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EFFECTS OF A POSITIVE EMOTION-BASED ADJUVANT PSYCHOLOGICAL THERAPY IN COLORECTAL CANCER PATIENTS



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EFFECTS OF A POSITIVE EMOTION-BASED
ADJUVANT PSYCHOLOGICAL THERAPY IN
COLORECTAL CANCER PATIENTS

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“For an idea that does not first seem insane, there is no hope.”

Albert Einstein

ABSTRACT

The purpose of this study is to examine the effectiveness of a Psychological Intervention based on the positive psychology and the cognitive behavioral therapy in relieving “psychological problems” at the time of adjuvant chemotherapy treatment (Folfox Protocol) in patients with colorectal cancer. This Psychological Intervention is structured and designed to enhance positive emotions in these patients and will be called “Enhancing Positive Emotions Procedure” (EPEP). The design of this study was of two groups with pre-post-test and follow-up comparisons. All participants were recruited between October of 2012 and February of 2014. 52 subjects diagnosed with colorectal cancer were recruited at the Portuguese Institute of Oncology, Oporto, Portugal. Results of this research suggest that some features could be modified by the EPEP procedure, whereas some others would remain unchanged. Some dimensions of quality of life, as well as anxiety and positive emotions could be slightly improved by the EPEP. Thus, coping skills and depression would not be affected by the EPEP. Thus, it can be stated, with caution, that EPEP should be useful to improve well-being in CRC patients receiving chemotherapy.

DEDICATION

This paper is dedicated to the thousands of patients with cancer, survivors and in the memory of the souls had departed. In particular, this paper is in honor of all the patients of the Portuguese Institute of Oncology Center, Oporto, Portugal who participated in this study.

This thesis is dedicated to very special people in my life: first, my parents, Agostinho and Maria de Lurdes, my brother, Hugo. All of you did your best to support my educational endeavors throughout my life. Your love, encouragement and sacrifices gave me the energy and courage to go persevere.

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PREFACE

I am a psychologist at an independent, non-profit *Europacolón Portugal Association-against to Colorectal Cancer* founded to raise public awareness about colorectal cancer and as a support to all citizens of Portugal as well as Europe in the fight against the disease. As a psychologist I play a role in supporting and helping patients and family members through the experience of cancer and its treatment. Cancer and its symptoms are severe stressors that can make it difficult to cope with everything in our lives, so Psychology Service is available to address the emotional and social needs of everyone involved with a cancer diagnosis (patients, family members and other caregivers).

As Psychologist I saw the need to improve my skills in my clinical practice and to justify what I am working. The scientific method is a body of techniques for investigating phenomena, acquiring new knowledge, or correcting and integrating previous knowledge...so I decided to make “science”.

The World Health Organization’s definition of health emphasizes that health is “physical, mental and social well-being, not merely the absence of disease and infirmity.” The study of health thus requires study of well-being, the positive side of health. However, health studies have long been largely focused on the negative side of health, that is, disease and infirmity, and for mental health, negative emotions and states such as depression and anxiety, whether as outcomes or as predictors. The idea of exploring positive emotions is often associated with health-promoting -conditions, and those interventions may lastingly increase positive emotions, which may in turn benefit health and well-being. Psychological Intervention studies with cancer patients are being conducted around the globe. More rapidly than ever, findings are disseminated and replications and extensions are underway. When I

did a search about psychological interventions in Portuguese Hospitals I found very few studies. Maybe one of the reasons is because there are not enough psychologists to do clinical practice and research in Hospitals and the cause for that is many administrations of hospitals see health as determined just by biological processes but not by people's emotions, behaviors, and social relationships. Sadly, these factors are often ignored or not defined as part of health care. Many doubt their importance and dismiss the evidence as being based on "soft science." Even when acknowledged, they are often seen as ancillary rather than central to care. High and escalating health care costs fuel the argument that addressing such concerns is a luxury rather than a necessity. These views fly in the face of evidence of the important role that psychosocial factors play in disease onset and progression, not to mention their impact on people's ability to function and maintain a positive quality of life. A growing body of scientific evidence demonstrates that psychological and social problems can prevent individuals from receiving needed health care, complying with treatment plans, and managing their illness and recovery. To accomplish this, good quality health care must attend to patients' psychosocial problems and provide services to enable them to better manage their illnesses and underlying health. Today, every individual treated for cancer can (and should) expect to have their psychological and social needs addressed alongside their physical needs. Psychosocial health services should be routinely incorporated into oncology care. This multidisciplinary standard can provide a common framework around which clinicians, health care organizations, patients and their advocates, payers, quality oversight organizations, and all concerned about the quality of cancer care can organize and coordinate their efforts and achieve synergy.

Thus, interest for giving a good psychological assistance, which should be based in the new trends offered by Positive Psychology, centered in enhancing positive emotions, brought

me to the conviction that the first step in this field should be to investigate whether a positive emotion-based intervention would be really effective for enhancing well-being in colorectal cancer patients. From this point on, an empirical study was developed using two groups of patients: one of them, received the psychological intervention, the other, would not receive this procedure and will be used as a comparison group. The present dissertation describes how this research was designed and developed.

The dissertation is organized into seven chapters, divided in two parts. The first part comprises four chapters and introduces the background, justification, problem statement, conceptual framework, justification and purpose of study. The first chapter is literature review about medical and psychological features of colon-rectal cancer. The second chapter describes the role of positive psychology. Then, in the third chapter, a wide description of Psycho-oncology is provided. In the fourth chapter the purpose of study and the specific aims of the study are described. On the second part, the empirical features of the study are described: In the fifth chapter the procedure and methodology are described. The results are included in chapter sixth and seventh chapter describes the summary and discussion of study, the limitations encountered, and recommendations for future clinical practice, theory, and research.

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CHAPTER I- Colorectal Cancer: Medical Data and Psychological Features

Medical Data

Colorectal cancer is the third most common cancer in men and the second in women worldwide. Almost 60% of cases occur in developed regions. Deaths from colorectal cancer are estimated, worldwide, as 8% of all cancer deaths, making it the fourth most common cause of death from cancer (Ferlay, Bray, Pisani, & Parkin, 2010). Colorectal cancer incidence rates have been diminishing for most of the past two decades; this fact has mainly been attributed to increases in the use of colorectal cancer screening tests that allow for early detection and removal of colorectal polyps before they progress into cancer. Mortality rates for colorectal cancer have also decreased, in both men and women, over the past two decades. This decrease reflects both declining incidence rates (improvement in early detection) and more effective treatment.

Survival Rates

In the United States of America the 1- and 5-year global/all stage survival rates for patients diagnosed with colorectal cancer are 84% and 64%. Survival declines to 58% at 10 years after diagnosis. Colorectal cancers detected at an early, localized stage, have 5-year survival around 90%; however, only 39% of colorectal cancer patients are diagnosed at this early stage, in part due to the underuse of screening. If the cancer has spread regionally and involves nearby lymph nodes at the time of diagnosis, the 5-year survival drops to 70%. If the disease has spread to distant organs, the 5-year survival is 12% (American Cancer Society, 2013).

Staging

The American Joint Committee on Cancer (AJCC) has designated staging by tumor, node, and metastasis (TNM) classification to define colorectal cancer extent of disease. Treatment decisions should be made taking into account the TNM classification (Compton & Greene, 2004) (Table 1 and 2), as well as the patient's medical condition.

Table 1: AJCC/UICC TNM, Definitions

	Category	Definition
Primary tumor (T)	TX	Primary tumor cannot be assessed
	T0	No evidence of primary tumor
	Tis	Carcinoma in situ (intraepithelial or intramucosal carcinoma)
	T1	Tumor invades the submucosa
	T2	Tumor invades the muscularis propia
	T3	Tumor invades through the muscularis propia into the subserosa or into the nonperitonealized pericolic or perirectal tissues
	T4	Tumor directly invades other organs or structures
Regional lymph nodes (N)	NX	Regional lymph nodes cannot be assessed
	N0	No regional lymph nodes metastasis
	N1	Metastasis in one to three lymph nodes
	N2	Metastasis in four or more lymph nodes
Distant metastasis(M)	MX	Presence of distant metastasis cannot be assessed
	M0	No distant metastasis
	M1	Distant metastasis

Table 2: AJCC/UICC Stage Groups

TNM			
Stage 0	Tis	N0	M0
Stage I	T1	N0	M0
	T2	N0	M0
Stage IIA	T3	N0	M0
Stage IIB	T4	N0	M0
Stage IIIA	T1, T2	N1	M0
Stage IIIB	T3, T4	N1	M0
Stage IIIC	Any T	N2	M0
Stage IV	Any T	Any N	M1

Survival rates are often based on previous outcomes of large numbers of people who had the disease. Knowing the type and the stage of a person's cancer is important in estimating their prognosis. But many other factors can also affect a person's prognosis, such as the grade of the cancer, the genetic changes in the cancer cells, the treatment received, and how well the cancer responds to treatment. Even when taking these other factors into account, survival rates are at best rough estimates. The figures below come from the National Cancer Institute's SEER database, looking at people diagnosed with colon cancer and rectal cancer between 2004 and 2010 (table 3 and 4).

Table 3: Survival Rates for Colon Cancer, by Stage

Stage	5-year relative survival rate
I	92%
IIA	87%
IIB	63%*
IIIA	89%*
IIIB	69%
IIIC	53%
IV	11%

*These numbers are correct: patients with stage IIIA or IIIB cancers have better survival than those with stage IIB cancers.

Table 4: Survival Rates for Rectal Cancer, by Stage

Stage	5-year relative survival rate
I	87%
IIA	80%*
IIB	49%*
IIIA	84%
IIIB	71%
IIIC	58%
IV	12%

*These numbers are correct: patients with stage III have better survival than those with stage II cancers.

Biomedical characteristics used to stage the disease are complex and will not be described here extensively, except for those aspects related to the group of selected patients for this study.

Both stages II and III are due to be treated with surgery, unless there is a medical contra-indication; all stage III patients will be on chemotherapy (if there are no clinically significant comorbidities) for 6 months after surgery; a number of stage II patients will also be proposed chemotherapy, based on clinical histopathological features (risk factors associated with worse prognosis). As both groups may have experienced similar symptoms before

diagnosis, after surgery and during chemotherapy we decided to include and evaluate patients at both stages to develop the sample for our study.

Treatment Modalities

The main treatment anti-cancer modalities used for colon and rectal cancer are:

- Surgery
- Radiation therapy
- Chemotherapy
- Targeted therapy

Their use depends on the individual cancer stage, on the patient's clinical condition and on the patient's will and consent for treatment.

Treatment for stages II and III of colon cancer

For colon cancers that have not spread to distant sites (M0), surgery is usually the primary or first treatment. During surgery, the malignant lesion, surrounding tissues and draining regions are removed *en bloc*, using a no-touch surgery technic. The lymph nodes within these draining regions are accounted for and examined under a microscope to determine if the cancer has spread beyond the colon into the lymph nodes (Nelson et al., 2001).

In most people, the two ends of the colon can be reconnected immediately after surgery; there are cases where a temporary or definitive colostomy has to be made. This is the case if the surgeon feels there is a high chance that the reconnection will fail or if local tissues are inflamed and need time to heal. If this occurs, the surgeon will sew the colon (and at times the

small bowel) to an opening in the skin on the abdomen. The opening is called an ostomy (colostomy if the colon is sewn to the abdominal wall or ileostomy if the ileum is sewn to the abdominal wall). The ostomy is usually temporary. The two ends of the colon can often be reconnected after a few months, usually after chemotherapy is completed. (Nelson et al.,2001).

Adjuvant chemotherapy may also be used/needed. Adjuvant treatment is given for about 6 months (NCCN, 2013) (Fig1).



Figure 1: Schema of Colon Cancer Treatment Stage II and II

In Stage II, cancers have grown through the wall of the colon but have not yet spread to the loco-regional lymph nodes. Surgery (colectomy) may be the only treatment needed (Nelson et al., 2001), but adjuvant chemotherapy may be recommended if the cancer has a high risk of relapse. There are some known risk factors that usually dictate the need for chemotherapy, such as

- High grade cancer - cancer cells looks very abnormal (high grade) when viewed under a microscope.
- The cancer has grown into nearby organs (T4 as for TNM staging).
- Less than 12 lymph nodes in the resected specimen.
- The patient presented as bowel obstructed (The cancer blocked the colon).

· The patient presented as acute abdomen due to perforation -The cancer caused a perforation (hole) in the wall of the colon.

In stage III, the cancer has spread to nearby lymph nodes, but not yet to other parts of the body. Surgery (partial colectomy) (Nelson et al., 2001) followed by adjuvant chemotherapy is the standard treatment for this stage. Either the FOLFOX (5-FU, leucovorin, and oxaliplatin) or CapeOx (capecitabine and oxaliplatin) regimen are usually proposed; some patients may get 5-FU with leucovorin or capecitabine alone based on their age and health status (NCCN, 2013).

Treatment by stage II and III of rectal cancer

Surgery is usually the main treatment for rectal cancers that have not spread to distant sites. Sometimes this will require that the anus be removed along with the rectum. In this case the surgeon will sew the remaining intestine to an opening in the skin on the abdomen, creating a permanent colostomy (Nelson et al., 2001). Additional treatment with radiation and chemotherapy may also be used before or after surgery (NCCN, 2013) (Fig2).



Figure 2: Schema of Rectal Cancer Treatment Stage II and III

In stage II, many of these cancers have grown through the rectum wall but not yet spread to the lymph nodes. In this stage rectal cancers were usually treated with surgery (Nelson et al., 2001). Most doctors now favor giving the radiation therapy along with chemotherapy before surgery (neo-adjuvant treatment), and then giving adjuvant chemotherapy after surgery, usually for a total of 6 months of treatment. The chemotherapy given with radiation is usually either 5-FU or capecitabine (Xeloda). The chemotherapy after

surgery may be the FOLFOX regimen (oxaliplatin, 5-FU, and leucovorin), 5-FU and leucovorin, CapeOx (capecitabine plus oxaliplatin) or capecitabine alone (NCCN, 2013).

In stage III, these cancers have spread to nearby lymph nodes but not to other parts of the body. Most often, radiation therapy is given along with chemotherapy before surgery. Giving radiation before surgery also tends to lead to fewer problems than giving it after surgery. The rectal tumor and nearby lymph nodes are then removed by surgery. After surgery, chemotherapy is given, usually for about 6 months. The most common regimens include FOLFOX (oxaliplatin, 5-FU, and leucovorin), 5-FU and leucovorin, or capecitabine alone (NCCN, 2013).

Adjuvant chemotherapy FOLFOX regimen

FOLFOX is the name of a combination chemotherapy treatment used to treat colorectal cancer. It is made up of the drugs FOL = Folinic acid (also called leucovorin, FA or calcium folinate), F = Fluorouracil (5FU), OX = Oxaliplatin. The numbers of cycles of treatment are 12 and each treatment cycle lasts 2 weeks. This adjuvant treatment is given for about 6 months. Before starting each cycle, patients are assessed by using the National Cancer Institute common toxicity criteria. Dose modifications are performed according to predefined guidelines based on toxicities (Andre et al., 2004). The most frequent adverse events during the treatment are peripheral sensory neuropathy (81.7%), neutropenia (74.4%), diarrhea (65.9%), and nausea (62.2%). Grade 3 and 4 hematologic adverse events include neutropenia (40.2%), anemia (2.4%), and thrombocytopenia (1.2%). Gastrointestinal toxicities include grade 3 and 4 nausea (4.9%), stomatitis (2.4%) (Jeon, Woo, Lee, Park, & Choi, 2011)

Tables 5 and 6 resumes the medical features of these patients, once surgery has been applied and a typology of patients is suggested. This typology will be used to identify the

patients who will be included in the study and has the purpose of identify the medical procedures they have followed. Next section will describe psychosocial features for each of the categories considered in this Table.

Table 5: Patients with Colon Cancer

Stage	II	II	II	II	III	III
Adjuvant Chemotherapy	No	No	Yes	Yes	Yes	Yes
Colostomy	No	Yes	No	Yes	No	Yes
Patients Typology	A	B	C	D	E	F

Table 6: Patients with Rectal Cancer

Stage	II	II	II	II	III	III
Adjuvant Chemotherapy	No	No	Yes	Yes	Yes	Yes
Colostomy	No	Yes	No	Yes	No	Yes
Patients Typology	A	B	C	D	E	F

Psychological Features in colorectal cancer patients

Receiving a cancer diagnosis represents an enormous psychological challenge (Simon, Thompson, Flashman, & Wardle, 2009). The individual’s psychological state may affect their health-related behavior (Schofield et al., 2004). Cancer can affect social relationships (Northouse, Mood, Templin, Mellon, & George, 2000), which may in turn influence the support the patients receive during their illness (Reynolds & Perrin, 2004).

Cancer and its treatment including surgery/chemotherapy/radiotherapy can also impose a variety of physical and functional disabilities that compromise the patient’s ability to work or to maintain independence (Wright, Kiely, Lynch, Cull, & Selby, 2002).

Surgical formation of a stoma is a common intervention that improves patients' condition and quality of life. Patients experience many challenges and concerns during the pre- and post-operative period (McCaughan, Parahoo, & Prue, 2011). Commonly reported experiences of patients during the pre-operative stage include fear, questions, isolation and uncertainty (Worster & Holmes, 2008). Post-operatively, patients experience physical, psychological and social challenges, especially for those with newly-formed stomas. Physical challenges faced by patients include bowel issues and sexual dysfunction, and patients with stomas, in particular, may face complications of leakage, skin and stoma problems, and odor (Nugent, Stewart, Patankar, & Johnson, 1999). The psychological challenges confronted by patients include severe anxiety, depression and disturbance in body image, which may lead to low self-esteem, poor self-concept and even sexual dysfunction (Ross, Abild-Nielsen, Thomsen, Karlsen, Boesen, & Johansen, 2007). Patients also showed avoidance and fear of social interactions, and dysfunctional relationships among patients with stomas due to lifestyle restrictions and change in body image (Simmons, Smith, Bobb, & Liles, 2007).

In short, for cancer patients, psychosocial adjustment involves making life adjustment to adapt to these altered roles and mental changes from the experience of cancer (Nishigaki et al., 2007). Both the disease itself and the side effects of interventions are of serious impact in the quality of life of the patients.

Colorectal cancer, psychological distress and quality of life

Little is known, however, about the complex interplay between the background psychological profile, the course of psychological distress during the disease's course and the formation of patients' quality of life. Distress is a general term referring to a range of negative psychosocial outcomes and poor quality of life (Ridner, 2004) and is identifiable in 30–75%

of all cancer patients (Zabora, Brintzenhofesoc, Curbow, Hooker, & Piantadosi, 2001). Clinical anxiety and depression are in one-third of cancer patients (Maguire, 2000) and can remain difficult for many years (Sukantarat, Greer, Brett, & Williamson, 2007). Although half of newly diagnosed patients are dissatisfied with their quality of life; there is insufficient evidence to conclude that this is due to clinical factors alone (Hulbert-Williams, Neal, Morrison, Hood, & Wilkinson, 2012).

Psychological distress was found negatively correlated to all quality of life dimensions in various types of cancer, while the limited evidence suggests that is similar to colorectal cancer (Tsunoda, Nakao, Hiratsuka, Yasuda, Shibusawa, & Kusano, 2005). Scarce studies also showed that depression was the leading predictor of colorectal cancer patients' global quality of life (Iconomou, Mega, Koutras, Iconomou, & Kalofonos, 2004). The role of psychosocial and personality variables in the increase of psychological distress and in determining quality of life is less clear, although several personality traits seem to play a significant role in the disease process.

In early non-metastatic colorectal cancer patients, psychological distress symptoms are increased and health related quality of life is decreased over one-year period. Symptoms of psychological distress are strong predictors of quality of life, while personality variables can also predict psychological distress symptoms' increase and health related quality of life decrease over time (Hyphantis, Paika, Almyroudi, Kampletsas, & Pavlidis, 2011).

Number of studies about quality of life in cancer survivors were conducted, but most of them dealt with short-term (less than 5 years post-diagnosis) treatment effects (Jansen, Koch, Brenner, & Arndt, 2010) in particular the direct impact of treatment during the first months after diagnosis. These studies showed that quality of life is reduced early after treatment but

gradually improves over time in the absence of disease recurrence or progression. The time course of quality of life depends on various factors like age and stage (Wilson, Alexander, & Kind, 2006).

Understanding the quality of life experienced by colorectal cancer (CRC) patients is important for evaluating the full impact of the disease on individuals and their families (Dunn et al., 2006). Quality of life is a complex and subjective concept and, as such, definitions vary. One well accepted definition is as a multidimensional concept encompassing an individual's perceived physical, psychosocial and emotional functioning (Dunn, Lynch, Aitken, Leggett, Pakenham, Newman, 2003).

Cancer-related stressors faced by individuals with CRC include physical and psychological factors of the diagnosis, treatments, side effects, reactions of friends/family, follow-up procedures, and recovery/recurrence fears (Rinaldis, Pakenham, Lynch, Aitken, 2009). Deficits in emotional and social functioning and specific limitations like fatigue, dyspnea, insomnia, constipation, diarrhea, and financial difficulties are main factors hampering the quality of life (QOL) among colorectal cancer patients and seem to affect predominantly younger patients (Arndt, Merx, Stegmaier, Ziegler, Brenner, 2004) . Most people with colorectal cancer are older and may have functional limitations, geriatric syndromes and other significant conditions (including heart disease, chronic obstructive pulmonary disease and other cancers) that are likely to affect how they feel (Koroukian, Xu, Bakaki, Diaz-Insua, Towe, Owusu, 2010).

Disease stage is a strong predictor of cancer survival and is therefore assumed to effect psychosocial outcomes in patients at stages II and III. Patients with colorectal cancer in advanced stages had worse effects than those with localized disease for almost every

psychosocial variable; these were explained as patients with a poor prognosis were expected to have lower levels of wellbeing than those with a good chance of a cure (Simon, Thompson, Flashman, Wardle, 2009).

Treatment almost always involves surgery, chemotherapy, radiotherapy. The adversative effects of both the disease and its treatment can be longstanding, including sleeping difficulties, fear of recurrence, anxiety, depression, sensory neuropathy, gastrointestinal problems, urinary incontinence and sexual dysfunction (Denlinger and Barsevick, 2009), as well as lack of energy, bowel problems, poor body image and emotional problems (Phipps, Braitman, Stites, Leighton, 2008). The QOL is poorer soon after diagnosis compared with advanced (Arndt, Merx, Stegmaier, Ziegler, Brenner, 2006) because this difference was accounted for by activity limitations and participation restrictions (e.g., work, daily activities and hobbies, interference with family and social life) (Gray et al., 2011).

Facing these difficulties can impair psychological, physical, and psychosocial domains of quality of life (QOL).

Conclusion

In conclusion, receiving a cancer diagnosis represents a huge psychological challenge. The individuals' psychological state may affect their health-related behavior. Cancer and its treatment including surgery/chemotherapy/radiotherapy can also enforce a variety of physical and functional disabilities that compromise the patient's ability to work or to preserve independence.

The quality of life experienced by colorectal cancer (CRC) patients is important for evaluating the full impact of the disease on individuals and their families. There is a need for an intervention based on psychological resources that will enable patients with cancer to live

as positively as they can with the difficulties of a chronic, sometimes debilitating, disease and the aversive secondary effects of the medical treatment. To this end, we have combined two approaches, each supported by an emerging body of evidence. One is positive psychology, which aims to increase a person's sense of pleasure, engagement and meaning rather than treat morbidity; the other is the cognitive behavior therapy focused to produce positive effect, which results in significant reduction in psychological morbidity related to cancer with consequent improvement in the psychological dimension of the quality of life of cancer patients.

CHAPTER II- Positive Psychology

Positive Psychology

The growth of the “positive psychology” (Seligman & Csikszentmihalyi, 2000) movement reflects increased scientific and lay importance in the relation of positive phenomena to mental and physical health and the corresponding potential for interventions that stimulate positive feelings, thoughts, and experiences to improve health and well-being.

The bang of research on “positive psychology” includes multiple theoretical and research areas that share a common emphasis on positive human functioning, psychological health, and adaptation to illness and other forms of adversity (Snyder & Lopez, 2002). Although many of these lines of research predate the use of the term “positive psychology”, this increased emphasis on positive phenomena has generated a corresponding upswing in interest in such topics as positive affect, positive emotions, meaning, mastery, personal growth, forgiveness, gratitude, hope, optimism, and spirituality, their relation to mental and physical health, and their potential for applications to stimulate well-being and health. When we consider the contribution of these viewpoints to health psychology, we find many ideas that may lead to interventions that promote healing and health (Aspinwall & Tedeschi, 2010; Casellas-Grau, Font, & Vives, 2014).

The origin of Positive Psychology

Positive psychological research probably developed as a result of a vacuum of research into positive functioning in psychology in general, which had occurred partially due to changes that occurred in the aftermath of World War II (Seligman & Csikszentmihalyi, 2000). Prior to the war, psychology had the dual aim of curing mental illness and promoting excellence and positive communities. Faced with the immense suffering caused by the war,

many psychologists saw the most urgent need as repairing damage. Governmental priorities promoted this focus, earmarking funding for research into repairing the psychological impact of the war. This deliberate focus on disorder created a substantial and valuable body of research into distress, although some have argued that this focus had the side effect of transforming psychology into a healing discipline, based upon a medical model of disorder (Maddux, 2008). Psychology's orientation towards the negative persisted long after the war, with successive generations of psychologists being socialized into the perception of psychology as disproportionately involving the study of disorder. Psychology became a profession effective at “learning how to bring people up from negative eight to zero, but not as good at understanding how people rise from zero to positive eight” (Gable & Haidt, 2005). This situation does not seem to have markedly changed in the intervening four decades. From this vacuum of research into the positive developed the positive psychology movement developed in the late 1990s and was self-consciously concerned at redressing the balance of focus within psychology, so that positive aspects of life were once again part of the mainstream research agenda in psychology. As an ideological movement, positive psychology is often attributed to the work of Martin E. P. Seligman, who served as president of the American Psychological Association (APA) from 1998 to 1999. Seligman himself attributes the movement to events in his own life. A precise definition of the mission of the movement was never provided, although indication can be taken from influential sources written at the beginning of the movement. Regardless of the precise cause of the positive psychology movement, between 1999 and 2006 the movement had become influential within psychology, with special journal issues, a new dedicated journal, international conferences, the development of Masters level courses across the world, and hundreds of articles in the popular press (Linley, Joseph, Harrington, & Wood, 2006).

There are different approaches to positive psychology: emotion-focused approaches, cognitive-focused approaches, biological approaches and much more (Snyder & Lopez, 2002). As we can see there are a lot of approaches but there isn't any construct that integrate all approaches in addition doesn't exist one construct theoretically defined, assessed, evaluated and measured (Lazarus, 2003).

Although this deficit is interest in the positive side of psychology, there were consistent ancestors of Positive Psychology. Since at least the time of Socrates, Plato, and Aristotle, the “good life” has been the subject of philosophical and religious inquiry. And, as the field of psychology took form over the eighteenth and nineteenth centuries, all of the great psychological traditions—psychoanalysis, behaviorism, cognitive therapy, humanistic psychology, and existential psychology—contributed to our present understanding of the positive aspects of human experience (Duckworth, Steen, & Seligman, 2005). For example the influence of Freud's (1933/1977) notion of the pleasure principle, Jung's (1955) ideas about personal and spiritual wholeness, Adler's (1979) conceptualization of “healthy”. The grandparents of humanistic psychology—Carl Rogers, Abraham Maslow, Henry Murray, Gordon Allport, and Rollo May—all grappled with many of the same questions pursued by positive psychologists (Sheldon & Kasser 2001). What is the good life? When are individuals at their best? How can we encourage growth in ourselves and in others? So much of the work that may be considered to fall within “positive psychology” originated before the use of the term in 2000 when Seligman and Csikszentmihalyi (2000) organized the field around three themes: positive experience, positive personality, and positive communities and institutions. Psychologists have long been concerned with understanding how people respond to adversity and whether particular personal, social, and developmental factors may be protective of long-

term mental and physical health (Seligman, 2008). In this context, positive affect and emotions clearly stand out from the rest of topics of study of Positive Psychology.

