

Not just body, physical exercise can safeguard our brain as well as we age

We are all aware that regular exercise and healthy food keep us strong and help us maintain our weight. These are essential for our general health and well-being. The capacity to exercise gradually declines as one ages. There is less mobility, which might have an effect on one's health. Physical activity in old age is considered beneficial to the body. It helps maintain our physique as we get older. Apart from declining physical strength, cognitive capacities also deteriorate as one ages. So, it is vital to explore lifestyle aspects that may offer neuroprotection for the brain during the ageing process.

A new study¹ conducted by a group of experts from the University of Georgia, USA, has found that physical activity can help safeguard our cognitive capabilities as we get older, and it does not have to be strenuous exercise to have an impact. The study tracked 51 elderly people (aged above 65 years), monitoring their physical activity and fitness levels. The participants underwent tests designed particularly to evaluate cognitive ability as well as magnetic resonance imaging to examine brain function. They wore a device known as the NL-1000 accelerometer to measure physical activity. Using a piezoelectric strain gauge, these accelerometers determine the intensity of physical activity, the number of steps taken and the distance travelled. It was worn around the waist by the participants in this study for seven days. The subjects were not included if their cognitive functioning was less than moderate cognitive impairment, as measured by their mini-mental state exam scores.

For the study, the adult activity intensity was grouped into three levels: 1–3 representing light activity (analogous to typical easy walking), 4–6 representing moderate activity (analogous to typical jogging levels of activity) and 7–9 representing vigorous activity (equivalent to sprinting activity), as measured by changes in the piezoelectric strain gauge. Moderate/vigorous physical activity (MVPA) measures the time spent engaging in moderate to vigorous activity and is recorded when the device is configured to record activity at levels 4–9. Time spent in MVPA was divided into 24-h

increments and was shown on the device up to day 7. MVPA has been proven valid and reliable in evaluating physical activity levels in both children and adults.

In the above-mentioned study, MVPA was computed as the average time in seconds per day spent in moderate to vigorous physical activity over seven days. From 47 individuals, usable accelerometry data were acquired. The researchers analysed fitness with a 6-min walk test (6MWT) in which the subjects walked as fast as they could to cover maximum distance in the shortest amount of time. The walking session was held inside building corridors with planned and measured distances before every session. The distance travelled throughout the time period was recorded in metres. Participants were told to wear comfortable clothes and shoes, and to take breaks as needed. The 6MWT has been found to be reliable and valid in differentiating physical capacity and fitness in older individuals. Its performance has been shown to have convergent validity with treadmill testing, a typical method of determining cardiorespiratory fitness levels. All 51 subjects had their 6MWT data collected. These data were used to analyse the relationship between anti-correlated brain networks and executive function efficiency in healthy, older individuals, as well as whether physical exercise and fitness modulated this relationship.

All physical exercise and fitness measures were substantially positively correlated with executive function, showing that increasing physical activity and fitness led to an improved executive functioning performance. The networks constantly communicate with one another, exchanging information. However, various areas of the brain are functional at different times. While a person attempts to finish a task, the network is activated when the body is at rest, for example, turns off, and another network begins to function at that moment. One of these networks should be turned off while the other is functioning. If not, it indicates that the person's brain is not working as well as. These networks are essential for performing basic everyday chores like memorizing essential information and main-

taining self-control. However, as people age, these activities frequently become more challenging. According to the researchers, this study is important because it provides evidence that when patients whose brain networks are not performing optimally participate in physical exercise, their executive function and independence improve. They stress that individuals need not drastically modify their lives, but that they use the stairs on their way to work or stand up and take a few more steps around the room.

This is the first study to examine how brain networks combine with physical exercise and fitness to influence brain processes. The researchers mention that future studies should examine replication with a larger, more representative sample with higher variation in physical activity, education level and race. In addition, upcoming research should examine how physical exercise and fitness affect other anti-correlated brain networks in older adults. Exercising is essential at any age and as we get older, our range of motion becomes more limited. However, the US National Library of Medicine recommends the following exercises: Aerobic exercise, which strengthens our heart and raises our heart and breathing rates. We can include exercises like walking, jogging, cycling, swimming and dancing. As one ages, the body loses muscular mass. Strength training like lifting weights can help build and maintain muscular mass. Greater flexibility is required for greater movement. As a result, flexibility-inducing exercises such as yoga and stretching exercises must be included. Balancing might be a problem in old age, as one may trip and fall, resulting in injury. As a result, we must do exercises that increase balance, like yoga and Tai Chi. Hence, as we age, we must prioritize physical activity. A good balance is essential for optimum health and happiness.

1. Gogniat, M., Miller, S., Robinson, T. and Jean, K., *Sport Sci. Health*, 2022; doi:10.1007/s11332-021-00887-9.

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