

# Cognitive Behavioral Therapy (CBT)-Based Group Intervention Plan for Liver Cancer Patients: Poetry, Healthy Habits, and Environmental Sustainability

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**Abstract:** The liver is responsible for transforming nutrients into energy. Liver cancer is a type of malignant tumour that develops through mutation and uncontrolled growth of liver cells in liver cells. This work proposes a Psychology intervention plan based on Cognitive Behavioral Therapy (CBT) for Liver Cancer Patients using Poetry, promoting Healthy Habits, and being aware of Environmental Sustainability. The Plan is developed into 6 group sessions.

## INTRODUCTION

Population aging is a growing phenomenon in the world that brings with it challenges in the fields of health, social organization and the economy. The World Health Organization estimates that in 2050, there will be around two billion individuals over the age of 60, and in 2100, around three billion. It is worth noting that older adults deal with several health problems that affect their physical and mental functioning, and the presence of chronic diseases can cause great emotional stress, reducing their quality of life (Kim et al., 2021). Therefore, instruments such as the WHOQOL-OLD (The World Health Organization Quality of Life Instrument – Older Adults Module), EQ-HWB (EQ Health and Wellbeing), SPF-ILs (Social Production Function Instrument) and the WHHQ-18 (Warwick Holistic Health Questionnaire) have been developed to measure quality of life and wellbeing, allowing the monitoring of variables, the identification of needs and the implementation and improvement of health policies and programs (Kim et al., 2021; Brazier et al., 2022; Brough et al., 2021; Nieboer & Cramm, 2018). Strategies to achieve healthy ageing are already being put into practice, such as the Decade of Healthy Aging 2021-2030, implemented by the United Nations General Assembly, which aims to improve the quality of life of older people, their families and communities by bringing together efforts at various levels (PAHO, n.d.). In this context, this psychological intervention proposal will focus on promoting wellbeing and quality of life for patients with liver cancer aged between 60 and 65 years (Baby Boomers). Baby Boomers are a generation

born after World War II when there was an exponential increase in the birth rate, economic growth and major social transformations. Its main characteristics are the appreciation of family, the search for peace and focus on work and career. It is a working, politically and environmentally active audience and consumers opting for quality and trustworthy products and services. However, Baby Boomers also stand out in terms of health and wellbeing, which highlights their interest in maintaining a healthy, active and quality life (Mídia Market, 2024). Currently, this generation comprises people between 60 and 75 years old who, despite now being mostly retired, were people who strongly influenced the economy and were even part of today's large companies (Hostmídia, 2023).

## LIVER CANCER

The liver is responsible for essential functions: transforming nutrients into energy; helping in the production of bile that digests and absorbs fats in the intestine; storing vitamins and minerals; converting glucose into glycogen, storing it and releasing it for energy; synthesizing essential proteins; allows detoxification and helps regulate cholesterol levels (Soares & Silva, 2024). Liver cancer is a type of malignant tumour that develops through mutation and uncontrolled growth of liver cells in liver cells (Marques, 2023) and has a higher incidence in males and in those aged between 50 and 69 years (Soares & Silva, 2024). It is the sixth most common cancer in the world, with more than 800,000 cases in 2022 (around 600,000 of which are male), and the third leading cause of death in

terms of cancer-related deaths, with more than 700,000 deaths in that year (International Agency for Research on Cancer, 2022). In Portugal, it is the 11th most common cancer and the seventh cause of death, estimating that, in 2017, its subtype (hepatocellular carcinoma) generated more than 600 deaths (Soares & Silva, 2024; Infocancro, n.d.). In the Autonomous Region of Madeira, in 2020, there were 34 deaths (23 men and 11 women) due to liver cancer (Regional Directorate of Statistics of Madeira, 2020).

## SUBTYPES

There are two subtypes of primary liver cancer: hepatocellular carcinoma and cholangiocarcinoma. Hepatocellular carcinoma (HCC) is the most common type (75% to 85% of cases), formed in liver cells, and its risk factors may include hepatitis B and C and cirrhosis. Cholangiocarcinoma or bile duct cancer (10% to 12% of cases) forms in the bile ducts, the tubes that carry bile from the liver to the gallbladder, and its risk factors may include primary sclerosing cholangitis, bile duct infections, and exposure to certain toxins (Soares & Silva, 2024). The intervention plan presented in this work will focus on HCC as it is the most common.