Positive Affect and Emotions

Prior to discuss the positive emotion it is required a definition on emotions and affect since working definitions of emotions and affect vary somewhat across researchers. Affect is the most used term, referring to a subjective feeling state that incorporates long-lasting mood states, such as cheerfulness, depression, happiness or anger. Positive Affect (PA) “is a state of high energy, full concentration, and pleasurable engagement. Negative Affect (NA) has been constructed as a general dimension of subjective distress, reflecting undifferentiated bad moods, unpleasant feelings, and low self-concept. Thus, negative affect can be regarded as a category that encompasses usual concepts such as anxiety, depression, neuroticism, or general maladjustment (Watson, Clark, & Tellegen, 1988). Emotion is generally seen as subtypes of affect, with emotions being more strongly directed towards a specific stimulus— be it a person, an object, or an event. An emotion is usually caused by a person consciously or unconsciously evaluating an event as relevant to a concern (a goal) that is important; the emotion is felt as positive when a concern is advanced and negative when a concern is impeded. The core of an emotion is readiness to act and the prompting of plans. An emotion is usually experienced as a distinctive type of mental state, sometimes accompanied or followed by body changes, expressions, actions (Frijda, 2009).

As discussed above, scientific research on emotions has ignored the positive ones until the emergence of Positive Psychology. What role do positive emotions play in the mission of positive psychology? On first deliberation, the answer seems simple: Positive emotions serve as markers of flourishing simply because they are markers of optimal well-being. Certainly

moments in our lives characterized by experiences of positive emotions (such as joy, interest, contentment, love, and the like) are moments in which we are not plagued by negative emotions (such as anxiety, sadness, and anger). Negative emotions—when extreme, prolonged, or contextually inappropriate—produce many serious problems, ranging from phobias and anxiety disorders, aggression and violence, depression and suicide, eating disorders and sexual dysfunction, to a host of stress-related physical disorders. In this sense, positive emotions signal optimal functioning. From this idea we can argue that positive emotions also produce optimal functioning, not just within the present, pleasant moment but over the long term as well. So the idea is that we should work to cultivate positive emotions in ourselves and in those around us not just as end states in themselves, but also as a means to achieving psychological growth and improved psychological and physical health over time (Fredrickson, 2001).

Usually, emotions begin with an individual's assessment of the personal meaning of some antecedent. Either conscious or unconscious, this appraisal process initiates a cascade of response tendencies manifested across loosely coupled component systems, such as subjective experience, facial expressions, and physiological changes. Sometimes various forms of sensory pleasure (e.g., sexual gratification, satiation of hunger or thirst) are taken to be positive emotions because they share with positive emotions a pleasant subjective feel and include physiological changes and because sensory pleasure and positive emotions often co-occur (e.g., sexual gratification within a loving relationship). Experiences of positive emotions prompt individuals to engage with their environments and partake in activities, many of which are evolutionarily adaptive for the individual, its species, or both. This link between positive emotions and activity engagement provides an explanation for the often documented positivity offset or the tendency for individuals to experience mild positive affect

frequently, even in neutral contexts (Diener & Diener, 1996). Without such an offset, individuals most often would be unmotivated to engage with their environments. Yet with such an offset, individuals exhibit the adaptive bias to approach and explore novel objects, people, or situations. Although positive emotions often do appear to function as internal signals to approach or continue, they share this function with other positive affective states as well. Sensory pleasure, for instance, motivates people to approach and continue consuming whatever stimulus is biologically useful for them at the moment (Fredrickson, 2001). This prediction stems from a new perspective on positive emotions offered within Fredrickson's (2001) broaden-and-build theory.

Broaden-and-build model of positive emotion

Fredrickson (2001) postulates a broaden-and-build model of positive emotion. Briefly, positive emotions such as joy and contentment may serve to expand the focus of attention and physical activity and may enhance mental and social resources.

Joy, for instance, creates the urge to play, push the limits, and be creative, urges evident not only in social and physical behavior but also in intellectual and artistic behavior. Interest, a phenomenologically distinct positive emotion, creates the urge to explore, take in new information and experiences, and expand the self in the process. Contentment, a third distinct positive emotion, creates the urge to sit back and savor current life circumstances and integrate these circumstances into new views of self and of the world. And love—which I view as an amalgam of distinct positive emotions (e.g., joy, interest, and contentment) experienced within contexts of safe, close relationships—creates recurring cycles of urges to play with, explore, and savor our loved ones. These various thought-action tendencies—to play, to explore, or to savor and integrate—represent ways that positive emotions broaden

habitual modes of thinking or acting. Importantly, the personal resources accrued during states of positive emotions are durable. They outlast the transient emotional states that led to their acquisition. By consequence, then, the often incidental effect of experiencing a positive emotion is an increase in one's personal resources. These resources can be drawn on in subsequent moments and in different emotional states. So, through experiences of positive emotions people transform themselves, becoming more creative, knowledgeable, resilient, socially integrated and healthy individuals. Figure 3 represents these three sequential effects of positive emotions (i.e., broadening, building, transforming) and also suggests that initial experiences of positive emotions produce upward spirals towards further experiences of positive. Moreover, to the extent that positive emotions both broaden and build, over time they also should produce improved well-being. For example, if positive emotions broaden the scope of cognition and enable flexible and creative thinking, they also should facilitate coping with stress and adversity. Consistent with this view, studies have shown that people who experienced positive emotions during bereavement were more likely to develop long-term plans and goals. By broadening people's modes of thinking and action, positive emotions should improve coping and thus build resilience. Increments in resilience should, in turn, predict future experiences of positive emotions (Fredrickson & Joiner, 2002). Fredrickson's model also suggests that positive emotion may serve to redirect both psychological and physiological action tendencies that accompany negative emotion, and hence increase quality of life (Fredrickson & Levenson, 1998).

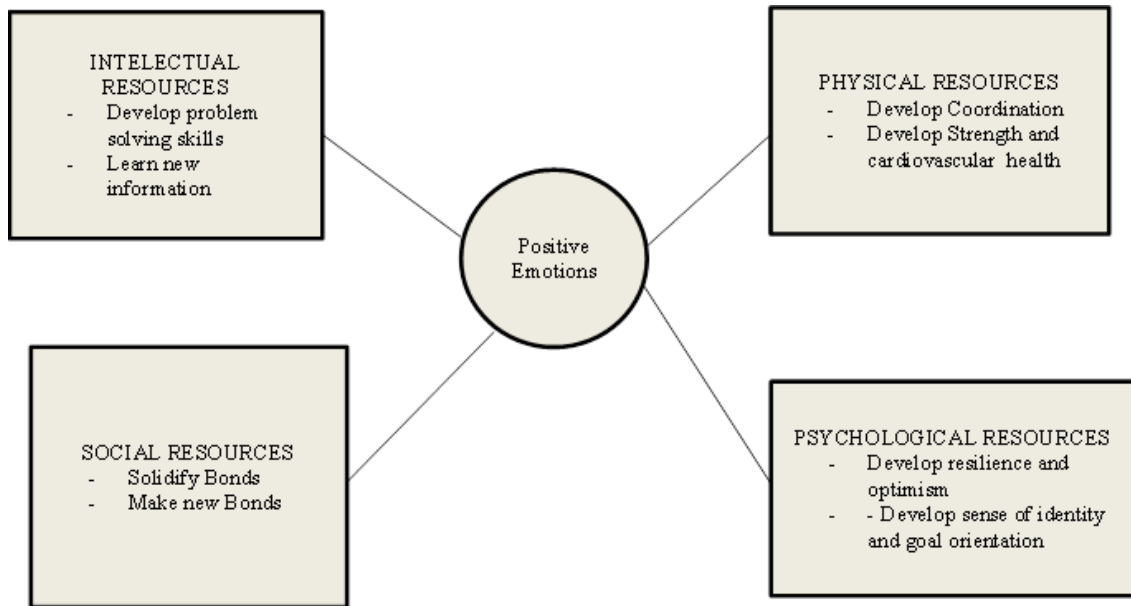


Figure 3: The Broaden-and-Build Theory (Fredrickson, 2001)

Intervention program to increase the prevalence of positive emotions

Although no intervention programs based directly on the broaden-and-build theory of positive emotions have yet been devised and tested, a handful of existing intervention techniques can be profitably reframed as techniques to increase the prevalence of positive emotions. To the extent that these existing techniques successfully elicit positive emotions, the broaden-and-build theory may explain their effectiveness (Fredrickson, Cohn, Coffey, Pek & Finkel, 2008).

In this sense, there are two main ways to increase positive emotions. The first one is focused on body, as for instance: relaxation, yoga, imagery exercises or mindfulness. The second one is based on increasing pleasant activities such as socializing or engage in creative and active activities. In this perspective, one example of program to increase positive emotions is, an 8-month-long experimental study examined the immediate and longer term effects of regularly practicing two assigned positive activities (expressing optimism and gratitude) on well-being (Lyubomirsky, Dickerhoof, Boehm & Sheldon, 2011). They

concluded that “positive effect” interventions are more than just placebos, but that they are most successful when participants know about, endorse, and commit to the intervention.

There are important questions about when and how to experience positive emotions, and which emotions are appropriate in different situations. Positive emotion interventions need to become more mature: to determine how best to deliver them, which interventions function for different populations, and how to maximize their effectiveness while minimizing their cost and time commitment. It is necessary to have interventions that focus on specific problems and therefore address only a specific group of people; interventions that teach how to generate positive emotions could be value to nearly anyone, in any situation. Therefore, they pose a wider variety of theoretical challenges, and possibly offer greater potential benefits as well. Despite the growing evidence in support of the broaden-and-build theory, additional tests are needed before it moves from a provocative proposal to a well-supported theory (Fredrickson, 2013).

Positive Phenomena and Health

Health psychology is “devoted to understanding the ways people stay healthy, the reasons they become ill, and the ways they respond when they become ill” (Seligman, 2008). A complete picture of adaptive functioning includes elements that promote successful management of illness and, in some cases, restoration of health. This increased emphasis on positive phenomena has generated a corresponding upswing in scientific and lay interest in such topics as positive affect, meaning, mastery, personal growth, forgiveness, gratitude, hope, optimism, and spirituality, their relation to mental and physical health, and their potential for applications to promote well-being and health (Aspinwall, & Tedeschi, 2010).

The contribution of these perspectives to health psychology may lead to interventions that promote healing and health.

Despite all these contributions much remains to be done to elucidate the specific mechanisms through which different positive phenomena may be related to the etiology and progression of diseases and to understand how these processes may operate differently for different diseases. In considering the concept of benefit to health, it will be important to recognize that interventions that promote psychological well-being have benefit in their own right, even if they have modest or no demonstrable influence on disease progression. It is necessary to assess both positive and negative phenomena, to examine how they may be related over time, to examine multiple pathways through which each may prospectively influence health, and to provide a fair test of positive phenomena by assessing them in their own right, continued research at the interface of health psychology and positive psychology has the potential to illuminate the potential benefits and liabilities of positive phenomena in the etiology, progression, and management of illness. Further work in this area is the next step in this field (Aspinwall, & Tedeschi, 2010).

Criticism of Positive Psychology

One critics of “Positive thinking” is Barbara Ehrenreich (2009), on her book say that psychologists today agree that positive feelings like gratitude, contentment, and self-confidence can actually lengthen our lives and improve our health. She said some of these claims are exaggerated, as though positive feelings hardly need to be justified, like exercise or vitamin supplements, as part of a healthy lifestyle.

As research at the interface of positive psychology and health proceeds, it is believed that researchers and practitioners should avoid contributing to the “tyranny of positive

thinking” by rejecting a singular focus on positive outcomes of illness and by actively debunking spurious claims about the curative power of positive beliefs. At the same time, however, researchers and practitioners should also avoid the premature rejection of systematic scientific efforts to elucidate the role of positive thoughts and feelings in human health and to develop interventions to promote those that provide benefit (Wood & Tarrier, 2010).

We have to be careful not to conceptualize these variables that have a “positive flavor” as contained within something we appeal of positive psychology. If we divide the world into positive psychology or not and designate specific concepts as “positive” or “negative,” we may produce artificial barriers in our communications, the development of our theoretical models, and our decisions about variables to include in our research and interventions (Coyne & Tennen, 2010; Lazarus, 2003).

CHAPTER III-Psycho-oncology

Psycho-oncology

Psycho-oncology is a field of research and intervention which belongs to the field of health psychology domain and has been integrated, as a subspecialty, into the disease specific specialty of oncology. Psycho-oncology contributes to the clinical care of patients and families, to the training of staff in psychological management, and to collaborative research that ranges from the behavioral issues in cancer prevention to the management of psychiatric disorders and the psychosocial problems during the continuum of the cancer illness (Holland, 2002). There are a lot of perspectives inside of psycho-oncology. So the idea is to integrating cognitive model of stress and coping to develop and sustain psychological well-being during serious illness, as a cancer and in this context, we are inclined to view the positive psychology movement, with its novel focus on identifying individual strengths and "building the best qualities in life", as a very hopeful development—one that appears to carry considerable promise for catalyzing innovations via the integration of positive psychology principles with existing forms of clinical interventions. Accordingly, we have outlined numerous ways in which the principles and methods of positive psychology might be successfully integrated with Cognitive Model and Cognitive Behavioral Therapy for people with cancer. So we are going to describe the principles of the theoretical model of stress and coping which is based on the cognitive model of stress and coping of Lazarus and Folkman (1984).

Principles of Cognitive Model of Stress and Coping

At the center of this model are two processes: appraisal and coping. Appraisal has to do with the individual's evaluation of the personal significance of a given event and the adequacy of individual's resources for coping. It influences emotion and subsequent coping.

Coping refers to the thoughts and behaviors a person uses to regulate distress (emotion-focused coping), manage the problem (problem-focused coping), and maintain positive well-being (meaning-based coping). Coping influences the outcome of the situation and the individual's appraisal of it. The appraisal process is based on the assumption that people are constantly appraising their relationship to the environment. The stress process begins when the person becomes aware of a change or a threatened change in the status of current goals and concerns. The appraisal of this actual or threatened change includes an evaluation of its personal significance, which is called 'primary appraisal', and an evaluation of the options for coping, which is called 'secondary appraisal'. Primary appraisal includes the appraisals of harm or loss that has already occurred, threatened harm or loss, or challenge, which refers to the opportunity for mastery or gain. Primary appraisal is influenced by the person's beliefs, values and commitments. Because people vary in these attributes, a given situation, such as a diagnosis of breast cancer, is appraised by some people primarily as a harm, by others primarily as a threat, and by still others as primarily as a challenge. Secondary appraisal has to do with the extent to which the situation is one that can be controlled or changed by the individual. Together, primary and secondary appraisal determine the extent to which the situation is appraised as a harm or loss, a threat, a challenge, or some combination of these, and the intensity of the emotion response that accompanies these appraisals. The appraisal process influences subsequent coping. Greater control (secondary appraisal) is associated with higher levels of problem-focused coping, such as information search, problem solving, and direct action to solve a problem. Less control is associated with higher levels of emotion-focused coping, such as escape and avoidance, the seeking of social support, distancing, or cognitive reframing. People vary their coping depending on the intensity of their emotion response and their ability to regulate it, the opportunities inherent in the situation for problem

solving, and changes in the person–environment relationship as the situation unfolds. Whether as a result of coping, changes in the environment that may or may not be related to the event, or changes in the individual, the relationship between the person and the environment continues to unfold. Events that are brought to a clear conclusion lead to an appraisal of the outcome as favorable or unfavorable. A favorable event outcome is likely to lead to a benefit appraisal, positive emotion, and the conclusion of coping activity. Coping does not cease, however, in events with unsatisfactory outcomes. An unsatisfactory outcome (e.g. an unfavorable resolution or no resolution), as in the case of a recurrence of a serious illness, is likely to lead to a further stress appraisal of harm, loss or threat, most likely in combination, and its attendant distress emotion. These distresses as well as the unresolved problem causing the distress are likely to motivate further coping processes. It is at this point that a third type of coping, meaning-based coping, is likely to come into play. This type of coping helps the person relinquish untenable goals and formulate new ones, make sense of what is happening, and appraise benefit where possible. This type of coping also generates positive affect, which provides a psychological ‘time out’ from the distress and motivates further coping. An important feature of this positive affect is that it can co-occur with negative affect, perhaps not at the very same moment, but certainly close in time (Folkman, 1997). Appraisal and coping processes are influenced by characteristics of the person and the environment, and are thus likely to have both stable and variable aspects. Stability in these processes is associated with person characteristics, such as temperament, personality and history, or with stable features of the environment that can create stress, such as street noise or air pollution. These person characteristics can influence, for better or worse, the person’s ability to appraise situations realistically, choose the appropriate coping strategy, and use it effectively. Variability is associated with situational demands and constraints, including the extent to

which the situation is changeable or controllable, with resources available for coping, and other goals and demands that may compete for time and resources. The theoretical model described here provides a useful framework for understanding where these conceptualizations fit into the stress process and suggesting how they may function to generate and maintain psychological well-being.

The conceptualizations disposed to fall into one of three categories defined by the theoretical model. The first category consists of personality or dispositional variables that influence the primary appraisal of the stressor. These variables are especially relevant to the patient's ability to generate a challenge appraisal in which the patient sees the possibility for a favorable outcome. A second category is mention to situational (as opposed to dispositional) efficacy beliefs. These beliefs are especially important in the secondary appraisal of changeability or options for controlling the situation. In the third category, coping processes that specifically help develop and sustain a sense of psychological well-being despite unfavorable circumstances (Folkman & Greer, 2000).

Cognitive Model and Psycho-oncology

Integrating cognitive model of stress and coping is suitable to develop and sustain psychological well-being during serious illness, as a cancer. This assertion can be justified based on the premise that those patients' psychological responses to cancer will depend not only on the physical effects of the disease but also on how the patient appraises the cancer, and on the available resources for coping (Folkman & Greer, 2000). Folkman and Moskowitz (2000) pointed at a special class of meaning-based coping strategy that support positive affect during chronic stress and it is complementary to the well know emotion-focused and problem-focused coping strategies and Greer (2008) wrote about exploring ways of inducing and encourage positive affect in order to enable patients to enjoy life despite their illness (fig 4).

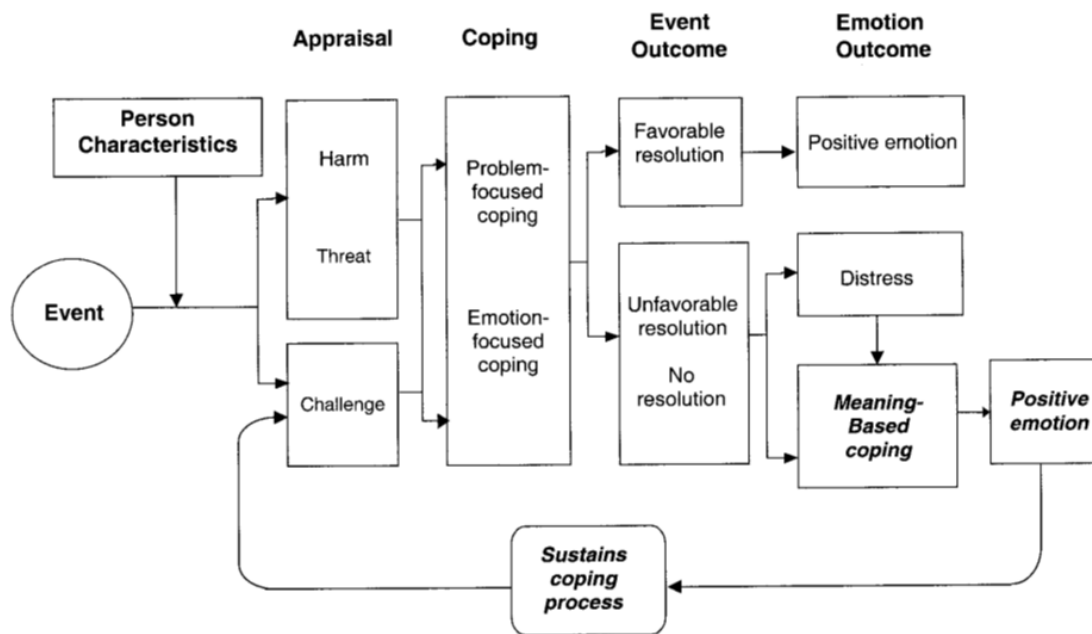


Figure 4: Theoretical Model Appraisal and Coping (Folkman and Greer, 2000)

The theoretical model is constituted by three categories of variables that contribute to psychological well-being in the face of adversity: *dispositional variables* related to optimism and personal control that influence challenge appraisals, *situational beliefs* about efficacy and control that motivate adaptive coping and *specific kinds of coping* processes that create positive meaning. Of these three categories, the first—dispositional variables—is probably least amenable to brief interventions. The second and third categories, however, are changeable variables that are amenable to brief interventions and they form the nucleus for generate positive emotions (Folkman & Greer, 2000).

Cognitive Behavioral Therapy for people with cancer

Adjuvant psychological therapy produces significant improvement in various measures of psychological distress among cancer patients. This therapy results in significant reduction in psychological morbidity related to cancer with consequent improvement in the psychological dimension of the quality of life of cancer patients (Greer, Moorey, & Baruch, 1991; Greer, 1995; Moorey, Greer, Bliss, & Law, 1998; Moorey & Greer, 2002).

A full description of cognitive behavior therapy for people with cancer has been provided by Moorey and Greer (2002). Adjuvant Psychological Therapy (APT) is a brief structured treatment program in which the principles of cognitive therapy are applied to the specific problems of cancer patients. Cognitive therapy aims to alleviate emotional disorders by identifying and correcting maladaptive thinking. Applied to cancer-related psychological disorders, it is hypothesized that these disorders depend not only on the physical effects of the disease process but also on two crucial factors:

- (1) the personal meaning of the disease;
- (2) the patient's coping ability;

These factors are influenced, in turn, by the degree of emotional support given by family and friends as well as by medical and nursing staff. Therapy is directed primarily at current problems and teaches patients new coping skills. APT is conducted with individual patients and, where possible, the spouse. Approximately six sessions, each lasting an hour, are held; occasionally more sessions are required. The therapeutic relationship is a collaborative one in which the therapist and patient set an agreed agenda, defining the specific problems to be addressed. These problems are then tackled using various cognitive and behavioral techniques including the following (Greer, Moorey, & Baruch, 1991):

(a) Patients are taught - to identify and record negative automatic thoughts, and to challenge these thoughts by reality testing; in this way, the negative thoughts can be replaced by more realistic, adaptive coping responses.

(b) Patients are encouraged to rehearse, in imagination and role play, impending stressful events and to practice ways of coping with such events.

(c) Patients are encouraged to plan and carry out various activities which give both a sense of mastery or control over some aspects of their lives and a sense of pleasure.

(d) Relaxation training is used if anxiety is severe.

(e) Patients are encouraged to express feelings openly. Open mutual communication of feelings between the patient and spouse is encouraged in sessions.

(f) The personal strengths of the patient are identified and fostered as a means of raising self-esteem, overcoming feelings of helplessness and inducing a fighting spirit.

(g) When the patient's predominant reaction to cancer is avoidance (denial) this is not challenged. The disease is not discussed; instead, therapy is focused on any symptoms present and on developing coping skills which will enable the patient to resume normal life as quickly as possible.

Positive Psychology and Psycho-oncology

The psychiatric and psychological literature is replete with studies of negative psychological states with scant attention being paid to positive psychological states. Indeed, published studies of negative psychological states outnumber those examining positive states (Diener, & Lucas, 1999). Voogt and others (2005) in their cross-sectional study of positive and negative effects among patients with advanced cancer reported that emotional distress appeared to be related mainly to low levels of positive affect. It is necessary to explore ways of inducing and fostering positive affect in order to enable patients to enjoy life despite their illness. The particular coping strategies they use to produce positive affect when emotionally distressed and apply that knowledge in therapy. The Folkman study revealed three such coping strategies: positive reappraisal, goal-directed problem-focussed coping and imbuing ordinary events with positive meaning (Folkman, & Moskowitz, 2000). Whether these findings apply also to cancer patients requires systematic study, but clinical experience suggests that these are useful coping strategies which can be taught during CBT (Folkman,

1997). This intriguing finding (which requires verification in prospective studies) suggests that is necessary to pay more attention on positive affect in CBT (Greer, 2008).

A promising approach is one that focuses on the induction of positive emotions, especially for the benefits which these emotional experiences have in the short-term as well as in the medium and long-term (Cohn, Fredrickson, Brown, Mikels, & Conway, 2009).

There are few studies that focus on mood induction in a clinical population, and none of them has been implemented with cancer inpatients. Some of these studies show that an induced positive affect is associated with better self-evaluations of health, lower sensitivity to pain, and better emotional well-being during radiotherapy in breast cancer patients (Schnur, David, Kangas, Green, Bovbjerg, & Montgomery, 2009). Another study claims about these areas of research routinely made in the positive psychology literature do not fit with available evidence. In particular the incoherence of claims about those interventions that enhance benefit finding improves the prognosis of cancer patients by strengthening the immune system (Coyne & Tennen, 2010). Recent studies have begun to explore the protective effects of positive affect (PA) on physical health, including cardiovascular risk factors, such as hypertension and diabetes and others have suggested an inverse relationship between positive affect and incident stroke and mortality in medical in-patients as well as diabetic patients (Ostir, Markides, Black, & Goodwin, 2000; Scherer, & Herrmann-Lingen, 2009).

In oncology, there are few interventions that include positive psychology elements, which have displayed encouraging preliminary results (Ramachandra, Booth, Pieters, Vrotsou, & Huppert, 2009). Some studies provided relevant evidence about the clear development of positive aspects from the cancer experience. Positive interventions applied to patients and survivors of cancer were found to be able to promote positive aspects. A global

consensus of a positive therapies classification is needed to take one more step in structuring positive psychology (Casellas-Grau, Font, & Vives, 2014).

Positive Affect and Colorectal Cancer Patients

Although the previous paragraph suggests the potential impact of positive affect in cancer patients (Penninx et al. 2000; Koenig, 2000), it is not still well known whether positive emotions would improve quality of life and disease evolution in CRC patients. The number of studies about PA in cancer patients published during the last ten years is limited. Thus only limited conclusions and considerations can be allowed. There are even a small number of studies in CRC patients, and any intervention study was specifically addressed to CRC patients. Therefore, it is difficult to state considerations about the role of PA in CRC patients so research about PA in CRC patients is largely needed.

In any case, the majority of studies reveal that changes in PA are best predictor of changes in quality of life and illness adaptation than changes in negative emotions. It seems that PA is clearly related with higher levels of well-being and that social support and benefit finding increase PA. However, since studies have not always addressed to assess positive and negative affect as the main purpose of the research, there are still some features which need further study (i.e. whether levels of affect differ between male and female patients, or whether changes in these levels across the disease evolution which reached statistical significance allow to clinical changes that could be also relevant to enhance well-being of patients). Thus, studies focused on the accurate assessment of positive and negative affect and their rate are required, and links between PA and long-term changes in patient's feelings, such as posttraumatic growth, should be considered (Vázquez & Castilla, 2007).

