

Effects of Yoga Interventions on Mental and Physical Health

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Abstract—The present study examined the potential therapeutic role of hatha yoga, particularly the role of 'āsana and pranayama' on health. A total of 80 men and women participants, non – 'āsana and pranayama' practitioners (n = 40; 20 male and 20 female, M age= 32. 87) (NAPP) who had not received any kind of 'āsana and pranayama' experience, and 'āsana and pranayama -participants' (n = 40; 20 male and 20 female, M age= 39) (APP) who had at least one year of experience in the practice of 'āsana' and 'pranayama' participated in the study. The findings highlight the importance and beneficial effects of practicing yoga on mental and physical health. It also has important implications for developing the self-care treatment skills across the life span for both men and women in education, clinical and organizational settings.

Keywords: Mental health, Physical health, Yoga.

1. INTRODUCTION

Yoga is an ancient practice to achieve physical, social, and psychological well-being. It has now become a part of mainstream culture, with major medical centres, community healthcare centres, and neighbourhood yoga studios offering yoga as a mind-body practice to support health and healing all around the world [16]. The phenomenon of "yoga for health" is a characteristic of more modern yoga [2] and brings balance and health to the physical, mental, emotional, and spiritual dimensions of the individual [28]. This was particularly intriguing as to why yoga is being the focus of all health practitioners. Most of the research has been quoted on Western population. Hence the present study was designed to gather empirical evidence of the psychological benefits of yoga on Indian population, particularly in Delhi, being the capital city, with an air of competitiveness and stress.

The word yoga means 'yoke' or 'unity' as translated from the classical language of India, Sanskrit [23].

Ancient yogis believed that in order for a person to be in harmony with themselves and their environment, they must integrate their body, mind and spirit. They formulated a way to achieve and maintain this balance through exercise, breathing and meditation, which form the three main yoga structures [23]. There are different forms of yoga also like 'bhakti-yoga', 'karma yoga', 'Jñāna-yoga' or 'raja-yoga', 'Hatha-Yoga', 'laya-yoga', and 'mantra-yoga' [18]. The present study focuses on 'hatha yoga' (āsana and pranayama) and understand how it influences one's psycho- physical health if it is practiced regularly in one's daily routine.

1.1 Hatha-Yoga

Hatha Yoga means a yoga or union between 'ha' and 'tha', where ha means the 'sun' and 'tha' means 'moon' or the union of the 'prana' and the 'apanavayus' [4]. The sun and moon are actually equated with the in-breathing and out-breathing. The practice of Hatha Yoga involves "pranayama" (breathing practice), 'āsana's and basic mudras [4, 19] that help the individual to achieve a balance between his/her sympathetic and parasympathetic nervous system through the regular practice of āsana and pranayama [19]. By maintaining the balance at the physical level, Hatha Yoga prepares the ground for the subtler level development. Also, the initial practice of āsana should always be practiced under the supervision of a guide, or else the wrong posture might harm the individual [16].

1.2 Āsana and Breathing

Āsana is basically a set of exercise, which involves slow stretching of the body parts without straining oneself, holding that position for a definite period and then coming back to the original posture. The basic breathing or 'pranayama', brings calmness to the individual.

Studies show low and deep breathing gives mental relaxation, improves circulation, and the focus of attention on breathing.

1.3. Health effects of yoga

A growing body of research evidence supports the belief that certain yoga techniques may improve physical and mental health through down-regulation of the hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic nervous system (SNS) [28]. Over time, the constant state of hyper vigilance resulting from repeated firing of the HPA axis and SNS can lead to dysregulation of the system and ultimately diseases such as obesity, diabetes, autoimmune disorders, depression, substance abuse, and cardiovascular disease [21]. Yoga which is used as a therapeutic intervention from the twentieth century involves physical exercises (*āsanas*) may increase patient's physical flexibility, coordination, and strength, while the breathing practices (*pranayama*) and meditation may calm and focus the mind to develop greater awareness and diminish anxiety [20], and thus result in higher quality of life [8].

1.3.1. Psychological/Mental health benefits

Studies have shown that yoga helps in improving quality of life and psychosocial outcomes by reducing symptoms of stress or generalized anxiety and depression [11,15,17], leads to better regulation of the autonomic nervous system and a decrease in depressive and anxious symptoms in a range of populations [24].

Yoga has been shown to have immediate psychological effects on increasing feelings of emotional, social, spiritual well-being [22], psychological and biological effects [29]. Significant improvements have also been seen in the overall quality of sleep in patients with cancer who were taught yoga [9]. It has been increasingly studied as a treatment or adjunctive treatment for a variety of mental health disorders. Practicing yoga regularly reduces the negative impact of stress on the immune system by increasing levels of natural killer cells [26].

