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Review Article

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The Role of Psychological Interventions for Patients with Hematologic Malignancies: A Review

Nethmini Ranasingha

Department of Psychology and Public Health, La Trobe University, Melbourne, Australia

Corresponding author
Nethmini Ranasingha, Department of Psychology and Public Health, La Trobe University, Melbourne, Australia.

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ABSTRACT

Purpose: This review explores the psychological interventions for patients with hematologic malignancies (HM). The primary emphasis is on four main interventions, including cognitive behavioral therapy (CBT), mindfulness-based therapy (MBT), acceptance and commitment therapy (ACT), and psychoeducation.

Approach: A comprehensive analysis of the relevant literature was conducted to identify significant studies and findings related to psychological treatments in individuals with hematologic malignancies. This review compiles the research to summarize how various interventions affect patient outcomes comprehensively.

Findings: The study combines results from other research studies, indicating that these psychological interventions are beneficial in reducing distress, depression, and anxiety while also improving the overall quality of life and well-being for patients dealing with hematologic malignancies. The psychological methods revealed in the psychosocial landscape of HM consistently showed positive outcomes, highlighting their potential importance in cancer therapy.

Conclusions: The results indicate the necessity of incorporating psychological interventions into comprehensive treatment strategy for cancer patients with hematologic malignancies. It is recommended that researchers conduct more studies to broaden the existing body of evidence, exploring various approaches to therapy and deepening the comprehension of personalized strategies and teleinterventions to address the distinct psychosocial requirements of this patient group.

Keywords: Hematologic Malignancies, Acceptance and Commitment Therapy, Mindfulness-Based Therapy, Cognitive-Behavioral Therapy, Psychoeducation, Psychological Interventions

Introduction

A Brief Overview of Hematologic Malignancies

Hematologic malignancies (HM) can be considered a group of blood cancers that affect the bone marrow, blood, and lymphatic systems [1]. Moreover, it is one of the leading causes of cancer related deaths in the world. Any stage of blood development may be impacted by hematologic malignancies, leading to impaired blood cell production and function due to an inability to fight infections or a tendency to uncontrollably bleeding [2]. They are classified into several common subtypes: Leukemia, Hodgkin lymphoma, non-Hodgkin lymphoma, and myeloma [3].

Leukemia is a type of blood cancer that arises due to the uncontrolled proliferation of immature white blood cells in blood-forming tissues in newborns [4]. It is categorized as either acute or chronic depending on how quickly it spreads, and as myelocytic or lymphocytic depending on the kind of cell it originates from [4]. Four significant subtypes of Leukemia are Acute lymphoblastic leukemia (ALL), Acute myelogenous leukemia (AML), Chronic lymphocytic leukemia (CLL), and Chronic myelogenous leukemia (CML) [4].

Lymphoma is a cancer characterized by the proliferation of cancerous cells inside the lymphatic system, a vital component of the body's immunological system Two characteristics distinguish leukemias: the lymphoid or myeloid subtype of white blood cell that is affected, and the rate at which the disease

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progresses and worsens [5]. Hodgkin lymphoma is a lymphoma subtype that arises from lymphocytes and may manifest with any part of the lymphatic system [6]. Non-Hodgkin Lymphoma (NHL) can be defined as the collection of cancerous growths that develop from the lymphoid tissues, primarily the lymph nodes. These tumors may arise from chromosomal rearrangement, chemical exposure, infections, or persistent inflammation. Multiple myeloma is a form of hematologic malignancy that is identified by the presence of abnormal plasma cells in the bone marrow. These cells can proliferate uncontrollably, leading to damaging bone lesions, kidney damage, anemia, and high levels of calcium in the blood [7].

Scope of the Review

Despite the advances in medical treatments, the psychological aspect of care among patients with hematologic malignancies have inadequately addressed in empirical evidence. Therefore, the aim of this review is to critically assess and combine the current research on psychological treatments for cancer patients with hematologic malignancies (HM). This review seeks to comprehensively examine the effects of psychological interventions, such as ACT, CBT, Mindfulness, and psychoeducation, on the mental well-being, quality of life, and coping mechanisms of individuals dealing with hematologic malignancies. It analyzes the outcomes and effectiveness of these interventions systematically. In addition, the review aims to examine the deficiencies in the existing literature and suggest potential areas for future study, thereby making a valuable contribution to the development of customized and scientifically supported psychological support techniques for this group of patients. The findings of this review can provide valuable insights for healthcare professionals, researchers, and policymakers. This can help them create specific interventions to improve the psychosocial care of cancer patients with hematologic malignancies. The review concludes with a summary of study limitations in the research literature and recommendations for future study directions.

Psychological Impact of Hematologic Malignancies

Uncertainty and Low Morality

Uncertainty of disease is a main psychological challenge faced by patients with Hematologic Malignancies as they endure a substantial load of symptoms as they approach the end of their life [8]. People with Hematologic Malignancies frequently have confusion over the progression of their illness and the effectiveness of treatments. The physical changes caused by disease and treatment might intensify underlying fears and depressions that patients already have about their future and mortality [9]. Patients experiencing chemotherapy-induced increased cancer-related fatigue (CRF) may encounter an exacerbation of their condition, leading to a surge of negative feelings that they have little influence over [10]. Consequently, this may significantly reduce their inclination and ability to combat the disease. Given the cohort's volatile and uncertain illness progression, it may be more beneficial to focus on identifying the risk of deterioration and mortality rather than attempting to predict specific survival timeframes [11]. Along with that, a reduced mortality rate can be a concerning factor that enhances the negative emotions among blood cancer patients [12]. Upon entering end-of-life care, patients often experience pre-loss grief, also known as anticipatory grief. This form of grief includes preparing for death and is associated with depressive symptoms, a heavy burden on careers, and a lack of communication about death with others [13]. Therefore, it has a substantial impact on the psychological welfare of cancer patients.grieving, pain management, and challenges with dignity [13].