A recent analysis about positive affect and quality of life in CRC patients (Louro, Blasco, & Fernández-Castro, 2015) shows that some studies suggest that positive affect (PA)

was significantly associated with greater levels of general health, better social functioning, benefit finding, positive changes, low depression, less anxiety and greater psychological well-being. PA also increases when different activities are developed. However, the studies do not provide enough evidence about whether cancer stage or kind of treatment could influence in the PA and well-being relationship. Thus, further studies which analyse these features are needed. About psychological interventions in this type of patients little is known about how useful these interventions should be in other kind of tumors and/or in male cancer patients in general. Although it can be expected that these results could be generalized to other samples of cancer patients, research which includes patients (especially male patients) with other kind of tumors must be developed. There are no data about CRC patients. Thus, specific research for this kind of tumor (the third common cancer) is needed.

Some studies provided relevant evidence about the clear development of positive aspects from cancer experience. Positive interventions applied to patients and survivors of cancer were found to be able to promote positive aspects (Louro, Blasco, & Fernández-Castro, 2015). As we have seen until now that positive psychology (Casellas-Grau, Font, & Vives, 2014) as a part of cognitive behavioral therapy (Moorey & Greer, 2002) may have useful application in people with cancer. It seems that is possible to apply to the colorectal cancer patients too. On the other hand, the search of a global consensus of a positive therapies classification is needed to take one more step in structuring positive psychology but this classification needs empirical tests to provide information which could allow to theoretical reflections. In this moment, empirical studies are needed.

Thus, it is necessary to develop new studies which could allow to a better understanding of the relationship between positive emotions and quality of life in cancer patients. There are many possibilities to achieve that. However, we consider that a fruitful line

of research should be addressed to assess whether a psychological intervention, which enhances positive affect, would increase quality of life and well-being in CRC patients.

CHAPTER IV-Research Questions

The purpose of the study

The purpose of this study is to examine the effectiveness of a Psychological Intervention based on the positive psychology and the cognitive behavioral therapy in relieving “psychological problems” at the time of adjuvant chemotherapy treatment (Folfox protocol) in patients with colorectal cancer. This Psychological Intervention is structured and designed to enhance positive emotions in these patients and will be called “Enhancing Positive Emotions Procedure” (EPEP). The EPEP is designed to be implemented during chemotherapy treatment. Its features are: a) teaching patients how to search for alternatives; b) using activity scheduling and c) creating positive meaning. It is expected that the EPEP should be a valuable tool to help them cope with the psychological distress associated with the diagnosis, stage of disease, treatment and its side effects and lack of social support. Building patient’s coping skills during the treatment might prevent depressive and anxiety symptoms and maintain or improve quality of life. This study attempts to determine if the Intervention Group, who will receive psychological intervention, will report significant reduction in depression and anxiety symptoms, will improved coping skills and positive affect and will preserve or improve quality of life greater than the Control Group, who will not receive psychological intervention.

Research Questions

Specifically, research questions guiding this study are:

1. Will the EPEP intervention significantly increase quality of life in CRC patients during chemotherapy treatment intervention and follow-up?

2. Will the EPEP intervention significantly decrease anxiety symptoms in CRC patients during chemotherapy treatment intervention and follow-up?

3. Will the EPEP intervention significantly decrease depressive symptoms in CRC patients during chemotherapy treatment intervention and follow-up?

4. Will the EPEP intervention significantly improve cancer coping skills in CRC patients during chemotherapy treatment intervention and follow-up?

5. Will the EPEP intervention significantly improve positive affect in CRC patients during chemotherapy treatment intervention and follow-up?

For all research questions the LOT-R will be used to examine personality type (optimism and pessimism) as possible confounding factor which could modulate the effects of the EPEP intervention in CRC patients during chemotherapy treatment intervention and follow-up. Thus, a sixth research question is to know whether optimism modulates the effects provided by the EPEP procedure.

CHAPTER V-Methodology

Previous Study

In order to test whether the research strategy designed should be suitable for the purposes of the study, a group of patients was recruited and a previous version of the psychological intervention (5 sessions) was applied to them. The aims of this procedure were to check that the measures were comprehensible by patients; to assess whether the level of intervention was appropriate, to identify the possible adverse effects caused by the procedure, and to know which actions should be applied to reduce them.

All participants were recruited between May of 2012 and September of 2012 of this initial approach. Among the 14 participants 3 (psychological intervention) completed their prescribed psychological intervention and follow-up assessment. There were 11 dropouts in the study. The reasons for dropouts were the refusal of psychological intervention (n = 2), change of medical treatment (n = 5), refusal to continue the study (n = 1), time constraints (n=1) and begin to receive other psychiatric or psychological support (n= 2). We considered that this high level of attrition was produced because the time-span and the number of sessions required were too long (5 sessions and three assessments). It was concluded that psychological intervention was much too long and for that reason we decided to reduce the number of sessions for the main study. On the other hand, this previous study confirmed that the measures and procedure were suitable for the patients. Finally, a reduced version of the psychological intervention procedure was designed for the main study. Features of this main study are described in the next sections.

Main Study Methodology

Design

The design of this study was of two groups with pre-post-test and follow-up comparisons. It was used a cluster sampling by time periods. Pre-tests were used to establish baseline information for the patients' levels of quality of life, anxiety, depression, affect and cancer coping skills. Post-tests were used to determine the effects of the interventions on quality of life, depression, anxiety, affect and cancer coping skills.

Participants

All participants were recruited between October of 2012 and February of 2014. 52 subjects diagnosed with colorectal cancer were recruited at the Portuguese Institute of Oncology, Oporto, Portugal. These participants had a stage of II and III cancer and oncological treatment as chemotherapy such as those stated into the types C D E F described at the Tables 5 and 6 at Chapter 1.

Initially, 107 patients which had those characteristics were approached. The flow of participants through the study is depicted in Figure 5.

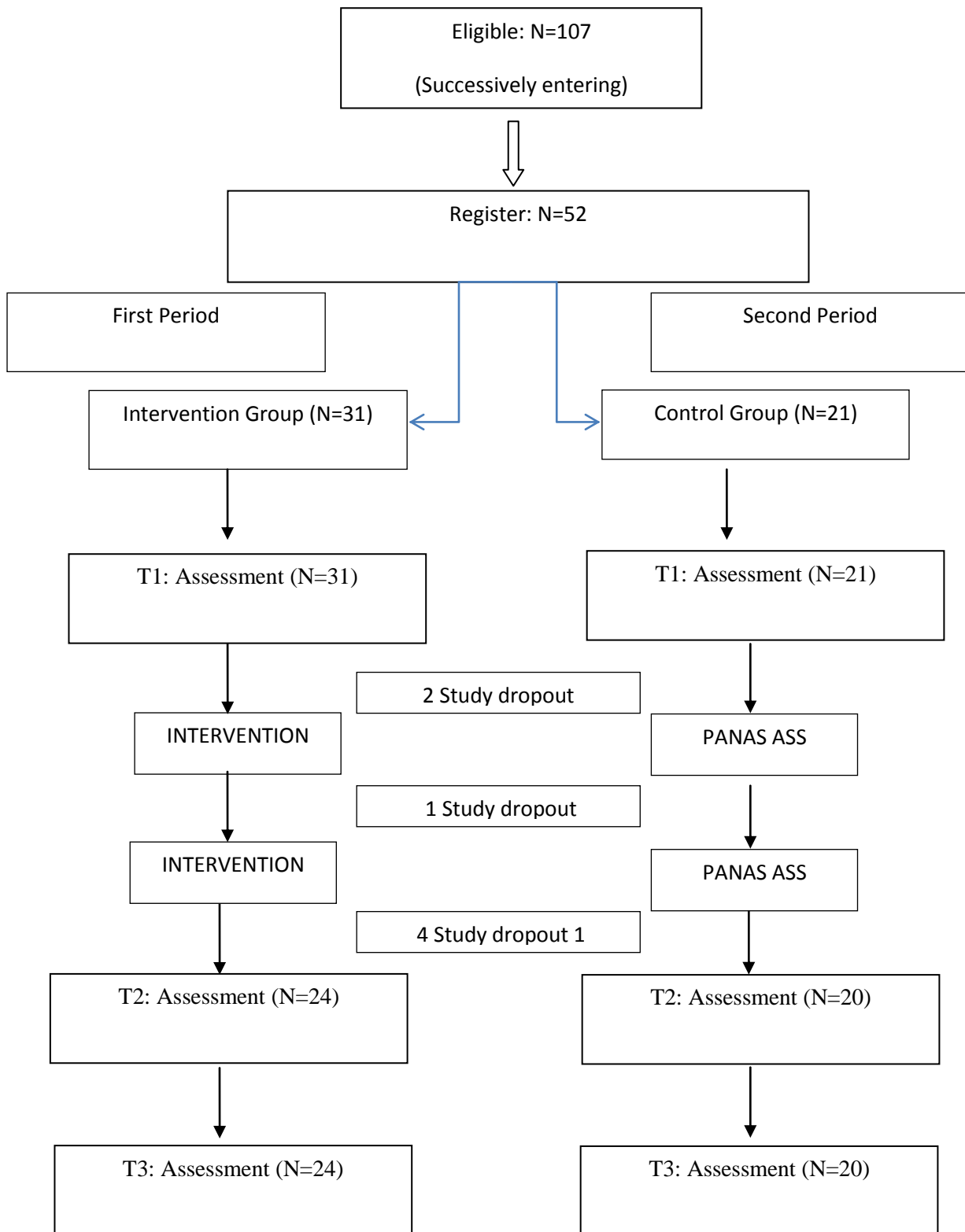


Figure 5: Design and Flow Diagram

Subjects were registered in terms of basic demographic and clinical characteristics. Exclusions were for prior cancer in addition to colorectal cancer (n=5), receive other psychiatric or psychological support (n=22), time constraints, between 8 and 12 chemotherapy treatment (n=26), and analphabetic (n=1). One additional man was not eligible since he was deaf.

Amongst the 52 participants which finally entered the study, 24 (psychological intervention group) completed their prescribed psychological intervention and follow-up assessment, whereas 20 patients (control group) followed the same procedure but without receiving the psychological intervention. There were 8 dropouts in the study (Fig. 5). The reasons for dropouts were migration to other hospitals (n = 1), change of medical treatment (n = 5), refusal to continue the study (n = 1), time constraints (n=1). Table 7 shows the distribution of the number and percentage of participants in function of the demographic and clinical variables. There were no differences between the groups in any of demographic and clinical variables.

Table 7: Distribution of the number and percentage of participants in function of the demographic and clinical variables.

	Intervention Group		Control Group		Total	
	Male	Female	Male	Female	Male	Female
Total	15(62.5%)	9(37.5%)	14(70%)	6(30%)	29(65.9%)	15(34.1%)
Age						
<50	4(26.7%)	2(22.2%)	3(21.4%)	0(0.0%)	7(24.1%)	2(13.3%)
50-59	4(26.7%)	3(33.3%)	3(21.4%)	4(66.7%)	7(24.1%)	7(46.7%)
=>60	7(46.7%)	4(44.4%)	8(57.1%)	2(33.3%)	15(51.7%)	6(40.0%)
Education						
Elementary School (1-4 grade)	7(46.7%)	4(44.4%)	6(42.2%)	2(33.3%)	13(44.8%)	6(40.0%)
(5-6 grade)	1(6.7%)	1(11.1%)	1(7.1%)	0(0.0%)	2(6.9%)	1(6.7%)
Middle School (7-9 grade)	3(20.0%)	4(44.4%)	5(35.7%)	3(50.0%)	8(27.6%)	7(46.7%)
Secondary School (11-12 grade)	3(20.0%)	0(0.0%)	0(0.0%)	1(16.7%)	3(10.3%)	1(6.7%)
Higher Education	1(6.7%)	0(0.0%)	2(14.3%)	0(0.0%)	3(10.3%)	0(0.0%)
Marital Status						
Married	13(86.7%)	3(33.3%)	12(85.7%)	5(83.3%)	25(86.2%)	8(53.3%)
Single	0(0.0%)	2(22.2%)	1(7.1%)	0(0.0%)	1(3.4%)	2(13.3%)
Divorce/Separated	2(13.3%)	2(22.2%)	1(7.1%)	0(0.0%)	3(10.3%)	2(13.3%)
Widowed	0(0.0%)	2(22.2%)	0(0.0%)	2(22.2%)	0(0.0%)	3(20.0%)
Employment status						
Employed/medical Absent	7(46.7%)	4(44.4%)	5(35.7%)	5(83.3%)	12(41.4%)	9(60.0%)
Unemployed	4(26.7%)	1(11.1%)	1(7.1%)	1(16.7%)	5(17.2%)	2(13.3%)
Retired	4(26.7%)	4(16.7%)	8(57.1%)	0(0.0%)	12(41.4%)	16(36.4%)
Location						
Greater Oporto Area	5(33.3%)	4(44.4%)	4(28.6%)	3(50.0%)	9(31.0%)	7(46.7%)
Remain of Country	10(66.7%)	5(55.6%)	10(71.4%)	3(50.0%)	20(69.0%)	8(53.3%)
Religion						
Catholic	12(80.0%)	9(100%)	13(92.9%)	6(100%)	25(86.2%)	15(100%)
Others	0(0.0%)	0(0.0%)	1(7.1%)	0(0.0%)	1(3.4%)	0(0.0%)
None	3(20.0%)	0(0.0%)	0(0.0%)	0(0.0%)	3(10.3%)	0(0.0%)
Type of cancer						
Colon	10(66.7%)	6(66.7%)	9(64.3%)	5(83.3%)	10(34.5%)	4(26.7%)
Rectal	5(33.3%)	3(33.3%)	5(35.7%)	1(15.7%)	19(65.5%)	11(73.3%)
Cancer stage						
Stage I	1(6.7%)	2(22.2%)	1(7.1%)	1(16.7%)	2(6.9%)	3(20.0%)
Stage II	14(93.3%)	7(77.8%)	13(92.2%)	5(83.3%)	27(93.1%)	12(80.0%)

In table 8 are presented the mean, std. deviation and t test equally mean of the scale of Lot (optimism and pessimism) for each group (intervention and control).

Table 8: Mean, SD and t test equally mean of the scale of LOT-R (optimism and Pessimism) for each group (intervention and control).

Group	Mean	SD	t test (equally mean)	p (sig.)
Intervention (N=24)	17,75	3,040	-0.955	0,345
Control (N=20)	16,80	3,563		

Measures

PANAS: We used the Portuguese version of the Positive and Negative Affect Schedule (PANAS) (Galinha & Pais-Ribeiro, 2005) which consists in a 20 emotions checklist with two sub scales, the positive affect and the negative affect. The psychometric data analyses resulted in a Portuguese version very similar to the original scale, sharing 13 items of the 20 from the American scale (Watson, Clark, & Tellegen, 1988). All the original categories of emotion are represented in the Portuguese PANAS. Results indicate a good internal consistency reliability of the scale and indicate a good internal consistency $\alpha=.86$ for the positive affect scale and $\alpha=.89$ for the negative affect scale. Scores range from from 10 – 50, with higher scores representing both higher levels for positive affect and negative affect. Watson, Clark & Tellegen (1988) provided mean scores of their sample both for momentary and weekly affect. For positive affect were 29.7 (SD=7.9) and 33.3 (SD=7.2) respectively. For negative affect, were 14.8 (SD=5.4) and 17.4 (SD=6.2) respectively.

HADS: We used the Hospital and Depression Scale (HADS) (Zigmond, & Snaith, 1983) in its Portuguese version (Pais-Ribeiro, Silva, Ferreira, Martins, Meneses, & Baltar, 2007). The validation process of the Portuguese HADS version shows metric properties similar to those in international studies, suggesting that it measures the same constructs, in the same way, as

the original HADS form. Cronbach's alpha was performed to identify the internal consistency of the two scales (depression and anxiety). For anxiety, a Cronbach alpha is 0.76 and for depression, a Cronbach alpha is 0.81. HADS consists of two subscales, one measuring anxiety, with seven items, and one measuring depression, with seven items, which are scored separately. Each item was answered by the patient on a 4-point (0 – 3) response category so the possible scores ranged from 0 to 21 for anxiety and 0 to 21 for depression. The HADS manual indicates that a score between 0 and 7 is “normal”, between 8 and 10 “mild”, between 11 and 14 “moderate” and between 15 and 21 “severe”. (Pais-Ribeiro, Silva, Ferreira, Martins, Meneses, & Baltar, 2007). In the present study, both Anxiety and Depression will be considered as a categorical variable with two levels: “Normal” (scoring 0-7) or “Not normal” (scoring 8 or more).

LOT-R: We applied the Life Orientation Test (Revised) (LOT-R) (Scheier, Carver, Bridges, 1994) which is a 10-item scale to measure individual differences in optimism/pessimism in its version for the Portuguese population (Laranjeira, 2008). Internal consistency Cronbach alpha is 0,71 (Laranjeira, 2008). For scoring: 1. Reverse code items 3, 7, and 9 prior to scoring (0=4) (1=3) (2=2) (3=1) (4=0). 2. Sum items 1, 3, 4, 7, 9 and 10 to obtain an overall score. Note: items 2, 5, 6, and 8 are filler items only. They are not scored as part of the revised scale (Scheier, Carver, Bridges, 1994). LOT-R was used to examine personality type or thinking style as possible confounding factors. There are not population scores or cut-off scores for the original version of Scheier et al. (1994) nor for the portuguese version (Laranjeira, 2008).

Mini-MAC: We applied the Portuguese version of the Mini-Mental Adjustment to Cancer (Mini-Mac) scale (Pais-Ribeiro, Ramos, & Samico, 2003) which is an instrument derived from the MAC and designed to measure styles of coping with cancer. The Mini-MAC was originally designed by Watson, Law, Santos, Greer, Baruch & Bliss (1994) contains 29 items

and the psychometric properties of the Mini-MAC have proved satisfactory. Mini-MAC consists of five dimensions namely Helplessness/Hopelessness (HH) 8 items, Anxious Preoccupation (AP) 8 items, Fighting Spirit (FS) 4 items, Avoidance (AV) 4 items and Fatalism (F) 5 items. The analysis of the main components of the Portuguese version confirms the existence of five factors, demonstrating the validity of the construct, with good internal consistency in the subscales and Cronbach's alpha values between 0.78 and 0.93. The Mini-MAC items are rated on a 4-point Likert scale ranging from "Definitely does not apply to me" (1) to "Definitely applies to me" (4) and measures patients experiences at present. A higher score represents higher endorsement of the adjustment response. The domains can be scored separately through simple addition. Since the domains consist of different number of items we also calculated mean scores dividing the sum by the number of items. The Portuguese version of Mini- MAC shows a similar pattern with the original version and with other versions (Pais-Ribeiro, Ramos, & Samico, 2003). Neither the authors of the original version nor the Portuguese version provide population scores or cut-off points for the Mini-MAC subscales.

EORTC QLQ-C30: It was used the Cancer Quality of Life Questionnaire Core-30 (EORTC QLQ-C30, version 3). It is a 30-item questionnaire, twenty-four of the items form nine multi-item scales and six items are single-item symptom measures (Aaronson et al., 1993). The scales are constructed by summation of the scores on the items. Multi-item subscales and single items intent to reflect the multidimensionality of the QoL construct (Aaronson et al., 1993), namely: five functional subscales (physical, role, cognitive, emotional, and social); a global health/QoL subscale; three symptom subscales (fatigue, pain, and nausea/vomiting); and single items for the assessment of additional symptoms commonly reported by cancer patients (dyspnoea, appetite loss, sleep disturbance, constipation, and diarrhea); one more item relates to the perceived financial impact of cancer and cancer treatment. All the items

scales are scored on 4-point Likert type scales ranging from 1 'not at all' to 4 'very much', except for the two items of the global health/QoL subscale, that uses a modified 7-point linear analogue scales. All of the scales and single item scales range in score from 0 to 100. A high score for functional scales and global health status/QoL represents high/healthy level of functioning and QoL. A high score for a symptom scale/item represents a high level of symptomatology or problems. The study of reliability through Cronbach alpha shows between 0,74 and 0,88 an appropriate internal consistency for multi item functional and symptom scales. The Portuguese version of the QLQC30 (Pais-Ribeiro, Pinto, & Santos, 2008). has good metric properties, and measures the same constructs, the same way, as the versions from other languages and cultures, and it is appropriate to be applied to people with cancer disease.

Sociodemographic and Clinical Data: Participants were also asked for age, sex, education, religion, marital status, occupation and location. It was recorded disease stage, disease site, treatment modality were collected. All the clinical variables were extracted from medical record using a standardized form by investigator.

Numeric Scales for execution of Psychological Intervention. Participants at the Intervention Group were asked to answer the following items: 1-How often they used alternative thinking strategy in the last two weeks. (Cognitive strategy); 2-How often they used the strategy (activities) to improve quality of life (Behavior strategy).

Psychological Treatment Evaluation: Participants at the Intervention Group were asked to answer final questionnaire with the following items: 1. How EPEP improves Positive Emotions. 2. How EPEP improves quality of life; 3. How EPEP is important to me. All these items were measured with a 0-10 numeric scale.

Procedure

The researcher has approached all persons meeting eligibility criteria. All participants were given detailed information by the researcher about the present study (see appendix B). Written informed consent was obtained from each participant before participation in this study (see appendix B). Ethical approval of the study was given by the Portuguese Institute of Oncology (see appendix A). All questionnaires applied to the patients are listed at Appendix C.

Since the researcher had not enough time availability to assess and apply psychological intervention simultaneously to both treatment and control groups, it was decided to develop the study in two time periods. In the first one, patients were assigned to the intervention group until to achieve a sample size of 31 patients. Once the treatment group was completed, the next patients were assigned to the control group until a sample size of 21 patients was obtained.

On the first period (From September 2012 to March 2013) participants were invited to participate in study and then were successively entering and assigned to the intervention. For control group participants (From September 2013 to December 2013) were invited to participate and then successively entering and assigned to the control condition on the second period (fig5). All the participants of control group were invited to participate in psychological intervention later. The numbers of cycles of chemotherapy treatment were 12 with an interval of 2 weeks each. This adjuvant treatment was given for about 6 months. Before starting each cycle, patients were assessed by using the National Cancer Institute common toxicity criteria, and the results allowed sometimes to delay the chemotherapy session. Thus, the time between sessions (weeks) was not always the same for all patients. Both the intervention and

assessment were administered when CRC patients were doing chemotherapy. Participants in both conditions met in individual sessions in a room equipped with armchairs where administered chemotherapy (FOLFOX) was. Patients entered the study once the FOLFOX protocol was started. Thus, they were recruited between their first and seventh sessions of chemotherapy. Although it would be ideal to include all patients (both in treatment and control groups) just from their first FOLFOX protocol this was not possible because of the reasons of time availability for the researcher previously stated. Both the intervention and assessment were led by clinical psychologist with professional card.

Table 9 and Figure 5 indicate the characteristics of the sessions for both treatment and control groups. Time 2 (T2) assessment was applied one month and half after the Time 1 (T1) assessment, and Time 3 (T3) assessment was applied one month after T2. For the former, features of the psychological intervention are widely explained in the next section.

Table 9: Structure of sessions applied to treatment and control groups, for each session, it is indicated which measures were applied. Characteristics of the treatment sessions are specified at the intervention section.

PROCEDURE	SESSION	TIME	CYCLE OF	TREATMENT	CONTROL
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		(Weeks)(*)	CHEMOTHERAPY (⁺)	GROUP	GROUP
ASSESSMENT (T1)	1	0	1-8	PANAS HADS	PANAS HADS
Pre-Treatment				LOT-R	LOT-R
PSYCHOLOGICAL INTERVENTION FOR THE TREATMENT GROUP (SESSION 1)				MINI MAC EORTC CLINICAL VARIABLES DEMOGRAPHIC VARIABLES	MINI MAC EORTC CLINICAL VARIABLES DEMOGRAPHIC VARIABLES
Searching for alternative thoughts					
PSYCHOLOGICAL INTERVENTION FOR THE TREATMENT GROUP (SESSION 2)	2	2	2-9	PANAS NUMERIC SCALE FOR EXECUTION OF TREATMENT (COGNITIVE)	PANAS
Planning a pleasure activity					
PSYCHOLOGICAL INTERVENTION FOR THE TREATMENT GROUP (SESSION 3)	3	4	3-10	PANAS NUMERIC SCALE FOR EXECUTION OF TREATMENT (BEHAVIOR)	PANAS
Creating positive meaning					
ASSESSMENT (T2)	4	6	4-11	PANAS HADS	PANAS HADS
Post-treatment					
PSYCHOLOGICAL INTERVENTION (SESSION 4)				MINI MAC EORTC NUMERIC SCALE FOR EVALUATION OF TREATMENT	MINI MAC EORTC
Overview of the intervention					
ASSESSMENT FOLLOW-UP (T3)	5	10	5-12	PANAS HADS MINI MAC EORTC	PANAS HADS MINI MAC EORTC

(*) Weeks varied between patients, since sometimes the chemotherapy session was delayed because of medical reasons.

(⁺) the number of Cycles of chemotherapy that psychological intervention was possibility used.

Intervention: The Enhancing Positive Emotions Procedure (EPEP)

A shorter intervention procedure was shared with the patient's visits to the hospital (to receive treatment). Patients were given sessions of psychological intervention over adjuvant chemotherapy (FOLFOX protocol); each session had the duration of 60 minutes. For

maintenance efficiency of psychological intervention patients were asked if they did some of activities between sessions (0-10 score). Topics were covered systematically during the oncological treatment and was monitoring during chemotherapy treatment. The intervention (see appendix D) was adapted by the author of this thesis from cognitive behavioral therapy designed by Folkman and Greer (2000) and by positive psychology (Seligman, Steen, Park, & Peterson, 2005). The goal of the intervention was to improve quality of life, improve health behaviors, increase a person's sense of pleasure, engagement and meaning, and facilitate cancer treatment compliance and medical follow-up. The therapeutic program for the promotion and maintenance of positive affect was adapted for to use with the wide range of a patient's concerns.

Content of Sessions (Fig. 6)

1st Session – Assessment (T1); Searching for alternative thoughts: Patients were invited to talk about three positive experiences and three negative experiences with exploring alternative ways of viewing the situation. They had to score the positive emotions and negative emotions 0-10 in intensity.

2nd Session - Planning a pleasurable activity: Participants were requested to talk about three past, present and future enjoyable and meaningful activities. They had to score the activities 0-10 in meaning and pleasure. Measures: PANAS and NUMERIC SCALES-They had to score 0-10 the use of strategy (searching for alternative thoughts) on last two weeks.

3rd Session - Creating positive meaning: Participants were requested to talk about three goals achieved in the past and three future goals; setting goals and reinforcement of strategies. Measures: PANAS and NUMERIC SCALES-They had to score 0-10 the use of strategy (the meaning and pleasure activities to improve quality of life) on last two weeks.

4th Session – Assessment (T2); Overview of the intervention (Patients had to score 0-10 how psychological intervention improved their positive emotions, their quality of life and how important the intervention was), feedback, and ending.

