

Effect of Physical Exercise on Cognitive Aging and Psychological Mechanism of the Elderly

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Abstract: With the advent of aging, aging not only brings a great threat to the physical and mental health of individuals, but also brings a huge burden to the whole society. Therefore, how to maintain the healthy physical and mental state of the elderly and delay cognitive aging has become the focus of the majority of scholars. This paper discusses the different effects of different physical exercise modes on the cognitive function of the elderly. The processing resources theory of cognitive aging and the role of executive decay theory in cognitive aging are discussed only from the point of view of psychological mechanism. This provides a reference for delaying the decline of cognitive function in the elderly and promoting it to slow down the aging.

1. Introduction

China has fully entered the aging society, cognitive aging has been the attention of the vast number of scholars. With the growth of age, cognitive function aging is a common phenomenon in the lives of the elderly, the elderly are the vulnerable age group in the population, cognitive function aging, the incidence of Alzheimer's disease is also increasing. An important index to test the physical and mental health and quality of life of the elderly is the quality of cognitive function, which directly affects the daily life of the elderly, so it is necessary to maintain the cognitive function of the elderly. The study found that different physical activity can delay cognitive decline in the elderly, including improved executive function and memory function. These findings are important for promoting the participation of older persons in physical exercise, promoting their health and reducing the stress of population ageing on families and society.

Cognitive aging declines with age, and cognitive aging mainly refers to the decline of cognitive function after an individual enters old age ,in the decline of cognitive function in old age compared to younger age[1-2].

Physical exercise refers to purposeful (e.g., physical development, health promotion and rich cultural life), planned physical activities, its role in delaying cognitive aging in the elderly is gradually paid attention to, physical exercise as an intervention or a way of life to delay cognitive aging in the elderly plays an important role. Based on the research results, this paper holds that the cognitive effect of physical exercise is not only reflected in the positive effect son-in-law of long-term physical exercise on the cognitive function of the elderly, but also in the immediate effect of physical exercise, but the positive effects of this one-time physical exercise may be maintained for a shorter period of time. Only the elderly long-term adhere to physical exercise, in order to better maintain this positive role. Using meta-analysis methods, the researchers found that physical exercise can promote the improvement of cognitive ability in the elderly and delay the occurrence of cognitive aging, which provides a certain basis for delaying the process of cognitive aging.

2 Research Questions

The following research questions are to be raised and answered in this study: (1) Effect of physical exercise on cognitive aging in the elderly (2) Effect of physical exercise on cognitive aging in the elderly

2.1 Effects of Different Types of Physical Exercise on Cognitive Aging in the Elderly

Aerobic exercise, resistance exercise, and physical and mental exercise are the three most common types of cognitive aging. Aerobic exercise is a form of exercise that uses large muscle groups of the body to continue to do long rhythmic exercises. Aerobic exercise is also used as an endurance activity, such as walking, running, swimming, cycling, etc. Research in sports medicine shows that long-term high-intensity aerobic exercise in the elderly has many physiological and health advantages, such as: enough strength, frequency and duration of aerobic exercise can improve aerobic fitness in healthy old people. Aerobic exercise can induce many beneficial metabolic adjustment ability. Many researchers have found that oxygen exercise on cognitive function of memory, attention, executive function.

Kramer and others found that older people who participated in aerobic exercise performed significantly better grades in need of functional tasks than those who sat down. Studies such as Angevaren have found that aerobic exercise is beneficial to cognitive functions such as cognitive speed, short-term memory, and auditory attention in healthy older people. Resistance exercise is a muscle-fighting resistance sport (such as the use of dumbbells, barbells strength training), but also a strength exercise. Participation in resistance exercises can significantly improve cognitive function in older people. Physical and mental exercise is a form of physical activity, accompanied by physical activity accompanied by concentration, control of breathing and to improve the body's strength, balance, flexibility, promote physical health, such as tai chi, yoga and so on. It is beneficial to the maintenance and improvement of cognitive function of middle-aged and elderly people. These findings provide theoretical basis for guiding the movement of the elderly and improving cognitive function.

2.2 Effect of different physical exercise intensity on cognitive aging in the elderly

Physical exercise intensity refers to the degree of physical stimulation of the human body, on the healthy elderly exercise intensity and its cognitive function of the study, there is oxygen exercise, moderate intensity aerobic exercise can make the elderly cognitive function to obtain improved benefits.

