more therapists in each treatment group. They should also contemplate treatment fidelity checks. Finally, future studies should provide for a follow-up of at least 6 months after the end of treatment to show the stability of the effects across the different conditions.

EMDR protocol for oncological patients by Elisa Faretta and Thomas Borsato, 2016

Several articles by Faretta (Faretta et al. 2013, Faretta 2014, 2015, Faretta and Sacchezin 2015) describe the EMDR protocol for oncological patients, specifically tailored to help patients to regain a control over specific aspects of the disease experience, such as the disclosure of the diagnosis. The EMDR intervention in psycho-oncology focuses on the problems related to the different stages of the disease (Faretta 2014, Shapiro 2001). At any stage the related level of distress requires specific processing to promote and enhance coping skills and empower resilience.

EMDR protocol for oncological patients (Faretta and Borsato 2016) is illustrated through the story of "Sandra", whose EMDR psychotherapy lasted 1,5 year for a total of 63 sessions. The protocol focuses on the traumatic cancer-related memories from the diagnosis to the present moment and involves the complete timeline of the patient: past, present and future.

The treatment aimed to enhance the patient's resiliency, self-regulatory skills and coping skills. The work on the past issues put into light the developmental history of the subject and specifically her attachment style. Because of the circular relationship between psychological trauma and organic disease, the protocol targets any significant factor of psychological vulnerability related to the activation of the attachment system, such as ACEs (mistreatment, abuse, neglect, etc.). After that, the work focused on more recent past events such as traumatic illness-related experiences following the patient's timeline from the first events to the more recent ones up to the future developments. This prospective is in accordance with the developmental vision where even the worst experience, if adequately processed, can help to give a positive meaning to any further event.

Pilot Research Study on the Provision of the Eye Movement Desensitization and Reprocessing Integrative Group Treatment Protocol With Female Cancer Patients by Ignacio Jarero et al. 2015

Another pilot study (Jarero et al. 2015) examined the EMDR Integrative Group Treatment Protocol (EMDR-IGTP) effectiveness in reducing the PTSD symptoms related to diagnosis and treatment of different type of cancer (cervical, breast, colon, bladder, skin) in 24 adult women. The statistical analysis used the General linear

model and the t-test, comparing the mean scores of Short Post-Traumatic Stress Disorder Rating Interview (SPRINT, Connor and Davidson 2001) at any given time of the evaluation: pre, post and two follow-up.

The outcome shows a significant enhancement after the EMDR-IGTP treatment during the active phase of cancer and at medical follow-up. It has also been possible to observe the effectiveness during time, with a progressive reduction of PTSD symptoms. The outcomes also have shown an overall self-perceived improvement in the subjects. This pilot study suggests that intensive delivering of the EMDR-IGTP protocol can be a valid support for tumor patients with PTSD disease-relate symptoms. The authors point out that further researches with RTC are needed to evaluate the efficacy of EMDR-IGTP for the oncological population.

EMDR and CBT: a comparative clinical study with oncological patients by Faretta et al. (2016)

In 2016 Faretta et al. published a study aimed to compare the effectiveness of EMDR intervention to the CBT no-trauma-centered intervention in a population of 57 subjects (11 men and 46 women) with mixed oncological diagnosis. The psychotherapeutic interventions were delivered in 12 weekly sessions of 60 minutes each: 31 subject received EMDR treatment, 26 the CBT treatment.

Symptoms scores were evaluated using the following questionnaires: Symptom Checklist 90-R (SCL-90-R), COPE Inventory and Davidson Trauma Scale (DTS) at three different times (before the treatment, T0; after the 6th session, T1; after the 12th session, T2); Karnofsky Performance Status has also been delivered but only at T0. The outcomes show a significant improvement in patients who received EMDR treatment after the first 6 sessions in 11 out of 17 of the studied variables: COPE sub-scales of "avoidance strategies" and "positive stance", DTS three sub-scales ("intrusion", "avoidance", "hyper-arousal"), SCL-90-R six sub-scales. Particularly, it has been possible to notice a decrease in avoidant behaviors and equivalent more assertive behaviors (COPE Inventory); a reduction in intrusive symptoms and in hyper-arousal (Davidson Trauma Scale); an enhancement in the sub-scales of "somatization", "obsessive-compulsive", "sensitivity", "depression", "anxiety", "phobic anxiety", "hostility", "paranoia", "psychoticism" of SCL-90-R. The patients treated with CBT non-trauma-centered showed improvement in 4 out of the 17 variables: "assertiveness", "religious coping" (COPE Inventory), "intrusive symptoms" and "avoidant behaviors" (Davidson Trauma Scale) and no improvement in any of the SCL-90-R sub-scales.