5th Session- Assessment (T3); Follow-up

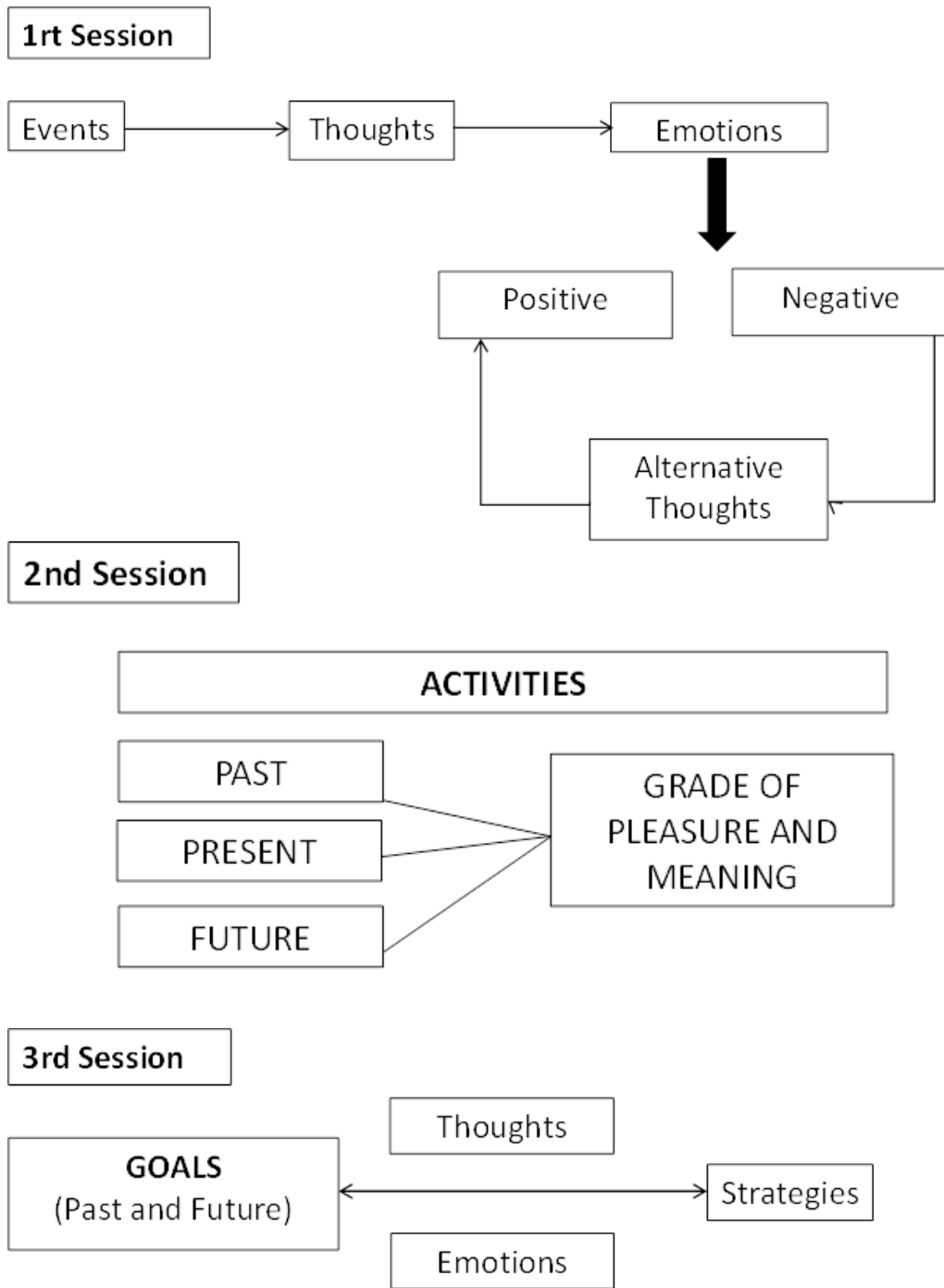


Figure 6: Content of EPEP

Control Group: The participants assigned to the Control group did not receive any psychological treatment. The researcher met with each participant assigned to the Control group to obtain the signed informed consent form, demographic form and to apply the

instruments. The instruments were administered in all 5 sessions in the same way they were used with the intervention group (Fig.5).

Data analysis

For each subscale it was performed a comparison of means with repeated measures applying a General Linear Model (GLM): the treatment was a between-subject factor and time of evaluation (pre, post and follow-up) was within-subject factor, in order to correct the Lot scale was considered as coverable. (To correct for violations of sphericity was used Greenhouse-Geisser correction to produce accurate significance (p) value). For the comparisons of proportions across time the Q Cochran test was used. Correlations between LOT scale and other variables were also applied.

CHAPTER VI. RESULTS

Correlational study of LOT scores

In the table 10 can be seen the correlations between LOT scores and the different scales of quality of life.

Table 10: Correlations between LOT-R and EORTC-QLQ-C30

EORTC-QLQ-C30	Pre	Post	Follow-up
Global Health Status	0.364**	0.161	0.354*
Physical Functioning	0.199	0.462**	0.451**
Role Functioning	0.147	0.178	0.307*
Emotional Functioning	0.330*	0.081	0.193
Cognitive Functioning	-0.031	0.013	0.012
Social Functioning	0.239	0.278	0.149
Fatigue	-0.254	-0.136	-0.292
Nausea and Vomiting	-0.083	0.255	0.131
Pain	-0.052	-0.112	-0.052
Dyspnea	0.086	0.029	0.079
Insomnia	-0.037	-0.009	-0.049
Appetite Loss	0.011	0.020	0.026
Constipation	-0.025	0	-0.105
Diarrhea	0.022	0.189	-0.004
Financial Difficulties	0.001	-0.224	-0.272

** Correlation is significant at the 0.01 level

* Correlation is significant at the 0.05 level

Correlations between LOT scores and coping strategies measured by Mini Mac are shown in table 11.

Table 11: Correlations between LOT-R and Mini-MAC.

Mini-MAC	Pre	Post	Follow-up
Fighting Spirit	0.474**	0.349*	0.484**
Avoidance	-0.188	0.043	0.041
Fatalism	-0.120	-0.204	-0.004
Anxious Preoccupation	-0.206	-0.290	-0.378*
Helplessness/Hopelessness	-0.289*	-0.532**	0.338*

** Correlation is significant at the 0.01 level

* Correlation is significant at the 0.05 level

Correlations between LOT scores and positive and negative affect are shown in the table 12.

Table 12: Correlations between LOT-R and PANAS

PANAS	Pre	Int.1	Int.2	Post	Follow-up
Positive Affect	0.437**	0.437**	0.388**	0.386**	0.451**
Negative Affect	0.125	0.299*	0.160	0.231	0.264

** Correlation is significant at the 0.01 level

* Correlation is significant at the 0.05 level

Table 13 shows correlations between LOT scores and the numeric scales for execution and table 14 shows correlations between LOT scores and treatment evaluation by participants.

Table 13: Correlations between LOT-R and Numeric Scales for Execution of Psychological Intervention (NSEPI).

	NSEPI
The use of cognitive strategy	0.119
The use of behavior strategy	0.058
** Correlation is significant at the 0.01 level	
* Correlation is significant at the 0.05 level	

Table 14: Correlations between LOT-R and Psychological Treatment Evaluation

	Psychological Treatment Evaluation
How EPEP intervention improve Positive Emotions	-0.062
How EPEP intervention improve Quality of life	0.036
How EPEP is important	0.033
** Correlation is significant at the 0.01 level	
* Correlation is significant at the 0.05 level	

Will psychological therapy intervention significantly increase quality of life in CRC patients during chemotherapy treatment intervention and follow-up?

Table 15 shows the mean and SD values of the subscales of EORTC QLQ-C30 version 3.0 obtained in intervention and control groups in the beginning of the intervention (pre), at the last session (post) and at the follow-up.

Table 15: Mean and SD of the Scales of EORTC QLQ-C30 for each group (intervention and control) and each assessment time (pre, post and follow-up).

	Pre		Post				Follow-Up				Clinical reference* N=1773 QR		
	Intervention (N=24)		Control (N=20)		Intervention (N=44)		Control (N=20)		Intervention (N=24)			Control (N=20)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD		Mean	SD
Global Health Status	73.95	17.25	66.25	20.31	77.77	14.88	65.83	16.64	81.59	12.28	66.66	19.68	(50-83.3)
Functional Scales													
Physical Functioning	89.44	12.26	78.66	14.28	90.00	9.63	80.66	14.96	87.77	12.53	73.00	20.79	(66.7-100)
Role Functioning	92.36	15.52	85.83	21.13	92.36	16.28	85.83	16.46	95.83	10.13	81.66	20.16	(50-100)
Emotional Functioning	82.98	13.34	77.50	16.24	85.06	13.45	79.16	19.21	84.72	13.82	71.25	24.25	(50-91.7)
Cognitive Functioning	90.97	12.98	85.00	17.01	92.36	9.80	86.66	17.60	93.75	9.59	88.33	16.31	(83.3-100)
Social Functioning	90.27	13.82	74.16	26.19	91.66	15.54	76.66	25.01	88.19	19.95	75.83	30.81	(66.7-100)
Symptom Scales													
Fatigue	10.64	13.30	22.22	16.51	13.42	15.70	26.66	21.14	15.74	16.68	31.66	26.06	(11.1-55.6)
Nausea and Vomiting	4.86	10.40	2.50	8.15	3.47	6.91	4.16	10.64	4.86	10.40	6.66	13.67	(0-0)
Pain	4.86	10.40	10.00	15.67	3.47	9.80	8.33	12.68	8.33	15.54	11.66	22.36	(0-33.3)
Dyspnea	1.38	6.80	0.00	0.00	1.38	6.80	3.33	10.25	0.00	0.00	1.66	7.45	(0-33.3)
Insomnia	22.22	27.21	33.33	35.86	18.05	27.76	36.66	30.39	13.88	19.45	33.33	30.58	(0-66.7)
Appetite Loss	2.77	9.41	6.66	17.43	5.55	16.05	11.66	19.57	6.94	19.60	11.66	19.57	(0-33.3)
Constipation	15.00	22.87	10.41(N=16)	26.44	10.00	19.04	12.50	23.95	5.00	12.21	8.33	19.24	(0-33.3)
Diarrhea	10.00	15.67	6.25(N=16)	18.13	8.33	18.33	14.58	20.97	6.66	13.67	10.41	20.06	(0-33.3)
Financial Difficulties	33.33	29.48	26.66	25.59	27.51	28.33	35.00	27.51	25.00	28.23	26.66	25.59	(0-33.3)

* (Scott, Fayers, Aaronson, Bottomley, Graeff, Groenvold et al., 2008)

There were statistically significant differences on the global health status (see figure 7) between the intervention group and control group ($F= 6.273$, $p = 0.016$) and there were differences almost significant in function of the score of LOT-R scale ($F=3.991$, $p=0.052$), while there were no differences between the three times of evaluation ($F= 1.223$, $p=0.295$). There was not found any interaction between treatment, time of evaluation ($F= 1.115$, $p=0.325$) and LOT-R scale ($F= 1.246$, $p= 0.289$).

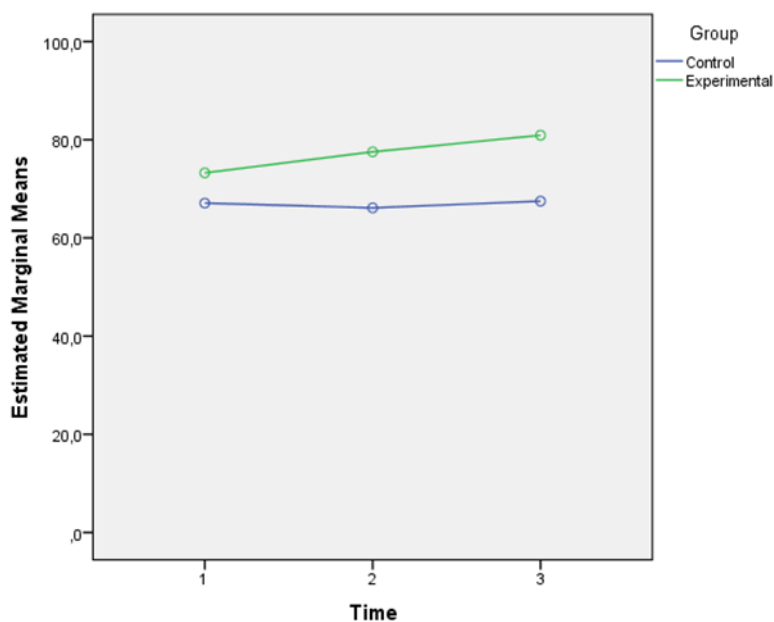


Figure 7: Evolution of the mean (%) of Global Health Status for each group (control and intervention) and each assessment time (Pre, Post and Follow-up).

In the physical functioning (see figure 8), only statistically significant differences were found between intervention and control group ($F= 7.931$, $p= 0.007$) and with the scale of LOT-R ($F= 10.704$, $p= 0.002$) while there were no differences between the three times of evaluation ($F= 2.151$, $p=0.130$). There was not found any interaction between LOT-R scale ($F=1.256$, $p=0.288$), treatment and time of evaluation ($F=1.154$, $p=0.316$).

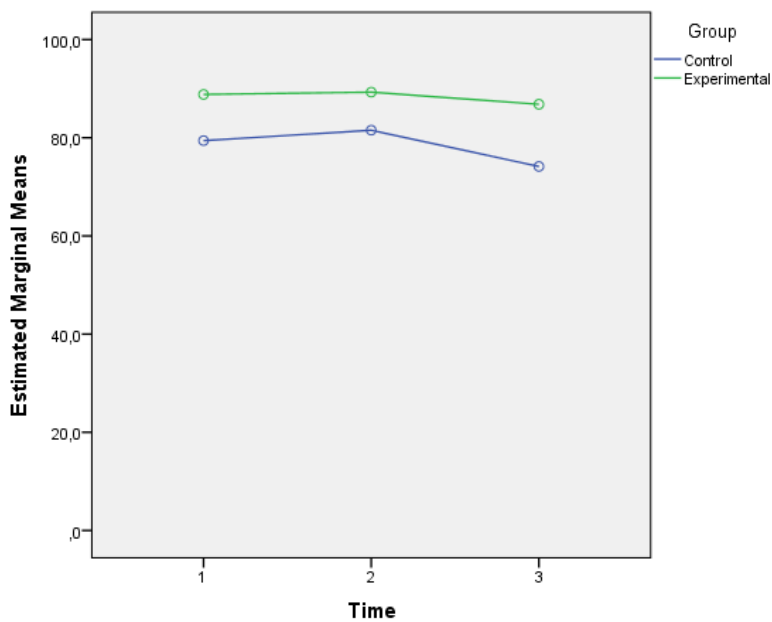


Figure 8: Evolution of the mean (%) of Physical Functioning for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the role functioning (see figure 9), only statistically significant differences were found between intervention and control group ($F= 4.406$, $p= 0.042$) and there were almost significant in relation to the LOT scale ($F= 3.876$, $p= 0.056$), while there were no differences between the three times of evaluation ($F= 0.286$, $p=0.726$). There was not found any interaction between LOT-R scale ($F= 0.289$, $p=0.725$) treatment and time of evaluation ($F=1.121$, $p=0.326$).

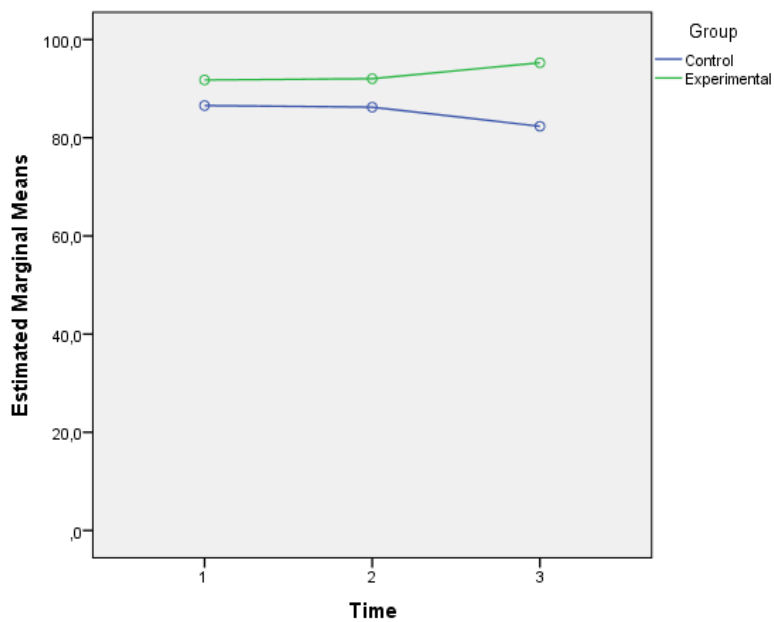


Figure 9: Evolution of the mean (%) of Role Functioning for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the emotional functioning (see figure 10), there was no statistically significant differences between intervention and control group ($F= 3.466$, $p=0 .070$), no differences between the LOT-R scale ($F= 1.292$, $p= 0.262$) and no differences between the three times of evaluation ($F= 0.624$, $p=0.515$). There was not found any interaction between treatment, time of evaluation ($F=1.274$, $p=0.283$) and LOT-R scale ($F=0.400$, $p=0.640$).

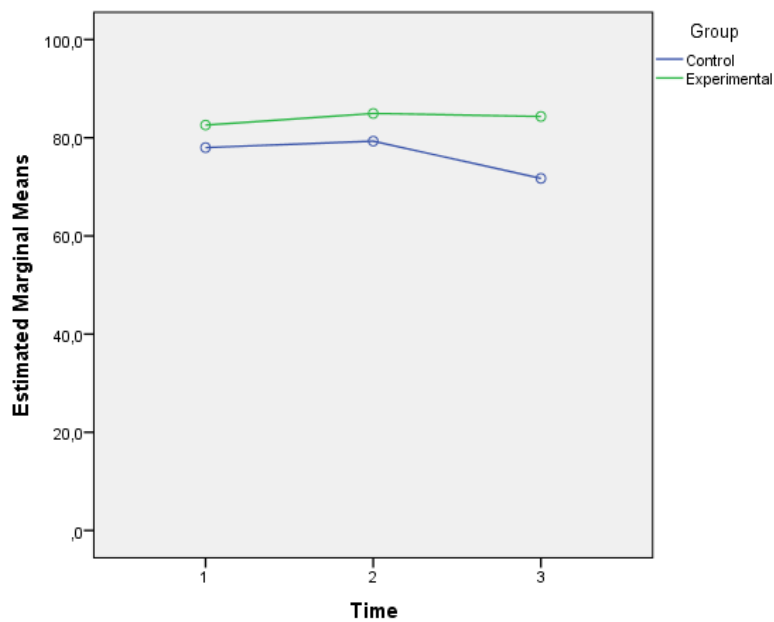


Figure 10: Evolution of the mean (%) of Emotional Functioning for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the cognitive functioning (see figure 11), there was no statistically significant differences between intervention and control group ($F= 2.695$, $p=0.108$), no differences between the LOT-R scale ($F= 0.125$, $p= 0.726$) and no differences between the three times of evaluation ($F= 0.091$, $p=0.890$). There was not found interaction between treatment, time of evaluation ($F=0.024$, $p=0.965$) and LOT-R scale ($F=0.210$, $p=0.783$).

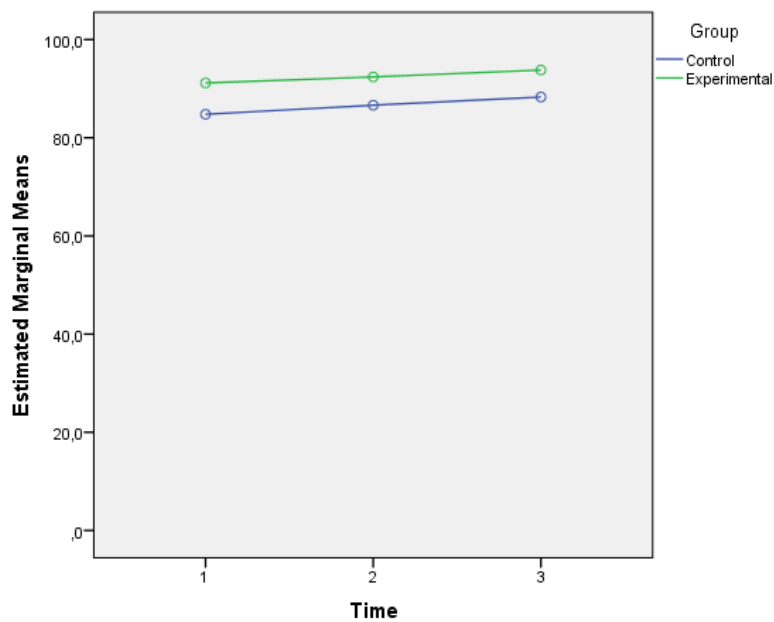


Figure 11: Evolution of the mean (%) of Cognitive Functioning for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the social functioning (see figure 12), only statistically significant differences were found between intervention and control group ($F= 5.069$, $p=0.030$) and no differences between the LOT-R scale ($F= 2.050$, $p=0.160$), while there were no differences between the three times of evaluation ($F=0.211$, $p=0.807$). There was not found any interaction between LOT-R scale ($F=0.285$, $p=0.749$) treatment and time of evaluation ($F=0.167$, $p=0.842$).

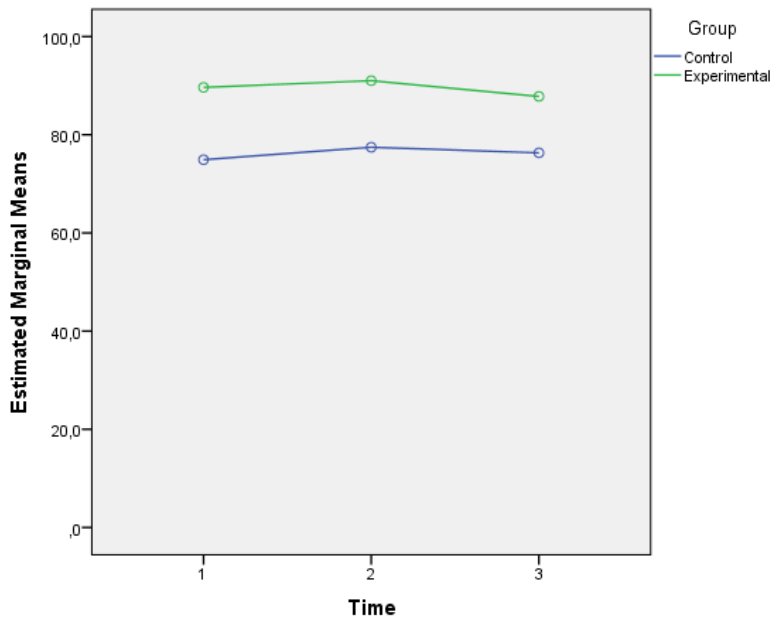


Figure 12: Evolution of the mean (%) of Social Functioning for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the fatigue symptom (see figure 13), only statistically significant differences were found between intervention and control group ($F= 7.077$, $p=0.011$) and no differences between the LOT-R scale ($F= 2.458$, $p=0.125$), while there were no differences between the three times of evaluation ($F=1.541$, $p=0.223$). There was not found any interaction between treatment, time of evaluation ($F=0.284$, $p=0.718$) and LOT-R scale ($F=1.107$, $p=0.328$).

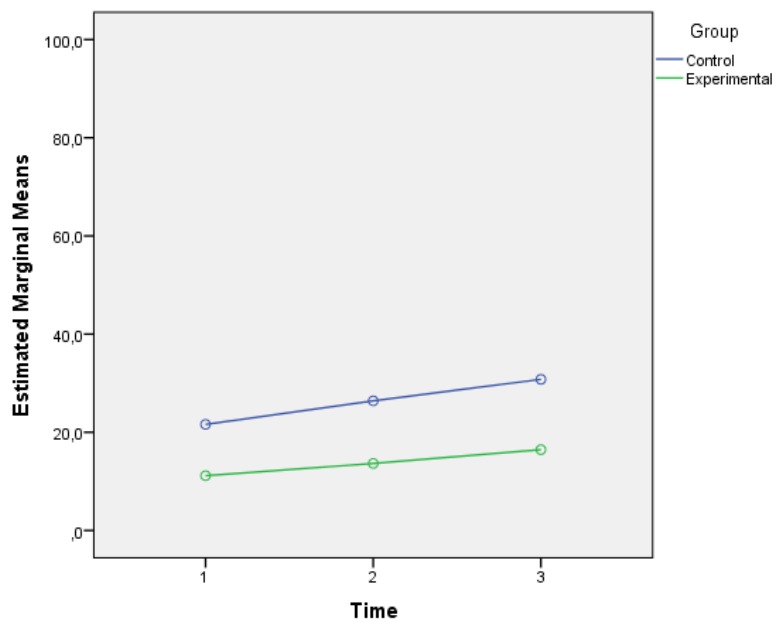


Figure 13: Evolution of the mean (%) of fatigue symptom for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the nausea symptom (see figure 14), there was no statistically significant differences between intervention and control group ($F=0.022$, $p=0.882$), no differences between the LOT-R scale ($F= 0.784$, $p=0.381$) and no differences between the three times of evaluation ($F=1.641$, $p=0.206$). There was not found any interaction between treatment and time of evaluation ($F=1.016$, $p=0.352$) and LOT-R scale ($F=1.856$, $p=0.172$).

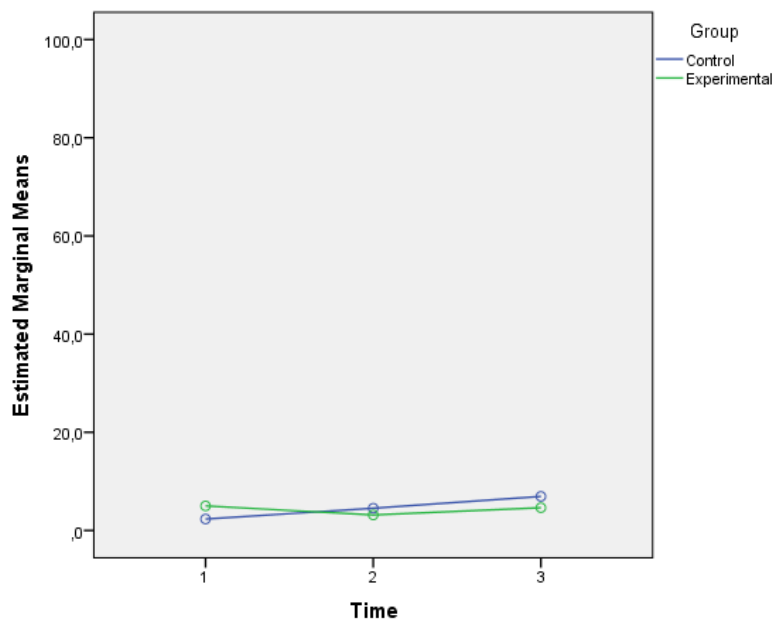


Figure 14: Evolution of the mean (%) of nausea symptom for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the pain symptom (see figure 15), there was no statistically significant differences between intervention and control group ($F= 1.594$, $p=0.214$), no differences between the LOT-R scale ($F=0.004$, $p=0.949$) and no differences between the three times of evaluation ($F=0.539$, $p=0.536$). There was not found any interaction between LOT-R scale ($F=0.489$, $p=0.562$) treatment and time of evaluation ($F=0.114$, $p= 0.834$).

