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The effect of happiness and humor on improving immune system function: A narrative review study

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Abstract--Stress makes people more susceptible to various diseases. Nervous tensions affect immune system function, increase stress hormones, and weaken the immune system. The body's defense system will not be able to function properly if stress hormones are constantly produced in large quantities. In this way, the ground is prepared for various infections and diseases and the internal organs of the body will be under severe pressure. Some of the characteristics of psychological resistance or resilience to life stressors include personality traits, happiness, and humor. This narrative review study was conducted to investigate the effect of happiness and humor on improving immune system function. The papers concerning this review study were searched in SCOPUS, Pubmed, Web of Science, MedLine (Ovid), PsychINFO (Ovid), Google Scholar, Social Work Abstracts Plus, CINAHL Plus, and ProQuest Dissertations, and Tes databases using the keywords including happiness, joy, humor, immune system, health, and physical health. The search was limited to English and Persian language journals, and there was no time limit. The papers whose content was more relevant to the topics of happiness, humor, health, and immune system were then selected from the papers found and reviewed. According to the results, exposure to unpleasant events changes immune system function so that negative emotions cause the disorder of the secretion of various hormones, and positive emotions such as freshness and love strengthen the immune system through hormonal changes. The results also showed that happiness leads to better blood vessel function, improved heart rate factors, increased life expectancy, improved physiological health, reduced depression, improved mental and physical health and quality of life, and increased resilience.

Furthermore, humor contributes to reducing negative emotions, improving anxiety, improving the quality of sleep of adults, improving depression, increasing pain tolerance, coping with pain and emotional distress caused by chronic pain, improving cardiovascular function, balanced growth, and human health. So, happiness and humor can be used as useful and socially acceptable behaviors to improve and promote mental and physical health, leading to improved immune system function.

Keywords--*Happiness, Humor, Immune System, Health, joy.*

Introduction

In the Ottawa Charter for Health Promotion, the World Health Organization (WHO) emphasizes the importance of health care for personal development (WHO) (WHO, 1986). The charter actively emphasizes the promotion of individual initiatives for self-care in life and mentions these initiatives as a solution to reduce the challenges in life (Van Der Wall & Kok, 2019). Besides, the importance of personal development for human health is emphasized in medical approaches (Gonot-Schoupinsky, Garip & Sheffield, 2020). Promoting health and well-being in life is considered a growing challenge due to its great importance. The search for effective interventions to improve health and well-being has led to the therapeutic use of humor and happiness as a way to promote mental and physical health (Ganz & Jacobs, 2014). Humor is referred to as a positive and unique mental state for each individual and involves various aspects such as cognition, emotion, and behavior. According to recent studies, various emotions in humans such as anxiety, depression, fear, happiness, and laughter profoundly affect psychological and physiological processes, and these emotions are a set of basic and evolved functions common to all humans (Clayton et al., 2021). The idea that humor, happiness, and laughter have many health benefits has recently become commonplace among health care providers as well as the general public. The papers published on the effects of humor, happiness, and laughter on health indicate the positive effect of these emotions on health (Akimbekov & Razzaque, 2021). The effects of humor and happiness and their promotion have been investigated by professional associations in various countries. For example, the Association for Applied and Therapeutic Humor (AATH) was established in the United States (Martin, 2001). Clinical studies suggest that happiness and laughter improve immune system function and health by affecting stress (Bennett & Lengacher, 2006). There are numerous studies on the clinical use of happiness for health-related purposes (Stiwi & Rosendhal, 2022). Studies also indicate that humor is a way to replace unacceptable motivations with a pleasurable mental state and replace aggression and pessimism with joy and laughter. According to psychological theorists, humor is an adaptive defense mechanism, and Freud considers it the highest defense process. As one of the most popular theories in the field of humor, the relief theory points out that humor is a highly socialized method that contributes to the release of stress (Shariatmadar et al., 2020). According to a 2018 Gallup report, Iran has the fifth saddest people in the world. Iran ranks 3rd in feelings of anger, 5th in feelings of sadness, 5th in feelings of stress, and 4th in feelings of anxiety among 140 countries (Gallup). Gallup is one

of the most reputable polling companies in the world. However, the mental state of people in the community can be improved by studying the importance of happiness and humor in improving health, helping to cure diseases, and improving the immune system.