## SYMPTOMS

Liver cancer does not present symptoms until more advanced stages, making early diagnosis difficult. However, people with hepatitis and cirrhosis should undergo regular tests to monitor the health of their organs. Despite this, some symptoms may include abdominal pain, weight loss and fatigue with no apparent cause, nausea and vomiting, loss of appetite, the appearance of a mass on the right side of the upper abdomen, jaundice and encephalopathy. In later stages, symptoms may include bleeding, bruising, mental confusion, and swelling of the legs and ankles due to fluid retention (Soares & Silva, 2024; Marques, 2023).

## DIAGNOSIS

Diagnosis may include blood tests and physical examinations, neuroimaging exams, laparoscopy, biopsies, and assessment of alpha-fetoprotein biomarker levels (Marques, 2023).

## STADIUMS

The most widely used staging system for liver cancer is the Barcelona Clinic Liver Cancer (BCLC) staging system, which includes five stages: the very early stage (BCLC 0) is characterized by the presence of a single tumor and preserved liver function, with the estimated life expectancy greater than five years; the initial stage (BCLC A) is characterized by the presence of a single tumor or up to three nodules measuring less than three centimeters, good liver function and no signs of spread, with an estimated life expectancy of greater than five years; the intermediate stage (BCLC B) presents with multiple tumors in the liver, reasonable liver function with some impairment and life expectancy greater than two and a half years; the advanced stage (BCLC C) corresponds to the spread of cancer to the blood vessels of the liver and to nearby organs, impaired liver function, presence of some symptoms and life expectancy equal to or greater than two years; End-stage (BCLC D) corresponds to severely compromised liver function, debilitating symptoms and a life expectancy of three months (Reig et al., 2022).

## TREATMENT

Treatment depends on the area of the liver affected, the stage of the disease, the size and number of tumours, damage to the unaffected area of the organ, the patient's preferences, and general health. When detected at an early stage, treatment aims to try to eliminate the cancer through transplantation, liver resection or ablation. When detected at an advanced stage, treatment aims to reduce the speed of cancer growth and alleviate symptoms through radiotherapy, chemotherapy and transarterial chemoembolization (TACE; Soares & Silva, 2024; Reig et al., 2022).

## RISK FACTORS

Risk factors include male gender; age over 70 years; hepatitis B and hepatitis C; hepatic steatosis; cirrhosis; consumption of foods with aflatoxins; and genetic factors. These factors can be reversed through the adoption of healthy lifestyle habits, vaccination against hepatitis B and care with food, such as storing it properly (Marques, 2023; Soares & Silva, 2024).

# COGNITIVE BEHAVIORAL THERAPY (CBT) - TREATING PATIENTS WITH LIVER CANCER

Cognitive Behavioral Therapy (CBT) is a therapeutic approach that assumes that thoughts influence feelings, and these, in turn, influence behaviour. Therefore, changing dysfunctional thoughts can help modify behaviours. Furthermore, it is a therapy that requires active participation, focus on the present and teaches the patient to be the author of their therapeutic process. CBT can be used in the treatment of oncological diseases and has demonstrated positive results at an individual and group level, improving stress management, social wellbeing, coping with illness, depression and anxiety, fatigue, self-esteem, body image, problems with sleep, pain management and quality of life, through techniques such as cognitive restructuring and relaxation (Ferreira et al., 2021).

## A PROPOSED GROUP INTERVENTION PLAN FOR LIVER CANCER PATIENTS

This intervention plan will begin with a one-hour zero session for each person and six two-hour group sessions weekly and aimed at ten patients aged between 60 and 65 (Baby Boomers). They will be patients diagnosed with intermediate-stage liver cancer (BCLC B), regular alcohol users and undergoing chemotherapy treatment. The overall goal is to promote patients' psychological, physical and social wellbeing through cognitive-behavioural techniques. We will seek to improve quality of life, help manage the most uncomfortable emotions resulting from the diagnosis, and promote coping strategies and self-care.