Decreased Quality of Life

It is generally accepted that the symptoms and treatments for blood cancer, such as chemotherapy and allogeneic hematopoietic cell transplantation (HCT), pose significant risks to the physical and emotional well-being of patients, thereby affecting their survival [14]. Thus, it dramatically influences patients' quality of life (QOL) with hematologic malignancies. It is widely acknowledged that a significant number of individuals who survived hematological cancer continue to confront unaddressed physical and psychological requirements after their treatment, leading to a decline in their quality of life [15]. The common side effects of chemotherapy, such as nausea, appetite loss, and exhaustion, may affect the physical, cognitive, and emotional aspects of quality of life [16,17]. The research conducted by Alibhai et al. (emphasizes the considerable influence of cancer survival on emotional well-being, which is an aspect of QOL that experiences significant improvement with time [18]. This highlights the ability of people to withstand and adjust to the difficulties posed by cancer and its treatment. Emotional functioning involves several facets of psychological well-being, such as mood, coping strategies, and general emotional well-being. The data indicates that cancer survivors receive significant enhancements in their emotional well-being over two years or more, as seen by the notable increase in emotional functioning compared to other aspects of their quality of life. The observed positive change may be attributed to various variables, including the implementation of effective psychological coping mechanisms, the presence of a solid social support system, and the individual's ability to adapt and recover while undergoing cancer treatment. However, the study's most intriguing part is the discovery that those who lived beyond two years had a shift in their perspective on the significance of various aspects of their life. This implies a profound reassessment of goals and values, which is a typical psychological occurrence when confronted with life-changing events such as being diagnosed with cancer. During the first two years after therapy, survivors saw a significant change in their perspective on the world.

Moreover, the qualitative study done with the Lived experience of 18 survivors of leukemia or malignant lymphoma in their phases of falling ill, being under treatment, and life following this event indicated that the participants in the first two groups had a favorable evaluation of their quality of life, observing it as enhanced [19]. Their contemplations on the battle against acute leukemia or extremely malignant lymphoma underscored the significance of the ordeal and the personal development it fostered. The optimistic perspective reflects constructing meaning, in which people extract a sense of purpose and understanding from their challenging experience. The experience is redefined as a transforming one, resulting in the acquisition of greater resilience and a more profound comprehension of existence. Attributing positive meaning to events is often linked to improved psychological outcomes and increased resilience when faced with challenges [20]. Most patients had advantages from the newfound significance

they attributed to life; they reevaluated their goals and derived more pleasure from life, surpassing the negative consequences of their therapies and remission status [21]. On the other hand, the third group of survivors perceived their quality of life to be worse. They saw the encounter as unimportant and assessed the situation with resentment. This unfavorable evaluation indicates a difficulty in discovering meaning or importance considering the severe crisis caused by acute leukemia or very malignant lymphoma [21]. Lack of meaning-making may exacerbate feelings of despair and impede psychological adaptation [22]. The group's bitterness indicates the emotional burden caused by the disease, emphasizing the need for specialized psychological assistance to aid persons in managing the intricate emotions linked to a pessimistic evaluation.Therefore, the quality of life perceived by patients with hematologic malignancies depends on their perception based on their symptoms, coping strategies, treatment impact, and resilience skills towards psychological interventions.

Treatment Impact and Side Effects

In addition, because of the severe and lengthy chemotherapy treatment required for hematologic malignancy treatment, patients undergoing stem cell transplantation must experience isolation, which is linked to decreased quality of life and often leads to feelings of loneliness [23]. The most prominent psychological deprivation reported by patients undergoing chemotherapy is the lack of physical contact and the inability to interact with others owing to the secluded surroundings [24]. Such isolation might result in emotions of solitude and a perception of disconnection from their usual daily routines, affecting their relationships, jobs, and social engagements. Consequently, these treatments influence the mental health and overall well-being of patients, leading to emotional exhaustion and burnout [25]. This underscores the psychological consequences of hematologic malignancies.

Furthermore, hematologic malignancies are characterized by side effects such as myelosuppression, gastrointestinal reactions, cardiotoxicity, and liver and kidney injury in leukemia patients undergoing chemotherapy [26]. These side effects contribute to negative emotions among patients, along with the psychological burden they experience [27]. The physical side effects not only provide significant obstacles to the patient's bodily well-being but also elicit unpleasant feelings that may greatly affect their psychological welfare. The adverse character of these side effects may result in increased anxiety, sadness, and general emotional discomfort among patients receiving treatment [28].

The study by Persson and Hallberg indicated that participants expressed feelings of powerlessness and tension [19]. Koenigsmann, Koehler, Franke, et al. also noted that those under the age of 33 provided detailed accounts of side effects and exhibited prolonged rumination to the extent of exhausting themselves. These findings indicate that patients experience a significant psychological burden throughout their illness, and it is suggested that young adults may need extra psychological care during their treatment. Moreover, Cancer- related fatigue (CRF) is a prevalent and often enduring symptom observed by individuals receiving treatment for hematologic malignancies [29]. The collective influence of therapies, in conjunction with the illness itself, may result in severe exhaustion, which hinders the patient's capacity to complete tasks, engage in employment, and participate in social events, which reduces their quality of life [30]. Research results indicate a temporal pattern in the decrease in quality of life (QOL) and self-reported physical function, with the lowest points occurring about three weeks following each round of chemotherapy [31]. This highlights the recurring pattern of how chemotherapy affects the well-being of patients, demonstrating that the treatment comes with substantial difficulties. Therefore, this empirical evidence highlights that treatments and side effects substantially impact the mental well-being of patients with HM.