1.3.2. Physical health benefits

Considerable research has also been conducted examining the effects of yoga on physical body such as physical flexibility, fitness and endurance [27]. It has been found that yoga improves individual functioning, reducing high blood pressure (hypertension), decreases heart rate and has beneficial effects on cardiovascular

diseases [10]. For asthma, the breathing component of yoga has been linked to improvements in lung function and asthma symptoms, but has not proven to be better than standard breathing exercises for those specific outcomes [12].

Clearly, in cases where yoga does not offer significant relief from physical disease, it can still offer some measure of relief from suffering. In this sense, yoga can provide a different way of looking at pain and suffering, which in itself can potentially alleviate some suffering [16].

Health, which is viewed as holistic in yogic traditions and aspects of health are clearly intertwined, the present research targets specific areas such as physical health and mental health. Reviewing the related literature gives an insight that yoga has sizable and replicable effects for many health conditions. Since most of the research involves medical, terminally, or cancer survivors that are in clinical population [8], the present study specifically focuses on healthy community members who had no or little medical problems, to see whether this is also apparent among general people without clinically diagnosed disorder. Also, most of the studies, which have examined the effects of yoga on health are inconclusive, so, the present study focused to understand how yoga works as an intervention to enhance health.

Yoga postures (*āsanas*) and breathing exercises (*pranayama*) are said to produce great changes in the body [23]. Though the earlier studies' results are so far not sufficient in quantity and quality to determine whether studies with a focus on the *āsanas* are more effective as compared to studies with meditation-focussed or *pranayama*-focussed styles [8]. Hence, the present study includes both *āsana* and *pranayama* to be more conclusive. The study intends to understand how *āsana* and *pranayama* produces qualitatively differences in one's health patterns. To explore how yoga (*āsana* and *pranayama*) mediates one's psychological, social, emotional, cognitive and physical health, which no study has so far investigated. Most studies, use a comprehensive score of GHQ, but the present study have gone further to understand psychological, social, emotional and cognitive health. The present study tries to study if *āsana* and *pranayama* is actually helping the participants in being in harmony with themselves and

the environment, using their GHQ scores to understand if yoga had any influence on psychological distress, social and emotional dysfunction and cognitive disorder.

1.4. Hypotheses

The present study was designed to examine the effect of '*āsana*' and '*pranayama*' on mental and physical aspect of health.

H1- '*Āsana* and *pranayama*' practitioners will have low levels of psychological distress than non- '*āsana* and *pranayama*' practitioners.

H2- Social and emotional dysfunctions will be low in '*āsana* and *pranayama*' practitioners than non- '*āsana* and *pranayama*' practitioners.

H3- '*Āsana* and *pranayama*' practitioners will have low levels of cognitive disorder than non- '*āsana* and *pranayama*' practitioners.

H4- '*Āsana* and *pranayama*' practitioners will have better health than non- '*āsana* and *pranayama*' practitioners.

2. METHODS

2.1. Participants

The present study has two groups: one control group (non- '*āsana*' and '*pranayama*' practitioners) and one experimental group ('*āsana*' and '*pranayama*' practitioners). Both the control group (n=40; males: 20 & females: 20) and experimental group (n=40; males: 20 & females: 20) consist of working individuals belonging to middle class socio-economic background. The '*āsana*' and '*pranayama*' participants were selected on the criteria that the participants must have at least one year experience in the practice of '*āsana*' and '*pranayama*'. The age of the participants ranged from 25 to 60 years. The total participants included 40 males and 40 females (N=80). The '*āsana*' and '*pranayama*' were selected from the Gandhi Bhawan, Delhi University, and from the two informal group, which practice basic *āsana* and *pranayama* taught by professionals in their club.

2.2 Measures

Data were obtained from the following measures:

GHQ. The General Health Questionnaire (GHQ) is a self-administered screening questionnaire, [13]. The 12-Item General Health Questionnaire [14] have 12 items concerning psychological distress, social and emotional

dysfunctioning and cognitive disorder, used to assess the severity of mental disorders as well as to measure general psychiatric well-being. The scale provides different mental states and one has to mark the severity of their mental states in regard to what they have felt in last 1 month on a four-point Likert-type scale ranging from 0 to 3. The positive items were scored from 0 (always) to 3 (never) and the negative ones from 3 (always) to 0 (never). The total score ranges from 0 to 36 and high scores indicate poor mental health.