Attention to the healing power of various factors such as humor and happiness, which are positive emotions that modulate and reduce the stress of illness, has begun in recent years (Seaward, 2012) with the development of the positive psychology movement and the positive effects of happiness and humor on different human states (Seligman, 2005). Thus, medical studies on psychoneuroimmunology (PNI) have sought to discover sources of resistance to the negative effects of stress in parallel with these studies (Rosenzweig, 2016). According to various studies, some of the characteristics of psychological resistance or resilience to life stressors include personality traits, happiness, and humor (Dowling, Hockenberry & Gregory, 2013). Stress makes people more susceptible to various diseases. Nervous tensions affect immune system function, increase stress hormones, and weaken the immune system (Christian, 2015). The body's defense system will not be able to function properly if stress hormones are constantly produced in large quantities. In this way, the ground is prepared for various infections and diseases and the internal organs of the body will be under severe pressure (Sergestrom & Miller, 2004). Various studies suggest that the stress caused by everyday life events gradually affects the function of various body systems, including the immune system, and weakens and disrupts them (Caillon & Schiffrin, 2016). This effect is modified or amplified by various variables. In this way, humans are prone to mental and physical illnesses due to the weakening of their immune system (Heinbockel et al., 2015). So, stress-modifying factors, of which happiness and humor are the most important, should be considered. According to various studies, happiness and humor are involved in increasing resilience to stress. The results of extensive studies on humor indicate that humor can be effective in strengthening and enhancing the body's immunity against a variety of diseases and harmful factors. In interaction with the immune system, humor acts as a modifier.

Considering the importance of happiness and humor in the field of health psychology and their significant effect on the immune system, this study reviews the literature on this subject and discusses some issues in this regard.

Methodology

The papers concerning this review study were searched in SCOPUS, Pubmed, Web of Science, MedLine (Ovid), PsychINFO (Ovid), Google Scholar, Social Work Abstracts Plus, CINAHL Plus, and ProQuest Dissertations, and Tes databases using the keywords including happiness, joy, humor, immune system, health, and physical health. The search was limited to English and Persian language journals, and there was no time limit. The papers whose content was more relevant to the topics of happiness, humor, health, and immune system were then selected from the papers found and reviewed.

Findings

The most important studies on the effect of happiness and humor on health and the immune system are reviewed below.

How Happiness and Humor Affect Health and Immune System

The most important factor involved in the effect of happiness and humor on the improvement of the immune system seems to be stress reduction (Bennett & Lengacher, 2006). For the first time, Galen found that cancer was more common in people with melancholy. Other findings show that different illnesses can occur in humans due to their specific psychological characteristics or the occurrence of stressful events in their lives. Such a view has a long history in medicine. In this regard, we can refer to Plato's view that "mental distress causes discomfort in the body." A study by Selye was the first to show that stress can affect many parts of the body. According to the results of various studies, stress leads to an increase in stress-related hormones, thus weakening the function of the immune system (O'Connor et al., 2021).

The emergence of such theories in medicine led to the development of a new interdisciplinary approach called psychoneuroimmunology (PNI) defined as the interaction between behavioral, nervous, endocrine, and immune systems (Ader, 2000). The field of study of psychoneuroimmunologists, psychoneuroimmunology (PNI), is a fully integrated field that examines how psychological, neurological, and immunological processes affect each other and shape human health and behavior (Slavich, 2020). In this approach, the interactions between the brain and the immune system are examined as a way to understand how behavior affects health and disease resistance. Studies indicate that mental states and behaviors affect the immune system and diseases and that psychological factors change the function of the immune system, thereby increasing the risk of developing various diseases (Ader, 2020). According to PNI researchers, increased stress levels can lead to changes in mental and physiological function. Moreover, changes in stress hormones such as ACTH, cortisol, epinephrine, and norepinephrine affect many other neurotransmitters and cause many hormones to be released in the body (Ranabir & Reetu, 2018). Physical and emotional stress can also affect prolactin, growth hormone, insulin, glucagon, thyroid hormone, and gonadotropin. Furthermore, stress can affect the levels of neurotransmitters, neurotransmitters, cytokines, and various cells in the immune system (Moraes et al., 2018). Researchers have also found that exposure to unpleasant events changes immune system function so that negative emotions cause the disorder of the secretion of various hormones, and positive emotions such as freshness and love strengthen the immune system through hormonal changes. (Sergestrom & Miller, 2004). So, the study of the supportive role of humor and happiness in the treatment of various diseases is included in this field (White et al., 2021).

Happiness

Happiness is defined as people's perception of their personal life consisting of having life satisfaction, positive feelings and mood, and a lack of anxiety and

depression (Amiri & Abbasi, 2019). Many studies have shown the positive effects of happiness on health.

