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Yoga and Meditation for Male Infertility Improvement

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ABSTRACT

Infertility is often a silent struggle. Despite the high prevalence of infertility in the current population, most couples do not share their struggles with family or friends due to social stigma, increasing their psychological vulnerability. And sometimes people end their lives by committing suicide. Heartfulness meditation has helped reduce stress, anxiety, loneliness and improve quality of life as well as sleep. The comprehensive role of yoga in improving male infertility has been highlighted, focusing on its effect on sperm nuclear and mitochondrial genome, epigenome and telomere health. In addition, it underlines the importance of self-care, open communication and shared experiences with partners. Regularly practicing yoga supports psychosocial well-being, promotes holistic healing, improves physical and mental health thereby helping to improve reproductive health, promotes resilience and self-efficacy during the journey of fertility and reproduction. Yoga and meditation have emerged as a potent modulator of sperm parameters, genome integrity and epigenetic factors, evidenced by various studies. Studies indicate that yoga practice significantly enhances sperm concentration, motility and morphology while simultaneously reducing semen and improving both mitochondrial and nuclear genomes. Traditional Eastern systems and practices are well recognized for general health as well as chronic diseases. Meditators who received special training to run the program and were certified through recognized institutions/organizations. Once most participants received 20 to 25 minutes of guided meditation, yoga or physical activities per session from certified Heartfulness Meditation instructors, they experienced improved health, fertility and fertility.

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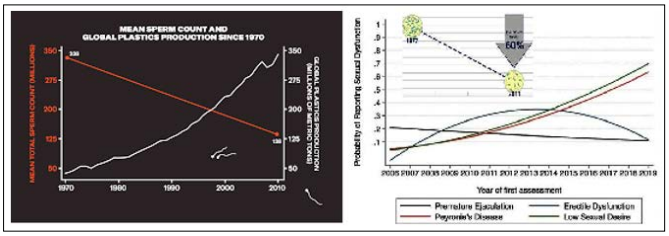
Global Male Infertility

Human health and gender equality are central elements of the Sustainable Development Goals, which call on governments to ensure universal access to sexual and reproductive health and rights. Fertility care is a core part of sexual and reproductive health, and responding to infertility can mitigate gender inequality. The drive to achieve the Sustainable Development Goals therefore must encompass actions to respond more effectively to the needs of people with infertility. Understanding the magnitude of infertility is critical for monitoring, assessing, and improving equitable access to quality fertility care services, as well as addressing risk factors for and consequences of infertility. every human being has a right to the enjoyment of the highest attainable standard of physical and mental health [1]. Individuals and couples have the right to decide the number, timing and spacing of their children [2]. Men and women of full age, without any limitation due to race, nationality or religion, have the right to marry and to found a family [3]. If infertility is not addressed, it can negate the realization of these essential human rights. Failure to address infertility will hamper global efforts to ensure universal access to sexual and reproductive health and rights. Consequently, urgent efforts are required to improve the prevention, management, and treatment of infertility worldwide [4]. Unlike other types of conditions, infertility is defined by the absence of an event (i.e., not getting pregnant), usually after a defined period of time. The World Health Organization (WHO) specifies a 12-month duration, defining infertility as "a disease of the male or female reproductive system characterized by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse" [5].