One open-ended questionnaire on '*Āsana* and *pranayama* experience'. A short open-ended questionnaire on '*āsana* and *pranayama* experiences' was also conducted on the participants to have details of their subjective experiences. The *āsana* and *pranayama* experience questionnaire included questions on the theme as need to do *āsana* and *pranayama*, effect on mental and emotional well-being, general lifestyle and in job experience. A short demographic form. It included general account of basic demographic details of the participants.

2.3. Procedure

Approval was taken from the formal and informal organizations that give practice in '*āsana* and *pranayama*'. The working participants with age range of 25 to 60 years and middle-class socio economic background were filtered and then approached. A consent letter was given to all the participants stating the purpose of the study and asking their permission to participate willingly. The General health questionnaire [13], and two open ended questionnaire on 'anger' and '*āsana* and *pranayama*' along with the demographic form were given to all the '*āsana* and *pranayama*' participants. The same forms were given to 'non-*āsana* and *pranayama*' participants except the *āsana* and *pranayama* questionnaire to fill the response sheets. The participants were instructed to respond to the scales and questionnaires regarding how they perceive their general health, and *āsana* and *pranayama* experience (only in case of *āsana* and *pranayama* practitioners). After the forms were filled by all the participants, the response sheets were collected and arranged according to the demographic information. The scoring of GHQ-12 was done.

Statistical Analysis was performed which includes descriptive analysis, which was performed to determine

the distributional characteristics of all the variables in the study. The totals, means, standard deviation, along with the minimum and maximum scores on the GHQ, were calculated. After that, analysis of variance was conducted. A 2X2 ANOVA were done to see any interaction between the three aspects of GHQ-12, including the total score of GHQ, gender and '*āsana* and *pranayama*' practice.

Finally, the result was discussed in relation to hypothesis and related literature work done in this field and conclusions were drawn.

3. RESULT

3.1. *Āsana* and *Pranayama* and Psychological Distress

A 2X2 ANOVA was done on the psychological distress. The results on psychological distress of the APP in comparison to NAPP showed significant difference ($F(1,76) = 20.39, p < .01$). The mean scores of psychological distress ($M=10.40, SD=2.42$) of NAPP were found to be higher than that of APP's psychological distress ($M=8.30, SD=1.72$) as shown in table 1 and figure 1. Higher score indicate poor health. This shows that APP had better psychological functioning than NAPP. There were no significant gender differences also, no significant interaction between yoga practitioners and gender was found.

3.2. *Āsana* and *Pranayama* and Social and Emotional Dysfunction

A 2X2 ANOVA was done on social and emotional dysfunction. The results on social and emotional dysfunction of the APP in comparison to NAPP showed significant difference ($F(1,76) = 32.44, p < .01$). The mean scores of social and emotional dysfunction ($M=8.70, SD=1.93$) of NAPP was found to be higher than that of APP's social and emotional dysfunction ($M=6.55, SD=1.44$) as shown in table 1 and figure 2. Thus, APP had better social and emotional functioning than NAPP. No significant gender differences were seen on social and emotional dysfunction. No significant interaction between yoga practitioners and gender was found.

3.3. *Āsana* and *Pranayama* and Cognitive Disorder

A 2X2 ANOVA was done on cognitive disorder. The results on cognitive disorder of the APP in comparison to NAPP showed significant difference ($F(1,76) = 25.31, p < .01$). The mean scores of cognitive disorder ($M=5.22, SD=1.36$) of NAPP was found to be higher than that of

APP's ($M=4.10, SD=1.00$) as shown in table 2 and figure 3. This shows that APP had better cognitive functioning than NAPP. Again, no significant gender differences were seen on cognitive disorder and no significant interaction between yoga practitioners and gender was found.

Table 1: Mean (SD) of Psychological and Social and Emotional Health of APP and NAPP

YE	Gender	PD	SED
		Mean (SD)	Mean (SD)
NAPP	M	10.25 (2.90)	8.40 (2.19)
	F	10.55 (1.87)	9.00 (1.65)
	T	10.40 (2.42)	8.70 (1.93)
APP	M	7.70 (1.59)	6.10 (1.25)
	F	8.90 (1.68)	7.00 (1.52)
	T	8.30 (1.72)	6.55 (1.44)
T	M	8.98 (2.64)	7.25 (2.11)
	F	9.72 (1.95)	8.00 (1.87)
	T	9.35 (2.34)	7.62 (2.01)

YE: Yoga Experience, PD: Psychological Distress, SED: Social and Emotional Dysfunction, APP: *Āsana* and *Pranayama*, NAPP: Non-*Āsana* and *Pranayama*, T: Total, M: Males, F: Females; Higher Score indicate poor health

