

## Review Article

# Role of Complementary and Alternative Medicine in Male Sub-Fertility

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**Abstract**

Infertility affects 1 in 6 couples worldwide according to the most recent estimates by the World Health Organization (WHO). While the female partner has historically borne much of the responsibility, it has been reported that abnormal male reproductive health may be involved in up to 50% of infertility cases. Although there are numerous explanations for male subfertility such as testicular dysfunction, genetic disorders and hormonal imbalance, modifiable lifestyle factors are the most frequently reported. Generally, men fear reproductive health issues such as low sperm count or reduced sperm motility due to the social stigma associated with reproduction as well as the emotional and psychological impacts on their sex lives. Sudarshan kriya is a breathing practice that has been shown to have positive influences on the personalities of individuals, improve mental health of males experiencing anxiety, and support balancing the autonomic nervous system. Men are increasingly utilizing complementary and alternative medicine (CAM) as corrective measures to address reproductive health challenges. The objective of this mini-review is to establish a theoretical framework for the utilization of CAM therapies in particular yogic breathing and yoga postures to manage modifiable risk factors (i.e., anxiety and stress) associated with male subfertility.

**ABBREVIATIONS**

CAM: Complementary and Alternative Medicine; ART: Assisted Reproductive Technology; TCM: Traditional Chinese Medicine; LH: Luteinizing Hormone; FSH: Follicle Stimulating Hormone

**INTRODUCTION**

Globally, couples are turning to various complementary, holistic and alternative therapies to treat a fertility problem. However, a recent study found that complementary and alternative therapies are most commonly used by more affluent couples who already have a foundational belief in the effectiveness in these types of approaches for wellness and health management [1]. Among U.S. males, dietary supplements, acupuncture, meditation, scrotal cooling, breathing techniques, mindfulness [2], and faith-based treatments are among the most common therapeutic approaches [1,3].

Infertility among men is an under-recognized, complex disorder which can impact a significant portion of the male population (5-25%) [3,4]. Historically, infertility has been considered a female issue and associated with a range of modifiable and nonmodifiable (genetic) risk factors. For example, mindfulness techniques have been shown to reduce

psychological distress among women experiencing infertility [2]. Therefore, it is likely that such approaches may be a useful intervention in some men as well. Additionally, meditation for the management of stress and anxiety among women undergoing in vitro fertilization (IVF) has been shown to improve fertility quality of life and pregnancy rates by promoting self-compassion and emotion regulation [5].

Lifestyle factors such as excessive body weight, smoking, and excessive alcohol consumption have been reported as crucial modifiable risk factors related to male infertility [6,7]. High body mass index (BMI) and obesity in reproductive age are also found to be a contributor to male infertility [8,9].

In fact, male infertility is often associated with an alteration in sperm concentration, motility or morphology. Recently, an epidemiological study in males between the ages of 23-35 years of old reported a 2% reduction in the quality of male sperm and an overall 40% in men of the reproductive period. The problem with sperm count, motility, and morphology stem from disarray in control mechanisms, including pre-testicular, testicular, and post-testicular factors [10].

Concomitantly, stress and emotional dysregulation diminish hormonal profiles that stimulate spermatogenesis. There can be other multiple reasons for male infertility, which may include

physical problems with the testes, blockage in the sperm-carrying ducts, genetic disorders, hormonal imbalance and lifestyle-related factors.

In eastern culture, for challenges associated with conception and infertility, humanity has employed folk medicine and other ancient healing techniques to enhance the body's natural ability to conceive. Currently, complementary and alternative medicine/therapies (CAM) are being employed for similar reasons. Due to the cost associated with assisted reproductive technologies (ART), some infertile couples are turning to CAM in an attempt to become pregnant. Acupuncture, hypnotherapy, chiropractic and osteopathic manipulation, naturopathy, homeopathy and traditional Chinese medicine (TCM) are examples of CAM [11].

CAM therapy is used for overall reproductive wellness, to enhance results of conventional treatments, and to advance the quality of life. In a growing number of American, yoga is being used by as a means of improving overall health and fitness. There is also a progressive trend toward the use of yoga as a mind-body CAM intervention to improve specific physical and neurocognitive conditions [10].

The purpose of this brief review is to establish a theoretical framework for the utilization of CAM therapies such as yogic breathing and yoga postures to manage modifiable risk factors (i.e., anxiety and stress) associated with male infertility.