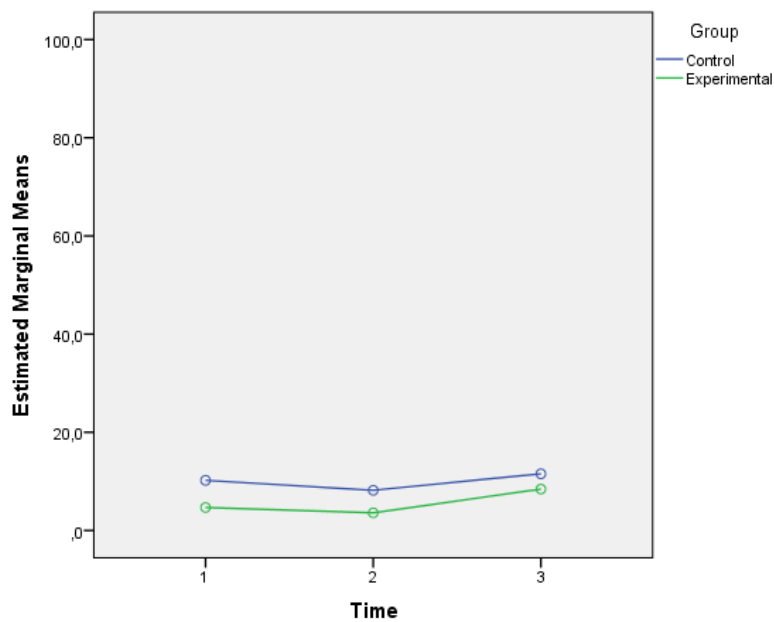


Figure 15: Evolution of the mean (%) of Pain symptom for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the dyspnea symptom (see figure 16), there was no statistically significant differences between intervention and control group ($F=0.605$, $p=0.441$), no differences between the LOT-R scale ($F= 0.543$, $p= 0.465$) and no differences between the three times of evaluation ($F= 0.042$, $p=0.940$). There was not found any interaction between treatment and time of evaluation ($F=0.865$, $p=0.411$) and LOT-R scale ($F=0.013$, $p=0.978$).

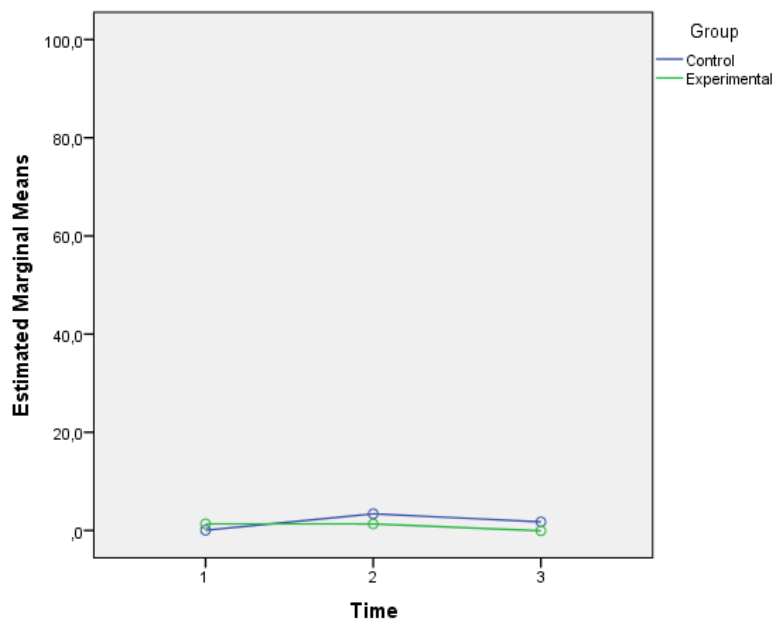


Figure 16: Evolution of the mean (%) of Dyspnea symptom for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the insomnia symptom (see figure 17), only statistically significant differences were found between intervention and control group ($F= 5.719$, $p= 0.021$) and no differences between the LOT-R scale ($F=0.026$, $p=0.873$), while there were no differences between the three times of evaluation ($F= 0.411$, $p=0.662$). There was not found any interaction between LOT-R scale ($F=0.356$, $p=0.699$) treatment and time of evaluation ($F=0.552$, $p=0.576$).

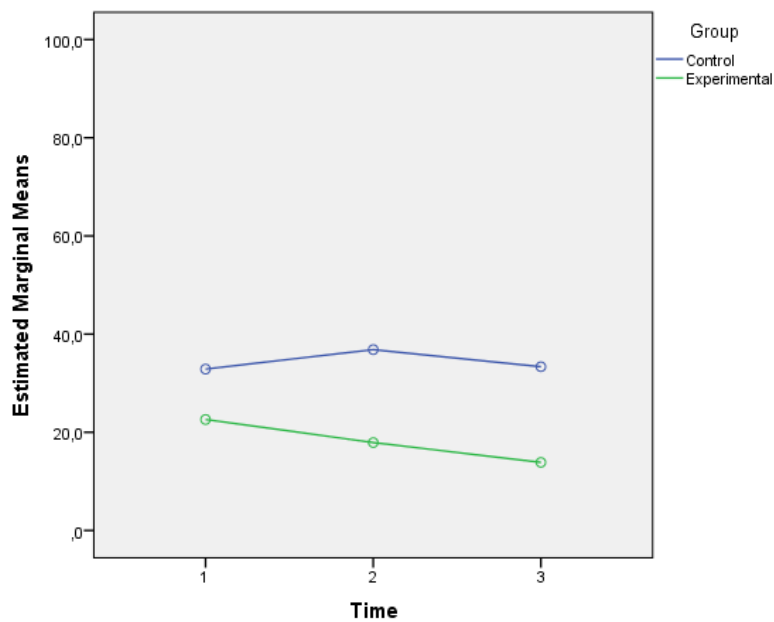


Figure 17: Evolution of the mean (%) of Insomnia symptom for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the appetite loss symptom (see figure 18), there was no statistically significant differences between intervention and control group ($F= 1.326$, $p=0.256$), no differences between the LOT-R scale ($F= 0.038$, $p=0.846$) and no differences between the three times of evaluation ($F=0.020$, $p=0.977$). There was not found any interaction between treatment and time of evaluation ($F=0.121$, $p=0.876$) and LOT-R scale ($F=0.153$, $p=0.849$).

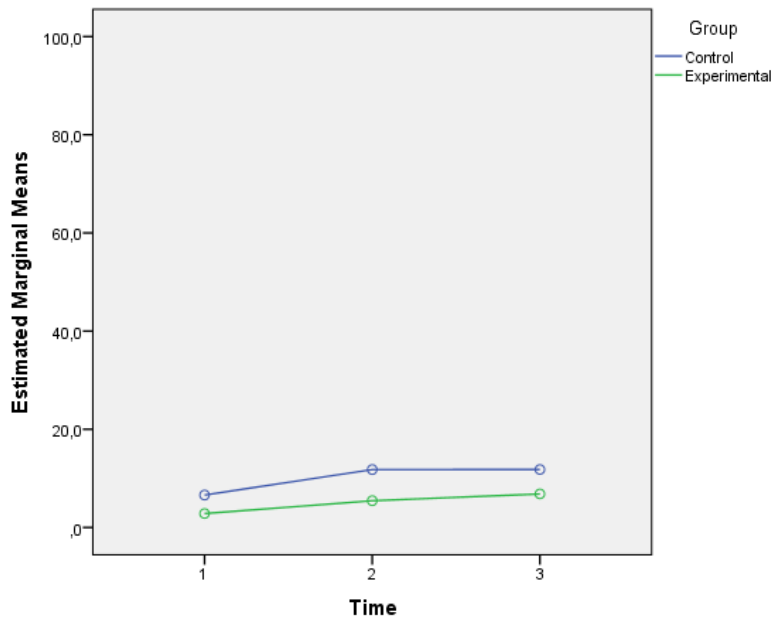


Figure 18: Evolution of the mean (%) of Appetite Loss symptom for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the constipation symptom (see figure 19), there was no statistically significant differences between intervention and control group ($F=0.001$, $p=0.978$), no differences between the LOT-R scale ($F=0.217$, $p=0.645$) and no differences between the three times of evaluation ($F=0.797$, $p=0.439$). There was not found any interaction between treatment and time of evaluation ($F=1.237$, $p=0.294$) and LOT-R scale ($F=0.628$, $p=0.514$).

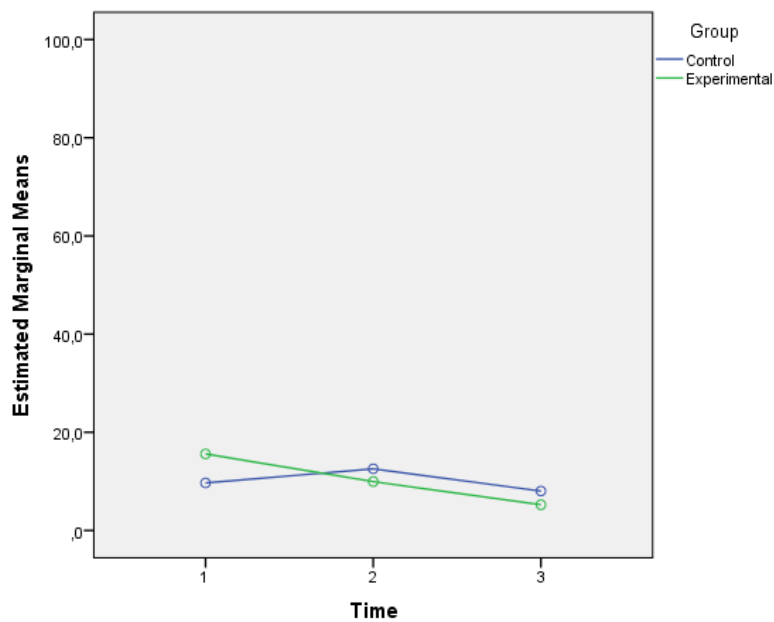


Figure 19: Evolution of the mean (%) of constipation symptom for each group (Control and intervention) and each assessment time (pre, post and follow-up).

In the diarrhea symptom (see figure 20), there was no statistically significant differences between intervention and control group ($F=0.359$, $p=0.553$), no differences between the LOT-R scale ($F=0.701$, $p=0.408$) and no differences between the three times of evaluation ($F=0.636$, $p=0.530$). There was not found any interaction between treatment and time of evaluation ($F=1.579$, $p=0.214$) and LOT-R scale ($F=0.915$, $p=0.404$).

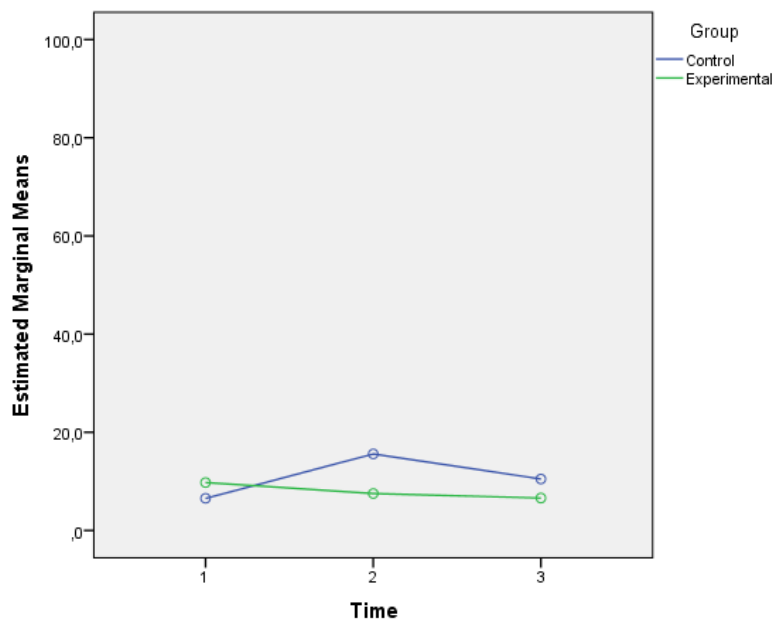


Figure 20: Evolution of the mean (%) of Diarrhea symptom for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the financial difficulties (see figure 21), there was no statistically significant differences between intervention and control group ($F=0.041$, $p=0.840$), no differences between the LOT-R scale ($F= 2.782$, $p= 0.103$) and no differences between the three times of evaluation ($F=0.151$, $p=0.834$). There was not found any interaction between LOT-R scale ($F=0.253$, $p=0.749$) treatment and time of evaluation (1.246 , $p=0.291$).

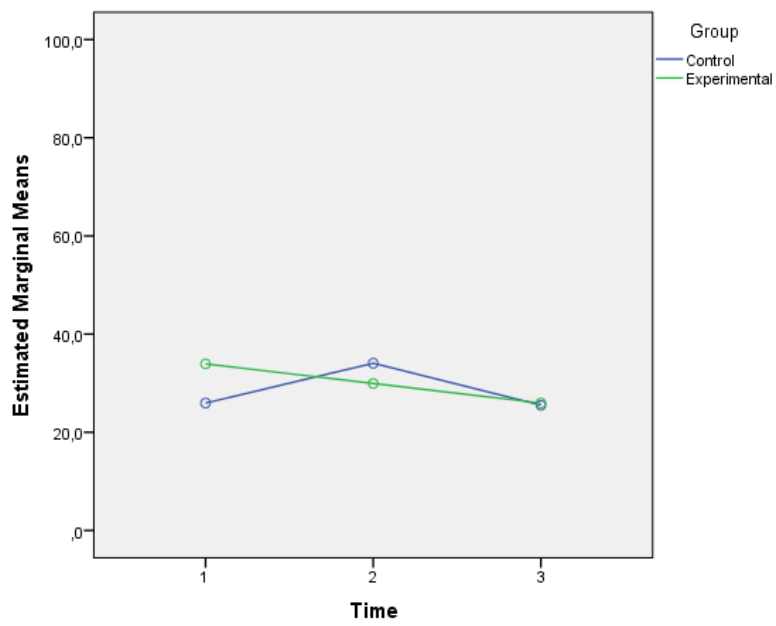


Figure 21: Evolution of the mean (%) of financial difficulties for each group (control and intervention) and each assessment time (pre, post and follow-up).

Table 16: Resumes the Statistical significances found on the previous analyses of the EORTC-QLQ-C30

EORTC-QLQ-C30	Differences between the intervention and control group	Differences between pre, post and follow-up measures	Interaction between groups and pre, post, and follow-up measures	LOT-R as a covariable
Global Health Status	0.016*	n.s.	n.s.	0.052*
Physical Functioning	0.007*	n.s.	n.s.	0.002*
Role Functioning	0.042*	n.s.	n.s.	n.s.
Emotional Functioning	n.s.	n.s.	n.s.	n.s.
Cognitive Functioning	n.s.	n.s.	n.s.	n.s.
Social Functioning	0.030*	n.s.	n.s.	n.s.
Fatigue	0.011*	n.s.	n.s.	n.s.
Nausea and Vomiting	n.s.	n.s.	n.s.	n.s.
Pain	n.s.	n.s.	n.s.	n.s.
Dyspnea	n.s.	n.s.	n.s.	n.s.
Insomnia	0.021*	n.s.	n.s.	n.s.
Appetite Loss	n.s.	n.s.	n.s.	n.s.
Constipation	n.s.	n.s.	n.s.	n.s.
Diarrhea	n.s.	n.s.	n.s.	n.s.
Financial Difficulties	n.s.	n.s.	n.s.	n.s.

* Correlation is significant at the 0.05 level

(n.s.) = no statistical significance was found).

Will psychological therapy intervention significantly decrease anxiety and depression symptoms in CRC patients during chemotherapy treatment intervention and follow-up?

Anxiety incidence was low, indicating the sample was relatively psychologically well. Incidence further no significantly decreased through the study (see Table 17) and subgroup analysis demonstrates no significant change in those categorized as ‘doubtful cases’ Cochran’s Q Test was applied (intervention group anxiety $p= 0.264$; control group anxiety $p=0.513$). With LOT scale there is no interaction with anxiety (see table 18).

Table 17: Distribution of the number and percentage of participants in function of the HADS scale (anxiety and depression).

	Pre		Post				Follow-Up					
	Intervention (N=24)		Control (N=20)		Intervention (N=24)		Control (N=20)		Intervention (N=24)		Control (N=20)	
	N	%	N	%	N	%	N	%	N	%	N	%
Anxiety												
Normal	17	70.8%	13	65%	19	79.2%	15	75.0%	21	87.5%	15	75.0%
Not “normal”*	7	29.2%	7	35%	5	20.0%	5	25%	3	12.5%	5	25%
Total	24	100%	20	100%	24	100%	20	100%	24	100%	20	100%
Depression												
Normal	21	87.5%	15	75.0%	20	83.3%	15	75.0%	21	87.5%	15	75.0%
Not “normal”*	3	12.5%	5	25%	4	16.7%	5	25%	2	12.5%	5	25%
Total	24	100%	20	100%	24	100%	20	100%	24	100%	20	100%

* indicating probable presence of a mood disorder.

Table 18: Mean, SD and t test equally mean of the scale of LOT-R (optimism and pessimism) with HADS scale (anxiety and depression) at pretest.

	Mean	SD	t test (equally mean)	p (sig.)
Anxiety				
Normal (N=30)	17.37	3.316	-0.142	0.888
Not Normal (N=14)	17.21	3.332		
Depression				
Normal (N=36)	18.00	2.662	-3.226	0.002
Not normal (N=8)	14.25	4.200		

Depression incidence was low, indicating the sample was psychologically healthy. Incidence further no significantly decreased through the study (see Table 17) and subgroup analysis demonstrates no significant change in those categorized as ‘doubtful cases’ Cochran’s Q Test was applied (intervention group depression $p=0.779$; control group depression $p=1,000$). However, there were differences in LOT scale between the patients who were Normal and Not-Normal in depression at pretest (see table 18).

Will psychological intervention significantly improve cancer coping skills in CRC patients during chemotherapy treatment intervention and follow-up?

Table 19 shows the mean and SD values of the subscales of Mini-Mental Adjustment to Cancer (Mini-Mac) obtained in intervention and control groups in the beginning of the intervention (pre), at the last session (post) and at the follow-up.

Table 19: Mean and SD of the scales of Mini-MAC for each group (intervention and control) and each assessment time (pre, post and follow-up).

	Pre		Post				Follow-Up					
	Intervention (N=24)		Control (N=20)		Intervention (N=24)		Control (N=20)		Intervention (N=24)		Control (N=20)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Fighting Spirit	11.79	.415	11.95	.759	11.88	.448	11.55	.686	11.88	.448	11.85	.366
Avoidance	10.75	1.452	10.95	1.432	10.96	1.429	11.15	1.348	11.04	1.429	11.20	1.105
Fatalism	14.29	.955	14.80	.696	14.29	1.301	14.20	1.005	14.29	.751	14.50	.889
Anxious Preoccupation	19.92	2.717	19.30	2.658	19.29	2.255	19.40	2.798	19.21	2.828	19.40	3.152
Helplessness/Hopelessness	15.96	1.301	16.30	1.342	15.96	.690	16.95	1.317	16.17	1.204	16.60	1.536

In the dimension of fighting spirit (see figure 22) there was statistically no significance between the intervention group and control group ($F=0.002$, $p=0.963$) but there was with the punctuation of LOT-R scale ($F= 15.904$, $p=0.000$), while there were no differences between the three times of evaluation ($F=0.035$, $p=0.957$).

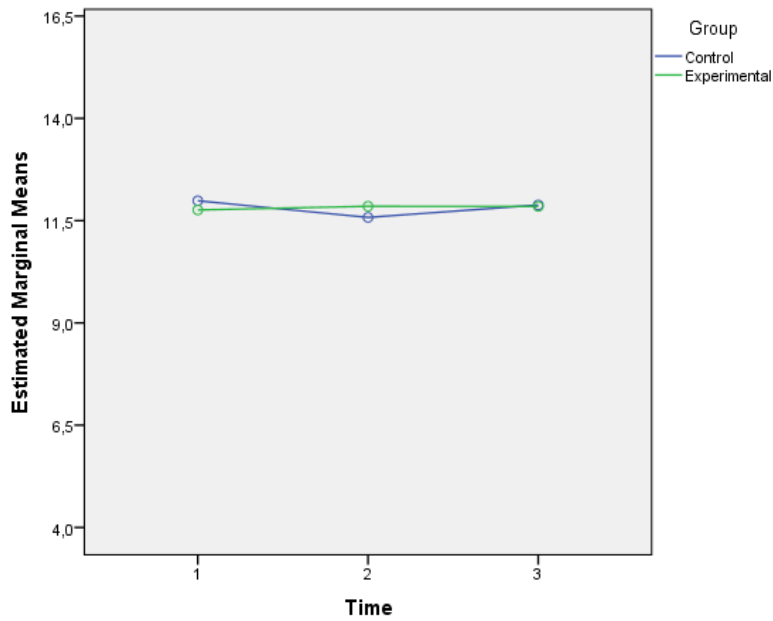


Figure 22: Evolution of the mean of the Fighting Spirit Dimension for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the anxious preoccupation dimension (see figure 23), there were no statistically significant differences between intervention and control group ($F=0.182$, $p=0.672$), no differences between the LOT-R scale ($F= 3.866$, $p=0.056$) but differences between the three times of evaluation ($F= 3.321$, $p=0.045$, time 1 to 3 $F=5.273$, $p=0.027$). There was statically a significant difference between the time 1 to 3 with interaction with LOT-R punctuation ($F= 6.425$, $p=0.015$). There was not found interaction between treatment and time of evaluation ($F=0.935$, $p=0.391$).

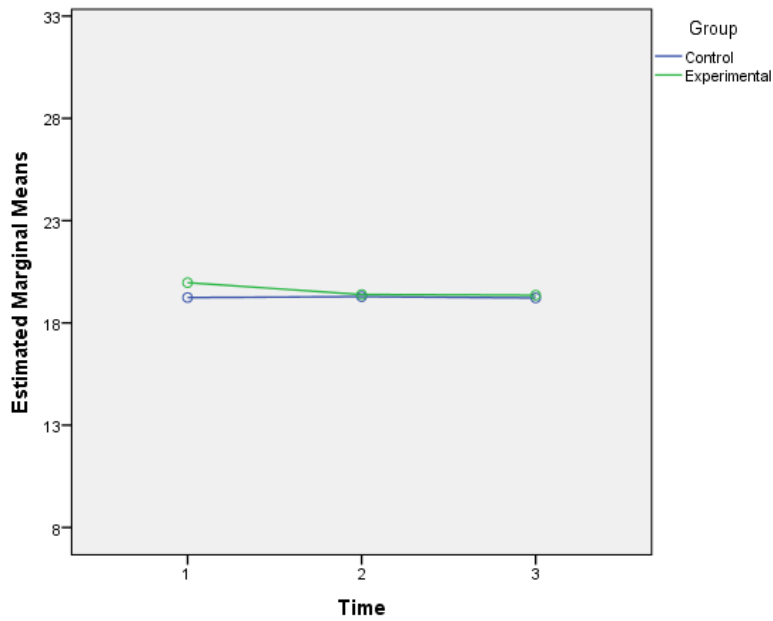


Figure 23: Evolution of the mean of Anxious Preoccupation dimension for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the fatalism dimension (see figure 24), there were no statistically significant differences between intervention and control group ($F=0.486$, $p=0.490$), no differences between the LOT-R scale ($F=0.872$, $p= 0.356$) and no differences between the three times of evaluation ($F=1.527$, $p=0.226$). There was not found any interaction between LOT-R scale ($F=1.913$, $p=0.162$) treatment and time of evaluation ($F=2.913$, $p=0,071$).

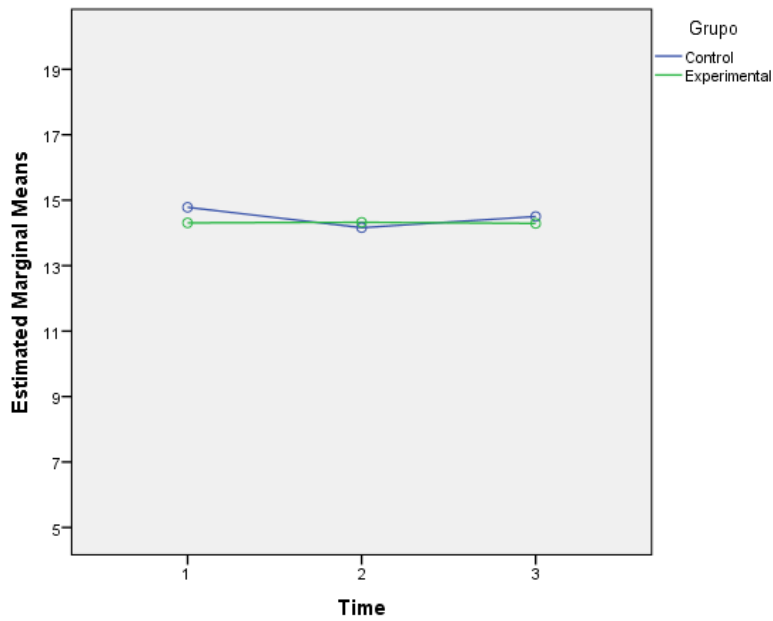


Figure 24: Evolution of the Fatalism dimension for each group (control and intervention) and assessment time (pre, post and follow-up).

In the avoidance dimension (see figure 25), there were no statistically significant differences between intervention and control group ($F= 0.168$, $p=0.684$), no differences between the LOT-R scale ($F=0.230$, $p=0.634$) but differences between the three times of evaluation ($F= 5.518$, $p=0.006$; time 1 to time 3 $F=6.624$, $p=0.014$). There was statically significant difference between the time 1 to 3 with interaction with LOT-R punctuation ($F= 8.587$, $p=0.006$). There was not found any interaction between treatment and time of evaluation ($F=0.107$, $p=0.893$).

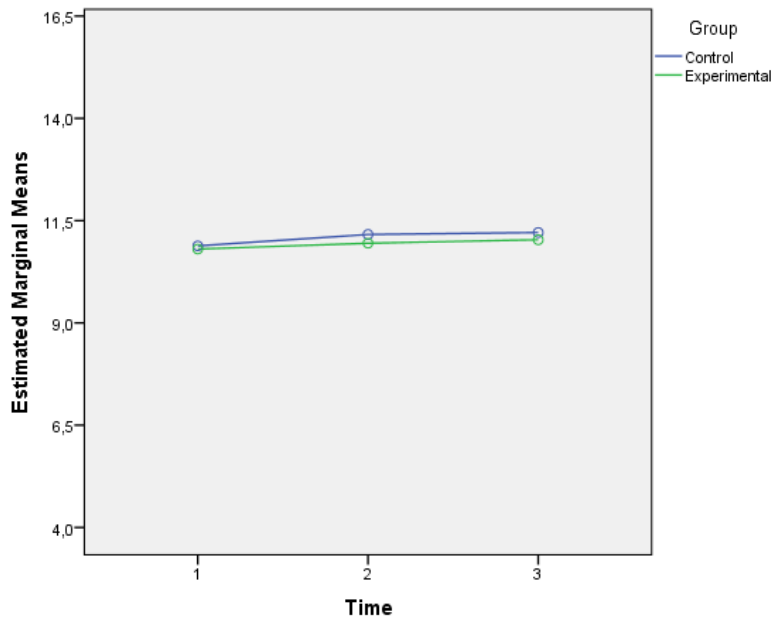


Figure 25: Evolution of the Avoidance Dimension for each group (control and intervention) and each assessment time (pre, post and follow-up).

In the dimension of Helplessness/Hopelessness (see figure 26) there was statistically no significant between the intervention group and control group ($F= 3.527, p =0.067$) but there was with the punctuation of LOT-R scale ($F= 14.433, p=0.000$), while there were no differences between the three times of evaluation ($F=0.329, p=0.646$). There was not found any interaction between LOT-R scale ($F=0.168, p=0.769$) treatment and time of evaluation ($F=1.068, p=0.330$).