Human health and gender equality are central elements of the Sustainable Development Goals, which call on governments to ensure universal access to sexual and reproductive health and rights. Fertility care is a core part of sexual and reproductive health, and responding to infertility can mitigate gender inequality. The drive to achieve the Sustainable Development Goals therefore must encompass actions to respond more effectively to the needs of people with infertility, leaving no one behind. These estimates show high prevalence of in relation to the availability, accessibility, and quality of interventions to prevent, diagnose and treat infertility in most countries. It is anticipated that these estimates will improve our understanding of the prevalence and burden of disease related to infertility globally and regionally, and will provide a basis for policy and practice to achieve universal access to fertility care. infertility globally and regionally, a finding that should be used to support the development of policies and practices that will help individuals and couples achieve their desired family size. Findings also provide insight into how the estimation of infertility prevalence can be improved in order to obtain more actionable data, including data that allow for more meaningful comparisons across settings and time. On global level, infertility is often a silent struggle. Despite the high prevalence of infertility in the country, the majority of couples do not share their struggles with family or friends due to social stigma, thus increasing their psychological vulnerability. Heartfulness meditation has shown to decrease stress, anxiety, loneliness and improve sleep along with quality of life. Objectives: The current retrospective series evaluated the effectiveness of Heartfulness based integrative therapy on infertility outcomes. Globally, infertility affects up to 15% of couples of reproductive age [6,7]. The National Survey of Family Growth estimated 6% of couples experience infertility issues in the United States [8]. By contrast, among couples of reproductive

age in India, prevalence of infertility ranged between 4% to as high as 17% [9,10].



Infertility in male, female or both partners may occur due to a combination of factors attributed to genetic, environmental, infectious diseases and dietary choices [11]. The incidence of infertility among couples is associated with lifestyle factors, stress, postponing parenthood and obesity [12,13]. Moreover, the inability to have children also causes significant emotional and psychological distress with patients reporting feelings of depression, stress, anxiety, isolation, and loss of control. Interestingly, studies have reported the prevalence of anxiety among infertile couples to be similar or higher to patients.

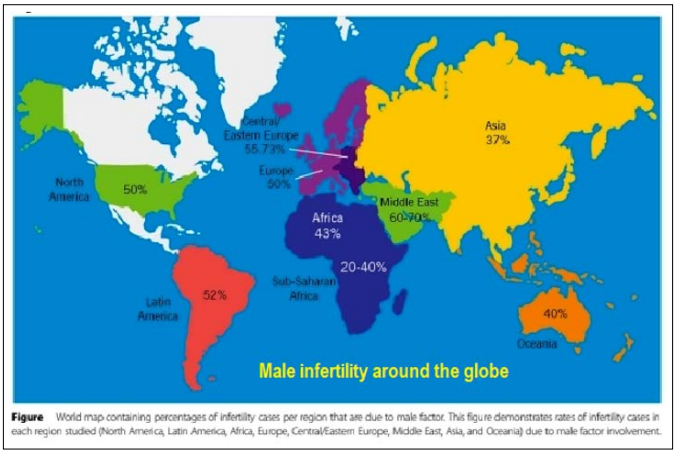


Figure World map containing percentages of infertility cases per region that are due to male factor. This figure demonstrates rates of infertility cases in each region studied (North America, Latin America, Africa, Europe, Central/Eastern Europe, Middle East, Asia, and Oceania) due to male factor involvement.

There are a wide variety of risk factors that could potentially influence sperm quality. These include lifestyle factors such as cigarette smoking, alcohol intake, use of illicit drugs, obesity, psychological stress, APA, diet, and caffeine intake. The adverse effects of these factors could even become intensified from one generation to the next, and then passed on to the resulting offspring. However, their negative effects can be overcome to a large extent by behaviour modification and better life-style choices. In this manner, the harmful impact of these factors on the male reproductive potential could also be alleviated and thus result in a more favourable outcome. The evidence supporting the adverse effect of each risk factor on male fertility, as discussed in the present review, are of varying strength. Almost all the studies focus on the specific effects of one or at most two risk factors that were under evaluation. However, in reality, exposure to these risk factors does not occur individually but rather simultaneously, with each one being at a varying duration and severity of exposure. It could then be said that without insight into the broader picture of these complex exposures, we may already be underestimating the consequences of each exposure. The additive effects from the risk factors of male infertility such as smoking and alcohol intake on sperm parameters have been recognized. Moreover, the other groups of risk factors of male fertility, such as environmental and occupational factors, may also pose a simultaneous underlying threat to male fertility. Exposure to the confounding factor(s) should also be taken into consideration when planning the study design. Perhaps by maintaining an overall positive lifestyle, the burden of the multiple factors that could influence sperm quality and male fecundity, may begin to slowly improve. In that respect, awareness and recognition of the possible impact of risk factors present in daily life is crucial amongst couples seeking conception. As the influence of several of these factors governing male infertility may be reversible, therefore the couple may benefit from early counselling and clinical intervention [14].