Table 2: Mean (SD) of Cognitive health and Total GHQ of APP and NAPP

YE	Gender	CD	GHQ
		Mean (SD)	Mean (SD)
NAPP	M	5.05 (1.39)	12.70 (5.61)
	F	5.40 (1.35)	13.95 (3.70)
	T	5.22 (1.36)	13.33 (4.73)
APP	M	3.75 (0.85)	6.55 (2.60)
	F	4.45 (1.05)	9.35 (3.39)
	T	4.10 (1.00)	7.95 (3.30)
T	M	4.40 (1.31)	9.63 (5.32)
	F	4.92 (1.28)	11.65 (4.21)
	T	4.66 (1.32)	10.64 (1.35)

YE: Yoga Experience, CD: Cognitive Disorder, GHQ: General Health Questionnaire, APP: *Āsana* and *Pranayama*, NAPP: Non-*Āsana* and *Pranayama*, T: Total, M: Males, F: Females; Higher Score indicate poor health

Table 3: F values for Factor (A) APP and NAPP, Factor (B) Gender and (AB) interaction effects on various measures

Measures	A	B	AB
PD	20.39**	2.60	0.94
SED	32.43**	11.25	0.45
CD	18.07**	3.93	0.44
GHQ	36.39**	5.16*	0.76

PD: Psychological Distress, SED: Social and Emotional Dysfunction, CD: Cognitive Disorder, GHQ: General Health Questionnaire; ** $p < .01$; * $p < .05$

