



# YOGA and self-regulation in management of essential arterial hypertension and associated emotional symptomatology: A randomized controlled trial



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## 1. Introduction

### 1.1. Essential arterial hypertension

Arterial Hypertension is a serious public health problem. It affects 40% of adults older than 25 worldwide [1] and it is the most important cardiovascular disease risk factor [2]. In total, complications derived from arterial hypertension are responsible for 9.4 million deaths worldwide.

Essential or primary arterial hypertension is a functional disorder, i.e., the organic cause of which cannot be determined. This disorder is highly related to lifestyle, so the initial strategy in its prevention and treatment, should be based on the implementation and maintenance of healthy behaviours and lifestyle.

Cardiovascular reactivity plays a key role in the establishment of arterial hypertension [3,4]. Thereby, high reactivity, which is linked to chronic stress response, leads to an excessive activation of the Sympathetic Nervous System and an alteration of the sympathetic-vagal balance, with a corresponding deterioration of the vagal brake role in the autonomic control of the heart. Thus, this process could be a pathophysiological link between psychological factors and hypertension [5]. However, this over-stimulation of the Sympathetic Nervous System could be more due to lack of awareness of painful and threatening emotions than to stress situations and

experienced emotional distress themselves [6]. This approach would be a key in the interpretation of the beneficial effect of yoga practices on this pathology, considering that these practices are based on the development of consciousness and mindfulness, through observation and acceptance of one's own feelings, thoughts and emotions.

### 1.2. Embodied mind and organization of experience

The theory of embodied mind raises cognition as a corporealized action, highlighting two points: one, that cognition depends on the experience of having a body with different sensory-motor abilities, which determines processes of perception and action that are inseparable in the lived cognition; two, that these abilities are integrated into a broader biological, psychological and cultural context [7]. Cognition is the process that results both, from the interaction of the different body systems, and from the relationship of the body to the environment. The sensations of the body are fundamental to our sense of identity, so that the consciousness of the body would originate the consciousness of itself.

Moreover, the three levels of organizing experience: sensori-motor, emotional and cognitive, are closely interrelated, and the processing for each of them is interdependent [8]. Both, body sensations and emotions, influence cognitive processes and decision making, encouraging or deterring our actions, in what has been called a “bottom-up processing” [9]. In the same way, emotions and cognitions correspond to sensory perceptions, bodily sensations and movements, known as “top-down processing” and these, in turn, contribute to generate emotional states of well-being or discomfort. From the level of visceral, sensory and motor consciousness, yoga practice could lead to awareness of this process of “embodiment” and transcending the linear action (bottom-up and top-down processing), can act on the complex network of interactions of what has been named by Fuchs [10], ‘systemic unit’ which configures the organism: brain, body and environment.

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