Male infertility is a complex clinical condition, and thus far, the clinical management of men with reduced fertility and impaired spermatogenesis has been fraught with difficulties and limited advancement [15]. This has led to frustration among both clinicians and patients, perpetuating the belief that intra cytoplasmic sperm injection (ICSI) is the only solution to provide the couple with a baby without the need to explore the nature or cause of the under lying male infertility [16]. The APHRODITE criteria aim to address this gap by providing a structured approach to characterize male infertility in men seeking paternity, particularly those who may benefit from hormonal treatment [17]. Importantly, these criteria are not designed for men with established infertility diagnoses, such as varicocele, infection, or obstruction, who would not benefit from hormonal treatment [18]. Rarely, male fertility problems can't be treated, and the affected person's sperm can't be used to start a pregnancy. If this happens to you, it's still possible to have a child. You and your partner can think about using sperm from a donor or adopting a child.

However, APHRODITE criteria significantly advance the stratification and management of male infertility. The criteria provide a clear and well-de fined system, classifying patients and promoting communication among healthcare providers, researchers, and patients. Moreover, these criteria open doors to research into new pharmacological interventions and the discovery of novel causes of male infertility [19]. The findings of provide preliminary evidence that Heartfulness Meditation based integrative therapy to be a safe and viable treatment option for couples with infertility and should be investigated further [20]. The program was beneficial in the cohort who utilized it as prescribed. Therefore, future research investigating the causal relationship of Heartfulness Meditation on fertility outcomes in a randomized controlled study could solidify this treatment method to be used independently or as an adjuvant therapy for assisted reproductive technologies.

Methods -Definition of The Target Behaviour

Enhancement of infertility were, for the purpose of this study, defined as the voluntary participation of one's personal resources (time, services, or assets/goods) to charity that provides benefits to others without expectation of benefits in return. Charities are not-for-profit/charitable organizations for public benefit. Potential subjects were required to be adult or elderly caregivers of patients with dementia being evaluated by the geriatric psychiatry and memory clinics. In addition, the subjects were identified by the patient or clinical staff as the primary source of assistance and/or support, and were in contact with the dementia patient at least three days per week. The program consisted of a 10-day onsite lifestyle ordination and meditation temporary seminar/workshop and one to one discussion sessions.

Heartfulness meditation sessions Meditation sessions were delivered by certified Heartfulness meditation trainers. Trainers were experienced meditators who received specialized training to conduct the program and were certified through the Heartfulness Institute. All participants received a 40 to 45 min guided meditation per session from certified Heartfulness meditation trainers with the following instructions.