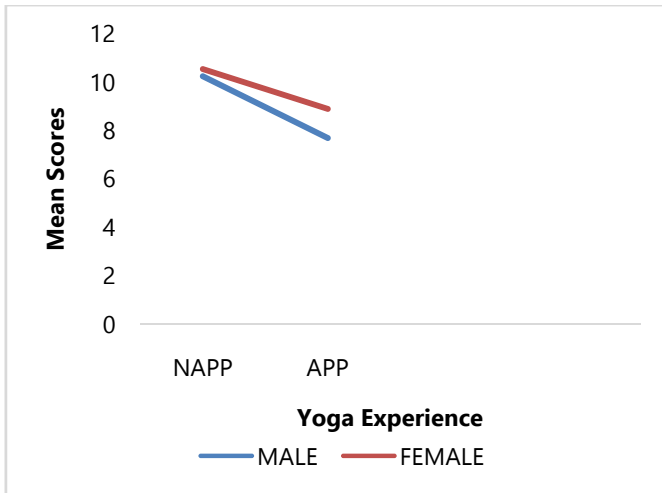


Figure 1: Mean scores of APP and NAPP on Psychological Distress

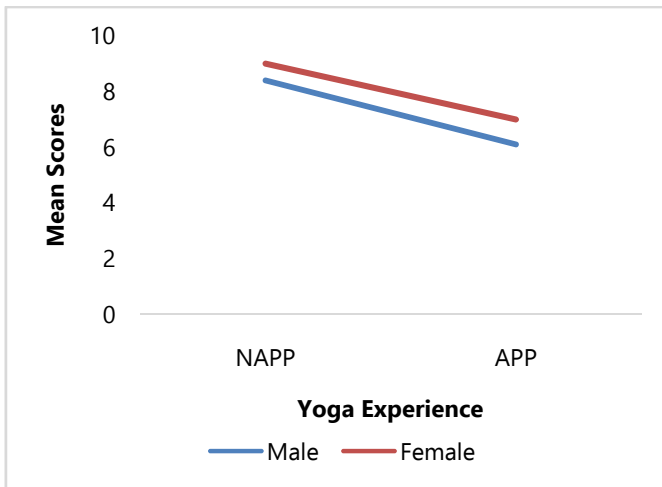


Figure 2: Mean scores of APP and NAPP on Social and Emotional Dysfunction

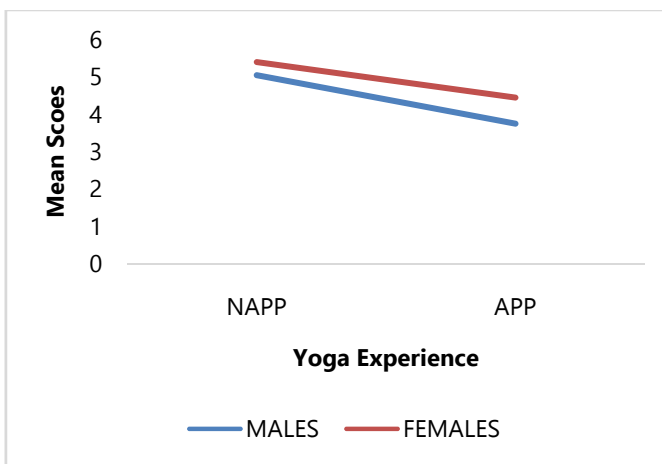


Figure 3: Mean scores of APP and NAPP on Cognitive Disorder

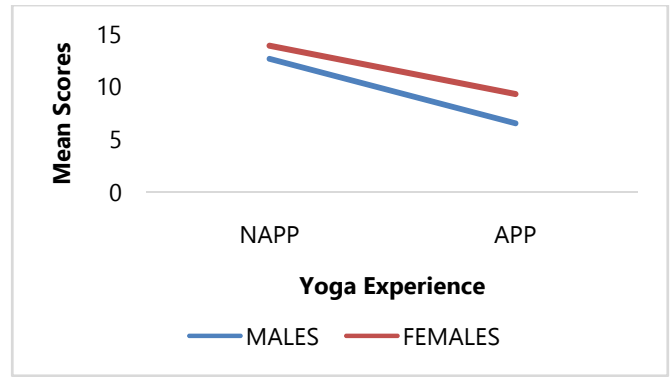


Figure 4: Mean scores of APP and NAPP on Total GHQ

3.4. *Āsana* and *Pranayama* and GHQ

A 2X2 ANOVA was done on GHQ. The results on general health of the APP in comparison to NAPP showed significant difference ($F(1,76) = 36.39, p < .01$). The NAPP had a significantly higher health score ($M=13.33, SD=4.736$) in comparison to APP ($M=7.95, SD=3.305$). These can also be seen in table 2 and figure 4. Hence, *āsana* and *pranayama* was beneficial in increasing health. Here, there existed significant gender differences i. e., women had poorer health than men ($F(1, 76) = 5.16, p < .05$). The GHQ mean score of females ($M=11.65, SD=4.210$) was found to be higher than males ($M=9.63, SD=5.324$). No significant interaction between yoga practitioners and gender was found.

4. DISCUSSION

The present study demonstrates that the practice of *āsana* and *pranayama* had beneficial effects on reducing Psychological Distress, and Social and Emotional Dysfunction as well as Cognitive Disorder and enhancing health. Results pertaining to hypotheses 1 to 3 showed that '*āsana* and *pranayama*' significantly reduces psychological distress, social and emotional dysfunction, and cognitive disorder in the APP than NAPP. The subjective responses of the participants in the open ended questionnaire related to '*āsana* and *pranayama*' experience, positively correlate with the results. For instance, participants shared the feeling of psychological well-being as feeling good from inside, energetic, and determined to solve problems. They experienced improved concentration, control over negative emotions such as anger, anxiety etc. and reduction in stress as an improved social and emotional functioning. Their experiences reported improvement in cognitive functioning due to *āsana* and *pranayama* practice as reduced negative thoughts, increased will power, and

feeling determined for the most of time. Also, in regard to the fourth hypothesis, the subjective responses of APP include improvement in physical health apart from psychological, social, emotional and cognitive health. They expressed an overall fitness in their health and relief from the suffering caused by illnesses such as cervical pain, head ache, back pain, joint pain, high and low blood pressure etc.

These results are consistent with the past researches which signifies the role of yoga in general in reducing symptoms of depression [25]; improvement in social and emotional functioning [22] such as stress [8, 7]; in enhancing relaxation [8], reducing anxiety [5, 6] and in improving quality of sleep especially in patients with cancer who were taught yoga [9] and in reducing varieties of health problems [5, 6, 10, 28, 29] such as fitness, physical flexibility, and endurance [27], but these studies vary in size, quality and methodology [17].

Also, men and women differ significantly in all aspect of their general health as shown in table 3. This is due the difference in approach to do *āsana* and *pranayama* by both genders. Most of female participants talked about the need to do yoga because of the health problems they were facing like joint pain, increased weight, stress, bell palsy, slip disk problem and cervical pain whereas the males issues were related to allergies, sensitivity to cold, stress, job requirements and in the cases where there were no such issues, the males expressed their desire to stay fit and healthy despite of any medical problem. Research suggests that women report higher levels of depression, psychiatric disorders, distress, and a variety of chronic illnesses than men [1, 3].

5. CONCLUSION

Overall, the study shows that practicing *āsana* and *pranayama* produces significant improvement in the psychological, social, emotional, cognitive and physical functioning in both men and women. The beneficial effects of '*āsana* and *pranayama*' intervention are evident on health. Future studies can be done taking a life-span perspective.

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