



Martial Arts as a Mindfulness in Motion: A Neurocognitive View

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Introduction

Mindfulness programs have given high visibility to bring the impact of the practice through a well-structured protocol that can be replicated over the years offering many clinical benefits as well as a greater understanding of neurophysiological mechanisms from immediate and long-term practice [1-5]. Since then, several protocols have been created to give specificity to the public suffering from mental health problems such as depression and anxiety (MBSR, MBCT), addicts (MBRP), eating disorders (MB-EAT), pain and chronic illness (MBPM). With this, Mindfulness has gained great popularity for a healthy population [6].

Thus, many studies have emphasized the structures and neurophysiology that Mindfulness practice promotes [7-9]. Based on these results, new protocols have been studied through body movement. The basis is that the body becomes an excellent anchor for maintaining attention, inasmuch attentional flexibility develops, the attentional process becomes faster and more natural [10]. An important factor in this finding is the main point that Mindfulness neurophysiology integrates different areas at different times of practice [11]. In the case of focused attention practice, attentional neural networks are present until distraction occurs, where more medial networks (default mode network) become more prominent [12,13]. As this distraction comes out, a deeper network (salience network) begins to activate so you can then decide to return to the focused object [14,15].

This neural flow became known as the neurocognitive model [11,14] that develops (neuroplasticity) throughout the training (hours/year of practice) [16].

Therefore, Mindfulness is no longer understood only as a practice of meditation or protocol but becomes a cognitive skill

or mental training that develops as these neural networks adjust [17]. Then, body awareness is the starting point in the development of Mindfulness due to sensory experience improves the focus [18]. Thus, studies based on martial arts have been studied using Mindfulness neurophysiology as a major aim [19,20]. Studies using the Tai Chi Chuan [21] and Chi Kung [22] Mindfulness attitude had a great impact on research, showing important neurophysiological changes that corroborated with current findings that posterior areas (parietal cortex) of the cortex play a key role in practitioners' development [23-25]. Conscious movements have become a practical way of training Mindfulness, while martial arts have been an important way of maintaining these practices, considering the synchronization of movement with the Mindfulness attitudes described above.

Karate studies, for example, have gained prominence as training develops cognitive aspects such as attention, working memory, decision making [17,26,27]. The repetition of the movement seems to be an important way to manage the cognitive skill in this learning process, which is associated with a subtle recognition of the movement [26] with lower activity of the brainpower [28,29] and improved body balance [30]. Moreover, studies have shown improvement in cognitive processing speed in older practitioners [31] which related to neural efficiency [28,32]. More studies are necessary to explore the efficacy of martial arts training in the cognitive aspects, whereas Mindfulness has shown an important factor to link the physical activity into cognitive abilities.

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