- Please sit comfortably and breathe normally. Gently close your eyes
- Now move your attention to your toes. Wiggle them a little and allow your toes to relax.
- Feel a very relaxing energy entering your feet from the ground allowing your feet to relax.
- Let this energy slowly move up, relaxing your ankles, lower legs, calf muscles, your knees, upper legs, and your hips. Feel all these parts completely relaxed.
- Allow this energy to slowly move up, relaxing your lower back and your upper back. Feel your entire back relaxed.
- Slowly move your attention to your stomach area and allow all the muscles to relax.
- Now, let the energy move up into your chest and let your chest deeply relax.
- Move your attention on to your shoulders and feel as if they are melting away.
- Let this energy slowly move into your upper arms, elbows, lower arms, hands and your fingers. Feel them completely relaxed.
- Slowly move your attention to your neck and allow your neck muscles to relax.
- Gently loosen your jaw and allow your chin and all the muscles of the face to relax. Your lips and your eyes are relaxing. Relax your forehead.
- Gently move into your mind and allow your mind to deeply and completely relax. Relax the top of your head.
- Gently scan your whole body from the top of your head to the tips of your toes and feel your entire body relaxed.
- Now gently move into your heart and settle in there. Rest your attention on the source of light that is already present within. Do this in a very gentle and natural way.
- Rather than trying to visualize this, participants were asked to simply tune in to their hearts and be open to any experience that they may have. If their mind wandered, participants were advised to gently redirect towards the heart 54 couples with infertility participated in the program with a mean age of 30.74 years (SD 5.04) for females and 34.03 years (SD 4.54) for males. 15 couples presented with male infertility, 16 couples presented with female infertility and in 5 couples both partners had infertility problems. Further, 18 couples had unexplained infertility. 24 couples conceived with 18 natural conceptions, five via assisted reproductive technology and one spontaneous abortion. Conclusion: The program was beneficial in the cohort who utilized it as prescribed resulting in conception of 24 out of 54 couples. Future research investigating the causal relationship of Heartfulness meditation on fertility outcomes in a randomized control study could solidify this treatment method to be used independently or as an adjuvant therapy with assisted reproductive technologies.

The estimated results of at least 30 million men worldwide are infertile with the highest rates in Africa and Eastern Europe. However, due to the varying credibility and older nature of many of the articles analyzed, it is quite difficult to make a definite conclusion on the nature of these infertility rates. The main message of these findings is that male infertility is a global health issue that has not been researched or studied to truly understand its magnitude and prevalence (Fig.). This information provides insight into where the greatest need is for further research into underlying etiology and treatment. The major recommendations of this manuscript are: 1. As a society, we must reduce barriers from stigmas associated with infertility due to religious and cultural beliefs. 2. We must create a globally accepted population-based calculation in order to understand the prevalence and magnitude of male infertility. 3. Much work is needed to raise awareness about male infertility. With broad and accurate understanding, we can both treat infertility by managing underlying conditions [21].

The term *male fertility* crisis dates to the 1970s [22]. Increased awareness during the 1990s expanded the scope of research to address social and biological factors. Academia and the scientific community have reached consensus in favor of the use of the term male infertility crisis, citing it as necessary to prompt preventative action to remedy the issue in the present time before it affects future generations on a greater scale. Social commentators have said that the wide-ranging consequences of male infertility necessitate the use of crisis, since widespread involuntary childlessness can be viewed as a crisis [23,24]. Research analysis has found that amongst a sample of British newspapers in the 1990s, there was a recognizable discourse about a male fertility crisis [25]. Media coverage increased during the 2010s, often coinciding with (or in response to) releases of studies and using words like "crisis", "apocalypse", "time bomb", and "threat to the human race". The mass-media coverage is controversial, since the use of such terms has led to concern that it has fostered clickbait or hysterical coverage playing on community fears.

