

Review Article

Positive emotion and cardiovascular disease in elderly people

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Abstract: Cardiovascular disease in elderly people is a psychosomatic disease, but the research on the relationship between positive emotion and cardiovascular diseases is few. Most previous studies have focused on a range of health status changes caused by negative emotion but have ignored the role of positive emotion in elderly people. Positive emotion has been considered a protective factor against health problems in elderly people. Research shows that a significant relationship between positive emotion and blood pressure remains after adjusting for depression in elderly people. In this paper, we summarize the relationship between positive emotion and cardiovascular diseases in elderly people.

Keywords: Positive emotion, cardiovascular disease, elderly

Health psychology is placing increasing emphasis on active rather than passive modes of intervention [1]. During the past century, psychologists have focused on negative psychology, which offers limited diagnosis and treatment of human psychological problems and mental disease. Emotion is an important psychological reaction to individual life events and an adaptation to environmental challenges. The structure of emotion appears to be multi-dimensional, with a distinction drawn between positive emotion and negative emotion on the basis of pleasant or unpleasant mood [2]. There is direct evidence for a relationship between negative emotion and health, which is linked especially with the neuroendocrine and immune functions [3]. However, the effect of positive emotion on health and its competing effects on negative emotion are more significant [4, 5].

The cardiovascular disease incidence rate in elderly people is high and poses a serious threat to life. Most previous studies have focused on a range of health status changes caused by negative emotion but have ignored the role of positive emotion [6-9]. In this paper, we summarize the relationship between posi-

tive emotion and cardiovascular diseases in elderly people.

The concept and classification of emotion

Emotion is an important part of healthy human functioning. Many studies show that emotion is not just experienced subjectively but also activates the sympathetic nervous system and hypothalamic pituitary adrenal (HPA) axis [10]. Psychologists classify emotion into two dimensions: the negative emotional dimension encompasses individual negative feelings, while positive emotion reflects an individual's positive emotional experiences, such as joy, happiness, excitement, enthusiasm, and satisfaction [11]. These experiences can be fleeting, but often have stable characteristics, especially in children [12]. Positive and negative emotions can be independent; for example, a generally happy, contented man can also occasionally appear angry or frustrated.

The factors influencing positive emotion

Positive emotion can have an antagonistic effect on negative emotion and can broaden thinking and behavior while rapidly restoring the body to baseline physiological activation.

Based on the above consideration, Fredrickson proposed that positive emotion can downregulate the continuing influence of negative emotion on the cardiovascular system [13-16]. In Fredrickson's research, negative emotion was induced in subjects by horror movie fragments or anxiety-inducing speech tasks; satisfaction, happiness, neutral emotions, and sadness were induced subsequently by movie clips. Fredrickson's hypothesis was tested by measuring how long subjects took to recover from initial negative emotions to baseline levels of activation. Experimental results have shown that, compared with neutral and sad emotion conditions, positive emotion conditions can significantly promote cardiovascular activity recovery; moreover, subjects who exhibited more spontaneous smiling experienced more rapid recovery from negative emotions. In fact, humor helps to resist negative emotions and stress [17]. For example, individuals receiving a humor intervention experienced significantly less anxiety and depression compared with a control group, which indicates that humor can relieve anger and sadness [18]. Therefore, humor can protect the body against negative stimuli and regulate negative emotion through the beneficial effects of positive emotion [19].

While pictures of positive emotion can alleviate negative emotion, and arousal levels can be significantly reduced by neutral emotional stimuli, negative emotional stimuli can evoke negative emotion in subjects. Systolic blood pressure, diastolic blood pressure, and cortisol levels increased in subjects under negative emotion stimulation, while systolic blood pressure and heart rate decreased and cortisol levels showed no change in subjects receiving neutral and positive emotion stimuli [20]. Many studies have demonstrated no significant difference in physiological reactions to positive emotion and neutral emotion in the emotion induction process; that is, positive emotion has little effect on the sympathetic nervous system and HPA axis [21-25].

Effects of positive emotions on cardiovascular diseases in elderly people

Previous research indicates that positive emotion is related to increased survival rate, enhanced immune ability, and low risk of diabetes and hypertension [12, 26-28], while negative emotions such as hostility, anxiety [29],

and depression [30, 31] are associated with a high risk of coronary heart disease. Positive emotion has been considered a protective factor against health problems for many years [12, 26-28]. However, few studies have suggested that positive emotion can protect against coronary heart disease. Positive emotions are associated with a reduced 10-year incidence of coronary heart disease, even after adjustment for depression, hostility, and anxiety [32]. Findings such as these indicate that positive emotion is a protective factor against coronary artery disease, suggesting that preventive measures should be taken to not only reduce depression, but also to increase positive emotion.

One prospective study found a negative correlation between positive emotion and both stroke duration and mortality of inpatients [33, 34], and another study revealed that positive emotion is a protective factor for recurrent clinical events in patients with coronary stents [35]. As individual levels of emotional health are associated with blood pressure, psychological or cognitive behavioral interventions such as relaxation therapy or stress management are clinically effective in reducing or normalizing blood pressure. A study of 1306 normotensive male soldiers found a lower incidence of angina and cardiac events in optimists compared to pessimists [36]; similarly, a study of 2478 elderly people found a significant reduction in the 6-year incidence of stroke in those with more positive emotions [37].

Positive emotion can enhance adaptation and promote the flexibility to cope effectively under pressure [38, 39]. Folkman identified three coping mechanisms related to positive emotion: positive reappraisal, centralized problem-solving ability, and expression and memory of positive events [40]. Use of these three mechanisms helps to create and strengthen purpose and meaning in life. Research has shown that positive emotion can contribute to the living environment and ability to adapt to mental health problems in elderly people [41].

Positive, rather than negative, emotion has been shown to predict parasympathetic adjustment of heart rate [42] and is related to stable systolic and diastolic pressure and activation of noradrenaline [43]. The protective effect of positive emotions on coronary heart disease

may be through the promotion of sleep habits and smoking cessation; some studies have found that positive emotions predict good sleep quality independent of other predictors of negative emotion and poor sleep [44] and that patients with positive emotions find it easier to give up smoking, independent of negative mood [45]. One recent study showed that antidepressant treatment in the absence of any psychological treatment resulted in decreased levels of positive emotion [40], so psychological treatment should be offered to elderly patients with cardiovascular disease.

Conclusion

Cardiovascular disease in elderly people is a psychosomatic disease. Most current research focuses on negative emotion and there is little research on the relationship between positive emotion and cardiovascular disease. Although the largest study to date found no evidence for a protective effect of positive emotion on cardiovascular events independent of negative emotion [46], the measurement of positive emotion in these types of studies is problematic, with some studies evaluating depression rather than positive emotion. Research shows that a significant relationship between positive emotion and blood pressure remains after adjusting for depression, so the effect does not reflect the relationship between negative emotion and elevated blood pressure [47]. We conclude that psychological intervention in elderly people with cardiovascular disease is of great importance in augmenting the healthcare of elderly hypertensive patients, improving social support, and establishing a comprehensive evaluation system for senile health.

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Positive emotion and cardiovascular disease

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