Common Psychological Symptoms (Anxiety, Depression)

Individuals who are diagnosed with cancer bear a considerable burden of mental health disorders, exhibiting notably elevated prevalence rates of anxiety and depression in comparison to the broader population [32]. Cancer patients have a greater than five times increased likelihood of developing depression compared to the general population [33]. Several studies have shown that the prevalence of anxiety and depression in blood cancer patients is more significant than in other types of cancer patients [34,35]. A study by Kuczmarski et al. which aimed to identify the prevalence of depression and anxiety in patients with blood cancers using the ≥67 years old diagnosed with lymphoma, myeloma, leukemia, or myelodysplastic syndromes between 2000 and 2015, indicates that among 75 691 patients, 18.6% had at least one diagnosis of depression or anxiety [36]. Of the total cohort, 13.7% had precancer depression and precancer anxiety, while 4.9% had CA-depression (Cancer-associated depression) or CA anxiety. cancer-associated anxiety. In this large cohort of older patients with newly diagnosed blood cancers, almost 1 in 5 suffered from depression or anxiety, highlighting a critical need for systematic mental health screening and management for this population.

Leukemia patients frequently experience feeling depressed due to the anxiety of the life-threatening illness and the uncertainty it entails. This is made worse by persistent concerns about the effects of treatment, which may result in higher levels of anxiety [24]. Hematologic Patients who receive hematopoietic stem cell transplant (HSCT) are more susceptible to an elevated risk of experiencing sadness and anxiety due to its lengthy hospitalization and frequent extended recovery periods [37]. The longitudinal prospective study conducted by Tecchio et al. further indicates that both anxiety and depression significant issues for HSCT patients during isolation [38]. The study also revealed that anxiety tend to remain substantially constant over time and the depressive symptoms of the patients increase over the period of isolation.

Moreover, non-medical issues such as personal qualities, lesser level of education, poorer socioeconomic position, family disputes, and lack of family support are contributing factors to the patient's emotional disturbance [35]. Depression and anxiety are not only distressing states, but they also lead to detrimental consequences in the long run, including diminished QOL challenges in information processing, delays in cancer treatment, noncompliance with guideline-concordant care, compromised survival rates, and more [36].

In addition, the fact that many hematologic cancers, such as myeloma, are incurable at the time of diagnosis adds another

level of psychological distress. The understanding that their condition is fundamentally untreatable may exacerbate feelings of anxiety and depression and increase hopelessness in these patients [39]. In addition to, the psychological and social impact of a cancer diagnosis is significant, and patients may experience more anxiety and depression than the general population [40]. Following a cancer diagnosis, emotional and psychological distress may sometimes lead to consequences such as suicide or cardiovascular fatalities and depression and anxiety can impact the overall cancer therapy, rehabilitation, and survival outcomes of the patients [41].

A study by Tomaszewski et al. indicates that Patients with Acute Myeloid Leukemia (AML) have a range of severe symptoms, treatment-related adverse effects, a bleak prognosis, and significant financial strain due to medical expenses [42]. Consequently, they also endure considerable mental distress, including worry, melancholy, dread, and hopelessness. Additionally, they often display indications of posttraumatic stress disorder, such as a high occurrence of intrusive thoughts and avoidance behaviors. The occurrence of cancer may be observed as a distressing incident, and the continued presence of intrusive thoughts and avoidance behaviors indicates that the psychological consequences extend beyond the period of treatment. This is consistent with the broader acknowledgment of cancer as a transformative encounter that may elicit symptoms like those of trauma in people. The results were consistent with the study conducted by Montgomery, Pocock, Titley, and Lloyd, which reported that 51% of leukemia patients had distress and mild-to-moderate depression during their whole disease trajectory, spanning from one month to eight years. It indicates that the psychological problems might last beyond the first therapy phase and remain for a prolonged amount of time.

The quantitative research done by Ding et al. provides beneficial details about the frequency and intensity of anxiety and depression in patients with acute myeloid leukemia (AML) compared to a group of healthy controls (HCs) with the use of 208 patients [43]. The research discovered that depression and anxiety were both common and more intense in AML patients in comparison to the healthy control group as The HADS-A score ($P<.001$), anxiety prevalence ($P<.001$) , and anxiety severity ($P<.001$) were all greatly increased in AML patients than those in HCs and The HADS-depression score ($P<.001$), depression prevalence ($P<.001$), and also depression severity ($P<.001$) were higher in AML patients compared with HCs. No correlation of anxiety or depression with clinical characteristics was found in AML patients (all $P>.05$). These findings indicate that the psychological consequences of AML go beyond the clinical manifestations of the illness and its treatment, exerting a substantial influence on the mental well-being of persons afflicted with this kind of leukemia. Moreover, another study by El-Jawahri et al. demonstrates that older AML patients undergoing intensive chemotherapy and non-intensive chemotherapy had depression rates of 33.3% and anxiety symptom rates of 30.0%, respectively [44]. These findings suggest that there is a significant degree of psychological distress in this group, regardless of the strength of the chemotherapy treatment. A similar prospective cohort research conducted on older adult AML patients receiving induction chemotherapy has shown a depression prevalence rate of 38.9% [45]. This highlights the susceptibility of this group to experiencing depressed symptoms at a crucial stage of cancer therapy. The consistent results from these studies cumulatively demonstrate that there is a substantial numerical incidence of anxiety and depression among patients with HM.