Overcome Infertility

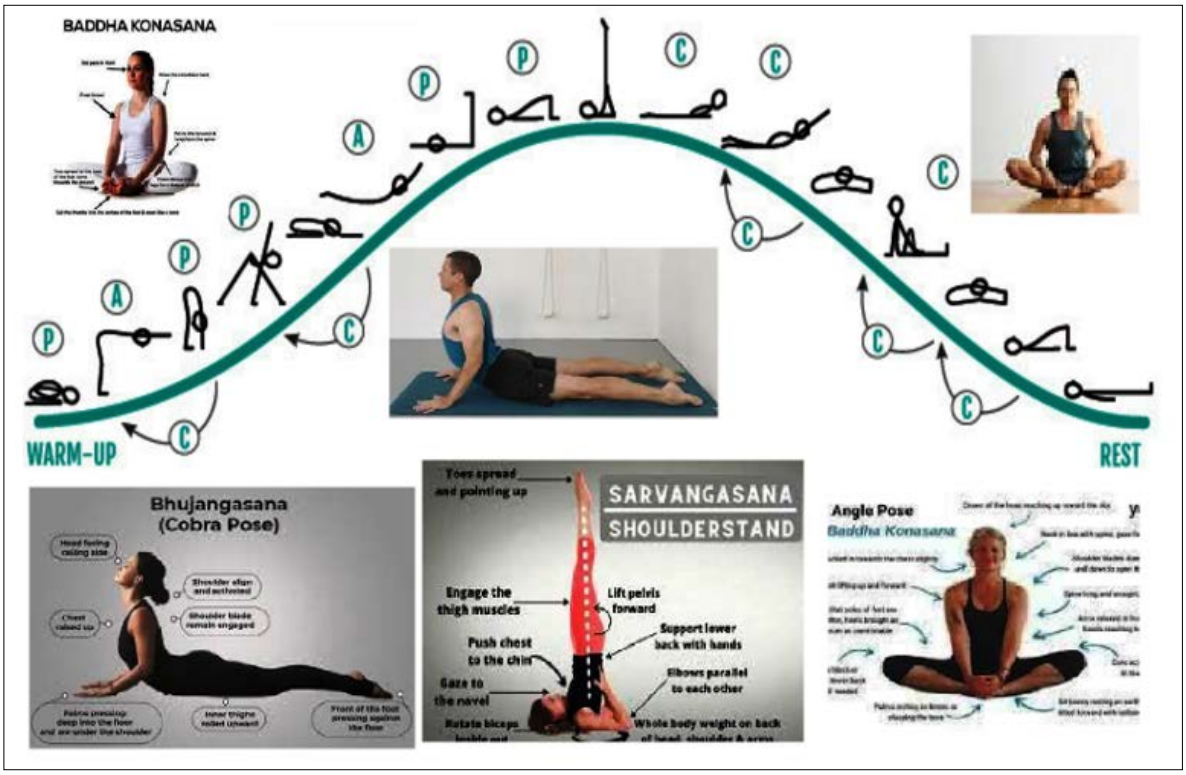
By incorporating yoga into infertility treatment plans, couples may experience not only improved reproductive health but also enhanced psychosocial well being, increasing the likelihood of successful conception and the health of future progeny. This comprehensive perspective highlights yoga as a valuable adjunct in the management of male infertility, supporting both physical and emotional healing throughout the fertility journey. Specific asanas, such as Baddha Konasana (bound angle pose), Bhujangasana (cobra pose) and Sarvangasana (shoulder stand), stimulate reproductive organs, enhance blood circulation and regulate hormone production. Pranayama techniques further support endocrine balance and overall vitality. Moreover, yoga provides a non invasive strategy for managing fertility related conditions leading to improved reproductive health and overall well being [26]. Yoga has emerged as a powerful modulator of sperm parameters, genome integrity and epigenetic factors evidenced by various studies. Studies indicate that yoga practice significantly enhances sperm concentration, motility and morphology while simultaneously reducing seminal OS and improving both mitochondrial and nuclear genome [27,28].

Baddha Konasana: (bound angle pose) also refer as butterfly pose as both legs get open for movement as butterfly. Depending on flexibility, you may not be able to sit up high enough for your spine to draw into your back. If this is the case, place your hands behind you and use your arms to help you sit up straight. Another

possible restriction you might encounter is discomfort in one or both of your knees. If this is the case, you can elevate your leg(s) by placing a folded blanket or yoga blocks under your thigh(s). You may, on the other hand, find that your legs release easily and your spine dips into your low back. If that is the case, you can practice Baddha Konasana sitting upright or you can bend forward, as always, beginning by tipping your pelvis forward [29]. Everybody reacts differently to the same pose. It depends on the individual's body about how they will react to a particular posture. So if you are among the people who aren't flexible enough or new to yoga, it becomes essential to practice the pose by using some props and modification.