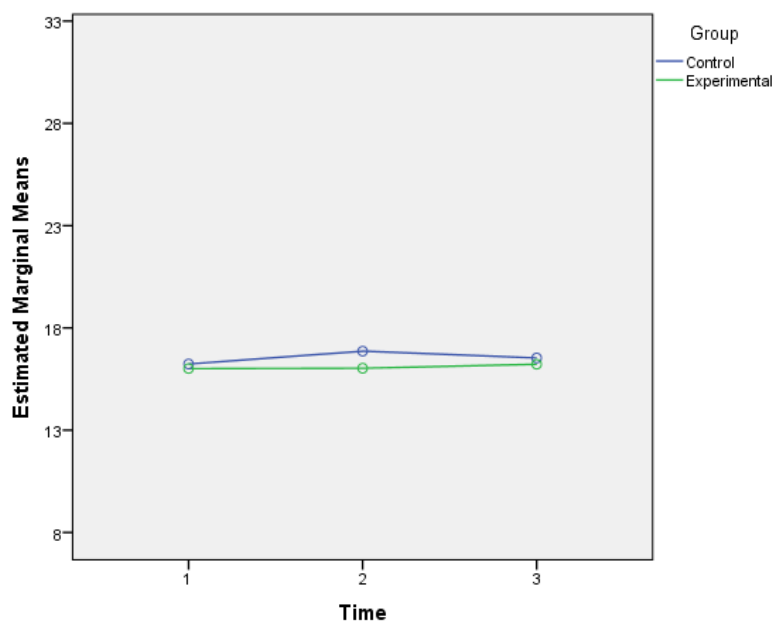


Figure 26: Evolution of Helplessness/Hopelessness dimension for each group (control and intervention) and each assessment time (pre, post and follow-up).

Table 20: Resumes the statistical significances found on the previous analyses of the coping skills.

Mini-MAC	Differences between the experimental and control group	Differences between pre, post and follow-up measures	Interaction between groups and pre, post, and follow-up measures	LOT-R as a covariable
Fighting Spirit	n.s.	n.s.	n.s.	0.00
Avoidance	n.s.	(pre and follow-up) 0.014	n.s.	(pre and follow-up) 0.006
Fatalism	n.s.	n.s.	n.s.	n.s.
Anxious Preoccupation	n.s.	(pre and follow-up) 0.027	n.s.	(pre and follow-up) 0.015
Helplessness/Hopelessness	n.s.	n.s.	n.s.	0.00

* Correlation is significant at the 0.05 level
(n.s.) = no statistical significance was found).

Will psychological intervention significantly improve positive affect in CRC patients during chemotherapy treatment intervention and follow-up?

Table 21 shows the mean and SD values of the subscales of The Positive and Negative Affect Schedule (PANAS) obtained in intervention and control groups in the beginning of the intervention (pre), intermedium (int1.), intermedium (int.2) at the last session (post) and at the follow-up.

Table 21: Mean and SD of scales of PANAS (positive affect and negative affect) for each group (intervention and control) and each assessment time (pre, intermedium, post and follow-up).

	Time1(Pre)		Time2(int.1)		Time3(int.2)		Time4(Post)		Time5 (Follow-up)											
	Interven tion (N=24)	Control (N=20)	Interven tion (N=44)	Control (N=20)	Interven tion (N=24)	Control (N=20)	Interven tion	Control	Interven tion	Control	Interven tion	Control	Interven tion	Control	Interven tion	Control	Interven tion	Control	Interven tion	Control
	M	S	M	S	M	S	M	S	M	S	Mea n	S D	M	S	M	S	M	S	M	S
Posi tive Affe ct	21 .6 3	4. 16 0	19 .8 1	4. 33 0	21 .2 5	4. 29 5	18 .7 6	3. 50 6	21 .9 6	4. 60 6	19.6 5	3. 54	22 .5 4	4. 70 0	20 .3 9	3. 75 9	22 .7 5	3. 45 5	19 .7 5	4. 85 5
Neg ativ e Affe ct	17 .1 7	3. 22 0	15 .8 3	3. 51 0	16 .3 3	3. 66 5	16 .0 6	3. 06 6	17 .4 6	3. 85 6	16.4 5	3. 80	16 .6 7	3. 63 5	15 .9 5	2. 54 3	16 .8 3	3. 57 3	16 .4 5	3. 50 5

In the positive affect (see figure 27) there was a statistically significantly-difference between the intervention group and the control group ($F= 4.553, p =0.039$) and with the punctuation of LOT-R scale ($F= 9.629, p=0.003$), while there were no differences between the five times of evaluation ($F=0.153, p=0.948$). There was not found interaction between LOT-R scale ($F=0.309, p=0.848$) treatment and time of evaluation ($F=0.215, p=0.911$).

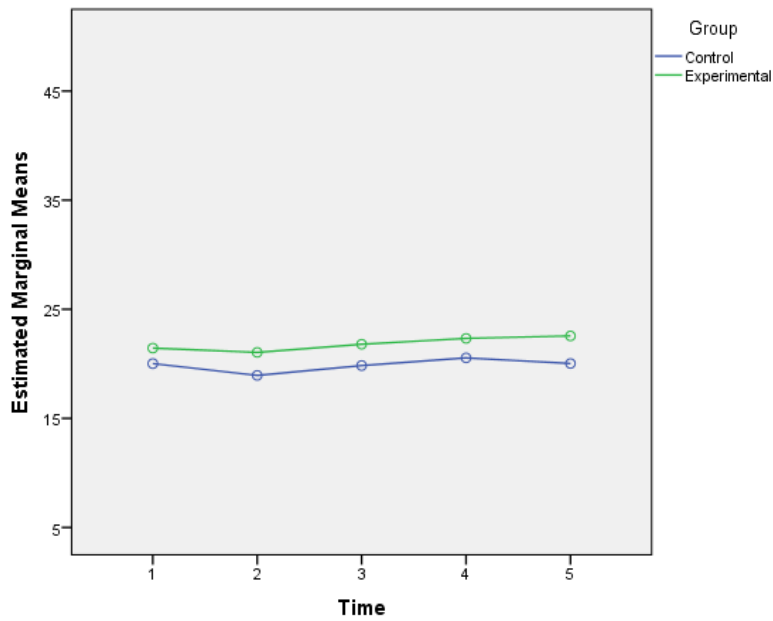


Figure 27: Evolution of Positive Affect for each group (control and intervention) and each assessment time (pre, int1, int2 and follow-up).

In the negative affect (see figure 28), there were no statistically significant differences between intervention and control group ($F= 0.616, p=0.437$), no differences between the LOT-R scale ($F= 1.523, p=0.224$) and no differences between the five times of evaluation ($F= 0.820, p=0.494$). There was not found interaction between treatment, time of evaluation ($F=0.495, p=0.738$) and Lot scale ($0.761, p=0.528$).

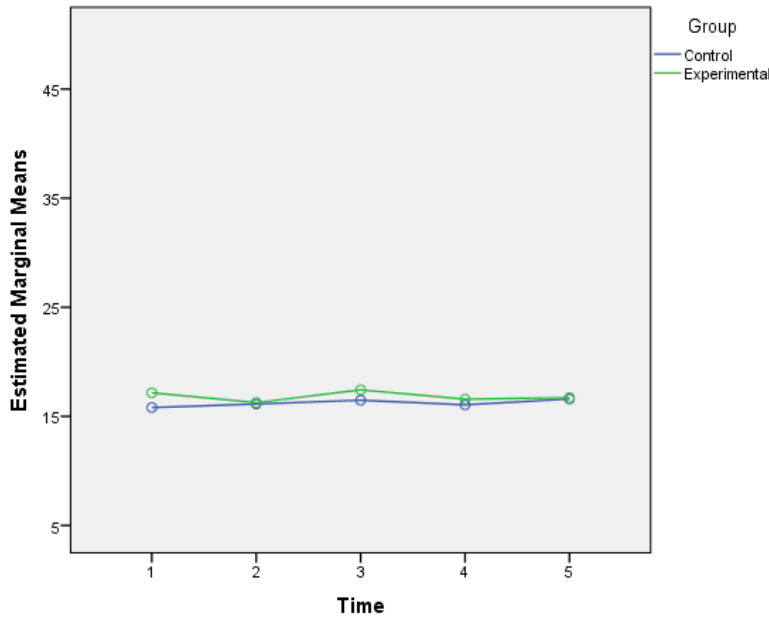


Figure 28: Evolution of Negative Affect for each group (control and intervention) each assessment time (pre, int1, int2, post and follow-up).

Table 22: Resumes the statistical significances found on the previous analysis of the positive and negative affect measures.

PANAS	Differences between the intervention and control group	Differences between pre, post and follow-up measures	Interaction between groups and pre, post, and follow-up measures	LOT-R as a covariable
Positive Affect	0.039*	n.s.	n.s.	0.003*
Negative Affect	n.s.	n.s.	n.s.	n.s.

* Correlation is significant at the 0.05 level

(n.s.) = no statistical significance was found).

What were the patients' opinion at the treatment group about the EPEP?

This section refers to the scores obtained at the items described at the Chapter V Table 23 shows the positive correlation between the use of cognitive strategy and scores about that EPEP improved positive emotions. There is a positive correlation between using behavior strategy and improving quality of life. There were also positive correlations between

improving positive emotions and improving quality of life. Finally, EPEP importance also correlates with improving positive emotions and quality of life.

Table 23: Correlations between strategies used in intervention and valorization of patients about EPEP.

	Behavior Strategy	How improve Positive Emotions	How increase Quality of Life	How is important
Cognitive Strategy	0.222	0.539**	0.090	0.173
Behavior Strategy		0.390	0.547**	0.392
How improve Positive Emotions			0.599**	0.556**
How increase Quality of Life				0.747**

**Correlation is significant at the 0.01 level

Figure 29 and 30 shows the number of patients who gave scores between 0-4, 5-7 and 8-10 ranges in each of the numeric scales. There were more patients who scored 5 or more for the behavior strategy (23/24) than for the cognitive strategy (21/24) (see figure 29). When higher scores (8-10) are considered, almost all patients (23/24) gave importance to the EPEP, whereas more than 50% stated that there was an improvement in PA (15/24) and quality of life (13/24) (see figure 30).

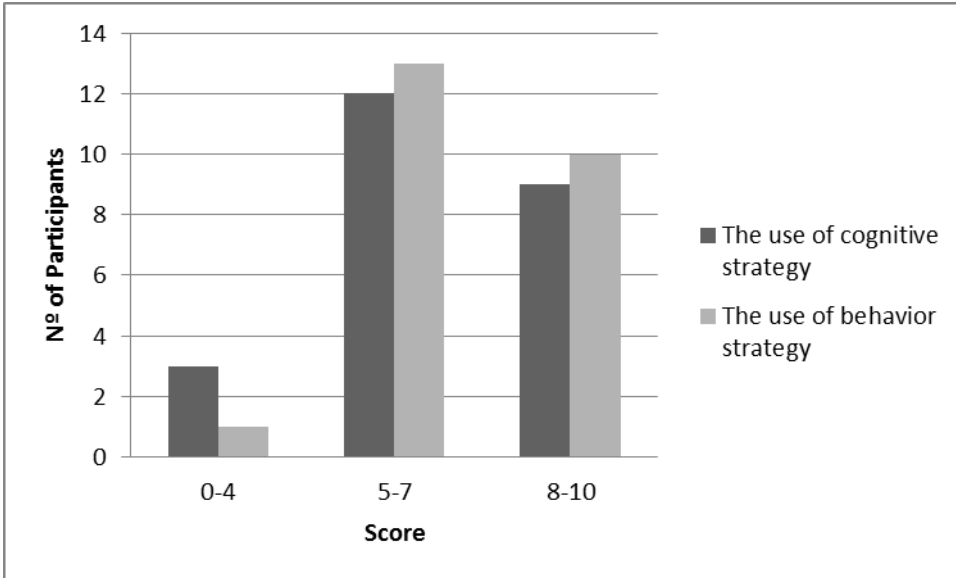


Figure 29: The frequency of strategies used by participants for execution of EPEP.

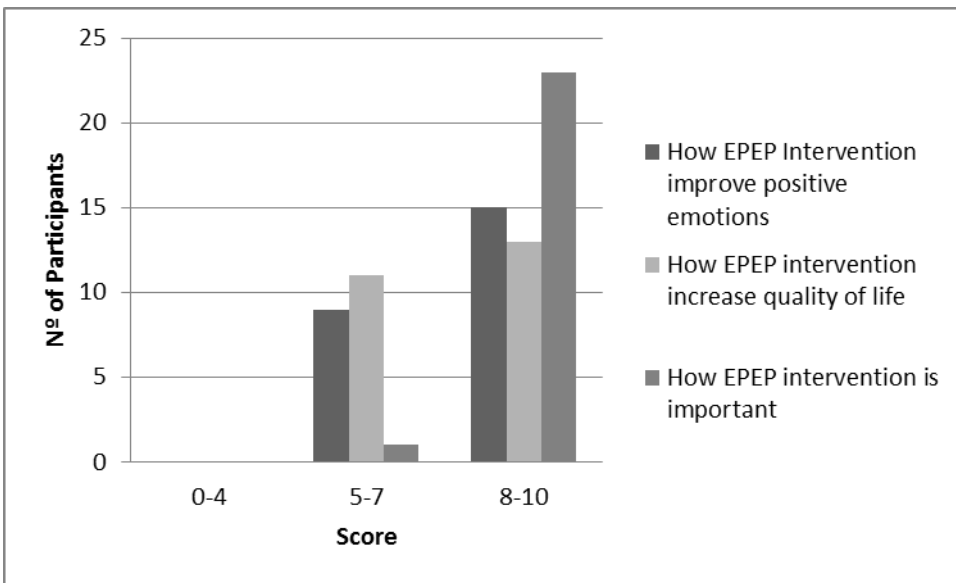


Figure 30: The frequency of Participants who score for evaluation of EPEP.

CHAPTER VII: Discussion

The purpose of this study was to examine the effects of the EPEP on quality of life, anxiety, depression, coping skills, and positive and negative affect. Each of these dimensions will be discussed separately, and at the end, a general discussion which will also analyze limitations and clinical implications of the research, will be presented.

Quality of Life

For quality of life the intervention group had better scores on global health status, physical, role and social functioning scales than control group at all assessments. Although this condition does not preclude the analysis about whether the EPEP increased quality of life, it would be desirable that both intervention and control groups had similar scores at the pretest condition. We cannot explain why these differences appeared but some considerations could be made. First, the fact that the intervention group was recruited in a different period of time than control group should produce a biased sample. Furthermore, this bias could also be enhanced because of the small number of participants in both groups. However, although statistical differences between groups have appeared, the mean scores for patients at both conditions were inside the range of normal clinical intervals (Scott, Fayers, Aaronson, Bottomley, Graeff, Groenvold, et al., 2008). Thus, from a clinical point of view, it could be considered that intervention and control groups did not differ. A second explanation should consider that a possible placebo effect appeared at the intervention group at the pretest level: since patients answered the EORTC-C30 questionnaire after knowing they belonged to a group which will receive psychological assistance, an optimistic bias in scoring items in some scales could be produced. In this sense, it must be pointed out that differences in emotional and cognitive functioning scales did not reach statistical significance, although mean scores

were also higher in the intervention group. Thus, this possible placebo effect should be restricted to some areas where patients should be more inclined to experience expectations of improvement (Manne, Edelson, Bergman, Carlson, Rubin, Rosenblum, et al., 2007).

Whatever the case, it is difficult to state that patients in treatment group achieved this improvement, since statistical differences in the scores evolution along the time between treatment and control conditions were not observed. However, a trend to a better condition in the global, physical, role and emotional scales in the treatment group was observed. Specially, mean score in treatment group at follow-up (81.59) was near the upper level of the clinical normal range (83.3), and has increased from the mean scores at pretest condition (73.95) thus suggesting that an improvement in these patients has been achieved, since patients at the control condition did not change mean scores across the three measures (66.25, at pretest, and 66.66, at follow-up). It is possible that EPEP had produced slight improvements in patients, which would not be detected by general measures such as those provided by quality of life questionnaires. Newell, Sanson-Fisher and Savolainen (2002) concluded that evidence of the efficacy of psychological treatment on distress and quality of life among people with cancer is inconclusive. They also noted a total lack of evidence for the efficacy of the interventions for improving social functioning. On the other hand, there are also conceptual reasons to explain inconclusive results. In one study (Kemmler, Holzner, Kopp, Dünser, Margreiter, Greil, et al., 1999) there was a lack of concordance between EORTC-QOL C30 and FACT scales on several domains of quality of life which demonstrate problems of concept of quality of life. It must be pointed out that currently there is already another questionnaire to assess the quality of life in patients with colorectal cancer specifically: the EORCT-QLQ-CR29. However, when this study began, the EORTC-CR29 was in validation process for the Portuguese population and was not available. In this study, (Moreira da Silva, 2012) QLQ-CR29

demonstrated construct validity, and was a good instrument to identify a poor QOL in patients with colorectal cancer, but did not correlate with QLQ-C30 scales. Because of that, it can be considered that if the EPEP effects in our study should be assessed with QLQ-CR29, bigger differences could be found between intervention and control groups.

In fact, studies which applied interventions which were based on positive psychology procedures, such ours, to enhance patients' conditions (for a review see Louro, Blasco and Fernández-Castro, 2015) did not generally use quality of life measures, whereas the instruments chosen were mainly addressed to assess mood and emotional states. Thus, perhaps changes in quality of life measures as a result of a brief-intervention procedure such as the EPEP, would be difficult to produce, since such a result would probably be more inclined to be expected from longer and larger interventions. For instance there was a study (Badger, Meek, Lopez, Bonham, & Sieger, 2005) that showed additional preliminary analysis which documented a dosage effect, such as that who received a greater number of minutes of the intervention evidenced greater gains in reducing negative and increasing positive indicators. This pattern was also consistent with findings provided by a meta-analysis, which showed that the duration of psychosocial interventions was positively correlated with improvements in patients' Quality of life.

In this sense, one study (Ramachandra, Booth, Pieters, Vrotsou, & Huppert, 2009) provided results that suggest improvements in quality of life assessed by the WHO Quality of Life Scale. It can be concluded that, in our study, the changes observed in the global scale suggest that, in spite of the absence of statistical significance, these improvements in quality of life should be partially achieved, and that, perhaps, our intervention procedure should produce small but permanent results.

Concerning symptoms scores, the means observed in both patient groups at pretest and posttest were very low in nausea, pain, and dyspnea (lower than 20 points in a 0-100 points scale) and, because of that, they should not be discussed. The same consideration can be stated about diarrhea and constipation symptoms. Fatigue and appetite loss scores increased across measures and this is a normal evolution produced by chemotherapy procedures. It is difficult to expect that psychological procedures should produce better scores in our intervention group when a powerful biological agent such as chemotherapy side-effects is present. Thus, these measures should not also be discussed from the point of view of whether psychological intervention would produce changes in these features, and the same can be stated about the dimension “Financial Difficulties”. Finally, we think that insomnia is the only symptom which should perhaps be affected by the EPEP. For example, in one study it was found a between-group difference based on treatment status (some of the women were in treatment - chemotherapy and/or radiation therapy during the study while others had already completed their treatment upon study entry) for sleep efficiency, with women currently receiving cancer treatment reporting worse sleep efficiency scores (Danahauer, Mihalko, Russell, Campbell, Felder, Daley, et al., 2009). In fact, we found a significant difference between intervention and control groups in insomnia scores, with insomnia reduced in the intervention group while the control group remained stable. However, as in the global health status case, this improvement did not reach significance.

In summary, if we consider as a whole the Global Health Status, the Emotional Functioning, and the Insomnia Scales, we can see the same evolution, suggesting that the intervention group had a slightly better condition than control patients, which could be produced by the EPEP. As it has been previously stated, perhaps these measures and scales are not suitable enough for observing the expected therapeutic effects. These considerations

will be reconsidered forward when discussing PANAS scores observed in our participants at the “Positive and Negative affect” section.

Anxiety and Depression

The prevalence of patients in our sample with scores over the cut-off points for anxiety and depression at the pretest was not very different of those observed in the study of a Portuguese version of the Hospital Anxiety and Depression Scale (Pais-Ribeiro, Silva, Ferreira, Martins, Meneses, & Baltar, 2007) where the cases of anxiety were 23.5% and 11.2% for depression. However, the percentage of patients with anxiety at pretest in our study was slightly greater (30% for treatment group and 35% for control group) but decreased at posttest and follow-up. This reduction was greater for treatment group, although this did not reach statistical significance. Once again, we can observe the same pattern of results than stated for some quality of life scales. Thus, the same statements can also be applied for the HADS-Anxiety measure. Ramachandra et al. (2009) observed a decrease in the HADS-Total scores in their patients of metastatic cancer after their psychological intervention. Thus, since our results are similar of those of Ramachandra's, it can be stated that probably the EPEP was also useful in decreasing patient's levels of anxiety.

Concerning the HADS-Depression scores, the percentages of patients with depression symptoms remained unchanged for both groups. However, the percentages of cases over the cut-off point at pretest were lower for the intervention group, although did not reach statistical significance. Reasons to explain these differences between groups should be the same of those previously stated for the quality of life measures. The question of why depression was unchanged could be due to the properties of the HADS instrument. The HADS was designed as a screening tool to identify patients which could be reaching levels of anxiety and

depression that would require psychiatric treatment. Since our sample had not a great number of cases with of these characteristics, it is difficult to find differences produced by the EPEP, which, on the other hand, was not designed to patients with these psychiatric features. For example a review of the literature (Greer, Moorey, Baruch, Watson, Robertson, Mason, et al., 1992) concluded that a quarter to a half of inpatients receiving treatment for cancer suffer from anxiety or depression, or both. Bearing this in mind, it can be considered that there was a relatively low prevalence of psychological morbidity in the sample of our study.

Thus, the EPEP seems to be useful for mood states related with anxiety symptoms, but not with depressive symptoms. However, these statements must be viewed with caution, and have to be revised in the light of results obtained by the EPEP to change positive and negative affect (see “Positive and Negative affect” section).

Cancer coping skills

The mean of subscales of Mini-MAC were low in contrast with those observed at the study validation of Mini-MAC for Portuguese cancer patients (Pereira & Santos, 2014), with the exception of the subscale of fighting spirit that in our study was higher. However, patients in this study were at the end of life. Thus, it is not proper to take these scores to assess whether our patients have lower or higher scores than other cancer patients. The same can be stated concerning the study of Johansson, Rydén, & Finizia (2011), which was developed in survivors. Fortunately, there are several studies which have studied the structure of Mini-MAC in cancer patients belonging to different countries such as Italy, Greece, China and The United Kingdom (Ho, Fung, Chang, Watson, & Tsui, 2003; Grassi, Buda, Cavana, Annunziata, Torta, & Varetto, 2005; Anagnostopoulos, Kolokotroni, Spanea, & Chrysochoou, 2006; Kang, Chung, Kim, Choi, Ahn, Jeung, et al., 2008; Hulbert-Williams,

Hulbert-Williams, Morrison, Neal, & Wilkinson, 2012). It seems that scores of Mini-MAC which seems to be suitable to be compared with a Portuguese sample, are those obtained in Italy, Greece or The United Kingdom. Concerning the Greek study, mean scores are not provided, since only factorial analysis was developed. The same can be stated about the United Kingdom study. Thus, only the Italian study (Grassi et al. 2005) can be used to establish comparisons. Scores of the Italian sample which included patients with different tumors were similar to our Portuguese sample in the Fighting Spirit Scale (mean of 12.64 for the Italian sample; 11.79 and 11.95 for our sample), Avoidance (mean of 11.75 for the Italian sample; 10.75 and 10.95 for our sample) and Fatalism (mean of 14.98 for the Italian sample; 14.29 and 14.80 for our sample). Slight differences were observed in Helplessness/Hopelessness (mean of 12.43 for the Italian sample; 15.96 and 16.30 for our sample) and Anxious Preoccupation (18.18 for the Italian sample; 19.92 and 19.30 for our sample). It seems that the Portuguese sample had higher levels of Helplessness and Anxious Preoccupation, but these differences could be produced by the different kind of patients in the Italian sample, since it was not an homogenous group of patients, although it included CRC patients. It would be necessary to know specifically the scores of other CRC samples to know whether Portuguese patients are or not different from patients at other countries. Whatever the case, the purpose of our study was to test whether the EPEP would change coping skills, and this question will be discussed right after.

Concerning the stability of the Mini-MAC scores, one possible argument could be that the clinical situation has not changed across measures: patients are under the side-effects of chemotherapy, but cancer situation remains without modifications. Patients could guess that they have a colorectal cancer and are receiving chemotherapy to treat it, but whether the cancer that is being cured, is unknown. Some worries are likely to be produced by

chemotherapy and its side-effects (fatigue, loss of appetite, etc.), but perhaps this does not produce new demands which require changes in the coping skills style, which could be enhanced by the EPEP procedure.

Finally, there is another reason to justify why coping skills did not change, even if this change would be required by the stress produced during chemotherapy. Theoretical explanations provided at the 2.2.1 section suggested that changes produced in behavior because of the presence of positive affect require that these positive affects appear frequently and with moderate to high levels of intensity. As it will be discussed at the next section, positive affect states produced by the EPEP in our study are generally small, and it is not clear whether their frequency and duration are high enough to generate changes in other psychological features such as personal resources and coping strategies.

Positive Affect and Negative affect

Two questions arise concerning the PA and NA in our patient's sample. Firstly, it will be discussed whether the affect levels were different or not from those found in other studies with cancer patients. Secondly, it is discussed whether the EPEP really was effective in increasing PA levels.

Some studies with cancer patients found PA or PANAS scores higher than those in our sample (Christie, Meyerowitz, Giedzinska-Simons, Gross, & Agus, 2009; Schroevers, Kraaij, & Garnefski, 2008; 2011; Voogt, Heide, Leeuwen, Visser, Vleiren, Passchier, et al., 2005); but mean scores of NA were very similar. PA is not just the flip side of negative affective states. Rather, there is increasing support for the idea that positive mood and negative mood are related but distinct constructs (Branstrom, Kvillemo, Brandberg, & Moskowitz, 2010). In spite of that, the mean PA and NA total scores were low in comparison with the range

provided in the original study (Watson, Clark, & Tellegan, 1988) and described at the Method section. This can be explained because the original range provided by Watson et al. (1988) was obtained in a sample of healthy persons. Furthermore, cultural differences could also produce different score levels. Thus, in the study of validation of PANAS Scale of the Korean version, Lim, Yu, Kim, & Kim, (2010) said that they had found lower total scores in contrast of others studies. These considerations need further research in Portuguese populations with healthy and non-healthy individuals to provide conclusions about whether CRC patients had normal or lower PA and NA than other persons.

The second question concerns the fact that the treatment group had higher score on positive affect at the five times of evaluation in contrast with control group although there were no significantly differences between groups and over time. Furthermore, no difference was found in the negative affect. This pattern is consistent with the pattern of results found in quality of life and anxiety. Therefore, it could be suggested that the differences between groups in quality of life and anxiety noted above, may be more related to differences in positive emotions than in negative emotions levels. In this sense, Hou, Law & Fu (2010) found that both loss and gain in PA during the immediate period of cancer diagnosis were significant predictors of anxiety and depressed mood. Although the previous considerations suggest that there was a slightly higher PA in the intervention group, which would be associated with less anxiety and better quality of life, it cannot be concluded, when PANAS scores are considered, that these effects were produced by the EPEP. It cannot be excluded that they could be related to the placebo effect mentioned above: patients at the intervention group could have increased their positive emotions because of knowing that they would be psychologically cared, but this fact should not affect negative emotions.

