

Effect of selected yogic asana on body mass index

Anjumanara Khatun

Assistant Teacher, Islamgonj Jr. High Madrasah, Unit-II, Nadia, West Bengal, India

Abstract

Background: It is already established that multiple intervention of yogic technique may improve physical fitness. But there was no such randomized control trial on the effect of yogic asana alone and its impact on Body Mass Index.

Aim: The aim of this study was to determine the effect of regular practice of yogic asana on Body Mass Index.

Materials and Methods: Total 48 residential male students (12 ± 1 years) were participated in this study. It was randomized into two equal groups as yoga group ($n=24$) and waitlist control group ($n=24$). Yoga group was regularly practiced only yogic asana for 1 to 1.5 hour per day, 6 days per week, for 12 weeks with a progressive training load method. The body mass index was assessed by measuring standing height and body weight. In the present study all the measurements were done at the baseline (before onset of training) after 6 and 12 weeks of asana practices. A repeated measure of ANOVA was used for analyzing the data. Simple percentage also calculated from the mean value to see the quantitative changes of the asana training.

Results: After 12 weeks, yoga group showed a significant improvement in body mass index (7.01%) which may be due to increase in body weight.

Conclusion: Yogic asana alone may elicit a positive improvement in the body mass index.

Keywords: yogic asana, body mass index

Introduction

Evidence already established that multiple intervention of yoga can improved physical fitness components such as speed, [1, 2, 3] agility [4, 5], coordination [6, 7, 8], balance [9, 10], power and reaction time [11, 12]. But there is no such randomized control trail on effect of only yogic posture on body mass index. With this background, the aim of the present study was to determine whether the regular practice of yogic postures alone can improve body mass index.

Materials and Methods

Subjects

Inclusion criteria: 11 to 13 years male generally healthy similar socio-economic background oriented and not specially acquainted with any yoga training residential students were included for this study.

Exclusion criteria: Chronic ailments and major injury were excluding criteria.

Ethical consideration: In this study the researcher took

1. Institutional permission (Visva-Bharati University) for this noninvasive experimental research.
2. Collected signed informed consent from the Headmaster and Hostel Super of Daronda Chandimata Vidyalaya before pilot final and study.

Design of the study

An experimental study was done for 12 weeks on randomly selected residential male school students. Before going to take the final experiment the researcher did a pilot study with the same age group in the same school but with the other students these who are not participating in the final experiment. There were two group namely yogic asana group (experimental) and waitlist control group in the final study. In the time of experiment the control group was maintained normal life and

observed all the practice of yoga asana group in the practice time.

Methods

- **Sampling:** Forty eight residential 11 to 13 years (mean = 12 ± 1 years) age male students of Daronda Chandrimata Vidyalaya, Bolpur, West Bengal, India were participated in this study.
- **Randomization:** 48 participants were randomized through www.randomizer.com into two groups (yoga group and waitlist control group).
- **Design:** All the measurements of yoga group ($n = 24$) and waitlist control group ($n = 24$) were taken at the baseline, after 6 weeks and after completion of 12 weeks yogic asana practice.
- **Procedure:** Body Mass Index is derived mathematically by using the following formula. (Kansal, 1996)

Body Mass Index

$$= (\text{Standing height in Mt.})^2 / \text{Body weight in Kg.}$$

- **Practice protocol:** The yoga asana group had an hour practice of suryanamaskar and 16 yogic asana (posture) in the initial day but it was increased to 1.5 hour gradually by increasing repetition and duration of the yogic asanas in a progressive load training method. They underwent 6 days per week practice for total 12 weeks in the common room of the school hostel. The waitlist control group was maintained normal life and observed all the practice of yoga asana group in the practice time. In the end of the study 6 students from waitlist control group and 4 students from the yoga group were dropped out. The yogic posture training was given by an instructor who was a disciple of Yogachariya B.K.S. Iyanger and two yoga assistants were

with him. Suryanamaskar, Uttita padmasana, salvasana, utkatasana, baisistasana, janusirasana, ardha chakrasana, dandasana, dhanurasana, padahastana, mayurasana, ardha masyendrasana, birvadrana, bagrasana, natarajasana, and solvasana were practiced with maintaining a order and time elapsed.