Overview of Psychological Interventions and Its Effectiveness for Patients with Hematologic Malignancies

Mindfulness-Based Therapy (MBT)

There has been a growing trend in using mindfulness-based treatments (MBIs) to alleviate depression and anxiety, as well as enhance emotional and physical well-being, among cancer patients [46,47]. MBT is a mild therapeutic approach that balances an individual's physical and spiritual aspects through mindfulness [24]. Empirical research has demonstrated that MBT is beneficial for enhancing the comfort and well-being of cancer patients as well as for overcoming psychological problems such as depression and anxiety [48]. MBIs enable people to address and control unpleasant bodily sensations and dysfunctional cognitive processes. This is accomplished by cultivating the capacity to focus on the current moment's unfolding experience. The acknowledgment, approval, and detachment from these adverse aspects of an individual's encounter are essential elements of mindfulness techniques [46]. Through the practice of mindfulness, people acquire skills critical to overcoming reactive avoidance behaviors and repetitive cognitive processes that are strongly linked to the occurrence and reappearance of anxiety and depression [49].

Zhang et al. performed an experimental study using a randomized control design in two hematology departments at a hospital in Zhengzhou [24]. The experimental group was given mindfulness-based psychological care (MBPC), while the control group got conventional therapy. MBPC was an adapted iteration of the first mindfulness-based stress reduction (MBSR) program, which is defined as "a structured collective program that utilizes mindfulness meditation to alleviate distress linked to physical, psychosomatic, and psychiatric ailments" [50]. Conventional care included a range of interventions such as physical examination, isolation measures to prevent infection, administration of medicine, provision of primary daily care (ensuring safety, managing nutrition, dental hygiene), additional essential care, and health education on topics like mouth hygiene, emotional adaptation, leukemia, and self-care. Through a comparison with conventional care, this study establishes a standard against which the relative efficacy of mindfulness-based interventions in hematology departments can be assessed.

The Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) were used to assess degrees of anxiety and depression. The study results demonstrated a significant decrease in anxiety and depression levels among patients who underwent MBPC. The research determined that MBPC is a cost-effective adjunctive therapy for treating leukemia, which is both noninvasive and linked to relaxation and pain alleviation. The results obtained add to the growing evidence demonstrating the effectiveness of MBPC as a helpful psychological intervention for leukemia patients. It provides a comprehensive and patient-focused strategy to improve overall well-being during treatment.

In their research, Ng et al. conducted a randomized controlled experiment to examine the effects of a single 30-minute

mindfulness session on alleviating cancer-related Fatigue (CTF) in patients with hematologic malignancies at the haemato-oncology unit at the University Malaya Medical Centre [51]. The research was conducted from October 1, 2019, until May 31, 2020. Patients in the intervention group got standard treatment and a supervised 30-minute mindful breathing practice, while those in the control group just received standard care. The mindfulness session, which effectively reduces fatigue in patients with hematological cancer, consisted of four activities, each lasting 7.5 minutes. The exercises focused on differentiating the breathing process, attentively observing the whole duration of each breath, focusing the attention on the physical body, and promoting relaxation across the entire body. The study's results indicate that a short 30-minute mindful breathing session can effectively reduce cancer-related fatigue in patients with hematologic malignancies. This highlights the potential of mindfulness interventions as a beneficial addition to standard care in the haemato-oncology field. The study results were evaluated at minute 0 (before the intervention - T_0) and minute 30 (after the intervention - T30). Upon completion of the trial, patients in the intervention group were surveyed on their comments, any adverse effects experienced, and their satisfaction and willingness to incorporate 30 minutes of mindful breathing into their daily routine. The study further emphasizes the effectiveness of a 30-minute mindfulness program as it resulted that, while traditional mindfulness practice may have the potential to generate a more enduring impact on reducing fatigue, a single session of short mindfulness practice provides a quick alternative at the bedside for relieving fatigue in patients with hematological malignancy. The 30-minute guided mindful breathing exercise script is simple, and the practice is straightforward to administer. Regarding the feedback received from patients in the intervention group, most of them said that engaging in 30 minutes of mindful breathing was beneficial in alleviating their weariness. The script for mindful breathing was excellent. They experienced a sense of tranquility and serenity while concentrating on their breath, successfully releasing all their worries. Several patients indicated their intention to persist in self-practice. Several individuals requested further structured sessions. Due to its simple structure, the 30-minute guided mindful breathing exercise is easy to do and does not require a lot of training from practitioners. This makes MBT an accessible and effective psychological intervention for people who have been diagnosed with hematologic malignancies. Short mindfulness exercises require less effort and time from individuals yet have the potential benefit of establishing long-lasting habits when done consistently. Even though the simplicity of the thirty-minute mindfulness session makes it easier to administer the intervention for the sample, focusing on the single session of 30 minutes may restrict the generalizability of the study findings and its influence on long-term effects.