Studies suggest that happiness is linked to health and leads to the activation of the immune system. Moreover, emotional states other than happiness that persist for a long time can have a detrimental effect on the human physiological system and lead to immune system dysfunction. However, happiness improves human mental health (Veenhoven, 2008). Happiness contributes to improving the immune system by reducing stress, anxiety, and anger. There is a lot of undeniable evidence for the various physical effects of anger and anxiety. Anger and anxiety can increase a person's chances of developing various diseases. Although depression does not make people more vulnerable to illness, it seems to delay recovery and increase the risk of death, especially in debilitated patients with more acute conditions. No matter how harmful chronic emotional helplessness is in all its forms, the opposing emotions are at least partially strong, and laughter and happiness change the course of a serious illness. Positive emotions seem to have little effect, but studies of many people point to the role of happiness and positive emotions among the many complex variables affecting the course of the disease (Barrett et al., 2013). Accordingly, happiness can be used as a reliable treatment method and result in significant savings in health care systems (Stiwi & Rosendhal, 2022). According to studies, happiness leads to better function of related blood vessels. Besides, psychological stress leads to inflammatory responses with vasoconstriction, which can lead to coronary artery disease. Happiness and laughter prevent heart disease (Miller et al., 2010). Examining the heart rate in states of happiness, sadness, and distress, Shi et al. (2017) found that heart rate in these states is significantly different and that different moods can cause changes in heart rate factors. According to a study by Boehm et al., happy people have higher cardiovascular health. They exhibit healthier behaviors and have greater physical health (Kushlev et al., 2020) and longer life (Diener & Chan, 2011). The results of a study by Frey showed that happiness positively affects life expectancy and physiological health (Frey, 2011). In their study, Nikrahan et al. argued that happiness in patients with heart disease can lead to increased positive thinking and optimism, decreased expectations, living in the present moment, increased activity, increased social interaction, and the elimination of negative emotions and can ultimately lead to a reduction in depression by promoting positive psychological states. Researchers and psychologists today have a special emphasis on improving the level of happiness because, as studies have shown, the mental and physical health of people improves with increasing their level of happiness. The results of a study by Naghibi et al. (2015) suggest that happiness is one of the components that affect the quality of life of cancer patients. Moreover, stress management promotes greater resilience and helps treat incurable diseases by increasing happiness.

Humor

According to various studies, different emotional states (happiness, sadness, hatred, surprise, anger, fear, etc.) are associated with different physiological characteristics in the human body. The use of physiological indicators to identify different emotional states is a reliable and reliable way to identify different emotional states (Shi et al., 2017). So, the psychological stress caused by daily life

events gradually affects the activity of various body systems, including the immune system, thus weakening and disrupting them (Caillon & Schiffrin, 2016). This effect is modified or amplified by various variables. In this way, humans are prone to mental and physical illnesses due to the weakening of their immune system (Heinbockel et al., 2015). Studies have also shown that humor reduces the effects of stress and has beneficial effects on human health by reducing muscle tension, increasing blood oxygen levels, and increasing blood endorphin levels (Fritz, 2020). The effect of humor and laughter on the treatment of many diseases has been emphasized by many recent studies. For example, Zhao et al. argued that laughter and humor significantly affect the reduction of negative emotions, improve anxiety, improve sleep quality in adults, and improve depression (Zhao et al., 2019). In a review study, Pérez et al. (2019) examined the effects of humor on pain sensation. According to the results, the distractions created by the humor, such as watching a comedy clip, increase pain tolerance. Humor positively affects coping with pain and emotional distress caused by chronic pain. The results also indicated that there was a significant relationship between humor and anxiety. As an accessible, low-risk, and easy method, humor is used for complementary therapies (Gonot-Schoupinsky et al., 2020). The effect of humor and laughter on the treatment of various diseases such as hypertension (Fry & Savin) and improving the function of the cardiovascular system (Miller & Fry) has been shown in various studies. According to a study by Berk, like exercise and physical activity, laughter and humor have seven positive effects on the body, including improving mental function, relaxing muscles, improving breathing, improving blood circulation, reducing stress hormones, improving the immune system, and increasing endorphin secretion. Laughter therapy was developed by Norman Cousins in 1964 and is now also used as an intervention and rehabilitation tool for patients with stress (Pargami et al., 2018). Humorous people are significantly moodier after negative life events. Humor is supposed to make people pay attention to the positive aspects of events rather than the negative aspects that cause them stress. Individuals can cope with this stress effectively in some situations through humor, adapt to it, and recover when the stressful period is over (McGhee, 2010). According to Stieger et al., People with high humor have high psychological well-being and use humor as a means to overcome their negative emotions (Stieger et al., 2011). Researchers see humor as a coping method to reduce stress, which creates flexibility and increases mental energy in addition to strengthening the immune system (Wellenzohn et al., 2018). According to Bennett et al. (2014), humor therapy in kidney patients had a significant effect on pain, sleep quality, respiratory system, depression, and anxiety compared to the control group.