This innovative study points out the importance of trauma-focused treatments for cancer patients and suggests crucial preliminary cues on the advantages of treating oncological patients with EMDR, but it also shows some methodological limitations. One of the limits that could undermine the internal validity of the research is represented by the non-random assignment of the participants to the CBT or EMDR groups, which was determined by location (the hospitals where the therapists worked). According to the definition of internal validity, this non-randomization could have led to misleading conclusions about the effectiveness of the treatments. This possibility was limited by performing nonparametric tests to ensure good study validity, without making any assumptions about the probability distributions of the variables studied.

Other limitations are because of the small number of included patients treated with CBT or EMDR, a non-homogeneity of cancer type, and the lack of fidelity control on the adherence of treatment sessions to the respective theoretical models. Finally, as is common when clinical and research contexts are combined, there can be subjective factors relating to the skill or personal characteristics of the therapist. These features can significantly impact on non-specific treatment variables such as the development of a therapeutic alliance or other factors, but are often impossible to control in a research design.

Furthermore, it is important to note that, in this study, the CBT treatment provided, even if tailored on the specificity of oncological disease, was primarily supportive, so to a large extent the research compared a trauma-focused treatment (EMDR) with a supportive therapy (CBT). Comparing EMDR outcomes with trauma-focused CBT would be an excellent topic for future research.

Discussion: clinical implications and future perspectives

The exposure to a life-threatening illness like cancer involves the exposure to psycho-physical distress and can be a traumatic experience. Particularly, diagnosis and treatment of a life-threatening illness can be traumatic experiences that lead to the development of a Post-Traumatic Stress Disorder.

The EMDR therapeutic intervention with oncological patients aims to repair the balance in emotional and relational spaces, to empower resilience factors and to allow the processing of traumatic disease-related experiences. Beside the processing of past traumas, it improves the enhancement of personal skills and resources in order to cope with the challenges of the daily life.

The effectiveness of EMDR can be observed at different levels: mastery of new skills and strengthening of the resources, increased resiliency and changes of the dysfunctional (or Negative, NC) cognitions, with special reference to the ones related to the body (e.g. "My body betrayed me", "I have no control", "My body doesn't belong to me anymore", "I'm weak").

EMDR intervention facilitates an indirect rebalancing of stress-related parameters that make the body vulnerable to inflammatory or pathogenic conditions of chronic pain. It also leads to an increased interceptive awareness, such as the perception of the bodily sensations, including the recognition and detection of basic needs (i.e. hygienic care, medical care routine, reduction of risky behaviors, etc.). Finally, EMDR responds appropriately to the need of adjusting to the hospital frenetic rhythms or to the timeline of a rapidly progressive illness, such as chronic disease or physical sufferance (Korn 2009).

On the other side, even if it is generally accepted that cancer survivors are at increased risk of Post-traumatic Stress Disorder, there is still no accordance regarding to which extent. Synthesis of eleven eligible comparison studies shows that cancer survivors have 1.66 times the odds of PTSD compared to controls with no history of cancer. This finding is noteworthy since, according to the DSM-5, cancer is no longer officially considered a traumatic event. Still, psychologists should be aware of this increased risk of PTSD among cancer survivors, as well as among their relatives.

If trauma represents a significant feature of the psychological distress of the oncological patient, even in the subclinical forms of PTSD, EMDR can be a therapeutic option. The analysis of the existing literature shows preliminary but encouraging results.

Anyway, further validation of EMDR in the oncology setting requires a more substantial production of research, demonstrating the ability of this approach to appropriately integrate the cancer story into the life story of the person.

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