- **Assessment criteria:** For body mass index detection standing height was measured by Rod Campus and body weight was measured by weighting machine.
- **Statistical analysis:** Repeated measures analyses of variance (ANOVA) were used for analyzing data with one between subjects' factor and other within subjects factors were used for analyzing all the data. Also t-test was used. The level of significance was set at .05 levels.

Results

There was no significant difference in the base level data between yoga asana group and wait list control group. Yoga group showed a significant improvement after 12 weeks yogic posture body mass index. (Table-2)

Discussion

In the present study body weight was measured three times (pre, mid and post test) in the experimental (YSG) and control (WCG) group. It was observed that after 6 weeks of yogasana practice the body weight was increased by 31.1% and after 12 weeks it was increased by 5.16% and the improvement was statistically significant (fig. no.1 and table no. 1).

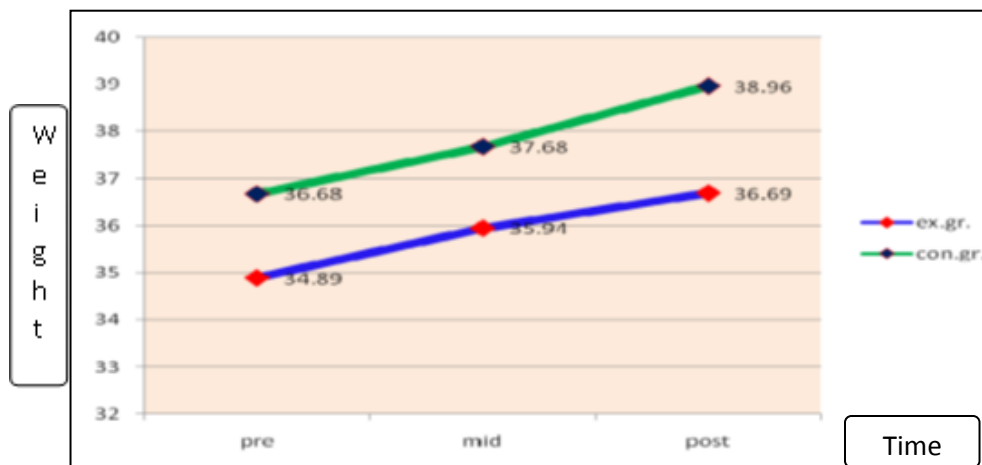


Fig 1: Body Weight

Table 1: Body weight

Group	Pre test mean and S.D. in Kg.	Mid test mean and S.D. in Kg.	Post test mean and S.D. in Kg.
Ex.Gr.(YSG)	34.89 + 10.14	35.94* + 10.14	36.69** + 10.14
Con.Gr.(WCG)	36.68 + 10.14	37.68* + 10.14	38.96*** + 10.14

The increase of body weight may be attributed to the decrease of body fat and increase of body mass. The data about this matter was incorporated in the health related physical fitness area of this work. Very similar result was found by the other researchers (Kristal, 2005, and Chen, 2009) [16]. The body mass index was calculated from the body weight and height. It was observed that the BMI was improved significantly (P<0.001). The BMI was increased by 3.31% after 6 weeks and 7.08% after 12 weeks, whereas there were very slight changes in the control group in the time of experiment (Figure no. 2 and Table no. 2).



Fig 2: Body mass index

Table 2: Body Mass Index

Group	Pre-test mean and S.D. in Kg.	Mid test mean and S.D. in Kg.	Post-test mean and S.D. in Kg.
Ex.Gr.(YSG)			
Con.Gr.(WCG)			

BMI is the calculation of height and body weight ratio. In this study the standing height of the subject was not changed but the body weight was increased significantly that may influence the improvement of BMI in this study. Chen *et al.* (2009) [16] reported that BMI improved after yogic training, whereas Siasankaran *et al.* (2006), McIver *et al.* (2009),

Kosuri *et al.* (2009), Telles *et al.* (2010) observed the decreased of BMI. Also, some other group Carei *et al.* (2010) reported no change in BMI after the practice of yoga. From the above discussion it may found that there are three types of report increase, decrease and no change of BMI after yogic practice. But in this study only yogasana is the intervention

improved body mass. The age group of the study was 11 to 13 years. This age is a growing age. The yogasana activity may improve anabolism of the various cells of the body which may improve cell volume.