It is possible that the EPEP was actually effective to produce several moments of PA in the intervention group across sessions which were not experienced by the control group, but that these moments were not reflected at the PANAS scores because of the retrospective assessment that patients had to make to answer the items. If these moments of PA were not very frequent and not very intense, they would not probably be remembered by the patients when answering the PANAS, but, at the same time, perhaps these PA moments, could have produced a “subliminal widespread effect” of benefits which allowed the slight effects of increasing quality of life and reducing anxiety in the intervention group. This hypothesis can be sustained by the patients’ comments described at the Results section when describing how EPEP intervention improved positive emotions and increased quality of life. Being the positive emotions produced by placebo expectancies or by indirect effects of EPEP, it seems that positive affect states actually appeared in the treatment group and were related to relief and well-being.

Optimism

Finally, optimism had a stronger relationship with positive emotions, since participants who scored higher on the LOT-R showed higher scores on positive emotions. The reason why LOT-R was used was because there was the possibility of the personality type was bound to mislead the results. No interaction between optimism and the group or time was found, so the effect is the same whether for participants in the treatment group and for the control group at any time for evaluation. That relationship between optimism and positive emotions could explain why optimism has a significant influence on the Physical Functioning, and an almost significant relationship with Global Health Status, Role Functioning and less anxious concern, in this case optimism could influence by facilitating positive emotions. In this sense, although in a sample of pediatric cancer survivors, Castellano-Tejedor (2015) has also found a

relationship between optimism and the physical dimension of quality of life, and has also suggested that perhaps optimism could enhance other psychological resources which would produce better levels of quality of life and well-being.

General Discussion

Results of this research suggest that some features could be modified by the EPEP procedure, whereas some others would remain unchanged. Thus, coping skills and depression would not be affected by the EPEP. In the case of coping skills, as it has been previously discussed, this fact can be understood both because the limitations of the EPEP and the difficulty to change coping styles when the situation does not require new strategies to be developed to cope with the stressor. Concerning depression, the limitations of the EPEP could also justify why the patients with mild or moderate levels did not modify their HADS scores.

On the other hand, some dimensions of quality of life, as well as anxiety and positive emotions could be slightly improved by the EPEP, probably because of the effectiveness of the procedure to provide patients to increase slightly their moments of positive emotions. This small effect, as it will be discussed below, could be partially explained because of the limitations to apply EPEP in its optimal structure. Thus, it can be stated, with caution, that EPEP should be useful to improve well-being in CRC patients receiving chemotherapy. However, some additional comments about the main features of the research, its limitations, and its clinical implications, must be added to this consideration.

In spite of the limitations of this research, which are discussed in the next section, some general comments can be stated from the methodology used and from the results obtained.

One of the advantages of this research was the homogeneity of the participants concerning the kind of tumor, since the sample did not have mixed cancers. On the other

hand, the psychological intervention was adjuvant to the medical treatment and patients received the intervention while were getting medical treatment. This fact allowed, undoubtedly, a very low rate of study refusal. In this way, patients who are often physically unwell are not burdened with frequent visits to hospital and, equally important, psychological therapy is seen by patients as part of medical treatment. However, the adaptation of the EPEP to each patient's conditions allowed a better adherence to the psychological procedure precluded the homogeneity that an empirical research requires. It cannot be stated that all patients received the same pattern of psychological assistance, although it would probably be true that all patients received the best attention that could be provided by the researcher at each moment. This can be confirmed because, at it has been showed at the Results section, the majority of patients stated that the EPEP was useful to them and allowed to higher levels of positive affect and quality of life.

With these features in mind, it seems that the EPEP should have slight effects in increasing quality of life and in decreasing anxiety, which persisted over time (follow-up) and that this pattern was not present in the control group. Furthermore, participants of intervention group reported they enjoyed and benefited from their therapeutic experience when they were asked to evaluate the psychological intervention.

It can be considered that the slight effects produced for the EPEP can also explain why there were not changes in coping skills, depression levels, and positive and negative affect scores, as it has been discussed at the previous section. And it can also be considered that EPEP did not allow higher effects because the procedure, as it has been stated before, could not be applied in its optimal pattern to all patients at the intervention group (for example, time between EPEP sessions was too long in some cases because of the delays in applying chemotherapy when patients have not the medical conditions required for receiving the

oncological treatment). From this point on, it would be necessary to develop further research applying when EPEP as a whole procedure in a larger sample of patients, since it seems that higher therapeutic effects could be achieved. Certainly, results offered by the present research are not conclusive, but suggest that the EPEP can actually be useful for CRC patients receiving chemotherapy and, probably, also for cancer patients with other tumors. One argument to justify this statement is that, as it can be concluded from the review provided by Louro, Blasco and Fernández-Castro (2015), other interventions in cancer patients use a higher number of therapeutic sessions than those provided by our EPEP. Thus, we consider that further research about the possibilities of the EPEP to provide an increasing in patients' well-being, is justified.

Limitations of the Research

Initially, the researcher's goal was to recruit 100 colorectal cancer patients (50 per group) to participate in the study. However, some circumstances allowed the reduction of sample size and number of sessions. These circumstances were: a) the low "target audience", since only patients with colorectal cancer with stage II and III and one type of medical treatment (adjuvant Folfox treatment) were selected, b) severe cases were sent to the Psycho-oncology service of hospital, and could not be included in the sample, c) side effects of treatment and other psychosocial issues (change of medical treatment).

The number of patients with colorectal cancer participating in this research study does not allow the assumption of normality distribution of scores in the different features assessed. Thus, generalizations from this research study may not be appropriate and should be used with caution. Because of randomized controlled trials are generally more costly and time consuming than other studies and we have not enough resources to develop this kind of

design, we decided to develop a non-randomized clinical trial study, with its constraints to achieve control over the confusing variables. As with all non-randomized studies, it cannot be fully ascertained that the observed changes can be attributed to the intervention. Furthermore, although it was expected that both groups were similar at pretest measures, this condition was not always satisfied. Thus, when a ‘between groups’ analysis comparing performance in the treatment and control groups was performed, and there were observed differences, it must be taken with caution the assumptions that these differences could be produced by the EPEP. For all these reasons, the author assumes the need to be cautious in the generalization of results.

Recommendations for Future Research

As far as we know, cognitive behavioral therapy or other psychotherapies have not been studied in CRC patients. Review of the literature related to this study failed to identify previous studies on psychological interventions with diagnosed with colorectal cancer patients (Louro, Blasco, & Castro-Fernandez, 2015). Because of that, the present study can offer some previous findings which can be used as a reference for further research.

In this sense, replicating this research study with a larger sample of CRC patients would allow a more sensitive and powerful data for interpretation. It would be interesting to develop studies in more hospitals which could include diverse areas (metropolitan area and rural). Furthermore, as our results suggest that EPEP can enhance well-being, replication of this research study in other populations with various cancers to determine if similar results could be found ought to be very interesting. On the other hand, some other lines of research can be addressed to assess whether the differential effects of adjuvant psychological time-limited individual therapy interventions over a longer period of time could yield different results, or

to examine other psychological theories and methods, in order to determine the most effective therapeutic modality to implement with CRC patients.

Clinical Suggestions

Outpatient psychotherapy with colorectal cancer patients might be a challenge to the therapist because of the unpredictability of the patients' lives, the time of chemotherapy treatment and duration and the response of patients' cancer treatment. Therefore, therapy should be flexible to meet the needs of patients. For example, if the patient is too tired or ill to come to the treatment, home visits or telephone calls from the therapist might be a good alternative.

Physicians should consider a holistic approach in treating cancer patients. They should consider psychological interventions as an essential component of patient care. Physicians specializing in the treatment of cancer patients may benefit from training and/or receiving information about the benefits of mental health counseling for patients who have received a cancer diagnosis or are undergoing cancer treatment.

Psychological services should be introduced when a patient is first diagnosed with cancer. Moorey and Greer (2002) posited that the traumatic impact of a cancer diagnosis requires close attention to the patients' emotional needs. In addition, psychological interventions should be continued throughout the cancer experience because patients face many emotional stressors. Early multidisciplinary support (medical, psychological, social and nutritional) is always associated with better outcomes for the patient. The negative impact of not applying psychological support can be expensive in terms of increased medical treatment costs, since patients are more likely to ask for medical attentions or emergency services in front of some symptoms and stress which could be treated and prevented if a good

psychological support is provided. In this sense, a simple and cost-effective psychological support provided by procedures such as the EPEP could be useful and suitable for oncology units.

Conclusions

1. CRC patients during chemotherapy treatment enrolled on a Enhancing Positive Emotions Procedure (EPEP) intervention showed a steady better quality of life than the control group in global health status, physical state, and role and social functioning.

2. EPEP seems to be potentially useful to reduce mood states related to anxiety symptoms, but not to depressive symptoms.

3 CRC patients during chemotherapy treatment enrolled on an EPEP intervention showed more positive affect than control patients, but there were not differences in negative affect between intervention and control groups.

4. EPEP did not influence on personal resources and coping strategies, possibly because it was a short intervention. So, it is possible to induce quick positive changes on quality of life and positive affect without major changes in attitudes and coping strategies.

5. CRC patients during chemotherapy treatment enrolled on an EPEP intervention believed that this intervention was important and improved their positive affect and quality of life.

6. Implementation of an EPEP-based psychological support to CRC patients should be seriously considered, considering its potential benefits.

REFERENCES:

- Aaronson, N., Ahmedzai, S., Bergman, B., Bullinger, C., Cull, A., Duez, N. et al. (1993). The European Organization for Research and Treatment of Cancer QLQ-C30: A quality-of life-instrument for use in international clinical trials in oncology. *Journal of the National Cancer Institute*, 85(5), 365-375.
- Anagnostopoulos, F., Kolokotroni, P., Spanea, E., & Chrysochoou, M. (2006). The Mini-Mental Adjustment to Cancer (Mini-Mac) Scale: Construct Validation with a Greek Sample of Breast Cancer Patients. *Psycho-Oncology*(15), 79-89.
- American Cancer Society. *Cancer Facts & Figures 2013* Atlanta, Ga: American Cancer Society; 2013.
- Andre, T., Boni, C., Navarro, M., Tabernero, J., Hickish, T., Topham, C., et al. (2009). Improved Overall Survival With Oxaliplatin, Fluorouracil, and Leucovorin As Adjuvant Treatment in Stage II or III Colon Cancer in the MOSAIC Trial. *Journal of Clinical Oncology*, 27(19), 3109-3116.
- Arndt, V., Merx, H., Stegmaier, C., Ziegler, H., & Brenner, H. (2006). Restrictions in quality of life in colorectal cancer patients over three years after diagnosis: A population based study. *European Journal of Cancer*, 42(12), 1848-1857.
- Arndt, V., Merx, H., Stegmaier, C., Ziegler, H., & Brenner, H. (2004). Quality of life in patients with colorectal cancer 1 year after diagnosis compared with the general population: A population-based study. *Journal of Clinical Oncology*, 22(23), 4829-4836.
- Aspinwall, L. G., & MacNamara, A. (2005). Taking positive changes seriously - Toward a positive psychology of cancer survivorship and resilience. *Cancer*, 104(11), 2549-2556.

- Aspinwall, L. G., & Tedeschi, R. G. (2010). The Value of Positive Psychology for Health Psychology: Progress and Pitfalls in Examining the Relation of Positive Phenomena to Health. [Article]. *Annals of Behavioral Medicine*, 39(1), 4-15.
- Badger, T., Segrin, C., Meek, P., Lopez, A. M., Bonham, E., & Sieger, A. (2005). Telephone interpersonal counseling with women with breast cancer: Symptom management and quality of life. *Oncology Nursing Forum*, 32(2), 273-279.
- Branstrom, R., Kvillemo, P., Brandberg, Y., & Moskowitz, J. T. (2010). Self-report Mindfulness as a Mediator of Psychological Well-being in a Stress Reduction Intervention for Cancer Patients-A Randomized Study. *Annals of Behavioral Medicine*, 39(2), 151-161.
- Casellas-Grau, A., Font, A., & Vives, J. (2014). Positive psychology interventions in breast cancer. A systematic review. [Review]. *Psycho-Oncology*, 23(1), 9-19.
- Castellano, T. (2015). Optimismo, Afrontamiento y Cáncer Pediátrico: Un estudio descriptivo. *Psicooncología*, 12(1), 19-38.
- Christie, K. M., Meyerowitz, B. E., Giedzinska-Simons, A., Gross, M., & Agus, D. B. (2009). Predictors of affect following treatment decision-making for prostate cancer: conversations, cognitive processing, and coping. *Psycho-Oncology*, 18(5), 508-514.
- Cohn, M. A., Fredrickson, B. L., Brown, S. L., Mikels, J. A., & Conway, A. M. (2009). Happiness Unpacked: Positive Emotions Increase Life Satisfaction by Building Resilience. [Article]. *Emotion*, 9(3), 361-368.
- Compton, C. C., & Greene, F. L. (2004). The staging of colorectal cancer: 2004 and beyond. *Ca-a Cancer Journal for Clinicians*, 54(6), 295-308.

- Coyne, J. C., & Tennen, H. (2010). Positive Psychology in Cancer Care: Bad Science, Exaggerated Claims, and Unproven Medicine. [Article]. *Annals of Behavioral Medicine*, 39(1), 16-26.
- Danhauer, S. C., Mihalko, S. L., Russell, G. B., Campbell, C. R., Felder, L., Daley, K., et al. (2009). Restorative yoga for women with breast cancer: findings from a randomized pilot study. *Psycho-Oncology*, 18(4), 360-368.
- Denlinger, C. S., & Barsevick, A. M. (2009). The Challenges of Colorectal Cancer Survivorship. *Journal of the National Comprehensive Cancer Network*, 7(8), 883-893.
- Diener, E., & Diener, C. (1996). Most people are happy. *Psychological Science*, 7(3), 181-185.
- Diener, E., & Lucas, R. E. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125(2), 276.
- Duckworth, A. L., Steen, T. A., & Seligman, M. E. P. (2005). Positive psychology in clinical practice *Annual review of clinical psychology* (Vol. 1, pp. 629-651). Palo Alto: Annual Reviews.
- Dunn, J., Lynch, B., Aitken, J., Leggett, B., Pakenham, K., & Newman, B. (2003). Quality of life and colorectal cancer: a review. *Australian and New Zealand Journal of Public Health*, 27(1), 41-53.
- Dunn, J., Lynch, B., Rinaldis, M., Pakenham, K., McPherson, L., Owen, N., et al. (2006). Dimensions of quality of life and psychosocial variables most salient to colorectal cancer patients. [Article]. *Psycho-Oncology*, 15(1), 20-30.
- Ehrenreich, B. (2009). *Smile or Die: How the Relentless Promotion of Positive Thinking Has Undermined America*. New York: Metropolitan Books.

- Ferlay J, Shin HR, Bray F, Forman D, Mathers C and Parkin DM. GLOBOCAN 2008 v2.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 10 [Internet]. Lyon, France: International Agency for Research on Cancer; 2010. Available from: <http://globocan.iarc.fr>, accessed on 19/10/2013.
- Folkman, S. (1997). Positive psychological states and coping with severe stress. *Social Science & Medicine*, 45(8), 1207-1221.
- Folkman, S., & Greer, S. (2000). Promoting psychological well-being in the face of serious illness: When theory, research and practice inform each other. *Psycho-Oncology*, 9(1), 11-19.
- Folkman, S., & Moskowitz, J. T. (2000). Positive affect and the other side of coping. *American Psychologist*, 55(6), 647-654.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology - The broaden-and-build theory of positive emotions. [Article]. *American Psychologist*, 56(3), 218-226.
- Fredrickson, B. L. (2013). Positive Emotions Broaden and Build. In P. Devine & A. Plant (Eds.), *Advances in Experimental Social Psychology*, Vol 47 (Vol. 47, pp. 1-53). San Diego: Elsevier Academic Press Inc.
- Fredrickson, B. L., Cohn, M. A., Coffey, K. A., Pek, J., & Finkel, S. M. (2008). Open Hearts Build Lives: Positive Emotions, Induced Through Loving-Kindness Meditation, Build Consequential Personal Resources. [Article]. *Journal of Personality and Social Psychology*, 95(5), 1045-1062.
- Fredrickson, B. L., & Joiner, T. (2002). Positive emotions trigger upward spirals toward emotional well-being. [Article]. *Psychological Science*, 13(2), 172-175.

- Fredrickson, B. L., & Levenson, R. W. (1998). Positive emotions speed recovery from the cardiovascular sequelae of negative emotions. *Cognition & Emotion, 12*(2), 191-220.
- Frijda, N. H. (2009). Emotions, individual differences and time course: Reflections. *Cognition and Emotion, 23*(7), 1444-1461.
- Gable, s. L., & Haidt, J. (2005). What (and Why) is Positive Psychology. *Review of General Psychology, 9*(2), 103-110.
- Galinha, I. C., & Pais-Ribeiro, J. L. (2005). Contribuição para o estudo da versão portuguesa da Positive and Negative affect Schedule (PANAS): II - Estudo psicométrico. *Análise Psicológica, 23*(2), 219-227.
- Gorin, S. S. (2010). Theory, measurement, and controversy in positive psychology, health psychology, and cancer: basics and next steps. *Annals of Behavioral Medicine, 39*(1), 43-47.
- Gray, N. M., Hall, S. J., Browne, S., Macleod, U., Mitchell, E., Lee, A. J., et al. (2011). Modifiable and fixed factors predicting quality of life in people with colorectal cancer. *British Journal of Cancer, 104*(11), 1697-1703.
- Grassi, L., Buda, P., Cavana, L., Annunziata, M. A., Torta, R., & Varetto, A. (2005). Styles of coping with cancer: The Italian version of the Mini-Mental Adjustment to Cancer (Mini-Mac) Scale. *Psycho-Oncology*(14), 115-124.
- Greer, S. (1995). Improving quality of life: adjuvant psychological therapy for patients with cancer. *Supportive Care in Cancer, 3*(4), 248-251.
- Greer, S. (2008). CBT for emotional distress of people with cancer: some personal observations. *Psycho-Oncology, 17*(2), 170-173.

- Greer, S., Moorey, S., & Baruch, J. (1991). Evaluation of adjuvant psychological therapy for clinically referred cancer patients. *British Journal of Cancer*, *63*(2), 257-260.
- Greer, S., Moorey, S., Baruch, J. D., Watson, M., Robertson, B. M., Mason, A., et al. (1992). Adjuvant psychological therapy for patients with cancer: a prospective randomised trial. *BMJ*, *304*, 675-680.
- Ho, S. M. Y., Fung, W. K., Chang, C. L. W., Watson, M., & Tsui, Y. K. Y. (2003). Psychometric properties of the chinese version of the mini-mental adjustment to cancer (MINI-MAC) scale. *Psycho-Oncology*, *12*, 547-556.
- Holland, J. C. (2002). History of Psycho-Oncology: Overcoming Attitudinal and Conceptual Barriers. *Psychosomatic Medicine*, *64*, 206-221.
- Howell, R. T. (2009). Review: positive psychological well-being reduces the risk of mortality in both ill and healthy populations. *Evidence Based Mental Health*, *12*(2), 41-41.
- Hou, W. K., Law, C. C., & Fu, Y. T. (2010). Does change in positive affect mediate and/or moderate the impact of symptom distress on psychological adjustment after cancer diagnosis? A prospective analysis. *Psychology & Health*, *25*(4), 417-431.
- Hulbert-Williams, N. J., Hulbert-Williams, L., Morrison, V., Neal, R. D., & Wilkinson, C. (2012). The Mini-Mental Adjustment to Cancer Scale: re-analysis of its psychometric properties in a sample of 160 mixed cancer patients. *Psycho-Oncology*(21), 792-797.
- Hulbert-Williams, N., Neal, R., Morrison, V., Hood, K., & Wilkinson, C. (2012). Anxiety, depression and quality of life after cancer diagnosis: what psychosocial variables best predict how patients adjust? *Psycho-Oncology*, *21*(8), 857-867.

- Hyphantis, T., Paika, V., Almyroudi, A., Kampletsas, E. O., & Pavlidis, N. (2011). Personality variables as predictors of early non-metastatic colorectal cancer patients' psychological distress and health-related quality of life: A one-year prospective study. *Journal of Psychosomatic Research*, 70(5), 411-421.
- Iconomou, G., Mega, V., Koutras, A., Iconomou, A. V., & Kalofonos, H. P. (2004). Prospective assessment of emotional distress, cognitive function, and quality of life in patients with cancer treated with chemotherapy. *Cancer*, 101(2), 404-411.
- Jansen, L., Koch, L., Brenner, H., & Arndt, V. (2010). Quality of life among long-term (≥ 5 years) colorectal cancer survivors - Systematic review. [Review]. *European Journal of Cancer*, 46(16), 2879-2888.
- Jeon, H.-J., Woo, J.-H., Lee, H.-Y., Park, K.-J., & Choi, H.-J. (2011). Adjuvant Chemotherapy Using the FOLFOX Regimen in Colon Cancer. *Journal of the Korean Society of Coloproctology*, 27(3), 140-146.
- Johansson, M., Rydén, A., & Finizia, C. (2011). Mental adjustment to cancer and its relation to anxiety, depression, HRQL and survival in patients with laryngeal cancer. *BMC Cancer*, 11, 283-292.
- Kang, J. I., Chung, H. C., Kim, S. J., Choi, H. J., Ahn, J. B., Jeung, H.-C., et al. (2008). Standardization of the Korean version of Mini-Mental Adjustment to Cancer (K-Mini-MAC) scale: factor structure, reliability and validity. *Psycho-Oncology*(17), 592-597.
- Kemmler G., Holzner B., Kopp M., Dünser M., Margreiter R., Greil R., et al. (1999) Comparison of two quality-of-life instruments for cancer patients: the functional assessment of cancer

therapy-general and the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-C30. *J Clin Oncol*, 17, 2932-2940.

Koroukian, S. M., Xu, F., Bakaki, P. M., Diaz-Insua, M., Towe, T. P., & Owusu, C. (2010). Comorbidities, Functional Limitations, and Geriatric Syndromes in Relation to Treatment and Survival Patterns Among Elders With Colorectal Cancer. *Journals of Gerontology Series a-Biological Sciences and Medical Sciences*, 65(3), 322-329.

Laranjeira, C. A. (2008). Portuguese Translation and Validation of the Revised Life Orientation Test (LO-R). *Universitas Psychologica*, 7(2).

Lazarus, R., & Folkman, S. (1984). *Stress, Appraisal and Coping*. New York: Springer.

Lazarus, R. S. (2003). Does the positive psychology movement have legs? [Article]. *Psychological Inquiry*, 14(2), 93-109.

Lim, Y.-J., Yu, B.-H., Kim, D.-K., & Kim, J.-H. (2010). The Positive and Negative Affect Schedule: Psychometric Properties of the Korean Version. *Psychiatry Investig*, 7, 163-169.

Linley, P. A., Joseph, S., Harrington, S., & Wood, A. (2006). Positive psychology: Past, present, and (possible) future. *The Journal of Positive Psychology*, 1(1), 3-16.

Louro, A. C., Blasco, T., & Castro-Fernández, J. (2015). Is there a relationship between positive affect and other dimensions of quality of life in colorectal cancer patients? *Anales de Psicología*, 31(2), 404-413.

Maddux, J. E. (2008). Positive psychology and the illness ideology: toward a positive clinical psychology. *Applied Psychology: An International Review*, 57, 54-70.

- Maguire, P. (2000). Managing psychological morbidity in cancer patients. *European Journal of Cancer*, 36(5), 556-558.
- Manne, S. L., Edelson, M., Bergman, C., Carlson, J., Rubin, S., Rosenblum, N., et al. (2007). Coping and communication-enhancing intervention versus supportive counseling for women diagnosed with gynecological cancers. *Journal of Consulting and Clinical Psychology*, 75(4), 615-628.
- McCaughan, E., Parahoo, K., & Prue, G. (2011). Comparing cancer experiences among people with colorectal cancer: a qualitative study. *Journal of Advanced Nursing*, 67(12), 2686-2695.
- Moreira da Silva, J. P. (2012). EORTC QLQ CR-29 evaluation in 500 patients with colorectal cancer. *J Clin Oncol* 30 (suppl 4; abstr 429).
- Moorey, S., & Greer, S. (2002). *Cognitive Behaviour Therapy for people with cancer*. New York: Oxford University Press.
- Moorey, S., Greer, S., Bliss, J., & Law, M. (1998). A comparison of adjuvant psychological therapy and supportive counselling in patients with cancer. *Psycho-Oncology*, 7(3), 218-228.
- National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Colon Cancer. V.1.2014. Accessed at www.nccn.org on 19/10/2013.
- National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Rectal Cancer. V.4.2013. Accessed at www.nccn.org on 19/10/2013.
- Nelson, H., Petrelli, N., Carlin, A., Couture, J., Fleshman, J., Guillem, J., et al. (2001). Guidelines 2000 for colon and rectal cancer surgery. *Journal of the National Cancer Institute*, 93(8), 583-596.

- Newell, S., Sanson-Fisher, R. W., & Savolainen, N. J. (2002). Systematic review of psychological therapies for cancer patients: Overview and recommendations for future research. *Journal of the National Cancer Institute, 94*, 558–584.
- Nishigaki, M., Oya, M., Ueno, M., Arai, M., Yamaguchi, T., Muto, T. et al. (2007). The influence of life stage on psychosocial adjustment in colorectal cancer patients. *Journal of Psychosocial Oncology, 25*, 71-87.
- Northouse, L. L., Mood, D., Templin, T., Mellon, S., & George, T. (2000). Couples' patterns of adjustment to colon cancer. *Social Science & Medicine, 50*(2), 271-284.
- Nugent, K. P., Daniels, P., Stewart, B., Patankar, R., & Johnson, C. D. (1999). Quality of life in stoma patients. [Article; Proceedings Paper]. *Diseases of the Colon & Rectum, 42*(12), 1569-1574.
- Ostir, G. V., Markides, K. S., Black, S. A., & Goodwin, J. S. (2000). Emotional well-being predicts subsequent functional independence and survival. *Journal of the American Geriatrics Society, 48*(5), 473-478.
- Pais-Ribeiro, J., Silva, I., Ferreira, T., Martins, A., Meneses, R., & Baltar, M. (2007). Validation study of a Portuguese version of the Hospital Anxiety and Depression Scale. *Psychology, Health & Medicine, 12*(2), 225-237.
- Pais-Ribeiro, J. L., Pinto, C., & Santos, C. (2008). Validation study of the portuguese version of the QLC-C30-V.3. *Psicologia, Saúde & Doenças 9*(1), 89-102.
- Pais-Ribeiro, J. L., Ramos, D., & Samico, S. (2003). Contribution to a conservative validation of portuguese version of the mini mental adjustment to cancer scale (Mini-Mac). *Psicologia, Saúde & Doenças, 4*(2), 231-247.