In addition to that, with technological advancements, the healthcare sector was able to facilitate interventions based on virtual reality to enhance the overall well-being of cancer patients. The study conducted by Zhang, Jin, et al. examined the effects of a virtual reality (VR) meditation programmer on anxiety, depression, and quality of life in patients who were recently diagnosed with acute leukemia and receiving induction chemotherapy [52]. The study used a randomized controlled experiment with 63 individuals. The intervention group got a daily 20-minute session of VR-based meditation for 14 days, while the control group did not get any such intervention. The findings demonstrated that the intervention group exhibited a noteworthy decrease in anxiety levels and a notable improvement in their quality of life compared to the control group. While the reduction in depression levels did not achieve statistical significance, a noticeable decline was detected in the intervention group. The results indicate that using virtual reality (VR) for meditation is a successful method for reducing anxiety and improving the overall well-being of acute leukemia patients undergoing induction chemotherapy. This research highlights the feasibility of integrating VR-based meditation into clinical practice as a convenient intervention that can be used almost anywhere and anytime. It emphasizes the potential of VR-based meditation to enhance the comprehensive care of cancer patients.

However, there is a lack of sufficient studies on the efficacy of Mind-Body treatments (MBIs) aimed at patients with hematologic malignancies, as most treatments and systematic reviews have been focused on breast cancer patients. Moreover, studies have not aimed at the qualification of MBI moderators or clinicians, as this directly impacts the efficacy of MBI in overcoming psychological barriers among patients.

Cognitive Behavioral Therapy (CBT)

Cognitive behavioral therapy (CBT) is a therapeutic method that employs psychological and behavioral techniques to modify the patient's maladaptive patterns. CBT can be defined as a "sophisticated psychotherapeutic approach, devised to rectify patients' erroneous cognitions, deleterious emotions, and adverse behaviors through the modification of their thought patterns, convictions, and actions [53]. CBT aims to modify patients' cognitive views since it focuses on the fundamental idea that an individual's thoughts profoundly impact their emotions and behavior [54]. CBT enables patients to address their issues and modify their behavior independently [55]. Empirical data indicates that CBT is the most efficacious psychological intervention for alleviating fatigue resulting from cancer treatment, enhancing the overall quality of life for cancer survivors [56,57].

Another study undertaken by Betiar et al. aimed to determine the effectiveness of CBT and Mental Imagery Exercises (MIE) on the Health-Related Quality of Life (HRQoL) of patients with leukemia and lymphoma living in Babol City, Iran, showed that, indicated that CBT had a significant positive effect on HRQoL in patients with leukemia and lymphoma ($P<0.001$) [58]. During the CBT intervention in this study, patients were trained towards practical social support-building skills by teaching them valuable and harmful sources of social support and learning how to expand the social support network, which can also improve their quality of life [59]. The potential consequences of enhanced psychological well-being on treatment adherence are significant, as patients who experience a favorable transformation in their mental health are inclined to be more motivated and involved in following their treatment protocols. The research findings indicate that CBT, which targets psychological well-being and social support, may be regarded as a successful intervention for improving the overall quality of life and treatment adherence in patients diagnosed with leukemia and lymphoma, showing CBT as an effective psychological intervention to mitigate

psychological challenges among patients with hematologic malignancies.

Another study intended to evaluate CBT's feasibility in improving cancer-related fatigue (CRF) in hematologic malignancies patients at the end of eight weeks using 48 patients of the 339 patients. Functional Assessment of Cancer Illness Therapy (FACIT) − Fatigue, M.D. Anderson Symptom Inventory - Acute Myeloid Leukemia / Myelodysplastic Syndromes (MDASI-AML/ MDS), Pittsburg Sleep Quality Index (PSQI), Hospital Anxiety Depression Scale (HADS), Herth Hope Index (HHI), and QOL (FACT-G) were collected at the baseline before the CBT intervention, and after eight weeks (Day 57). The CBT intervention, whether conducted in-person, remotely, or via a mix of both, showed a notable satisfaction rating of 92%. The patients, who mainly were diagnosed with acute myeloid leukemia, showed enhancements in symptoms linked to cancer-associated fatigue, quality of sleep, and scores measuring worry. Integrating diverse CBT techniques, such as providing information on stress management and diaphragmatic breathing, scheduling activities, setting goals, restructuring cognitive patterns, and employing guided imagery, demonstrated a comprehensive strategy for addressing the complex effects of cancer and its treatment on patients' well-being. Significantly, the research omitted a comparison analysis between in-person and digital sessions, resulting in a lack of comprehension of the relative efficacy of various delivery systems. Although the CBT intervention had the potential in improving some facets of psychological well-being, such as anxiety and sleep quality, there was no notable alteration in depression ratings. The elevated satisfaction rate (92%) indicates the acceptance among patients, highlighting the possible practicality of incorporating CBT into treating individuals with hematologic malignancies. Nevertheless, the study emphasizes the need for additional randomized controlled trials to thoroughly investigate the efficacy of CBT in this group of individuals experiencing distress. These trials should also examine how CBT affects treatment adherence, thereby establishing a basis for evidence-based interventions that are specifically designed to improve the psychological well-being of individuals with hematologic malignancies.

However, studies have shown that CBT does not exhibit efficacy with other active comparisons, such as relaxation training, supporting therapy/counseling, physical exercise, yoga, and mindfulness-based stress reduction (MBSR) [60]. Furthermore, it is significant that most studies on CBT have focused on women with breast cancer or patients who completed their treatment and are considered cancer survivors. Consequently, there is a lack of research explicitly undertaken on patients with blood cancer. However, majority of studies have shown that CBT shown to be efficacious in enhancing the functional health outcomes of individuals who have survived cancer, irrespective of the method of treatment delivery or the number of cancers diagnoses they have had [60]. CBT, apart from the newly diagnosed individuals, demonstrated statistically significant improvements in all treatment periods. Cancer patients who have just been diagnosed frequently have a sense of being overwhelmed by the unpleasant feelings that are often associated with receiving a cancer diagnosis [61]. As research progresses, improving and tailoring psychosocial therapies, such as CBT, will enhance the accuracy and effectiveness of addressing the varied requirements of cancer patients throughout their treatment process.