The results of a study by Mohd Sukor et al. (2018) showed that the more humorous people are, the less they suffer from anxiety and depression, whether life stress is low, medium, or high. Humor is effective because it allows a person to distort reality in a way that is socially acceptable and somewhat reasonable. As a coping strategy, humor can pave the way for relieving anxiety and coping with life's ongoing problems by changing external situations and rationally distorting reality. Accordingly, it can prevent many diseases and strengthen the immune system by reducing anxiety, stress, anger, and rage.

Humor Styles and Their Effect on Health

According to the American Psychiatric Association (APA), humor is a defense mechanism that focuses on the funny and entertaining aspects of a stressful situation.

Humor is a developed defense mechanism that enables individuals to deal with emotional conflicts or external stressors by emphasizing humorous and entertaining aspects. As a manifestation of humor, jokes are divided into different types from different perspectives. Humor is a multidimensional concept that can both improve mental health and threaten mental health. Accordingly, various studies suggest that four styles of humor can be distinguished and that there are differences between different styles of humor. Based on the style, humor is divided into four categories, including two adaptive styles and two maladaptive styles. Accordingly, self-enhancing and affiliative humor fall in the adaptive group, and self-defeating and aggressive humor fall in the maladaptive group.

- **Self-Enhancing Humor:** This style refers to the process of using humor as a coping strategy and looking at life with a humorous perspective in times of stress. This style helps people to accept themselves and not harm others. People who practice this style find life's weird and fun things entertaining and have a very funny view of the world. This style, which is more about individuals than interpersonal interactions, helps them overcome life's stressors. It protects people against depression and is negatively correlated with psychological distress and positively correlated with mental health and self-esteem (Strick, 2021).
- **Affiliative Humor:** Affiliative humor is a type of humor used to develop interpersonal interactions. People who practice this style tend to say funny things and entertain others with jokes, thereby improving relationships and reducing interpersonal tensions. When dealing with stressful situations, they try to calm others down by expressing humor and jokes and having a humorous perspective on the situations they face. This style is more about interpersonal interactions and is correlated with extraversion, kindness, self-esteem, intimacy, relationship satisfaction, and positive moods and emotions (Asghari Ebrahimabadi, 2020).
- **Aggressive Humor:** In this maladaptive style, people seek to satisfy their desires for excellence and emotions in a socially inappropriate way. People who practice this style try to reinforce their self-concept in any way without worrying about the well-being of others and achieve this feeling about themselves by making fun of and despising others. Although temporarily beneficial, repeated practices of this style weaken interpersonal relationships and lead to the exclusion of individuals without social support. This style is positively correlated with hostility, resentment, anger, and aggression (Sevari & Farzadi, 2021).
- **Self-Defeating Humor:** In this style, people say humorous things about themselves that make them ridiculed and belittled for making others laugh. People who practice this style underestimate their achievements and evaluate

others positively. They try to entertain others by humiliating themselves by telling jokes or humor. This is a maladaptive style that is considered a conflicting avoidance process. Such people avoid confronting stressful stimuli and, consequently, deny their negative emotions. This style is negatively correlated with self-esteem, satisfaction with interpersonal relationships, mental health, and appropriate treatment of others, and positively correlated with psychosis, depression, anxiety, and other negative emotional states (Olson et al., 2005).

According to the results of studies, it can be found that all types of humor are equally effective. Positive humor (self-enhancing and affiliative humor) not negative humor (aggressive and self-defeating humor) plays a protective role against the effects of negative emotions (Samson & Gross, 2012).