Conclusion

From the present study, it may be concluded that yogic asana alone bring a positive improvement in the body mass index.

Reference

- Ades PA, Savage PD, Brochu M, Tischler MD, Lee NM, Pochlman ET *et al.* Resistance training increases total daily energy expenditure in disabled older women with coronary heart disease. *J Appl Physiol.* 2004; 98: 1280-1285.
- Balasubramanian B, Pansare MS. Effect of yoga on aerobic and anaerobic power of muscles. *Indian J Physiol Pharmacol.* 1991; 35(4):281-2.
- Bastille JV, Gill-Body KM. A yoga-based exercise program for people with chronic poststroke hemiparesis. *Phys Ther.* 2004; 84(1):33-48.
- Benavides S, Caballero J. Ashtanga yoga for children and adolescents for weight management and psychological well being: an uncontrolled open pilot study. *Complement Ther Clin Pract.* 2009; 15(2):110-4.
- Bera TK, Rajapurkar MV. Body composition, cardiovascular endurance and anaerobic power of yogic practitioner. *Indian J Physiol Pharmacol.* 1993; 37(3):225-8.
- Berger DL, Silver EJ, Stein RE. Effects of yoga on inner-city children's well-being: a pilot study. *Altern Ther Health Med.* 2009; 15(5):36-4
- Bharshankar JR, Bharshankar RN, Deshpande VN, Kaore SB, Gosavi GB. Effect of yoga on cardiovascular system in subjects above 40 years. *Indian J Physiol Pharmacol.* 2003; 47(2):202-6.
- Bhavanani AB, Madanmohan, Udupa K. Acute effect of much Bhastrika (A yogic bellours type breathing) on reaction time. *Indian J Physiol Pharmacol.* 2003; 47(3): 297-300.
- Bhutkar PM, Bhutkar MV, Taware GB, Doijad V, Doddamani BR. Effect of Suryanamaskar Practice on Cardio-respiratory Fitness Parameters: A Pilot Study. *Al Ameen J Med Sci.* 2008; 1(2):126-129.
- Borker AS, Pednekar JR. Effect of pranayam an visual and auditory reaction time. *Indian J Physisol Pharmacol.* 2003; 47(1):229-230.
- Bosch PR, Traustadóttir T, Howard P, Matt KS. Functional and physiological effects of yoga in women with rheumatoid arthritis: a pilot study. *Altern Ther Health Med.* 2009; 15(4):24-31.
- Carei TR, Fyfe-Johnson AL, Breuner CC, Brown MA. Randomized controlled clinical trial of yoga in the treatment of eating disorders. *J Adolesc Health.* 2010; 46(4):346-51.
- Chaya MS, Kurpad AV, Nagendra HR, Nagavathna R. The effect of long term combined yoga practice on the basal metabolic rate of healthy adults. *BMC Complementary and Alternative Medicine.* 2006; 6:28.
- Chen KM, Chen MH, Hong SM, Chao HC, Lin HS, Li CH. Physical fitness of older adults in senior activity centres after 24-week silver yoga exercises. *J Clin Nurs.* 2008; 17(19):2634-46.
- Chen KM, Fan JT, Wang HH, Wu SJ, Li CH, Lin HS. Silver yoga exercises improved physical fitness of transitional frail elders. *Nurs Res.* 2010; 59(5):364-70.
- Chen TL, Mao HC, Lai CH, Li CY, Kuo CH. The effect of yoga exercise intervention on health related physical fitness in school-age asthmatic children. *Hu Li Za Zhi.* 2009; 56(2):42-52.
- Cowen VS. Functional fitness improvements after a worksite-based yoga initiative. *J Bodyw Mov Ther.* 2010; 14(1):50-4.
- Dash M, Telles S. Improvement in hand grip strength in normal volunteers and rheumatoid arthritis patients following yoga training. *Indian J Physiol Pharmacol.* 2001; 45(3):355-60.
- Dash M, Telles S. Yoga training and motor speed based on a finger tapping task. *Indian J Physiol Pharmacol.* 1999; 43(4):458-62.
- de Godoy DV, Bringhenti RL, Severa A, de Gasperi R, Poli LV. Yoga versus aerobic activity: effects on spirometry results and maximal inspiratory pressure. *J Bras Pneumol.* 2006; 32(2):130-5.
- Dhume RR, Dhume RA. A comparative study of the driving effects of dextroamphetamine and yogic meditation on muscle control for the performance of balance on balance board. *Indian J Physiol Pharmacol.* 1991; 35(3):191-4.
- DiBenedetto M, Innes KE, Taylor AG, Rodeheaver PF, Boxer JA, Wright HJ, Kerrigan DC. *Et al.* Effect of a gentle Iyengar yoga program on gait in the elderly: an exploratory study. *Arch Phys Med Rehabil.* 2005; 86(9):1830-7.
- Dvivedi J, Dvivedi S, Mahajan KK, Mittal S, Singhal A. Effect of '61-points relaxation technique' on stress parameters in premenstrual syndrome. *Indian J Physiol Pharmacol.* 2008; 52(1):69-76.
- Elavsky S, McAuley E. Personality, Menopausal Symptoms, and Physical Activity Outcomes in Middle-Aged Women. *Pers Individ Dif.* 2009; 46(2):123-128.
- Flegal KE, Kishiyama S, Zajdel D, Haos M, Oken BS. Adherence to yoga and exercise interventions in a 6-month clinical trail. *BMC Complementary and Alternative Medicine.* 2007; 7:37.
- Galantino ML, Bzdewka TM, Eissler-Russo JL, Holbrook ML, Mogck EP, Geigle P, *et al.* The impact of modified Hatha yoga on chronic low back pain: a pilot study. *Altern Ther Health Med.* 2004; 10(2):56-9.
- Greendale GA, McDivit A, Carpenter A, Seeger L, Huang MH. Yoga for women with hyperkyphosis: Results of a Pilot Study. *American journal of Public Health.* 2002; 92(10).
- Hagins M, Moore W, Rundle A. Does practicing hatha yoga satisfy recommendations for intensity of physical activity which improves and maintains health and cardiovascular fitness? *BMC Complementary and alternative Medicine.* 2007; 7:40.
- Hart CE, Tracy BL. Yoga as steadiness training: effects on motor variability in young adults. *J Strength Cond Res.* 2008; 22(5):1659-69.
- Hill K, Smith R, Fearn M, Rydberg M, Oliphant R. Physical and psychological outcomes of a supported

