



The Role of Neuroplasticity in Chronic Stress and Cancer Outcomes

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DESCRIPTION

Cancer is a life-threatening disease that can cause significant physical and psychological distress for patients and their families. Cancer patients often experience chronic stress, which is a prolonged and overwhelming state of emotional and physiological arousal that exceeds the coping resources of the individual. Chronic stress can have negative effects on the psychological well-being and clinical outcomes of cancer patients.

Chronic stress can impair the mental health and quality of life of cancer patients, by causing anxiety, depression, fear, anger, sadness, hopelessness, and loneliness. Chronic stress can also affect the cognitive function and memory of cancer patients, by reducing their attention, concentration, learning, and recall abilities. Chronic stress can also interfere with the social and emotional support of cancer patients, by reducing their communication, intimacy, and satisfaction with their partners, family, and friends.

Chronic stress can deteriorate the physical health and survival of cancer patients, by affecting their immune system, inflammation, and tumor growth. Chronic stress can suppress the immune system of cancer patients, by reducing the number and activity of natural killer cells, T cells, B cells, and macrophages, which are essential for fighting infections and cancer cells. Chronic stress can also increase the inflammation of cancer patients, by stimulating the production of pro-inflammatory cytokines, such as interleukin-6 and tumor necrosis factor-alpha, which can promote tumor angiogenesis, invasion, and metastasis. Chronic stress can also enhance the tumor growth of cancer patients, by increasing the levels of stress hormones, such as cortisol and adrenaline, which can activate the signaling pathways that regulate cell proliferation, apoptosis, and DNA (Deoxyribonucleic Acid) repair.

Therefore, it is important to develop effective stress management interventions for cancer patients, to help them cope with their

disease and improve their psychological well-being and clinical outcomes. Stress management interventions are a group of psychological treatments that aim to reduce the stress level and enhance the coping skills of cancer patients.

Common stress management interventions

- Cognitive-Behavioral Therapy (CBT) is a treatment that teaches cancer patients how to identify and challenge their negative and irrational thoughts and beliefs that cause them stress, and how to replace them with more positive and realistic ones. CBT also teaches cancer patients how to use relaxation techniques, such as deep breathing, progressive muscle relaxation, or guided imagery, to reduce their physiological arousal and calm their mind. CBT has been shown to be effective for improving anxiety, depression, mood, self-esteem, and pain in cancer patients.
- Mindfulness-Based Interventions (MBIs) are treatments that involve cultivating mindfulness, which is the awareness and acceptance of the present moment, without judgment or reactivity. MBIs can help cancer patients to reduce their rumination, worry, or avoidance of their stressful thoughts and emotions, and to increase their attention, concentration, and emotion regulation. MBIs also teach cancer patients how to use meditation, yoga, or body awareness techniques, to enhance their self-compassion and well-being. MBIs have been shown to be effective for improving anxiety, depression, mood, fatigue, sleep quality, and immune function in cancer patients.
- Positive Psychology Interventions (PPIs) are treatments that focus on enhancing the positive aspects of life, such as happiness, optimism, gratitude, meaning, or purpose. PPIs can help cancer patients to increase their positive emotions, thoughts, and behaviors, which can buffer them from the negative effects of stress. PPIs also teach cancer patients how to use positive activities, such as journaling, expressing gratitude, or performing acts of kindness, to improve their happiness and contentment in life. PPIs have been shown to be effective for improving happiness, optimism, meaning, hope, resilience, and quality of life in cancer patients.

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Psychological and clinical benefits of stress management interventions in cancer patients

Psychological mechanisms: Stress management interventions can improve the psychological well-being of cancer patients by enhancing their cognitive appraisal, coping strategies, self-efficacy, social support, and spirituality. These psychological factors can help cancer patients to perceive their situation as more manageable and less threatening, to use more adaptive and flexible ways of dealing with stress, to feel more confident and competent in facing challenges, to receive more emotional and instrumental assistance from others, and to connect with a higher power or a greater purpose.

Physiological mechanisms: Stress management interventions can improve the clinical outcomes of cancer patients by modulating their neuroendocrine system, immune system, and tumor

biology. These physiological factors can help cancer patients to reduce their stress hormones, such as cortisol and adrenaline, which can impair their immune function and tumor growth. They can also help cancer patients to increase their immune cells, such as natural killer cells, T cells, B cells, and macrophages, which can enhance their anti-tumor activity and resistance to infections. They can also help cancer patients to decrease their inflammation, such as pro-inflammatory cytokines, which can inhibit their tumor angiogenesis, invasion, and metastasis.

In conclusion, stress management interventions are a valuable group of treatments that can provide various benefits for cancer patients. By reducing stress and enhancing coping skills, stress management interventions can improve the psychological well-being and clinical outcomes of cancer patients.