### **Potential impact of yoga on reproductive health in men**

Today, many individuals report practicing yoga for its health benefits. As a growing body of clinical evidence and scientific data suggests, specific yoga techniques may improve physical and mental health through modulating the balance between the parasympathetic and sympathetic nervous system [12]. Yoga therapies have found to enhance reproductive functions both in men and women by strengthening the overall integration of these compensatory physiological systems [6,7,13]. Couples yoga is increasingly popular form of fertility yoga, which involves completing postures with the help of a partner and is especially beneficial for individuals experiencing fertility and communication problems [6]. Studies have shown that yoga therapy orchestrates fine-tuning and modulates the neuroendocrine axis which results in significant beneficial fluctuations in neurophysiological and endocrine systems [7,13-17].

While overwhelming scientific data on the benefits of yoga may be lacking, available evidence suggests that yoga supports the improvement of reproductive functions by reducing stress and balancing the neurohormonal profile. These physiological alterations reduce urinary excretion of catecholamines, and aldosterone decreases serum testosterone and luteinizing hormone (LH) levels and an increased cortisol excretion, indicating optimal changes in hormonal profiles [14]. During yoga therapy, alterations in brain waves (primarily an increase in alpha waves) [18, 19] and the decrease in serum cortisol levels have also been reported [19,20].

Based on limited scientific data, available evidence suggests that yoga may be associated with the sympathetic activation and increased blood flow to the pelvic muscle and reproductive organs. A review of the literature indicates that yoga may help to:

- promote male sexual hormonal balance production [21-23].
- improve sperm motility and mobility [10].
- improve the overall quality of the sperm [6,12].
- reduce the size of the prostate and decreased prevalence of prostate diseases [11].
- reduce stress and anxiety contributing to all-round improved well-being thus increasing the general health of the reproductive system [6,8].

Yoga primarily acts as the complementary mind-body medicine of male reproductive health by improving health in various ways [10].

### **Stress, reproductive health, and disease**

The field of psychoneuroimmunology generally is defined the role of stress in reducing the effectiveness of the immune system in combating infections and the growth of cancer in the human body. One study reported that Kundalini Yoga might be useful in the regulation of terminal prostate cancer [11]. Based on Eastern medicine, diseases of the pelvic area are often related to blocks in the second chakra, which can be connected to emotional or sexual issues and passion for life in general. This is also the area that carries deepest emotions, including pain and grief. If one does postures that activate the second chakra (i.e., associated with intimacy, passion), especially those with imbalances in the pelvic area, may experience those feelings emerging.

Compression in postures such as the Yoga Mudra and Locust are hypothesized to improve prostate health by increasing blood flow and vascular tone [24]. It is recommended that men with an inflamed prostate should avoid postures that press down into the pelvic region [6]. Pranayama breathing is often practiced in conjunction with these yoga positions. While Eastern medicine is not as well understood, Kapalabhati is an excellent breathing technique for moving energy into the pelvis and may be particularly helpful for prostate enlargement and inflammatory conditions (Table 1) [13]. Pranayama breathing or ujjayi breath may help regulate body temperature and slightly reduce the size of the prostate. Hatha yoga is a slow form of yoga with methodical postures and movements, which focuses on improving posture and relaxing meditative breathing techniques.

Conventionally, many yoga postures have been reported to improve serum adiponectin and leptin levels along with serum lipids and metabolic syndrome risk factors [12]. Yoga and other relaxation techniques have also been to have higher potency in modifiable adiposity than other complementary and alternative therapies [25].

### **Potential impact of yogic breathing on reproductive health in men**

Several clinical studies examining the effects of psychological stress on male fertility have shown that stress is associated with reduced paternity and abnormal semen parameters [5,8,9,16]. Sufficient scientific evidence exists to suggest that mental stress could severely affect spermatogenesis, mainly because of varying testosterone secretion [26]. Since the 1970s, meditation, yogic

**Table 1:** Potential Benefit of Yoga and Breathing Techniques Relative to Common Causes of Male Fertility Challenges.

Moderate or Strong Evidence for Yoga and Breathing Techniques Benefit	Little or No Evidence of Yoga and Breathing Technique Benefit
Premature or Failure of ejaculation [35,36]	Spinal cord injury affecting sexual health [38,39]
Over heating of the testicles [6,7,23]	Nerve Damage or Neuropathy to Prostate [8,9,35]
Erectile dysfunction [22,28]	Nerve damage to male reproductive organs [39]
Infrequent intercourse [35,36]	Undescended testicles [7,8]
Anxiety and Emotional Stress [5,23]	Chromosome or genetic defects [6,10]
Spermatogenesis and Low Sperm Count [28,35]	Prior surgeries (hernia, testicular or vasectomy) [7,8]
High Body Mass Index (BMI) or Obesity [9,12,25,29,37]	Environmental causes [40-42]