The choice of this generation for this Plan is due to the higher prevalence of liver cancer in this age range, as well as a higher incidence of cirrhosis and hepatitis B and C (Gomide et al., 2021). Furthermore, as this is a generation interested in their health, wellbeing and quality of life, the application and acceptance of this intervention may be more appropriate (Mídia Market, 2024). Chemotherapy treatment generates fatigue,

depression, anxiety and stress, and therefore, the use of cognitive and behavioural techniques can help develop coping mechanisms to mitigate these aspects, contemplating the main objective of the Plan (Moreira et al., 2024).

## SESSION 0: INITIAL INTERVIEW AND INDIVIDUAL ASSESSMENT

Session 0 has the following main objectives: to learn about the medical, personal, family and social history of each participant; identify individual needs and expectations; apply an instrument to assess participants' current quality of life and wellbeing (World Health Organization Quality of Life Assessment Instrument, WHOQOL-BREF); apply an instrument to assess mild cognitive impairment (Montreal Cognitive Assessment, MoCA) and apply an instrument to assess symptoms of anxiety, stress and depression (Anxiety, Depression and Stress Scale, EADS-21); contextualize the intervention to be developed; prepare the free and informed consent form and clarify any doubts. This session is done individually, lasting one hour for each participant.

The session will begin with the facilitating psychologist presenting the Plan, the objectives of the intervention, the purpose of session 0 and what will occur in the next sessions. Thus, the importance of the intervention plan and the application of instruments to understand their needs and challenges will be explained to participants. Before the tests are applied, the psychologist must provide a calm, safe and welcoming environment to establish a therapeutic relationship of trust and mutual understanding, as well as knowing the patient's history. The first test to be applied is the MoCA to assess cognitive function since, due to the fact that they consume alcohol regularly, participants may present some cognitive impairment (Han et al., 2023). Thus, the test quickly and accurately assesses short-term memory, visuospatial skills, cognitive functions, attention, concentration, working memory, language and orientation in time and space in a total of 11 exercises. (MoCA Cognition, 2024). The second test to be applied is the EADS-21, a 21-item scale to assess symptoms of depression, anxiety and stress associated with the disease and

treatment. Each dimension is composed of 7 items that correspond to statements about negative symptoms, asking the participant to evaluate the extent to which they experienced the symptom in the previous week (Ribeiro et al., 2004). The third test to be applied is the WHOQOL-BREF to assess the different areas associated with the participants' quality of life, such as physical health, psychological health, social relationships, environment and general perception of quality of life and health, through 26 items. (Serra et al., 2006). After applying the tests, the psychologist will conduct a brief individual interview to contextualize some answers, understand how the participant felt when completing the instruments, ask about individual, group and intervention expectations; be aware of personal goals; listen to the participants' opinions; offer emotional support and reinforce the environment of safety and acceptance.

Then, informed consent will be drawn up, and confidentiality rules will be established. It is explained that the data obtained from the instruments are used exclusively for monitoring and improving the intervention.

## **SESSION 1: PSYCHOEDUCATION AND COGNITIVE RESTRUCTURING**

The objectives of this session are to increase knowledge about liver cancer and the emotional impact of the disease through psychoeducation, something that meets the objectives of the National Health Plan in Portugal, Europe, which is to promote health literacy, longevity and active and healthy ageing and promote health-promoting environments (General Directorate of Health, 2023). CBT techniques will also be introduced to help manage the stress and anxiety associated with diagnosis and treatment.

The session will begin with a welcome from the psychologist, who will remind the objective and dynamics of the program. Participants will then be invited to introduce themselves through the game "Two truths and a lie", where each person presents three statements about themselves, two of which are true and one false. The group must try to guess the false statement, stimulating involvement and curiosity. The game works as an icebreaker and

provides an opportunity to get to know each other. The psychologist will then begin a brief presentation on liver cancer, including information on symptoms, risk factors, side effects, available treatments, and common challenges faced by the group. At the end of the presentation, there is room for questions and comments. Consequently, the psychologist must address what Cognitive-Behavioral Therapy is, citing some techniques, with a special focus on the Cognitive Restructuring technique (Conceição and Bueno, 2020). This technique aims to identify and change negative automatic thoughts that generate suffering. After explaining the technique, participants will be invited to form pairs and reflect on automatic thoughts that arise during moments of greatest stress, regarding cancer. The psychologist will then ask each participant to share the thought with their partner and ask how they would rephrase it to make it more adaptive and realistic. The psychologist must monitor the pairs and help whenever necessary. After the pair exercise, the psychologist should give examples of common negative automatic thoughts and how they could be reformulated.

