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## The impact of standing Yogasana on core muscle strength and function: A thematic review

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### Abstract

Yoga, an ancient practice originating in India, encompasses a wide range of physical, mental, and spiritual exercises aimed at achieving holistic well-being (Taimni, 1961). Among its various components, Yogasana (postures) have gained substantial attention for their potential to enhance physical fitness (Williams, 2017). This thematic review focuses on the effect of standing Yogasana on core muscle strength and function, shedding light on the physiological mechanisms and benefits of integrating these practices into fitness routines. Through a comprehensive exploration of scientific literature, this paper aims to provide a deeper understanding of the influence of standing Yogasana on the core musculature, emphasizing their potential role in promoting overall health and functional stability.

**Keywords:** Yoga, Yogasana, standing poses, core muscles, core strength, balance, stability, flexibility, mind-body connection, biomechanics

### 1. Introduction

Yoga is now widely used to promote physical, mental, and spiritual well-being. Yoga aids in a person's ability to regulate their body, mind, and spirit (Singh, 2015) <sup>[25]</sup>. To relax the body and mind, it combines mental and physical discipline. Additionally, it promotes relaxation and aids in reducing stress and anxiety. Yoga asanas are said to improve flexibility, strength, and self-assurance (Wang *et al.*, 2013) <sup>[29]</sup>. Yoga's ability to reduce stress is only one of its many benefits. Indeed, yoga has been recommended as a form of "total-solution" exercise for seniors by the National Recreation and Park Association (Wang *et al.*, 2013) <sup>[29]</sup>. These days, stress is widespread and is considered to be extremely harmful to one's body and mind. Stress can lead to major health issues such as sleep disorders, back, neck, and headache discomfort, as well as high blood pressure, sweating palms, heartburn, rage, sleeplessness, and attention deficit disorder (Wankhade, 2020) <sup>[30]</sup>. Additionally, a recent systematic study indicated that yoga improves senior people's quality of life and some components of fitness for health, such as muscle strength, flexibility (Büssing *et al.*, 2012; Ebnezar *et al.*, 2012; Liu *et al.*, 2021) <sup>[9, 10, 15, 1]</sup>, and balance. (Sivaramkrishnan *et al.*, 2019; Wibowo *et al.*, 2022) <sup>[26, 31]</sup>. The core muscles play a pivotal role in maintaining stability, balance, and posture (Hrysomallis, 2011) <sup>[1]</sup>. Standing Yogasana, a subset of yogic postures, engage various muscle groups, particularly the muscles of the core, to achieve and maintain proper alignment during the poses. This review delves into the intricate relationship between standing Yogasana and core muscle strength, examining the biomechanical and neuromuscular aspects of their interaction.

### 2. Biomechanics of Standing Yogasana

Standing Yogasana often require participants to sustain poses that involve bearing their body weight, aligning the spine, and distributing force through different muscle groups. These asanas demand conscious engagement of the core muscles to stabilize the spine and pelvis, ultimately promoting enhanced strength and coordination.

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### 3. Core Muscle Activation during Standing Yogasana

Scientific studies utilizing electromyography (EMG) have demonstrated increased activation of core muscles during standing Yogasana (Marshall & Murphy, 2006) [3]. Muscles such as the rectus abdominals, transverse abdominals, oblique's, and erector spine are engaged to maintain balance and prevent overloading on particular muscle groups. This activation fosters not only strength but also endurance, contributing to functional stability.

### 4. Benefits of Standing Yogasana for Core Muscles

#### 4.1 Strength Enhancement

Standing Yogasana, when practiced regularly, have been demonstrated to improve core muscular strength, improving postural stability and lowering the risk of musculoskeletal ailments. Recently, numerous targeted exercise interventions have been developed and put into practice to enhance physical capacity and muscular strength so that this population can continue to engage in activities of daily life. (Hamed *et al.*, 2018; Liu *et al.*, 2021; Widjaja *et al.*, 2021) [11, 15, 32]. However, leg press muscular strength improved in the Yoga participants (Kim *et al.*, 2012) [14].

#### 4.2 Balance and Coordination

The demand for balance in standing Yogasana necessitates engagement of core muscles, leading to improved proprioception and overall body coordination. In comparison to the traditional exercise group, the Yogasana intervention group showed the greatest improvement in variables related to static balance, followed by moderate improvements in variables related to dynamic balance and lower extremity strength (Kanjirathingal *et al.*, 2021) [13]. Yogasana (Yoga Postures) that range from very dynamic, active movements that go from one posture to another (and result in a thorough aerobic workout) to more slow-paced practices that hold postures for several minutes and form an intense strength training and balanced workout (Ramakrishnan & Sankaran, 2019) [22].