Cassilhas and others recruited 62 normal elderly people, randomly divided into control groups, medium-intensity resistance movement and high-intensity resistance movement group to investigate the changes in cognitive function after 3 groups of exercise intervention, the results showed that both moderate and high-intensity resistance movement had an improved effect on cognitive aging. Domestic studies have found that long-term tai chi exercise can significantly shorten the response of middle-aged and elderly people, which is conducive to the maintenance and improvement of cognitive function of middle-aged and elderly people, and foreign studies have also reported that tai chi can improve the memory function, executive function and attention of the elderly cognitive function.

3. Effect of physical exercise on cognitive aging in the elderly

Physical exercise plays an important role in delaying cognitive aging in middle-aged and elderly, but its internal mechanism, especially the psychological mechanism, is still unclear. For why cognitive function in middle-aged and elderly people declines with age, in the past 30 years, five theories have been put forward in the field of cognitive aging psychology to explain the psychological mechanism of cognitive aging, namely, processing speed theory, working memory theory, inhibition of recession theory, sensory function theory and execution of decline theory. Processing speed, working memory, inhibition function and sensory function in the first four mechanisms are regarded as indicators of information processing resources, that is, the amount of psychological processing ability or psychological energy that individuals can use when completing cognitive tasks, so these theories are referred to in this paper as the processing resource theory. The research shows that the processing speed theory is one of the most mature and influential theories in the field of cognitive aging. Salthouse is equivalent to the significant effect of cognitive processing

of individuals on cognitive aging of mobile objects as proposed in 1985. A review of studies on aging that affect auditory processing and cognitive function found that more and more studies show that the increased perceived burden caused by hearing loss affects the acquisition of cognitive processing resources, and thus shows cognitive function aging. There have also been studies that have found that hearing aids can not only improve hearing, but also cognitive function, while sensory function can be improved through certain interventions, such as physical exercise, LAMBOURNE and other research found that immediate exercise can improve the exercise reventy, promote their awareness, But it will soon return to pre-workout levels, suggesting that you should stick to exercise for a long time to maintain better sensory function.

Along with the decrease of sensory function in middle-aged and elderly people, the speed of information processing in the brain will also decrease acceleration theory that the individual cognitive processing speed with the wall age and decrease is the main cause of cognitive aging. The elderly, who regularly take part in physical exercise, are better at processing quick waste, thus promoting good cognitive function. The study found that older people who regularly took part in exercise performed better in terms of executive function, processing speed, and control of processing.

It is self-evident that the decrease in processing speed will also have an impact on the processing capacity. The study found that the decrease in processing speed will lead to the decline of working memory capacity, which in turn leads to the aging of inductive reasoning cognitive ability. At the same time, the theory of working memory holds that the decline of working memory leads to cognitive aging, which plays a role in intermediation between aging and cognitive aging. A large number of studies have also shown that the decline in information processing capacity is an important cause of the decline in cognitive processing and motor behavior performance. The study found that both processing speed and processing energy can directly delay cognitive aging. In addition, as with processing speed, working memory can be improved through physical exercise. In summary, with age, the individual's cognitive processing speed and processing energy will show a downward trend, but regular physical exercise will improve the aging of both.

The theory of execution of decline is the advanced cognitive activity of the brain, which is responsible for coordinating and controlling various specific cognitive processes, including the process of attention conversion, inhibition of superior response, monitoring of memory processes, and so on. The above results show that physical exercise can not only directly delay cognitive aging, but also delay cognitive aging by improving basic sensory function, and then delay basic cognitive aging by improving sensory function and thus promoting processing speed and processing capacity, which explains the psychological mechanism of physical exercise to delay cognitive aging in middle-aged and old people.

That is, the hierarchical intermediary role of 5 cognitive processing resources. That is, the delayed effect of physical exercise on cognitive aging is mainly achieved through the change of the theory of processing resources.

4. Conclusion

Different forms of physical exercise have different effects on the cognitive function of the elderly, aerobic exercise, resistance exercise and physical and mental exercise will produce different exercise benefits.

Physical exercise has a delayed effect on the cognitive aging of the elderly, which can directly promote the cognition of the elderly, and can also improve the cognitive ability of the elderly through the intermediary of cognitive processing resources in 4. In particular, aging of attention, memory and executive function sits to improve the quality of life of older people.

The development of cognitive aging is a long-term process, is its complex phenomenon, both by individual factors, but also by social factors, so to reveal the mechanism of cognitive aging and its effects, it is necessary to synthesize a number of angles of analysis.

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