- physical activity program for older carers. *J Aging Phys Act.* 2007; 15(3):257-71.
31. Tran MD, Holly RG, Lashbrook J, Amsterdam EA. Effects of Hatha Yoga Practice on the Health-Related Aspects of Physical Fitness. *Prev Cardiol.* 2001; 4(4):165-170.
 32. Tuzun S, Aktas I, Akarirmak U, Sipahi S, Tuzun F. Yoga might be an alternative training for the quality of life and balance in postmenopausal osteoporosis. *Eur j phys rehabil med.* 2010; 46:69-72.
 33. Ulger O, Yağlı NV. Effects of yoga on balance and gait properties in women with musculoskeletal problems: A pilot study. *Complement Ther Clin Pract.* 2011; 17(1):13-5.
 34. Vani PR, Nagarathna R, Nagendra HR, Telles S. Progressive increase in critical flicker fusion frequency following yoga training. *Indian J Physiol Pharmacol.* 1997; 41(1):71-74.
 35. Vempati RP, Telles S. Yoga based guided relaxation reduces sympathetic activity Judged from baseline levels, *Psychol Rep.* 2002; 90(2):487-94.
 36. Vijayalakshmi P, Madanmohan, Bhavanani AB, Patil A, Babu K. Modulation of stress induced by isometric handgrip test in hypertensive patients following yogic relaxation training. *Indian J Physiol Pharmacol.* 2004; 48(1):59-64.
 37. Yadav RK, Das S. Effect of yogic practice on pulmonary functions in young females. *Indian J Physiol Pharmacol.* 2001; 45(4):493-6.