breathing and other stress-reduction techniques have been studied as possible treatments for depression and anxiety [7,8,27] (Table 1). Yogic breathing practices such as alternate nostril breathing and Sudarshan Kriya have received less attention in the medical literature, though it has become increasingly popular in recent decades. Stress is known to increase the likelihood of infertility, and yogic breathing is very effective at reducing stress and anxiety [27]. The links between stress and infertility are complex and not fully understood; however, cortisol can interfere with standard reproductive functions [25]. Lower stress levels and having a positive mood and outlook can increase the odds that fertility treatments will be sufficient. Perhaps the most reliable evidence is that reducing stress through yoga can boost fertility [11,22]. Another prevalent form of yoga is Kripalu, which is believed to improve mind and body connection through simple postures and breathing techniques [28].

The stresses of modern life seem to be accelerating among the Western population and may play a more significant role in younger men. Recently, review of the literature covering a wide range of yoga practices suggest they can reduce the impact of exaggerated stress responses and may be helpful for both anxiety and depression [21-23,27, 29]. It mainly acts via down-regulating the HPA axis that triggers as a response to a physical or psychological demand (stressor), leading to a cascade of physiological, behavioral, and psychological effects, primarily as a result of the release of cortisol and catecholamines [28,30]. These responses lead to the mobilization of energy needed to combat the stressor through the classic “fight or flight” syndrome. In this respect, yoga functions like other self-soothing techniques, such as meditation, relaxation, and exercise. By reducing perceived stress and anxiety, yoga appears to modulate stress response systems [31].

Tooley and colleagues [32], found significantly higher plasma melatonin levels in experienced meditators in the period immediately following meditation compared with the same period at the same time on a control night. It was concluded that meditation could affect plasma melatonin levels. It remains to be determined whether this is achieved through decreased hepatic metabolism of the hormone or via a direct effect on pineal secretions. Regardless, facilitation of higher physiological melatonin levels at appropriate times of day might be one avenue through which the claimed health-promoting impacts of meditation occur.

These observations suggest that yogic practices can be used as psychophysiological stimuli to enhance endogenous

secretion of melatonin. These physiological mechanisms may be responsible for the improved sense of well-being. Along, with better management of stress, one can not only help to maintain muscle strength and flexibility but also can improve reproductive health. Yogic breathing techniques such as Sudarshan Kriya also help to improve circulation, promote proper functioning of the internal organs, and contribute to peripheral nerve function and integrity [6,7,27]. Regarding reproductive health, Kundalini Yoga is considered the ultimate yoga by which masculinity and sexual energy are not suppressed [11]. Sexual liveliness, which is regarded as the most potent form of biochemical stamina in the body is the one form of energy that can be used for rejuvenating the entire physical apparatus [17] (Table 1). In men, practicing moola bandha has been associated with relieving spermatorrhea, preventing inguinal hernia, and controlling testosterone secretion [33]. A review described how moola bandha stretches the muscles of the pelvic floor, increases circulation in that area, balances, stimulates, and rejuvenates the area through techniques that improve awareness and flow [31]. As a result, exercises that utilize moola bandha may be helpful in aiding people who lack sexual vitality and have poor sexual functioning. Sudarshan kriya has positive influences on the personalities of individuals and helps to improve mental health of individuals, which may help with male infertility related to mental health conditions such as anxiety disorders [27].

## CONCLUSION

Whether it is as a supplement to or instead of conventional allopathic therapy, men are increasingly using lifestyle modifications and following holistic, complementary, and alternative therapies for the management of male subfertility. While there is a global trend for reduced female fertility [34], low sperm counts among men between the ages of 24 to 44 are a growing concern. It is intuitive that these changes in lower female and male subfertility rates are related to global changes to lifestyle, diets, and activity levels over recent decades will have impacted negatively reproductive health at the genetic and cellular level.

The likelihood is that small effects of several diverse factors to include stress and anxiety may work together to induce adverse effects on spermatogenesis. Thus, the present review postulates that yoga postures, meditation, and yogic breathing are effective holistic approaches to trigger neurohormonal mechanisms that reduce stress and anxiety and may improve reproductive health among men. The role of yoga in male infertility focuses on reducing anxiety and optimizing erectile

function. While there is a growing body of medical and scientific evidence for complementary and alternative approaches in managing reproductive pathophysiology, more research is needed to elucidate the mechanisms of such impacts of yoga on reproductive physiology.

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