Acceptance and Commitment Therapy (ACT)

ACT is a cognitive-behavioral approach of the third wave that seeks to enhance psychological flexibility. It is defined as the capacity to engage in valuable, purposeful activity while remaining open and aware in the present moment [62]. ACT therapy is founded on the premise that people undoubtedly face many difficulties and unpleasant situations throughout their lives. Still, effective strategies exist to manage and ultimately overcome them, which help change their perception of suffering [63]. This intervention facilitates individuals in embracing suffering (the inclination to endure pain or unpleasant occurrences without attempting to manipulate them) or ideas associated with pain, fostering the beneficial sides of life, and enhancing useful pursuits [64]. Additionally, it promotes the acceptance of suffering and its repercussions among individuals experiencing discomfort, urging them to engage in meaningful activities that enhance their psychological well-being instead of futilely resisting the pain [64]. Therefore, ACT can be beneficial for cancer patients in general as it helps them to comprehend that distress and suffering are expected in the human experience, and suffering is also joint within cancer diagnosis, thereby reducing their level of distress and painful thoughts among cancer patients.

The study, which intended to examine the efficacy of ACT and Hope Therapy in alleviating pain anxiety and promoting self-acceptance among 167 leukaemia patients in Saudi Arabia, produced valuable findings [65]. The research used two measures, the Unconditional Self-Acceptance Questionnaire (USAQ) and the Pain Anxiety Symptoms Scale (PASS), to evaluate the results. The results demonstrated that ACT is a very productive approach for augmenting self-acceptance and mitigating anxiety and distress in individuals diagnosed with leukemia. Significantly, the research revealed that ACT treatment was superior to hope therapy in attaining these positive outcomes [65]. These findings indicate that the concepts of ACT, which entail acknowledging and embracing one's thoughts and emotions while actively engaging in meaningful acts, significantly enhance the psychological well-being of patients with hematologic malignancies. The proven efficacy of ACT in improving self-acceptance is especially vital for patients dealing with the difficulties associated with leukemia. Furthermore, the observed decrease in anxiety and pain suggests potential advantages for the general psychological well-being of patients.

Moreover, the superior efficacy of ACT compared to hope therapy highlights the distinctiveness and strength of ACT in this situation. In addition to mental well-being, the potential influence of improved self-acceptance and decreased anxiety on adherence to therapy is significant. Patients who achieve enhanced psychological well-being are more inclined to comply with their treatment programs, leading to improved health results. Although the study offers important insights, doing more research with more significant sample numbers and longitudinal designs would be advantageous to enhance the data supporting ACT's efficacy in hematologic malignancies.

Empirical evidence suggests that ACT effectively enhances the quality of life and psychological well-being of 45 Leukemia

patients [66]. Further, the study indicates that ACT caused a decrease in mood disturbances and distress among leukemia patients. The results highlight the potential advantages of ACT for persons with hematologic malignancies. However, it is essential to recognize the absence of comparative studies in this patient group. The lack of research in the literature comparing ACT with other psychological therapies for hematologic malignancies necessitates a thorough evaluation of the therapy's distinct benefits and possible limitations. Future research should do comparison trials to determine if ACT is more effective or synergistic with other treatments in addressing the intricate psychological issues experienced by individuals with hematologic malignancies.

Furthermore, a systematic review conducted by González-Fernández & Fernández-Rodríguez, indicates that ACT showed a better result in psychological outcomes of cancer patients as it helped improve their quality of life and the emotional states (anxiety, depression, and emotional distress) [67]. However, although demonstrating the efficacy of ACT, the trials were constrained by factors such as study design, poor quality, and limited sample size. Furthermore, a limited number of research have focused explicitly on cancer patients with hematologic malignancies, while most current studies have been conducted on a broader population of oncology patients.

Psychoeducation

Psychoeducation integrates psychological concepts and education to provide people and their families with knowledge and assistance in comprehending and managing the difficulties related to a medical condition. Psychoeducation plays a crucial role in resolving the complex connection between the physical components of blood cancer and the psychological aspects of coping and adjustment [68]. Psychoeducation attempts to facilitate patients in gaining a more comprehensive understanding of their circumstances, fostering the development of problem-solving abilities through the provision of incentives and knowledge that promote behavioral modifications, cultivating motivation to engage in self-care practices, averting complications, and ultimately enhancing overall well-being, adaptability, and quality of life [68]. Patients' quality of life is improved, their level of wellness is elevated, and potential adversities are averted through the assistance of the psychoeducation program, which also assists them in identifying and comprehending themselves. Psychoeducation programs help patients surmount feelings of isolation, acquire knowledge, overcome fears and anxieties, express their emotions and thoughts, and gain insight into themselves [68]. Additionally, to aiding cancer patients in problem-solving, psychoeducation practices are efficacious in mitigating symptoms of anxiety and depression [69].