Discussion

Stress and mental disorders weaken the immune system of living organisms and increase the risk of various diseases. They also cause changes in the endocrine glands, thus affecting the immune system, increasing the living organism's vulnerability to disease, and leading to psychosomatic disorders and physical illness. Happiness and humor are stress coping strategies and are considered mechanisms against anxiety and depression. As two important psychological components, happiness and humor have recently been considered by many researchers with the development of positive psychology. So, this study investigated the correlation between happiness and humor with immune system function separately. The results show that happiness is significantly associated with physical health. Thus, it can be argued that happiness affects physical health by affecting the immune system. Studies suggest that emotional states such as anxiety and stress, if persist for a long time, can have a detrimental effect on the body's physiological system and disrupt the immune system. Happiness consists of emotional, social, and cognitive components. The emotional component refers to a person being moody. The social component refers to a person's good and effective relationships with others, and the cognitive component causes the individual to process and interpret information in a specific way (Valois et al., 2004). So, it can be concluded that happiness is involved in balanced development and human health. Furthermore, humor can be considered a socially useful and acceptable behavioral method for improving and promoting mental and physical health. Mental health is a general concept. People need to have many positive traits such as intimacy, kindness, extraversion, self-esteem, relationship satisfaction, and positive moods and emotions to enjoy mental health. Positive humor is directly correlated with all these factors. Due to the psychological tendency towards health and well-being, humor can be used as a positive behavioral component for well-being, establishing healthy relationships, increasing understanding, preventing mental disorders, and even treating them.

Recommendations

Immune system function can be improved through happiness and humor. Happiness contributes significantly to a person's mental health, but it does not come on its own, although it is not very difficult to achieve. In this section,

practical recommendations for increasing happiness as well as tips on humor are provided. Happiness is associated with traits and characteristics, each of which is in the form of one of the dimensions of human personality. Therefore, happiness can be increased by strengthening each of these traits, some of which are mentioned below.

- **Internal Control.** People who believe more in internal control experience less mental distress. Internal control is a personality variable associated with satisfaction. It is also seen as an aspect of personality, a predictor of happiness, and a way of coping with stressful life events. Those who have a greater sense of internal control are more satisfied with life, healthier, and less depressed (Lachman & Weaver, 1998).
- **Positive Thinking.** Positive thinking is about focusing on the positive aspects of life rather than the negative aspects. Positive thinking is defined as thinking well of others, being kind to them, and treating them positively. A positive person never recognizes negative issues but confronts them. Positive thinking enables a person to have the right inner balance, calmness, and composure in the face of adversity so that he or she can maintain personal motivation, take appropriate action, and feel good about what he or she is doing. Happiness is developed following good feelings. So, positive thinking means having a strong belief that everything will be fine despite the obstacles and frustrations. Optimists have more happiness than pessimists and realists. Thus, one way to increase happiness is to be optimistic.
- **Purposeful Life.** Argyle believes that the scores on the Purpose in Life Scale are strongly correlated with the scores on happiness. People will be happier if they feel that their lives are purposeful and confident in the values that give them direction. Some purposeful sources of life include employment, family care, political activities, and recreational activities.
- **Self-Esteem.** Those who consider themselves useful and valuable and have high self-esteem will enjoy higher mental health. In contrast, people who have a negative self-image and low self-esteem and consider themselves incapable and worthless will suffer from many mental disorders and fail to resist difficult life situations. Self-esteem is one of the most important predictors of happiness. The importance of self-esteem in the development of happiness is such that some psychologists consider it an integral part of happiness. Self-esteem is of fundamental importance in mental health.
- **Leisure Activities.** Leisure activities are a great source of happiness. One of the leisure activities that can eliminate fatigue and increase vitality and happiness is exercise, which strengthens muscles by speeding up the activities of the circulatory and respiratory systems. Exercise makes people feel that their ability has increased and makes things easier for them because it reduces fatigue, stress, anxiety, and depression and increases people's energy. Exercise boosts self-esteem and increases happiness in addition to reducing depression and anxiety. Another leisure

activity is music that softens the souls of human beings and frees them from the violence and hardships of the material world and its laws.

- **Social and Positive Relationships with Others.** The ability to establish positive relationships with others is an important part of mental health. People who are more socially skilled and better able to relate to others are happier than those who are financially wealthy but do not have good social relationships.
- **Avoiding Inappropriate Jokes.** The content of the joke should be chosen according to the situation, the audience, the time, and the place. In this case, humor is considered positive. People who embrace a positive humor strategy in critical and stressful situations are likely to have a pleasurable experience in their relationship. Extensive use of available resources and creative use of humorous content can be effective in building closer ties in interpersonal relationships. Considering such things as avoiding vulgar or stressful jokes and contributing to creating a pleasant feeling caused by them can help prevent stress from inappropriate joke content, benefit from its positive effects and consequences against stress, and improve the mental state in critical situations. However, the condition of being humorous is to observe the conditions of the other people involved in the relationship.

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