Bhujangasana: (cobra pose)-Bhujangasana is often referred to as the Cobra Pose. This Yoga Asana helps tones the abdomen and strengthen the spine. One of the main benefits of Bhujangasana is that it helps to improve blood circulation. Snake pose in Yoga is considered one of the best Asanas to get a flat stomach. Bhujangasana benefits are extended to your beauty because of the stretching of the abdominal muscles [30]. Observed and advised that With Bhujangasana you can make your lower back muscles strong. It also improves metabolism [31]. Your chest raises in bhujangasana/ cobra pose which improves blood flow and has an effect on your heart. As a result, it also aids in the relief of stress and exhaustion by removing unpleasant feelings. It aids in the opening of the lung and heart, which is beneficial in preventing lung congestion

which is common throughout the COVID -19 pandemic.



Sarvangasana: is often referred to as the Shoulder Stand pose [32]. This Asana stimulates and regulates the entire body i.e. show benefits from toes to fingers. Sarvangasana is known for many important health benefits. The shoulder Stand pose is worked well for the different internal organs of the body and also smoothes the functions of these sensitive organs. Because of its significant roles in the management and preventions of diseases and disorders, the Yogasana is known as 'Mother of Asanas'. Observed and reported that Yoga and meditation can help women experiencing the challenges of infertility [33]. The practice of meditation and relaxation can help increase the clarity of the mind, maintain healthy body chemistry, and give patients the patience to undergo the rigors of infertility treatments. When one understands and can attain physical relaxation, one tends to feel better about the body itself, and begins to treat the body with more respect. This understanding can lead to heal their life style habits as well as increased sensitivity regarding symptoms and body processes. This is beneficial to both doctor and patient as the patient can report with more clarity and sense cycles and physical issues more readily.

Utilization of yoga and Yoga Nidra techniques demonstrated a notable enhancement in semen quality in male partners exhibiting abnormal seminal parameters. Although these findings are promising, further inquiry involving larger sample sizes and rigorous controlled trials is warranted to establish a definitive association between these practices and heightened male fertility. Nonetheless, the holistic and noninvasive nature of yoga and Yoga Nidra renders them attractive adjuncts to conventional therapies for male infertility [34,35].

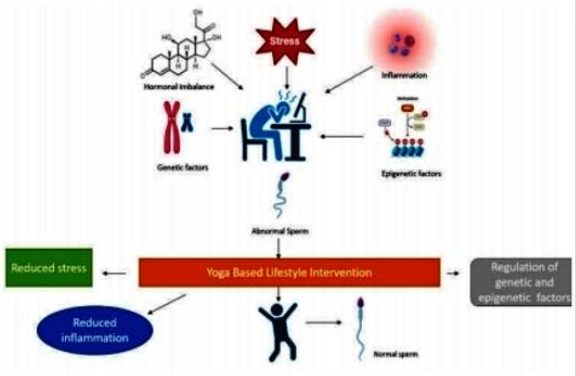


Fig Role of Yoga-Based Lifestyle Intervetion In Male Infertility

Before intervention		Normal range
Semen volume	1.3 milliliter	1.5-2.0 milliliter
Sperm count	5 millions/milliliter	15 million/milliliter or more
Vitality	48%	58% or more
Progressive motility	24%	32% or more
Morphological defects	89%	96% or less
pH	7.3	7.2-7.8
Post-intervention		
Semen volume	1.5 milliliter	1.5-2.0 milliliter
Sperm count	13 millions/milliliter	15 million/milliliter or more
Vitality	60%	58% or more
Progressive motility	38%	32% or more
Morphological defects	86%	96% or less
pH	7.2	7.2-7.8

Sperm count and motility before and after the intervention (yoga and Yoga Nidra)

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