Empirical evidence has shown that computer-delivered psychoeducation enhanced treatment adherence in adolescent cancer and the locus of control in children with leukemia [70,71]. Another study, the research undertaken by Day et al. examines the efficacy of a psychoeducational intervention for children between the ages of 7 and 12 who are receiving treatment or have survived leukemia at four hospitals in the United Kingdom [72]. The intervention consisted of four 2-hour sessions held over consecutive weeks. Its objective was to improve children's comprehension of leukemia, its treatment, and the need to live a healthy lifestyle. The study used a longitudinal randomized controlled trial methodology, which included collecting data from parents to evaluate the effects on the child's quality of life and behavioral issues. The main results were assessed using the Pediatric Quality of Life Inventory (PedsQL) general scale and the Strengths and Difficulties Questionnaire (SDQ), respectively. The findings demonstrated that the psychoeducational intervention was well-received by both children and parents, with reported advantages including enhanced child cognition, enhanced interpersonal exchange, and less anxiety. The acceptability test focused on the intervention's capacity to improve health-related quality of life (HRQoL) via providing information, encouraging healthy behaviors, and facilitating relationships with peers with comparable experiences.

Üzüm's research offers significant contributions to the body of knowledge regarding the efficacy of psychoeducation as a psychological intervention for individuals afflicted with hematologic malignancies [68]. The results indicate that engagement in a psychoeducation program significantly affects the psychological welfare of individuals. Positive changes were observed in individuals following the intervention, including the development of future-oriented plans, a reduction in self-blame, an increase in self-awareness, and the promotion of stronger social connections. Significantly, the program's implementation was correlated with enhanced emotional regulation, the conversion of adverse emotions into favorable ones, and the growth of self-assurance. The significant improvement in patients' problem-solving abilities, as measured by the increased self-esteem, suggests that these patients are better equipped to confront and overcome the obstacles presented by hematologic malignancies. Although the study does have a limitation in that it does not specify the number of participants who have hematologic malignancies, the results demonstrate that psychoeducation can generally assist individuals dealing with the complexities of blood cancers in undergoing a positive psychological transformation and developing adaptive skills. The significant enhancements observed in various aspects, such as cognition, emotion, and interpersonal relationships, underscore the potential of psychoeducation as a supplement to conventional medical interventions. These results have encouraging ramifications for treatment outcomes and psychological well-being in the context of hematologic malignancies. Additional research that is more specifically aimed at hematologic malignancies is necessary to enhance the body of evidence and further comprehend the unique effects of psychoeducation on this group of patients.

Every intervention exhibits distinctive benefits; cognitive behavioral therapy (CBT) targets maladaptive cognitions; mindfulness cultivates awareness of the present moment; acceptance and commitment training (ACT) encourages psychological adaptability; and psychoeducation furnishes enlightening and encouraging materials. Contrary to CBT and mindfulness interventions, which focus on psychological symptoms, ACT, and psychoeducation approach adaptation more comprehensively and holistically. Patient preferences, contextual factors, and the requirements of individuals with hematologic malignancy ought to guide the choice of interventions. By integrating components of these interventions, integrative strategies may offer potential solutions to the complex issues presented by hematologic malignancies.

Conclusion

The profound implication of Hematologic Malignancies extends beyond the physical health significantly affect the mental well-being of patients. The review demonstrates that hematologic malignancies is a serious and severe condition that significantly contribute to the mental health of patients due to lengthy hospitalization, constant treatments, low mortality, and uncertain nature of the disease. Therefore, it is substantial to consider the mental health aspect of patients and how it impacts for them along with their declining or enhancing physical health. The review emphasizes the significance of incorporating psychosocial therapies into the treatment paradigm, recognizing that treating the mental health element is just as important as controlling the patients' changing physical health. Cognitive behavior therapy (CBT), mindfulness therapy (MBT), acceptance and commitment therapy (ACT), and psychoeducation are identified as critical techniques for relieving the psychological distress experienced by hematologic malignancy patients. The findings suggest that MBT helps to reduce the anxiety and depression level among patients with HM. Similarly, CBT is shown effective in alleviating cancer related fatigue, enhancing treatment adherence and the enhancing overall well-being. ACT shown beneficial in self-acceptance, enhanced quality of life and reduced anxiety. Psychoeducation assists in providing valuable information for patients and their families, improved coping mechanisms and enhanced quality of life.

Nevertheless, it is important to recognize the intricate and subtle characteristics of these treatments. The success of each psychological intervention differs depending on aspects such as the unique features of the condition, its stage, individual tolerance and coping mechanisms, the availability of social support, and the effectiveness of concurrent medical therapies. It is crucial to use these interventions in a customized manner, considering each patient's distinct and varied circumstances. This study promotes the adoption of a comprehensive strategy to the treatment of patients with hematologic malignancies, recognizing the interconnectedness of illness comprehension, psychological effects, and healthcare results. Healthcare practitioners may improve the overall well-being of patients with hematologic malignancies by adopting a holistic strategy that addresses both the physical and psychological aspects of the disease. This approach develops resilience and enables patients to better cope with the obstacles they face.

Limitations of the Study

The first limitation is majority of the studies used in this research have primarily concentrated on the blood cancer known as Leukemia, while neglecting to adequately address other varieties. This lack of consideration to other types of cancer may limit the applicability of the study's breadth and findings to clinical practice. The second limitation is only four evidence based psychological interventions have utilized in this study that are CBT, ACT, psychoeducation, and the mindfulness. Although these methods have shown significant effectiveness, the only emphasis on them could restrict the investigation of possible alternative or supplementary approaches. The third limitation is majority of research studies were included few small sizes which may impact the generalizability of study findings. The fourth limitation is there were noticeable differences in the intensity, duration, and frequency of some of the psychological interventions, as well as the way they were delivered, making it difficult to draw true comparisons across studies. Future research should concentrate on conducting larger-scale studies to strengthen the reliability of results and explore a wider range of psychological interventions. This will allow researchers to gain an expanded knowledge of effective strategies that can be customized to meet the specific needs of cancer patients with hematologic malignancies. Moreover, as the studies have conducted in different hospital settings it may influence generalizability of the study findings. Furthermore, most of the randomized controlled studies employed in the research were characterized by short-term interventions and short-term follow-up with patients, resulting in limited generalizability of the findings. Conducting longer-term follow-ups could offer valuable insights into the durability of the observed improvements and the possible necessity for ongoing interventions. Many studies only look at pre-post intervention changes, which creates impact on durability of effects. Moreover, while most studies have concentrated on specific psychological therapies, there is a need for research that examines the efficacy of integrated or combination methods that holistically meet the diverse requirements of patients with hematologic malignancies.