Next, the psychologist will present a relaxation technique through breathing: "square breathing". Participants are asked to sit with their spine straight and imagine a square in front of them and, on each side, inhale through the nose, hold the air, exhale through the mouth and hold the air again (Conceição & Bueno, 2020).

Finally, the psychologist will ask how the participants felt throughout the dynamics, if they have any questions or comments to make and if they want to share something or make a suggestion. Finally, two homework assignments are requested: write down the negative automatic thoughts that may arise in a notebook, which will be given by the psychologist, and try to reformulate them and practice square breathing once a day.

## **SESSION 2: EMOTIONAL MANAGEMENT AND RESILIENCE**

The objectives of this session are to introduce the concepts of emotional management and resilience to deal with emotional issues associated with cancer through the use of coping cards and to facilitate the exchange of experiences and support among participants.

The psychologist will begin the session with a warm welcome, reviewing the previous session and asking participants how they have felt since the last meeting. The concept of emotional management is introduced as the ability to identify and regulate difficult emotions, and the concept of resilience as the ability to adapt and recover after stressful events. Thus, the first activity is the "coping cards" (Conceição & Bueno, 2020). The psychologist should guide the group to reflect on situations that cause them stress, anxiety, fear, anger, guilt or sadness. Then, each participant creates their cards with phrases that can help in these situations, functioning as quick reminders of how to face challenging moments. Some example sentences would be: "This moment is very difficult, but I believe in myself, and I know that I can overcome it calmly", "although I cannot control what happens, I can control how I respond," or "I have already overcome it". immense challenges even when I thought it was impossible so that I can face this one too." Participants will then be invited to share their cards with the group, encouraging a supportive environment and reflection on other strategies that could also be helpful.

Afterwards, a simulation activity will be carried out where the psychologist proposes challenging emotional scenarios and asks participants to use their cards to deal with the situation. An example of a situation would be: "Imagine that you go to the doctor, and he says that the results of your treatment are not evolving as expected. How would you use the card at this time?" The activity allows participants to internalize the use of the cards, promoting the practice of emotional management and resilience.

The session then ends with the group reflecting on what they learned and how they can apply the strategies in their daily lives. Participants are encouraged to carry coping cards with them, using them whenever they need to. Additionally, participants are asked to continue completing homework from the previous session.

## SESSION 3: POETRY, HEALTHY HABITS AND ENVIRONMENTAL SUSTAINABILITY

The objectives of this session are to integrate poetry and creativity as tools for emotional and cognitive reflection, encourage healthy lifestyle habits and promote sustainable behaviours, meeting the objectives of the National Health Plan, which are promoting healthy behaviours and communities, promoting healthy eating, protecting the planet for present and future generations and minimizing the consequences climate change and other environmental determinants on health (General Directorate of Health, 2023). Furthermore, by addressing environmental sustainability, one of the goals of the International Health Plan is met (United Nations, 2024; United Nations, 2024).

The session will begin with the reception of the psychologist, reinforcement of the confidentiality of the space and a brief recap of the previous session. It is explained that the focus of this session is lifestyle habits and how they can influence the body, especially the liver. So, the psychologist will quote a poem by Diogo Duarte entitled "Ode to the Liver" (2013):

Oh, liver!  
You, who are such a warrior  
And you accompany me  
From the first day  
At the end of the month,  
In the night and during the day  
On the way to Vagrancy  
In search of poetry  
On the trips  
In beer glasses!  
Oh, liver!  
You are a friend  
Do not forget  
That I am with you  
No one separates us,  
Be it Vodka or Montilla,  
Ypioca or Sapupara,  
Whatever comes from cachaça  
We Toast to Hypocrisy  
Let us drink to the rejection!

Oh, liver!  
Just do not go away  
Before the time comes  
In which drunk  
Remember her as a sign,  
Blame me by chance  
Not showing myself worthy  
What I drink  
And come to my senses  
Of the illusion I pursue

My heart  
Love printer  
My fate is solitude,  
Discard reasoning  
The Art of Reason,  
I come to you with this design  
Proclaim in advance  
That I change without thinking  
What beats in my chest  
For the two of you, remade  
Oh, liver!  
Diogo Duarte, "Ode to the Liver" (2013)

The purpose of using this poem is to evoke thoughts about consumption habits in relation to alcohol and the importance of the liver as a vital organ and, therefore, the group will be invited to make a collective reflection on it. The psychologist should guide the group discussion, raising questions such as: "What habits did you have in the past that you consider having been harmful to your liver?"; "What kind of relationship do they have with alcohol?"; "What kind of emotions does the poem arouse?"; "Do you identify with the poem?" Participants should connect the main ideas of the poem to their experiences and habits that may have contributed to their current health status.

The group will then be invited to write a letter to the liver, opening a space to express regrets, apologies, concerns or thanks. Reflecting on past habits can generate a commitment to future changes. This activity helps the group process difficult emotions, stimulates creativity and self-expression, promotes self-awareness and develops the ability to reflect critically.

Consequently, it will also address environmental sustainability in relation to self-care and health, including the impact of climate change. Increased air pollution leads to exposure to toxic substances that increase the risk of liver disease, and climate change affects food production, increasing the intake of processed foods and

worsening health (United Nations, 2024). Therefore, it is essential to encourage sustainable behaviours that minimize environmental impact and simultaneously improve health. Reducing exposure to pollutants, adopting a healthy diet and promoting conscious consumption practices (Soares & Moniz, 2023) are important steps. Sustainable behaviours are not restricted to the environment; they can also be practised in relation to our bodies: we take care of the planet so that it lasts for future generations, and we also need to take care of our bodies so that they accompany us throughout our lives. Thus, the "Sustainability Wheel" activity is carried out, asking the group to sit in a circle. The psychologist will present several sentences that represent sustainable behaviours. The group will be asked to, through an open discussion, indicate how these behaviours are related to the environment and the body, such as: "eating fresh and local foods" is associated with reducing the environmental impact of food transportation and promotes healthy eating and "exercising outdoors" is associated with avoiding the use of energy resources in gyms and strengthening physical and mental health.

To close the session, the psychologist asks participants to do their homework by thinking of a sustainable change they would like to implement in their lives and to continue doing their homework ("square breathing").

## SESSION 4: SOCIAL SUPPORT AND EFFECTIVE COMMUNICATION

The main objectives of this session are exploring the importance of interpersonal relationships and assertive communication in the context of liver cancer treatment and, improving communication with family, friends and health professionals, promoting social support networks, one of the objectives advocated by the Plan. International Health (United Nations, 2024).

The psychologist should welcome and review previous learning, encouraging participants to share their experiences with homework: recording negative automatic thoughts and reformulation, practising the square breathing technique, using coping cards and sustainable changes. The session will continue with a brief explanation about the importance of interpersonal relationships in coping

with the disease, explaining that, when dealing with cancer, participants may experience feelings of isolation or difficulties in communicating what they really feel. The bonds we have with the people around us influence our emotional, psychological and physical well-being. The ability to express thoughts, needs and feelings clearly and respectfully is very important (Anderson et al., 2021).

Next, a dynamic will be conducted to help participants practice assertive communication (Escola do Saber, 2023; Conceição & Bueno, 2020). Each participant should think of a recent situation in which they had difficulty expressing their needs to a friend, family member, or doctor. Afterwards, the psychologist will ask participants to analyze their way of communicating in this situation, reflecting on whether or not it was assertive and how they could have expressed their needs more effectively. An example of assertive communication would be when the doctor explains the treatment and questions arise. Instead of being afraid to ask, the patient should mention that they are confused about what was said and ask the doctor to explain it in another way.

A Role-play activity will be organized to consolidate the task (Conceição & Bueno, 2020). In pairs, participants will choose a situation from their daily lives in which communication has been challenging. One member of the pair will pretend to be the person they need to communicate with (friend, family member, or healthcare professional), and the other member will practice communicating. After a few minutes, the roles will be switched so that the other members can practice.

After the role-play, the psychologist will guide a group reflection on each participant's experiences during the activity, encouraging them to discuss the challenges they faced and how they felt when expressing their needs directly and clearly.

The second activity of the session will be the "Empathy Wheel", where participants will form a circle, and the psychologist will mention a situation that may occur during treatment, such as talking to a family member about the fear that the disease will get worse. The first participant in the circle should talk about the situation presented, expressing their feelings and needs related to it. The other members of the circle must listen carefully, and when the first participant finishes, the participant next to

him/her must express how he/she interpreted what the other person said. The first participant will confirm whether it was understood correctly or not. The activity will continue until everyone has had a chance to express themselves and hear the interpretation. To conclude the activity, participants are asked to share moments of social support and suggestions for strengthening interpersonal relationships.

The session ends with the psychologist asking participants to commit to practising assertive communication throughout the week, along with homework from previous sessions.

## **SESSION 5: SELF-ESTEEM AND BODY ACCEPTANCE DURING TREATMENT**

The fifth session aims to work on developing self-esteem and self-acceptance, focusing on the physical and emotional changes that accompany the disease. Additionally, self-compassion and the ability to deal with these changes positively and healthily will be promoted.

As with other sessions, the psychologist will welcome the group and give a summary of the previous session. Participants will be encouraged to share their experiences with assertive communication throughout the week, and after sharing, the psychologist will present the topic of this session. The aim is for participants to reflect on how physical and emotional changes can impact the way they see themselves.

The first activity of the session will be the "Self-Esteem Mirror". Through this dynamic, participants will be helped to identify negative thoughts about themselves and how they can replace them with more positive and realistic thoughts through the cognitive restructuring learned in the first session. The psychologist will ask each participant to anonymously write down a negative thought they have had about themselves or their body since their diagnosis. The papers are collected and read aloud by the psychologist. The goal is for participants to understand that many of their negative thoughts are common to the group. For each negative thought, the group will be encouraged to find a positive alternative. So, each participant should write down the new version of

their negative thought and keep it to themselves as a reminder whenever the negative thoughts return.

After the activity, the psychologist will lead an open discussion about self-compassion and body acceptance, encouraging participants to share their thoughts on the activity and how they can be kinder to themselves. Self-compassion involves treating themselves with care and kindness, just as they would do with a friend if they were going through a difficult time (Oficina da Psicologia, 2018). The second activity, entitled "Seeing Self-Compassion", begins. In this activity, the psychologist asks everyone to feel comfortable, relax, breathe in and out deeply and close their eyes. The psychologist then asks them to imagine their body as a source of strength and resilience, encouraging them to communicate with themselves with words of encouragement, as they would with a loved one. With eyes still closed, the psychologist should begin the progressive muscle relaxation technique (Conceição & Bueno, 2020). Participants will be asked to place their feet on the floor and rest their hands in their lap. The psychologist will guide participants to relax their muscles, starting with the feet, legs, abdomen, hands, arms, shoulders, neck and finally the head, and should take about 10 to 15 seconds for each muscle group. During relaxation, the psychologist will suggest paying attention to breathing, inhaling when tensing muscles and exhaling when relaxing. After the exercise, the psychologist will ask participants to open their eyes slowly and reflect on how they felt. The technique not only allows one to relax but also reinforces the idea of self-care and body acceptance.

The last activity of the session will be the "Positivity Chain" to strengthen the bonds between participants, creating a network of emotional support through the exchange of positive and personalized messages, which they can take home and use as a source of motivation. The psychologist will distribute an envelope to each participant, explaining that each person should write messages of support, motivation or praise for the other members of the group. After writing the message, the envelopes will be placed in a box, and each person must remove an envelope for themselves. No one should keep the letter they wrote. Participants can choose to read the letter to themselves during the session or read it at home. The psychologist should explain that these

messages are a reminder that they are not alone on this journey and suggest that they keep them in a special place to read whenever they need support or motivation.

The session ends with a reflection on the day's learnings and sharing of their feelings or thoughts regarding the activities. The psychologist asked them to bring the notebook where they wrote down their negative automatic thoughts and respective reformulations to the next session.

## SESSION 6: CLOSING AND GOAL REVIEW

The objectives of this session include reflecting on the patients' journey, reapplying the instruments to assess their progress, strengthening the group's connection and the continuity of mental and physical health care. Therefore, the last session will begin with the psychologist welcoming the participants and reminding them of the purpose of the session and the program and the importance of reflecting on individual progress. Then, the tests from session 0 (MoCA, EADS-21 and WHOQOL-BREF) will be reapplied to assess potential changes in patients after completing the program. After completing the tests, the psychologist will lead a group conversation where participants can share how they feel after completing the instruments and whether they notice any difference in their wellbeing since the beginning. The psychologist will ask each person to read one of their negative automatic thoughts and respective reformulation written down in the notebook at the beginning of the sessions versus the most recent one mentioned. This task serves to verify whether there has been any evolution in the process of reformulating thoughts and adopting more adaptive, realistic and healthy responses. Some participants may see that they have the same automatic thoughts and thus strengthen the group bonds and learn about how other participants chose to respond to that thought.

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Finally, the psychologist should give a final thank you to the participants for their dedication to the program, recognizing their progress and performance. It is important to explain that although the program is ending, mental and physical health care must continue, and it is informed that should any participant feel the need to continue the personal development process or face additional challenges, counselling services are available—support for it. To end the session in a relaxing and positive way, the psychologist will conduct the square breathing technique, as in session 1.

## CONCLUSION

The use of the WHOQOL-BREF, MoCA and EADS-21 instruments in the Plan aims to assess the quality of life, cognitive function and emotional state of the participants before and after the intervention (Na-Nan & Wongwiwatthanakut, 2020; Peasgood et al., 2022). The WHOQOL is widely validated in health and wellbeing contexts, offering a comprehensive view of the physical, psychological, social and environmental aspects that affect the quality of life, and its application in populations with chronic diseases reinforces the relevance of its use. Furthermore, the WHOQOL-OLD version, aimed at elderly populations,

constitutes an important contribution in view of the increase in the number of older adults and the need to assess their quality of life. Regarding MoCA (MoCA Cognition, 2024), the literature emphasizes its sensitivity to detect mild cognitive deficits, which constitutes an added value for monitoring potential cognitive changes in patients (Tomashek et al., 2018). The EADS-21 is a concise and effective tool for measuring depression, anxiety and stress, and its validity and reliability have been confirmed in several studies, essentially in populations with a high level of emotional distress; therefore, its application is aligned with the reality of patients diagnosed with liver cancer. The application of instruments before and after the intervention allows for monitoring and providing valuable feedback to participants.

CBT was incorporated into the Plan as a core methodology to promote cognitive restructuring and the development of coping skills. Uncertainty about the results of treatment and expectations regarding a cure can lead to feelings of helplessness and despair, and the effects of treatments weigh on body image, identity and self-esteem, which can lead to depersonalization and a negative perception of oneself. In this sense, CBT has shown effectiveness in improving emotional and mental wellbeing in cancer patients (Ferreira et al., 2021), helping the patient to reconnect with themselves and accept their changes, improve their depressive and anxious symptoms and cope with fear.

The integration of relaxation techniques and practical and active strategies in a healthy and harmonious environment helps reduce stress and improves patients' perception of control. Group intervention can provide an environment of social support, sharing of experiences and increasing motivation, combating isolation and stigma and fostering social networking, critical and positive thinking, satisfaction with life and hope (Oliveira & Soares, 2011; Lucas & Soares, 2013; Lucas & Soares, 2014). However, it should be kept in mind that group interventions may not meet everyone's needs, constituting a limitation for participants who require more individualized monitoring.

It is worth noting that social ties are essential to development, and the quality of interactions directly affects mental and physical health. Therefore, safe, welcoming and healthy environments must be created so that participants feel comfortable expressing themselves.

Furthermore, the presence of a family and social support network is crucial since cancer does not only involve the patient but also their family members, caregivers and people they live with. Family involvement is beneficial in improving the effectiveness of therapy, and investing in quality time with them can increase emotional and physical wellbeing and self-connection. Therefore, it is recommended that family members be involved in the intervention and its consequences be analyzed in a future study. On the other hand, it is also recommended to explore the advantages and disadvantages of the main CBT techniques, to understand the most appropriate contexts, populations and moments for their application.

Thus, this proposed group intervention plan has a robust, solid and valid theoretical basis, integrating psychometrically validated and reliable instruments and effective cognitive-behavioural techniques. Implementation of the Plan should be accompanied by strategies to increase participation and consider complementary individual interventions for participants who need more targeted support. Additionally, the importance of a multidisciplinary approach is emphasized, where health professionals must work together to minimize the psychological effects of treatments and improve patients' quality of life and wellbeing.

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