Benefits of Judo Training for Brain Functions Related to Physical and Cognitive Performance in Older Adults

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Judo is a well-known Japanese martial art that also features in Olympic games. Recently, an increasing interest has been observed in the application of judo as a multicomponent exercise, with a growing body of evidence showing that this feature improves physical and cognitive performance in older adults. Therefore, this review highlights the benefits of judo training in preventing physical and cognitive decline in older adults. Specifically, first, this review outlines the basic characteristics of judo (philosophy, match, and training). Subsequently, prior research examining the impacts of judo training on the physical and cognitive aspects of elderly individuals is reviewed. Thereafter, the brain mechanisms underlying the effects of judo training in improving physical and cognitive performance are discussed. Throughout this review, judo training demonstrated some positive effects on physical (gait and balance, among others) and cognitive (memory and executive function) function in older adults. These positive effects are attributed to a variety of changes in the brain (e.g., increased neurotrophic factor expression and increased cerebral blood flow, among others) that affect different brain regions and networks both functionally and structurally. From these findings, this review concludes that judo training can be an effective way to maintain and prevent physical and cognitive decline in older adults.

judo martial art combat sport open-skill exercise brain function physical performance cognitive performance old adults

Judo, an internationally renowned Japanese martial art and Olympic combat sport, emphasizes self-improvement, physical and mental well-being, and mutual welfare [1]. Worldwide, this martial arts sport is practiced by millions of people from ages 4 to 80+ [2]. The International Judo Federation consists of over 200 national federations spanning across five continental unions, namely Africa, Asia, Europe, Oceania, and Pan-America [3]. Thus, judo is enjoyed by judo practitioners (judokas) and fans across the world.

There are two types of competition in judo: “combat (shiai) judo” and “form (kata)” competitions [4]. The “combat judo” consists of throws, takedowns, ground submissions, and pinning of their opponents, with high physical and psychological demands. To excel in judo, individuals need to possess a high level of coordination, cognitive and emotional control, as well as the ability to execute quick and precise technical skills when engaging with their opponents [5]. In contrast, the “form” competition is where judo athletes perform a prearranged form in a competition setting. This competition is growing to a greater degree and more judo practitioners are participating in it, especially older practitioners [6]. Moreover, judo can be practiced at various intensities and pursued with different objectives, such as competition, recreation, or health-focused purposes [2]. It also allows people with specific needs

to participate [2]. Judo, therefore, is not only a competitive sport, but an optimal physical activity suitable for people of all skill levels, ages, sexes, and abilities.

The most important medical and socio-demographic problem worldwide is the aging of the global population, as it causes various health problems in the elderly [7]. Cognitive impairment and falls are one of the major health problems [7][8][9][10]. Conversely, physical activity and exercise are well-recognized as one of the most effective lifestyle modifications to counteract brain and muscle aging [9][10][11]. For older adults, the World Health Organization advises a minimum weekly commitment of 150 min of moderate-intensity aerobic physical activity or 75 min of vigorous-intensity aerobic physical activity. It is also recommended to engage in muscle-strengthening activities for major muscle groups at least 2 days per week [10][11][12][13]. Furthermore, a combination of physical and cognition exercises (i.e., dual tasks) should be incorporated in training programs for older people [13].

As a result, judo is progressively utilized as a valuable exercise for older adults, promoting cognitive and physical well-being, by tailoring its multifaceted nature to the individual needs and characteristics of practitioners while upholding traditional values and beliefs [14]. Indeed, practicing judo promotes maintenance or improvement of anthropometrics and functional fitness, psychological health, gait kinematic stability, acquisition of control during falls, and improvement of cognitive function, leading to an improved quality of life later in life [1][5][14][15][16][17][18][19][20][21][22][23][24][25][26][27][28][29][30]. Thus, judo has been proposed as a relatively inexpensive nonpharmaceutical intervention to prevent physical and cognitive function decline in the elderly.

Thus, this review elucidates the benefits of judo training in preventing physical and cognitive decline in older adults. Particularly, this review first provides an overview of the characteristics of judo, especially “combat judo” (philosophy, characteristics of match, and training). Next, the efficacy of judo training on physical and cognitive aspects of older adults is reviewed. Finally, this review discusses the brain mechanisms underlying the benefits of judo training in relation to physical and cognitive functions. From this review, the author suggests that judo training can be an effective strategy for preventing physical and cognitive decline in the elderly.

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