Recommendations

In the future of psychosocial oncology, recent developments indicate a need for inventive or innovative methods to improve the accessibility and efficacy of psychological therapies. An area with great potential for future investigation is using technology to provide psychological assistance. A limited number of research studies have focused on digital psychological intervention, particularly with patients with hematologic malignancies. Due to the inaccessibility of face-to-face psychological interventions for cancer patients, recent research studies have focused on online psychological interventions that aim to enhance the psychological well-being of cancer patients. In addition to being easily accessible, more cost-effective, and time-efficient, online therapies have other benefits, including anonymity and uninterrupted availability. Furthermore, they mostly do not need the engagement of a skilled mental health practitioner [73]. Moreover, the positive aspects of these treatments include effortless information updating, patients' capacity to enquire about and obtain assistance, and the capability to monitor their mental health. The interventions that are embedded with the technology include online therapy, Mobile apps focused on mental health, online psychoeducation, text messages and reminders about mental health, etc.

In a review of psychological interventions for cancer patients, Hulbert-Williams et al. pointed out several limitations of current effectiveness research. These included, among other things, a lack of multiple-arm studies that would allow comparisons between different interventions, a lack of active control studies, a lack of high-powered studies testing for outcome moderators, and narrow choices of intervention outcomes. A study by Leslie et al. showed that web-based psychosocial oncology therapies are effective in lowering depression and stress [74]. However, the results for distress, anxiety, quality of life, and well-being were inconsistent and varied in strength. Therefore, future researchers must conduct comparative analyses and trials to assess the efficacy of online psychological interventions and their impact on the overall mental well-being of cancer patients.

This is because online or telephone-based interventions may be constrained by the patient's level of technical knowledge or computer literacy and issues such as dissatisfaction, transparency, and time constraints. To optimize mental health treatment in the digital era, it will be crucial to comprehend the intricacies of online interventions, their extent of influence, and their capacity to cultivate a feeling of community and connection among individuals with cancer.

Potential Areas for Further Research

Further research is required, using bigger sample sizes, to improve the applicability and statistical strength of the results. To enhance our understanding of effective interventions, it would be beneficial to broaden the scope of research by incorporating a more comprehensive range of psychological interventions, in addition to the currently studied Cognitive-Behavioral Therapy (CBT), Acceptance and Commitment Therapy (ACT), mindfulness, and psychoeducational approaches. Investigating innovative therapy techniques, such as expressive arts treatments, virtual reality interventions, and positive psychology methods, may provide a range of customized ways to address the specific psychological difficulties experienced by patients with hematologic malignancies. Furthermore, considering the long-term effects of these therapies on both psychological outcomes and physical health, as well as their influence on treatment adherence, would provide a more comprehensive viewpoint. Furthermore, exploring the possible synergies among various therapies and their collective impact on patient well-being can facilitate the development of more comprehensive and tailored psychological care approaches for individuals with hematologic malignancies. In addition to that, more comprehensive comparative research of each psychological intervention and its efficacy is needed. Further study is required to examine the usage of patients with hematologic malignancies, since most existing studies have mostly focused on patients with other forms of cancer. Therefore, it is important to address how the psychological intervention may vary depending on the type of cancer in future research.

Implications for Healthcare Professionals

The profound implications for healthcare professionals necessitate a paradigm shift towards a patient care approach that should be more holistic, integrated, and comprehensive. By combining these psychological interventions into regular clinical practice, significant progress can be made in providing comprehensive cancer care for patients with hematologic malignancies. This requires collaboration from different healthcare professionals, including oncologists, psychologists, nurses, and others, to effectively incorporate psychological support into the overarching system of cancer treatment. Healthcare professionals could inform the creation of customized interventions aimed at the distinct requirements of this group of patients by acknowledging the effectiveness of MCT, CBT, ACT, and Psychoeducation. Such interventions would promote resilience, coping mechanisms, and ultimately, enhanced quality of life for individuals undergoing cancer treatment. Furthermore, the incorporation of psychological care into treatment programmes for hematologic malignancies is crucial. This involves establishing all-encompassing care protocols that smoothly integrate psychological therapies with medical treatments, promoting a holistic approach to patient well-being. In addition, healthcare providers must guarantee the efficacy of evidence-based therapies among patients with hematologic malignancies since their effectiveness is contingent upon factors such as the patient's disease stage, severity level, and mortality rate. Consequently, some psychological interventions may not be applied to every patient since some individuals may require other interventions that were not included in the research. Therefore, healthcare practitioners have a substantial and vital responsibility to determine the appropriate and optimal psychological intervention for each patient and its effect on their psychological well-being. Efficient psychological interventions that focus on crucial processes for coping with distress in cancer can potentially decrease expenses across several domains, such as people, medical systems, and broader health networks [75-90].

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