- Penninx, B., Guralnik, J. M., Bandeen-Roche, K., Kasper, J. D., Simonsick, E. M., Ferrucci, L. et al. (2000). The protective effect of emotional vitality on adverse health outcomes in disabled older women. *Journal of the American Geriatrics Society*, 48(11), 1359-1366.
- Pereira, F. M. P., & Santos, C. S. V. d. B. (2014). Initial validation of the Mini-Mental Adjustment to Cancer. *European Journal of Oncology Nursing*, 18, 534-539.
- Phipps, E., Braitman, L. E., Stites, S., & Leighton, J. C., Jr. (2008). Quality of life and symptom attribution in long-term colon cancer survivors. *Journal of Evaluation in Clinical Practice*, 14(2), 254-258.
- Pressman, S. D., & Cohen, S. (2005). Does Positive Affect Influence Health? *Psychological Bulletin*, 131(6), 925-971.
- Rinaldis, M., Pakenham, K. I., Lynch, B. M., & Aitken, J. F. (2009). Development, confirmation, and validation of a measure of coping with colorectal cancer: a longitudinal investigation. *Psycho-Oncology*, 18(6), 624-633.
- Ramachandra, P., Booth, S., Pieters, T., Vrotsou, K., & Huppert, F. A. (2009). A brief self-administered psychological intervention to improve well-being in patients with cancer: results from a feasibility study. *Psycho-Oncology*, 18(12), 1323-1326.
- Rasmussen, H. N., Scheier, M. F., & Greenhouse, J. B. (2009). Optimism and physical health: a meta-analytic review. *Annals of Behavioral Medicine*, 37(3), 239-256.
- Reynolds, J. S., & Perrin, N. A. (2004). Mismatches in social support and psychosocial adjustment to breast cancer. *Health Psychology*, 23(4), 425-430.

- Ridner, S. H. (2004). Psychological distress: concept analysis. *Journal of Advanced Nursing*, 45(5), 536-545.
- Ross, L., Abild-Nielsen, A. G., Thomsen, B. L., Karlsen, R. V., Boesen, E. H., & Johansen, C. (2007). Quality of life of Danish colorectal cancer patients with and without a stoma. *Supportive Care in Cancer*, 15(5), 505-513.
- Scheier, M. F., Carver, C. S., and Bridges, M.W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A re-evaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, 67, 1063-1078.
- Scherer, M., & Herrmann-Lingen, C. (2009). Single item on positive affect is associated with 1-year survival in consecutive medical inpatients. *General Hospital Psychiatry*, 31(1), 8-13.
- Schnur, J. B., David, D., Kangas, M., Green, S., Bovbjerg, D. H., & Montgomery, G. H. (2009). A Randomized trial of a cognitive-behavioral therapy and hypnosis intervention on positive and negative affect during breast cancer radiotherapy. *Journal of Clinical Psychology*, 65(4), 443-455.
- Schofield, P., Ball, D., Smith, J. G., Borland, R., O'Brien, P., Davis, S. et al. (2004). Optimism and survival in lung carcinoma patients. *Cancer*, 100(6), 1276-1282.
- Schroevers, M., Kraaij, V., & Garnefski, N. (2008). How do cancer patients manage unattainable personal goals and regulate their emotions? *British Journal of Health Psychology*, 13, 551-562.
- Schroevers, M., Kraaij, V., & Garnefski, N. (2011). Cancer patients' experience of positive and negative changes due to the illness: relationships with psychological well-being, coping , and goal reengagement. *Psycho-Oncology*, 20, 165-172.

- Scott, N. W., Fayers, P. M., Aaronson, N. K., Bottomley, A., Graeff, A., Groenvold, M., et al. (2008). *This manual presents reference data for the QLQ-C30 based upon data provided by EORTC Quality of Life Group Members and other users of the QLC-C30*. Brussels: EORTC Quality of Life Group.
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology - An introduction. [Editorial Material]. *American Psychologist*, *55*(1), 5-14.
- Seligman, M. E. P. (2008). Positive health. [Article]. *Applied Psychology-an International Review-Psychologie Appliquee-Revue Internationale*, *57*, 3-18.
- Seligman, M. E. P., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress - Empirical validation of interventions. *American Psychologist*, *60*(5), 410-421.
- Sheldon, K. M., & King, L. (2001). Why positive psychology is necessary. *American Psychologist*, *56*(3), 216-217.
- Simon, A. E., Thompson, M. R., Flashman, K., & Wardle, J. (2009). Disease stage and psychosocial outcomes in colorectal cancer. *Colorectal Disease*, *11*(1), 19-25.
- Simmons, K. L., Smith, J. A., Bobb, K.-A., & Liles, L. L. M. (2007). Adjustment to colostomy: stoma acceptance, stoma care self-efficacy and interpersonal relationships. *Journal of Advanced Nursing*, *60*(6), 627-635
- Simon, A. E., Thompson, M. R., Flashman, K., & Wardle, J. (2009). Disease stage and psychosocial outcomes in colorectal cancer. *Colorectal Disease*, *11*(1), 19-25.
- Snyder, C. R., & McCullough, M. E. (2000). A Positive Psychology Field of Dreams: ““If You Build it, They Will Come.....””. *Journal of Social and Clinical Psychology*, *19*(1), 151-160.

- Snyder, C., & Lopez, S. (2002). *Handbook of Positive Psychology*. New York: Oxford University Press.
- Sukantarat, K., Greer, S., Brett, S., & Williamson, R. (2007). Physical and psychological sequelae of critical illness. [Article]. *British Journal of Health Psychology*, *12*, 65-74.
- Tsunoda, A., Nakao, K., Hiratsuka, K., Yasuda, N., Shibusawa, M., & Kusano, M. (2005). Anxiety, depression and quality of life in colorectal cancer patients. *International journal of clinical oncology*, *10*(6), 411-417.
- Vázquez, C. & Castilla, C. (2007). Emociones positivas y crecimiento postraumático en cáncer de mama. *Psicooncología*, *4*(2-3), 385-404.
- Voogt, E., Van der Heide, A., Van Leeuwen, A. F., Visser, A. P., Cleiren, M., Passchier, J., et al. (2005). Positive and negative affect after diagnosis of advanced cancer. *Psycho-Oncology*, *14*(4), 262-273.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS Scales. *Journal of Personality and Social Psychology*, *54*, 1063–1070.
- Watson, M., Law, M. G., Santos, M., Greer, S., Baruch, J., & Bliss, J. (1994). The Mini-MAC. *Journal of Psychosocial Oncology*, *12*(3), 33-44.
- Wilson, T. R., Alexander, D. J., & Kind, P. (2006). Measurement of health-related quality of life in the early follow-up of colon and rectal cancer. *Diseases of the Colon & Rectum*, *49*(11), 1692-1702.

- Wood, A. M., & Tarrier, N. (2010). Positive Clinical Psychology: A new vision and strategy for integrated research and practice. *Clinical Psychology Review, 30*(7), 819-829.
- Worster, B., & Holmes, S. (2008). The preoperative experience of patients undergoing surgery for colorectal cancer: A phenomenological study. *European Journal of Oncology Nursing, 12*(5), 418-424.
- Wright, E. P., Kiely, M. A., Lynch, P., Cull, A., & Selby, P. J. (2002). Social problems in oncology. *British Journal of Cancer, 87*(10), 1099-1104.
- Zabora, J., Brintzenhofesoc, K., Curbow, B., Hooker, C., & Piantadosi, S. (2001). The prevalence of psychological distress by cancer site. *Psycho-Oncology, 10*(1), 19-28.
- Zigmond, A. S., & Snaith, R. P. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica, 67*(6), 361-370.

APPENDIX A: Research Certificate

Research stay certificate at Portuguese Institute of Oncology – Oporto, Portugal

STUDENT'S PERSONAL DETAILS:

Surnames and First Name: ANDRÉ CARDOSO LOURO

ID Card Number: 11905886

Degree: PhD. Student

(to be filled in by the host institution)

HOST INSTITUTION:

Name: Instituto Português de Oncologia do Porto FG, EPE (IPO-Porto)

Postal Address: Rua Dr. António Bernardino de Almeida 4200-072 Porto

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Name: *Lúcia José de LARA Santos*

Telephone: *+351 21 6 321 314*

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I certify that the student named above has stayed in this institution engaged in research related to the preparation of his doctoral thesis during the period indicated below:

Arrival Date: May, 2012

Departure Date: February, 2014

Name:

Signature and stamp:

Lúcia José de LARA Santos
PhD



APPENDIX B: Research Informed Consent

Informação sobre investigação (Intervenção)

Título do estudo: Emoções positivas e qualidade de vida em doentes com cancro do cólon rectal

Autor da Investigação: André Cardoso Louro

Propósito do estudo

Ter uma doença significa viver uma série de novas situações que requer adaptação a determinadas circunstâncias. Nem todas as pessoas têm a mesma facilidade para lidar com a doença e é por esta razão que consideramos necessário compreender em profundidade as reacções dos pacientes à doença. Pretende-se com esta investigação perceber qual é o impacto que as emoções positivas têm na qualidade de vida do paciente e na evolução da doença e aplicar uma intervenção psicológica, de forma, a aumentar as emoções positivas.

Condições de Participação

Estamos a convidá-lo para participar nesta investigação.

Caso aceite participar, iremos aplicar uma intervenção psicológica adjuvante ao tratamento médico. A intervenção psicológica irá ser realizada por psicólogos especializados. Esta investigação requer dispêndio de tempo, mas não trará qualquer risco para a saúde.

Os dados que solicitamos são de carácter pessoal. Seremos responsáveis pela informação obtida e comprometemo-nos a fazer uso exclusivo desses dados na investigação, assim como preservar a confidencialidade e a guarda-los de acordo com a lei orgânica nº.67/98, de 26 de Outubro, de protecção de dados pessoais.

Se desejar conhecer os resultados dos questionários a que respondeu e da intervenção psicológica, poderá ser informado, uma vez finalizado o estudo.

Qualquer esclarecimento adicional que necessite, poderá solicitá-lo ao responsável pela investigação, André Louro, e-mail: louro.andre@gmail.com.

A participação neste estudo é livre e voluntária. Poderá desistir em qualquer momento, se assim o entender.

A sua colaboração nesta investigação é muito importante, em todo o caso, se não puder participar no estudo deverá devolver os questionários ao investigador.

Obrigado pela atenção dispensada.

Informação sobre investigação (controlo)

Título do estudo: Emoções positivas e qualidade de vida em doentes com cancro do cólon rectal

Autor da Investigação: André Cardoso Louro

Propósito do estudo

Ter uma doença significa viver uma série de novas situações que requer adaptação a determinadas circunstâncias. Nem todas as pessoas têm a mesma facilidade para lidar com a doença e é por esta razão que consideramos necessário compreender em profundidade as reacções dos pacientes à doença. Pretende-se com esta investigação perceber qual é o impacto que as emoções positivas têm na qualidade de vida do paciente e na evolução da doença e aplicar uma intervenção psicológica, de forma, a aumentar as emoções positivas.

Condições de Participação

Estamos a convidá-lo para participar nesta investigação.

Caso aceite participar, iremos fazer algumas perguntas durante o tratamento oncológico.

Esta investigação requer dispêndio de tempo, mas não trará qualquer risco para a saúde.

Os dados que solicitamos são de carácter pessoal. Seremos responsáveis pela informação obtida e comprometemo-nos a fazer uso exclusivo desses dados na investigação, assim como preservar a confidencialidade e a guarda-los de acordo com a lei orgânica nº.67/98, de 26 de Outubro, de protecção de dados pessoais.

Se desejar conhecer os resultados dos questionários a que respondeu, poderá ser informado, uma vez finalizado o estudo.

Qualquer esclarecimento adicional que necessite, poderá solicitá-lo ao responsável pela investigação, André Louro, e-mail: louro.andre@gmail.com.

A participação neste estudo é livre e voluntária. Poderá desistir em qualquer momento, se assim o entender.

A sua colaboração nesta investigação é muito importante, em todo o caso, se não puder participar no estudo deverá devolver os questionários ao investigador.

Obrigado pela atenção dispensada.

DECLARAÇÃO DE CONSENTIMENTO

Considerando a "Declaração de Helsínquia" da Associação Médica Mundial
(Helsínquia 1964; Tóquio 1975; Veneza 1983; Hong Kong 1989; Somerset West 1996 e Edimburgo 2000)

Designação do Estudo (em português):

Emoções Positivas e qualidade de vida em pacientes com cancro do cólon rectal

Eu, abaixo-assinado, (nome completo do doente ou voluntário são) -----

-----, compreendi a explicação que me foi fornecida acerca do meu caso clínico e da investigação que se tenciona realizar, bem como do estudo em que serei incluído. Foi-me dada oportunidade de fazer as perguntas que julguei necessárias, e de todas obtive resposta satisfatória.

Tomei conhecimento de que, de acordo com as recomendações da Declaração de Helsínquia, a informação ou explicação que me foi prestada versou os objectivos, os métodos, os benefícios previstos, os riscos potenciais e o eventual desconforto. Além disso, foi-me afirmado que tenho o direito de recusar a todo o tempo a minha participação no estudo, sem que isso possa ter como efeito qualquer prejuízo na assistência que me é prestada.

Por isso, consinto que me seja aplicado o método, o tratamento ou o inquérito proposto pelo investigador.

Data: ____ / _____ / 200__

Assinatura do doente ou voluntário são: _____

O Investigador responsável:

Nome: André Cardoso Louro

Assinatura:

O **modelo** de solicitação de consentimento informado aqui apresentado é optativo

APPENDIX C: Criterion Instruments

Dados clínicos

Data: __/__/__

Código: _____

Nome: _____

Diagnóstico clínico:

_____ Data: __/__/__

Recto Cólon Estadio II Estadio III

Antecedentes familiares oncológicos: Não __ Sim __

Quais: _____

Fumador: Não __ Sim __ Consome álcool: Não __ Sim __

Patologias Crónicas: Não __ Sim __

Quais: _____

Medicação regular: Não __ Sim __

Quais: _____

Co-morbili dade: Não __ Sim __

Tratamento

Cirurgia _____ Data: __/__/__

* Quimioterapia pré-operatória _____ Data: __/__/__

* Radioterapia pré-operatória _____ Data: __/__/__

* A preencher caso seja recto segundo o protocolo.

Dados sociodemográficos

Data: __/__/__

Código: ____

Nome: _____

Idade: __ Sexo: __

Estado civil: Casado __ Divorciado __ Separado __ Solteiro __ Viúvo __ Outro __

Nº de filhos: ____

Vive acompanhado: Não __ Sim __ Quem: _____

Local de residência: _____

Grau de escolaridade: Ano de escolaridade _____

Profissão: _____ empregado __ desempregado __ reformado __

Ocupação dos tempos livres:

Actividade Desportiva __ Leitura __ Bricolage __ Dança __ Pintura __ Sem ocupação __

Outra: _____

Religião: Não __ Sim __ Qual: _____



EORTC QLQ-C30 (version 3)

Gostaríamos de conhecer alguns pormenores sobre si e a sua saúde. Responda você mesmo/a, por favor, a todas as perguntas fazendo um círculo à volta do número que melhor se aplica ao seu caso. Não há respostas certas nem erradas. A informação fornecida é estritamente confidencial.

Escreva as iniciais do seu nome:

A data de nascimento (dia, mês, ano):

A data de hoje (dia, mês, ano):

31

	Não	Um pouco	Bastante	Muito
1. Custa-lhe fazer esforços mais violentos, por exemplo, carregar um saco de compras pesado ou uma mala?	1	2	3	4
2. Custa-lhe percorrer uma <u>grande</u> distância a pé?	1	2	3	4
3. Custa-lhe dar um <u>pequeno</u> passeio a pé, fora de casa?	1	2	3	4
4. Precisa de ficar na cama ou numa cadeira durante o dia?	1	2	3	4
5. Precisa que o/a ajudem a comer, a vestir-se, a lavar-se ou a ir à casa de banho?	1	2	3	4

Durante a última semana :

	Não	Um pouco	Bastante	Muito
6. Sentiu-se limitado/a no seu emprego ou no desempenho das suas actividades diárias?	1	2	3	4
7. Sentiu-se limitado/a na ocupação habitual dos seus tempos livres ou noutras actividades de lazer?	1	2	3	4
8. Teve falta de ar?	1	2	3	4
9. Teve dores?	1	2	3	4
10. Precisou de descansar?	1	2	3	4
11. Teve dificuldade em dormir?	1	2	3	4
12. Sentiu-se fraco/a?	1	2	3	4
13. Teve falta de apetite?	1	2	3	4
14. Teve enjoos?	1	2	3	4
15. Vomitou?	1	2	3	4

Por favor, passe à página seguinte

ESCALA DE ANSIEDADE E DEPRESSÃO HOSPITALAR

Este questionário foi construído para ajudar a saber como se sente. Pedimos-lhe que leia cada uma das perguntas e faça uma cruz (X) no espaço anterior à resposta que melhor descreve a forma como se tem sentido na última semana.

Não demore muito tempo a pensar nas respostas. A sua reacção imediata a cada questão será provavelmente mais correcta do que uma resposta muito ponderada.

Por favor, faça apenas uma cruz em cada pergunta.

1. Sinto-me tenso/a ou nervoso/a:

Quase sempre

Muitas vezes

Por vezes

Nunca

2. Ainda sinto prazer nas coisas de que costumava gostar:

Tanto como antes

Não tanto agora

Só um pouco

Quase nada

3. Tenho uma sensação de medo, como se algo terrível estivesse para acontecer:

Sim e muito forte

Sim, mas não muito forte

Um pouco, mas não me aflige

De modo algum

4. Sou capaz de rir e ver o lado divertido das coisas:

Tanto como antes

Não tanto como antes

Muito menos agora

Nunca

5. Tenho a cabeça cheia de preocupações:

- A maior parte do tempo
- Muitas vezes
- Por vezes
- Quase nunca

6. Sinto-me animado/a:

- Nunca
- Poucas vezes
- De vez em quando
- Quase sempre

7. Sou capaz de estar descontraidamente sentado/a e sentir-me relaxado/a:

- Quase sempre
- Muitas vezes
- Por vezes
- Nunca

8. Sinto-me mais lento/a, como se fizesse as coisas mais devagar:

- Quase sempre
- Muitas vezes
- Por vezes
- Nunca

9. Fico de tal forma apreensivo/a (com medo), que até sinto um aperto no estômago:

- Nunca
- Por vezes
- Muitas vezes
- Quase sempre

10. Perdi o interesse em cuidar do meu aspecto físico:

- Completamente
- Não dou a atenção que devia
- Talvez cuide menos que antes
- Tenho o mesmo interesse de sempre

11. Sinto-me de tal forma inquieto/a que não consigo estar parado/a:

- Muito
- Bastante
- Não muito
- Nada

12. Penso com prazer nas coisas que podem acontecer no futuro:

- Tanto como antes
- Não tanto como antes
- Bastante menos agora
- Quase nunca

13. De repente, tenho sensações de pânico:

- Muitas vezes
- Bastantes vezes
- Por vezes
- Nunca

14. Sou capaz de apreciar um bom livro ou um programa de rádio ou televisão:

- Muitas vezes
- De vez em quando
- Poucas vezes
- Quase nunca

MUITO OBRIGADO PELA SUA COLABORAÇÃO.

ESCALA DE ADAPTAÇÃO À DOENÇA

A seguir vai encontrar uma lista de afirmações que descrevem reacções que as pessoas têm face a uma doença como a sua.

Cada pessoa reage de uma maneira diferente da outra. Nós queremos conhecer a sua forma pessoal de reagir. Se tiver dúvidas sobre a resposta a dar responda da maneira que lhe parecer mais apropriada.

Por favor assinale até que ponto cada afirmação mostra o seu modo de reagir, marcando o quadrado que se lhe aplica, à frente de cada afirmação.

Por exemplo, se a afirmação não se aplica a si deve assinalar (x) o primeiro rectângulo

Por favor escreva o nome da doença a que está a ser tratado _____

	Não se aplica de modo nenhum a mim	Não se aplica a mim	Aplica-se a mim	Aplica-se totalmente a mim
Sinto que a vida não tem esperança				
Não consigo controlar isto				
Estou determinado/a a vencer a minha doença				
Faço um esforço positivo para não pensar na minha doença				
Desde que a minha doença foi diagnosticada, percebi que a vida é valiosa e estou a aproveitá-la da melhor forma possível				
Não consigo lidar com isto				
Entreguei-me nas mãos de Deus				
Estou preocupado/A com a minha doença				
Esforço-me por me distrair quando pensamentos acerca da minha doença me vêm à cabeça				
Estou preocupado/a que doença volte a aparecer				
Tive uma vida boa e o que vier daqui para a frente é bem-vindo				
Estou um pouco assustado/a				
Sinto que não há nada que eu possa fazer que me ajude				
Tenho dificuldade em acreditar que isto me				

tenha acontecido				
Sofro de grande ansiedade por causa disto				
Não tenho muita esperança no futuro				
Neste momento vivo um dia de cada vez				
Apetece-me desistir				
Sinto-me muito optimista				
Encaro a minha doença como um desafio				
Não pensar na minha doença ajuda-me a lidar com isto				
Sinto-me completamente perdido/a sem saber o que fazer				
Sinto-me muito zangado/a com o que me aconteceu				
Intencionalmente empurro todos os meus pensamentos sobre a minha doença para longe				
Dou valor às coisas boas que me acontecem				
Tento combater a doença				
Estou apreensivo/a				
Penso que isto é como se o mundo tivesse acabado				
Sinto-me arrasado/a				

OBRIGADO PELA SUA COLABORAÇÃO

A PANAS

Esta escala consiste num conjunto de palavras que descrevem diferentes sentimentos e emoções. Leia cada palavra e marque a resposta adequada no espaço anterior à palavra. Indique em que medida sentiu cada uma das emoções. Inserir aqui as instruções de tempo de resposta adequada *:

1. Nada ou muito Ligeiramente
2. Um Pouco
3. Moderadamente
4. Bastante
5. Extremamente

Interessado
 Perturbado
 Excitado
 Atormentado
 Agradavelmente surpreendido
 Culpado
 Assustado
 Caloroso
 Repulsa
 Entusiasmado

Orgulhoso
 Irritado
 Encantado
 Remorsos
 Inspirado
 Nervoso
 Determinado
 Trémulo
 Activo
 Amedrontado

*** Tempos de resposta utilizados pelos autores:**

- agora, ou seja, neste momento;
- hoje;
- durante os últimos dias;
- durante a última semana;
- durante as últimas semanas;
- durante o último ano;
- geralmente, ou seja, em média.

TESTE DE ORIENTAÇÃO DE VIDA - Revisto

(Versão Portuguesa do Life Orientation Test-R; SCHEIER, CARVER & BRIDGES, 1994)

Não existem respostas certas ou erradas. Seja cuidadoso(a) ao responder à questão de cada item e não deixe que a resposta dum(a) influencie a resposta às outras.

Emita a sua opinião a partir da seguinte escala:

- 0 – Discordo bastante
- 1 – Discordo
- 2 – Neutro
- 3 – Concordo
- 4 – Concordo bastante

1 – Em situações difíceis espero sempre o melhor.	0	1	2	3	4
2 – Para mim é fácil relaxar.	0	1	2	3	4
3 – Se alguma coisa de errado tiver de acontecer comigo, acontecerá de certeza.	0	1	2	3	4
4 – Sou sempre optimista relativamente ao futuro.	0	1	2	3	4
5 – Eu gosto muito dos meus amigos.	0	1	2	3	4
6 – Para mim, é importante manter-me ocupado(a).	0	1	2	3	4
7 – Quase nunca espero que as coisas corram a meu favor.	0	1	2	3	4
8 – Não fico facilmente preocupado(a).	0	1	2	3	4
9 – Raramente espero que as coisas boas me aconteçam.	0	1	2	3	4
10 – No conjunto, espero que me aconteçam mais coisas boas do que más.	0	1	2	3	4

Obrigado pela sua colaboração!

APPENDIX D – Content of Sessions

Identificação de acontecimentos, emoções e pensamentos

Objetivos:

1. Distinguir entre emoções positivas e negativas;
2. Ter consciência das emoções e da sua intensidade;
3. Distinguir entre pensamentos positivos e negativos;
4. Ter consciência dos pensamentos que desencadeiam as emoções;
5. Identificar os pensamentos alternativos de forma a transformar as emoções negativas em positivas;

Instruções:

1. É solicitado ao doente para identificar as emoções mais intensas da última semana. Pode ter havido várias, portanto, escolher as mais fortes. Explicar que temos emoções negativas como o medo, tristeza ou raiva e emoções positivas como a alegria, contentamento, satisfação ou gratidão.
2. É pedido agora ao doente para identificar o pensamento associado a cada emoção. *“O que diria para si mesmo naquela situação que possa ter provocado a emoção.”* Relativamente às emoções negativas pedir ao doente que encontre pensamentos/respostas alternativas para que transforme as emoções negativas em positivas. (Completar o quadro)

Registo dos acontecimentos, emoções, pensamentos					
Nº.	Situação/acontecimento	Emoção/consequência	Intensidade (0-10)	Pensamentos	Pensamentos /Resposta alternativa
1.	Ex: 1.Fui ver o resultado do exame	Senti-me nervoso (medo)	8	Penso que o resultado será negativo;	Não tenho elementos suficientes para pensar que o exame vai ser negativo nem positivo;
2.	Ex:2.Fui fazer o tratamento da quimioterapia	Senti-me deprimido (triste)	6	Depois de fazer quimioterapia fico cada vez pior;	Enquanto estou a fazer tratamento é sinal que ainda existe possibilidade de se tratar;
Negativas					
1.					
2.					
3.					
Positivas					
1.					/
2.					/
3.					/

Identificação de atividades que sejam importantes e que dão prazer para aumentar as emoções positivas e a qualidade de vida

Objetivos:

1. Identificar atividades passadas, presentes e futuras que são importantes e que dão prazer para o doente;
2. Identificar novas atividades que possam aumentar as emoções positivas e melhorar a qualidade de vida.

Instruções:

1. Avaliar numa escala de 0-10 até que ponto usaram a estratégia (pensamento, emoção e comportamento, pensamento alternativo) durante as duas últimas semanas que passaram.

0 1 2 3 4 5 6 7 8 9 10

Nada

Moderadamente

Extremamente

2. É solicitado a doente para identificar atividades que tenham maior significado e que sejam as mais prazerosas no passado, presente e futuro, no sentido de aumentar as emoções positivas e a qualidade de vida. (Completar o quadro).

Registo de Atividades			
Nº.	Atividades	Grau de Significado (0-10)	Grau de Prazer (0-10)
/	Ex: Estar com os amigos	5	8
/	Ex: Ver televisão	2	3
Passadas			
1.			
2.			
3.			
Presentes			
1.			
2.			
3.			
Futuras			
1.			
2.			
3.			

Objetivos Passados			
Metas/objetivos	Emoções Positivas	Pensamentos	Estratégias
Ex: Ter investido na educação do meu filho	Grande Alegria	Penso que valeu a pena o esforço porque ele agora tem uma boa formação	Ter metido o meu filho numa boa escola
1.			
2.			
3.			
Objetivos Futuros			
1.			
2.			
3.			

Avaliação da Intervenção

Objetivos:

1. Avaliação de toda a intervenção, feedback e finalização;
2. Avaliação final;

Instruções:

1. Averiguar se foi apreendida os objetivos principais da intervenção com avaliação quantitativa da intervenção (Fig1).
2. Avaliação qualitativa da intervenção, aspectos positivos e aspectos negativos.
3. Preenchimento dos questionários EORTC QLQ-C30, HADS, MAC, PANAS.

Fig1:

Se a intervenção aumentou as emoções positivas.

0	1	2	3	4	5	6	7	8	9	10
Nada				Moderadamente						Extremamente

Se a intervenção aumentou a qualidade de vida.

0	1	2	3	4	5	6	7	8	9	10
Nada				Moderadamente						Extremamente

Qual foi o grau de importância que a intervenção teve para a sua vida?

0	1	2	3	4	5	6	7	8	9	10
Nada				Moderadamente						Extremamente

Aspectos Positivos da Intervenção:

Aspectos Negativos da Intervenção: