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The Effectiveness of Acceptance and Commitment Therapy on Distress Tolerance and Death Anxiety in Patients with Lung Cancer

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Quantitative Study

Abstract

Background: Lung cancer is one of the most prevalent types of cancer and one of the world's leading causes of death. The purpose of the current study is to evaluate how well acceptance and commitment therapy (ACT) treats distress tolerance and death anxiety in patients with lung cancer.

Methods: The current research was practical in terms of purpose and quasi-experimental in terms of method with a pre-test, post-test, and follow-up design with a control group. The statistical population consisted of 317 patients with lung cancer referred to the King Faisal Specialist Hospital and Research Center in Riyadh, Saudi Arabia, in 2021. Simple random sampling was utilized to select 70 patients from the group. The participants were separated randomly into experimental and control groups (35 in each group). In order to collect information, questionnaires of distress tolerance and death anxiety were used. The SPSS software was used to perform repeated measures analysis of variance (ANOVA).

Results: The experimental and control groups differed in the post-test death anxiety measures and distress tolerance components ($P < 0.001$). In addition, the outcomes remained constant across the follow-up period ($P < 0.001$).

Conclusion: This study showed that in patients with lung cancer, ACT raised distress tolerance and decreased anxiety about death. In addition to medical programs to lessen and manage discomfort and death anxiety, educational and psychological programs must be offered to patients with lung cancer in order to improve their mental health.

Keywords: Lung neoplasms; Acceptance and commitment therapy; Psychological distress; Anxiety

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Introduction

There are various manifestations of lung cancer and its warning signs include an increased or severe cough in smokers, cough with bloody sputum, shortness of breath due to activity, acute wheezing, vague or pronounced chest pain, hoarseness, weight loss, anorexia, and swelling in the lungs. The neck and face are extremely feeble and exhausted. This type of cancer has no symptoms in its early stages, and patients frequently visit a doctor when the disease is in its advanced stages, which has led to an increase in the cancer mortality rate (Hinrichs, Steadman-Wood, & Meyerson, 2020).

Patients with different types of cancer have high rates of mental disorders, such as depression, anxiety, inability to adapt to the disease, and low self-confidence. They also have high rates of emotional disorders and fear of the disease coming back or dying (Haji-Adineh, Rafeian, Tavakoli, & Farisat, 2019). The link between how the mind of a patient with cancer changes and how they act in ways that are good for their health is an important topic that is discussed worldwide. Because cancer has more than one cause and more than one way to be treated, psychological and behavioral factors are just as important as physical factors. It seems that, in addition to drug treatments, psychological treatments and interventions can also help with mental health problems (Molavi, Afshar-Zanjani, & Hajializadeh, 2020). Acceptance and commitment therapy (ACT) is based on a philosophy that does not suggest building a model that matches reality. Instead, it thinks that the essence of work is to be accurate, wide, and deep to predict and change behavior. ACT improves the quality of life, makes people want to be more creative, lowers the risk of job burnout, and helps people learn new things better and faster (Li, Li, Guo, Li, & Yang, 2021).

Numerous psychological treatments, such as ACT, have been applied to various aspects of patients with lung cancer thus far. Acceptance is moderated during this procedure by incorporating a commitment to alter behavior by values (Kaplan et al., 2022). This therapy focuses on acceptance as a process that enhances psychological adaptability and counteracts experiential avoidance and ineffective coping. The second focus of therapy is commitment and action toward constructing a sustainable value-based life. Due to the increasing prevalence of lung cancer in modern societies, the prevalence of psychological disorders in these patients, and the effect of psychological treatments on reducing side effects and slowing the progression of the disease, it appears that an ACT, focusing on the component of acceptance and changing behavior, can reduce side effects and improve the living conditions of this population. Acceptance among patients with lung cancer can lead to advancing medical treatments and accepting new conditions that improve the patient's quality of life (Gueserse, Zali, Hassanzadeh, Hatami, & Ahadi, 2022).

Psychological distress, which includes feelings of anxiety, depression, and stress, is one of the psychological issues that patients with lung cancer face. Numerous studies have demonstrated that psychological distress is associated with elevated cancer risk. Changes in the neuroendocrine system, hypothalamic-pituitary and adrenal axis, blood platelet function, and heart rate are associated with psychological distress. People with a lower distress tolerance exhibit avoidance behaviors or do not express their emotions when exposed to stressful situations; to reduce their distress quickly, they continue the avoidance behaviors and turn them into a pattern of behavior (Masjedi-Araani & Khanaliloo, 2018). The manifestations of experiential avoidance are frequently physiological experiences, thoughts, emotions, and memories.

Psychological distress is regarded as the most important risk factor for various diseases, including heart failure and cancer. Psychological and physical problems have a significant negative impact on the family life, work, social activities, and sexual performance of people with cancer, as well as causing numerous psychological issues and a poor quality of life. Since ACT focuses on clarifying and emphasizing values and goals, studies have been conducted to demonstrate its effectiveness in treating psychological disorders and problems (Gonzalez-Fernandez & Fernandez-Rodriguez, 2019; Moreno et al., 2022; Salari et al., 2021; Vilardaga et al., 2020).

As cancer progresses, patients are exposed to various discomforts, which frequently manifest as anxiety, depression, and despondency. Anxiety is a response to an unknown, internal, and ambiguous threat; its origin is unconscious and uncontrollable, and multiple factors contribute to its development. Death anxiety is one of the most significant types of anxiety that are known and named based on their origin. Death anxiety, which is the most significant concern of human life and the root of all anxiety disorders, is one of the constant stresses that humans experience in life (Gueserse et al., 2022). It is defined as an irrationally intense fear of death accompanied by feelings of dread or apprehension when contemplating the dying process or the afterlife. Since death has never been experienced and no one has had direct contact with it, everyone is apprehensive about it (Serfaty et al., 2019).

People with a high tolerance for ambiguity are better at resolving conflicting issues because they have multiple solutions in mind and make the best use of the best possible solutions; they are less stressed and worried by negative thoughts and perform better when resolving conflicts. In contrast, anxious individuals view uncertain or ambiguous situations as stressful and upsetting, and as a result, they experience chronic worry in response to such situations. As one of the most prevalent diseases, lung cancer can cause emotional and psychological issues such as death anxiety. Studies show that ambiguity tolerance is associated with grief, neuropsychiatric symptoms, and post-traumatic stress disorder. According to the findings of several researchers, both groups of patients with acquired immunodeficiency syndrome (AIDS) and patients with cancer had greater death anxiety than their caregivers (Mosher, Krueger, Secinti, & Johns, 2020). They also have demonstrated that patients with cancer hold more negative beliefs about what happens after death and have a higher death anxiety level (Salari et al., 2020).

Overall, the empirical evidence supporting ACT as a treatment for patients with lung cancer is extremely limited. Even though this treatment is related to physical and mental health and research has confirmed its effectiveness, this field has a high potential for further research. In light of the significance of psychological constructs in the health of patients with lung cancer, the significance of mental health and its potential effect on the outcome of treatment, and the lack of specialized educational programs in medical centers, there is a need for psychological interventions based on new treatments, particularly interventions based on experience in this field. In this regard, the aim of the present study was to evaluate the effectiveness of ACT on distress tolerance and death anxiety in patients with lung cancer.

Methods

The current study was quasi-experimental with a pre-test, post-test, and follow-up design with a control group. A total of 317 individuals with lung cancer who were referred to the King Faisal Specialist Hospital and Research Center in Riyadh, Saudi Arabia, in 2021, comprised the study's statistical population. The participants were

selected by purposeful sampling and then randomly separated into experimental and control groups (35 in each group). Inclusion criteria included written consent to participate in the study, a lower-than-average score on the Distress Tolerance Scale (DTS), a higher-than-average score on the Death Anxiety Scale (DAS), age between 45 and 65, absence of concurrent medication for another disorder, and a minimum literacy level of a high school diploma. Exclusion criteria included unwillingness to participate in the study, unwillingness to complete questionnaires, and absence from more than two treatment sessions. To comply with ethical considerations, participation in this research was entirely voluntary, and the participants were briefed on the project's parameters and regulations before its commencement. In addition, members of the experimental and control groups were permitted to withdraw from the study at any time, only the experts had access to all documents, questionnaires, and confidential records, and all volunteers provided written informed consent.

Before beginning the research, both the experimental and control groups completed a pre-test. ACT (Luoma, Hayes, & Walser, 2007) was conducted through eight 90-minute sessions and one session per week for two months (Table 1). The experimental and control groups were given a post-test under the same conditions following the sessions. In addition, two months after the post-test, two groups underwent a follow-up phase.

The DTS (Simons & Gaher, 2005) is a self-measurement index of emotional distress tolerance. The items on this scale measure a person's ability to deal with emotional distress, how they think about it, how much they notice negative emotions when they happen, and what they do to calm themselves down. This scale contains 15 items scored on a Likert scale from 1 to 5 points. Individuals with high scores on this scale have a high distress tolerance. The creators have reported an alpha coefficient of 0.82 for all questions. In addition, this scale has been found to have good criterion validity and initial convergence (Van Eck, Warren, & Flory, 2017). In the current study, the Cronbach's alpha of the DTS questionnaire was obtained to be 0.84.

Table 1. Description of sessions based on acceptance and commitment therapy (ACT)

Session	Description of the session
1	Getting to know the group members and establishing a therapeutic relationship, stating the treatment period's objectives, discussing the impacts of lung cancer on life, establishing group rules, and administering the pre-test
2	Practicing mindfulness, articulating the distinction between value and purpose, and elucidating values
3	Identifying life's significant components, and summarizing the session
4	Practicing mindfulness (listening to music) improves responses to distressing internal experiences, decreasing motivation for avoidant behavior
5	Practicing mindfulness (practicing distant and recent memories), perceiving thoughts realistically, and attending to thoughts and experiences as a continuous behavioral process rather than a predetermined event
6	Practicing mindfulness (paying attention to signs) and employing techniques that help a person recognize herself as a self-observer
7	Practicing mindfulness (entering the body), experiencing the past and future as thoughts, emotions, and memories, and focusing on the present as the actuality of the present moment
8	Practicing the advertising mind (rehearsing the concept of a speech), recognizing a series of value-aligned behaviors, and completing the post-test

The DAS (Templer, 1970) is a self-administered questionnaire consisting of 15 questions (in the form of two options, "yes" and "no") that cover the spectrum of death changes; a "yes" response indicates the presence of death anxiety in individuals. Higher scores on this questionnaire indicate increased death anxiety, while lower scores indicate decreased death anxiety. They scored zero for "no" response and one for "yes" response. Templer reported that the questionnaire's validity and reliability were 0.42 and 0.83, respectively (Vodermaier & Linden, 2019). In the current study, the Cronbach's alpha of the DAS questionnaire was obtained to be 0.82. The repeated measures analysis of variance (ANOVA) was applied to the pre-test, post-test, and follow-up using SPSS software (version 23, IBM Corporation, Armonk, NY, USA).

Results

In the current study, the experimental group had a mean ± standard deviation (SD) of age of 57.71 ± 4.13, while the control group had a mean ± SD of age of 58.23 ± 5.09. Table 2 displays the mean and SD of research variables for experimental and control groups during the pre-test, post-test, and follow-up.

Before performing the ANOVA test with repeated measurements between groups, the assumption of normality of the data was verified with the Shapiro-Wilk test. This assumption indicates that the observed difference between the distribution of the sample group scores and the normal distribution in the society is equal to zero. The results of this test showed that all the variables in the pre-test, post-test, and follow-up followed the normal distribution. Moreover, in order to check the assumption of uniformity of covariances or the equality of covariances with the total covariance, Mauchly's test of sphericity was used. If the significance in Mauchly's sphericity test is higher than 0.05, it is usually used for the assumption of sphericity test, and in case of non-confirmation, the conservative Greenhouse-Geisser test is used for repeated measures ANOVA. In this research, the results of the Mauchly test of the research variables were not established ($P > 0.05$). Therefore, the results of the repeated measures ANOVA for the comparison of two groups in the variables of death anxiety and distress tolerance in the three stages of pre-test, post-test, and follow-up based on the Greenhouse-Geisser correction are reported in table 3.

Based on the results, the difference between the scores of death anxiety variables ($P < 0.01$) and distress tolerance components ($P < 0.01$) was significant in three stages of the research. Moreover, the average scores of the research variables in the two groups of the test and the control were significant ($P < 0.05$). In addition, the interaction between research stages and group membership was also significant in all research variables ($P < 0.01$). In other words, the difference between the scores of the research variables in the three stages of the research in the two groups was significant; therefore, it can be concluded that ACT is effective in changing the death anxiety and distress tolerance of patients with lung cancer.

Table 2. Mean and standard deviation (SD) of the variables for experimental and control groups

Variable	Group	Pre-test (mean ± SD)	Post-test (mean ± SD)	Follow-up (mean ± SD)	P-value
Distress tolerance	Experimental	30.76 ± 4.78	59.12 ± 5.17	56.41 ± 5.64	< 0.001
	Control	29.53 ± 4.38	28.92 ± 4.51	30.16 ± 4.63	0.830
Death anxiety	Experimental	12.53 ± 2.17	7.34 ± 1.28	7.62 ± 1.74	< 0.001
	Control	12.19 ± 2.04	11.70 ± 1.63	11.91 ± 2.27	0.670

SD: Standard deviation

Table 3. The results of repeated measures analysis of variance (ANOVA) with Greenhouse-Geisser correction to investigate the difference between groups in the variables of death anxiety and distress tolerance in the three stages of pre-test, post-test, and follow-up

Group	Source	SS	df	MS	F	P-value	Effect size
Death anxiety	Stages	81.02	1.73	46.88	45.05	0.001	0.61
	Stages × Group	64.22	1.73	37.16	35.71	0.001	0.55
	Groups	156.99	1.00	156.99	13.87	0.001	0.32
Distress tolerance	Stages	54.04	1.27	42.44	39.82	0.001	0.58
	Stages × Group	69.16	1.27	54.32	50.96	0.001	0.63
	Groups	114.35	1.00	114.35	16.32	0.001	0.36

SS: Sum of squares; df: Degree of freedom; MS: Mean square

Discussion

The current study aimed to examine the effectiveness of ACT on distress tolerance and death anxiety in patients with lung cancer. The results demonstrated that the treatment based on acceptance and commitment effectively enhanced distress tolerance and decreased death anxiety, and these results persisted throughout the follow-up period. Over the years, researchers have examined various treatment methods, such as ACT, and have evaluated several dependent variables, such as distress tolerance and death anxiety. Some of the cited studies are in line with the results of the current research (Li, Jin, Ng, Mann, Wang, & Wong, 2022; Mosher et al., 2019; Zhao et al., 2021), while others are not (Han, Yuen, & Jenkins, 2021; Lewson, Johns, Krueger, Chinh, Kidwell, & Mosher, 2021). In the report by Butow et al. (2013), it was determined that the protocol of overcoming fear, which was developed based on a combination of treatments, including ACT, was able to reduce patients' fear of disease recurrence and improve their quality of life. In the study by Hulbert-Williams et al. (2015), it was found that patients with cancer adapted well to ACT. In addition, Thekiso et al. (2015) demonstrated that ACT reduced anxiety and depression in people, even after a 6-month follow-up. Feros et al. (2013) demonstrated that ACT could affect psychological flexibility and mood of patients with cancer.

Because acceptance and commitment are nonjudgmental and balanced states of awareness, they facilitate clear perception and acceptance of emotions and physical phenomena as they occur when explaining these findings. Consequently, teaching it to patients with lung cancer enables them to accept their feelings and psychological symptoms. Acceptance of these feelings and thoughts reduces excessive attention and feelings to the issues related to one's illness, thereby improving their compatibility. Cognitive isolation enables patients with lung cancer to view their problems from the outside and speak more freely about their problems and illness; this enables a person to identify their personal and primary values, discuss them in detail, and develop specific behavioral goals (O'Hayer, O'Hayer, & Sama, 2018). Increasing mental awareness also aids patients with lung cancer in making accurate assessments of the disease and its complications. Mindfulness is an important part of this therapy because it allows patients to gain a new perspective on their mental events and see their thoughts as something separate from themselves. People with greater experiential avoidance have fewer positive emotional experiences, less life satisfaction, and a sense that life has lost meaning. The mentioned therapy influences outcomes such as increased life satisfaction and decreased psychological distress by decreasing experiential avoidance and, consequently, increasing acceptance (Kohle et al., 2021).

The effectiveness of treatment depends on the patient's acceptance and dedication to the processes governing this treatment. Mindfulness is one of the most important techniques in this treatment. Multiple studies have highlighted the effect of mindfulness on chronic patient recovery (Hinrichs et al., 2020). Mindfulness makes him aware of his negative thoughts and emotions by bringing him into the present and reducing cognitive dissonance (two fundamental processes in the treatment based on acceptance and commitment), thereby diminishing their impact. A patient's abilities are more likely to be preserved if they are treated with an accepting attitude towards chronic pain. Maintaining abilities despite chronic pain is one of the primary goals of numerous pain treatment programs, as numerous studies have demonstrated that avoiding activity accelerates the transformation of acute pain into chronic pain (Li et al., 2022).

Contrary to this, patients with chronic pain sometimes insist obstinately on finding a method to control their pain. By insisting on being pain-free, these individuals deny and demonstrate their pain's uncontrollable nature. This contradiction has led to a trend toward more balanced approaches, such as acceptance-based approaches, in which the patient is instructed to control the controllable aspects and accept the uncontrollable aspects (Zhao et al., 2021). In general, based on the researchers' findings, it can be stated that an accepting attitude toward cancer is predictive of the preservation of patients' abilities, regardless of the intensity of distress and death anxiety. Maintaining abilities despite a disease is one of the primary objectives of numerous treatment programs designed to alleviate patients' distress and anxiety, as numerous studies have demonstrated that avoiding physical activity accelerates the progression of the disease. Consequently, focusing on psychological factors such as distress tolerance and death anxiety can effectively reduce the amount of psychological damage in patients (Moreno et al., 2022).

Throughout the progression of their disease, patients with cancer face numerous stresses, including the fear of possible death, the stress of notifying family members of the illness, and the stress of being aware that there will be significant life changes such as the disintegration of life, social stigma, difficult and annoying treatments, physical disfigurement due to side effects of surgery and adjuvant treatments, persistent physical limitations, disruption of social support networks, and a persistently low tolerance for uncertainty due to the rugged nature of the disease. In other words, death anxiety includes the anticipation of one's death and the fear of the process of death and dying in the case of significant others, and individuals are aware of their mortality (Arch et al., 2020). Patients with difficult diagnoses, such as cancer, are forced to face their demise in the interim. This group of patients with psychological and even mental disorders may experience diminished quality of life because of their fear of death. Due to cancer's association with death, those who suffer from it face grave concerns in this area. People with high death anxiety react immaturely to ambiguous stimuli and endure a great deal of stress in these situations; consequently, they avoid ambiguous stimuli and situations. People with less death anxiety, on the other hand, are aware that death is inevitable for all humans and attempt to postpone their demise with specific solutions and a positive outlook (Kaplan et al., 2022).

The findings of this study indicate that a purely medical approach is insufficient to improve the mental health of patients with lung cancer. Specialists must, therefore, be aware of the impact of psychological factors and adopt a more comprehensive approach to treating this disease, one that takes into account psychological

characteristics in addition to physical ones. One of the limitations of this study is the absence of international comparisons. In addition, conducting the research in a medical center is a limitation of the study. Future research should design treatment packages that affect a greater number of mental health factors to observe significant changes in increasing distress tolerance and decreasing death anxiety. Additionally, integrated treatment packages containing various tools should be used to investigate different aspects of lung cancer disease.

Conclusion

The findings of this study revealed that ACT increased distress tolerance and decreased death anxiety in patients with lung cancer. These results indicate that these two variables significantly contribute to mental health of patients with lung cancer. In order to improve the mental health of patients with lung cancer, it is necessary to provide educational and psychological programs in addition to medical programs to reduce and manage distress and death anxiety.

Conflict of Interests

Authors have no conflict of interests.

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