#### 4.3 Flexibility and Range of Motion

Standing Yogasana often involve gentle stretches that target core muscles, contributing to increased flexibility and a wider range of motion. Yoga poses are used to improve fitness and treat neuromusculoskeletal conditions because they allow the spine and lower extremities to move through a wide range of motion. (Jakhotia *et al.*, 2015; Mullerpatan *et al.*, 2020) [12, 20]. Yoga poses involve tonic muscular contraction, which uses less energy than phasic muscle contraction, which is frequently seen in physical workouts, and is coordinated with breathing control and kinesthetic awareness. Yogasana involve coordinated, rhythmic movements that correct postural abnormalities, muscular imbalance, promote joint mobility and muscle strength, stimulate postural control systems, and extend self-awareness without wearing you out too much (Balaji *et al.*, 2012; Mullerpatan *et al.*, 2020) [7, 20].

#### 4.4 Pain Management

Strong core muscles can alleviate lower back pain and promote better spinal alignment, which can be particularly beneficial for individuals with sedentary lifestyles. Primary dysmenorrhea is the commonest problem experienced by adolescent girls. The term "menstrual cycle" refers to the time frame from the start of one cycle to the start of the next. It is frequently thought of as a painful syndrome. Dysmenorrhea is the name of this syndrome. It is the issue that teenage girls

encounter the most frequently. Menstruation causes an end to the pain that started immediately before or at the beginning of the menstrual flow. The pelvis, lower back, or upper legs may all feel painful. There are two kinds of dysmenorrhea. Primary and secondary dysmenorrhea, respectively (Aggarwal *et al.*, 2020) [6]. The idea that yoga has advantages for the body and mind is supported by a large body of research. It causes the hypothalamopituitary adrenal axis to be regulated. Menstrual issues are treated safely and affordably. Primary dysmenorrheics use a variety of therapeutic approaches, including prescription drugs and home cures, but many of these are either ineffective or have long-term negative effects. Simple lifestyle changes, such as yoga anulomvilom, may help to reduce menstrual pain (Aggarwal *et al.*, 2020; Rani *et al.*, 2013) [6, 24].

### 5. Neurological and Mind-Body Aspects

Yogasana that are performed while standing require a high level of mental attention and concentration, developing a mind-body connection that improves muscle control and engagement. In regular tasks, better posture and body awareness are other benefits of practicing mindfulness. The ancient Indian practice of yoga has provided man with the answers to his spiritual and all-encompassing quest for ideal health and wellbeing. It is a tried-and-true technique for addressing psychosomatic and long-term degenerative illnesses, as well as for enhancing general health. Both the general population and health experts have recently developed a greater knowledge of and interest in health issues and natural cures (Trakroo *et al.*, 2013) [28]. There is evidence that pranayama training produces deep psychosomatic relaxation and improvement of cardio respiratory efficiency (Madanmohan *et al.*, 2005; Trakroo *et al.*, 2013) [17, 28]. This improvement could be either peripheral (heart and lung physiology) or central (brain regulation of these functions by autonomic nervous system) (Raghuraj *et al.*, 1998; Trakroo *et al.*, 2013) [21, 28] have found that practice of nadishuddhi pranayama results in alteration of autonomic balance towards the parasympathetic side whereas bellows type pranayama like kapalabhati increases the sympathetic activity (Ramamurthi, 1981; Trakroo *et al.*, 2013) [23, 28], has suggested that yoga training might help to achieve voluntary control over medullary autonomic centers to achieve supernormal functions. The neurological benefits of yoga have interested scientists all over the world and studies have reported beneficial effects in both peripheral nerve function as well as central neuronal processing (Bhavanani *et al.*, 2012; Madanmohan *et al.*, 1992; Malathi & Parulkar, 1989; Malhotra *et al.*, 2002; Telles *et al.*, 1993; Trakroo *et al.*, 2013) [8, 16, 18, 19, 27, 28].

### 6. Practical Implications

Incorporating standing Yogasana into fitness routines offers a versatile and holistic approach to core muscle training (Key, 2014) [2]. Individuals seeking to improve core strength, stability, and overall physical fitness can benefit from the integration of these postures.

### 7. Conclusion

Standing Yogasana represent a valuable avenue for enhancing core muscle strength and function. Through their biomechanical demands and neurological components, these postures provide a holistic approach to core muscle training that goes beyond mere physical fitness. The integration of standing Yogasana into fitness regimens can contribute to

improved posture, balance, and overall well-being, making them a valuable addition to modern fitness practices.

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