Chapter 25
An Exploration of Influence of Duration on Physiological Effects of Asanas

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ABSTRACT

Different body postures that can be maintained for a certain duration with awareness are called yoga-asanas. These asanas matter flexibility, coordination, and strength, while the breathing practices and meditation sharpens the mind for better awareness and reduce anxiety and thus adds quality into life. Other beneficial effects might involve a reduction of stress, blood pressure, and improvements in resilience, mood, and metabolic regulation. The asanas performed regularly for a short duration in hours is well studied in the literature. However, when performed for a long duration continuously for several hours (40-hour yogathon), without food and sleep has a significant effect in regulating homeostasis. The homeostasis is accessed through cardio-respiratory and galvanic skin response changes. The study shows the physiological changes after the yogathon and compares it with effects on physiology due to short term yoga. It also emphasizes on the reduction of dependency on food, because of energy compensation through yoga-asanas.

INTRODUCTION

Physiological and Psychological Effects of *Asanas*

Asana (physical posture) is described as the body posture attuning stability along with ease (Bhavanani et al., 2018). *Asanas* have physiological significance in regulating homeostasis and autonomic balance through massage of internal organs that clears the blockages in the energy channels of the body and the

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body energy system becomes more balanced (Woodyard et al., 2011). The range of motion of human body parts reduces as it gets aged. A set of *asanas* brings a full range of motion of all joints thereby enhancing flexibility with time (Petric et al., 2014). Combination of *yoga-asanas* with relaxing postures such as *savasana, balasana* improves the cardiopulmonary system, diminishing O_2 consumption (Telles et al., 2000). Immediate effect of 30 minutes *yoga-asanas* brings the mind to a calm state with reduction of GSR (De et al., 2019).

The duration of performance of *asanas* has a significant effect on the physiology. Depending on the duration *asanas* it can be classified into two types such as short-term and long term. Short-term *yoga-asana* is defined as *yoga-asanas* carried out for hours (< 2 hours) in one or two sessions per day on a weekly or monthly basis. Whereas the long term *yoga-asana* is carried for more than a month up to 6 months. Most of the literature is based on the above two categories. However, the authors in this chapter include another classification called 'Yogathon'. Yogathon is defined as performing *asanas* more than 12 hours, continuously at a stretch. There are no studies known regarding how it affects physiology and psychology of the subjects. This chapter analyses the physiological and psychological effects on health after performing 40 hours of *yoga-asana* without food and sleep. The physiological aspect is assessed from the variability of cardiac and pulmonary systems called cardio-respiratory variability (CRV). The psychological aspect is assessed from the galvanic skin response (GSR). CRV consists of heart rate variability (HRV), pulse rate variability (PRV), and breath rate variability (BRV). The variability depicts the characteristics of the autonomic nervous system (ANS). The ANS has sympathetic and parasympathetic divisions which control the internal organs. The authors consider the cardio-pulmonary system to describe changes in the sympathetic nervous system (SNS) and the parasympathetic nervous system (PSNS). The yogathon is generalized for the individuals, practicing *asanas* regularly for at least 2 to 3 years and yogathon should be performed under guidance.

OBJECTIVES

The chapter focuses on evaluating physiological and psychological effects due to yogathon for 40 hours with fasting and without sleep. The results of yogathon are compared with that of short-term *yoga-asanas*, obtained from existing literature.

Specifically, the chapter focuses on:

a. Changes in CRV after yogathon.
b. Changes in CRV due to no intake of solid foods (Water and juices are allowed as prescribed by the committee).
c. Changes in CRV without sleep for 40 hours, however subjects are resting in Corpse-pose, child-pose, lotus-pose, reclining-bound-angle-pose, easy-pose and various reclining pose.

The Changes in HRV, PRV, BRV due to no intake of solid foods and without sleep are obtained from the literature. The authors also show how *asanas* help the self in managing metabolic energy consumption by interventions other than food and sleep.