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The Effect of Yoga Exercises on Body Composition and Quality of Life in Sedentary Women

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Abstract

The aim of this study is to investigate the effects of yoga exercises on body composition, flexibility, and quality of life in sedentary women. In line with this aim, the one-group pretest-posttest research design was used in the study. A total of 33 sedentary women who are between the ages of 20-47, live in Gaziantep, and started doing sports as of the beginning of pandemic restrictions voluntarily participated in our study. SF-36 Quality of Life questionnaire and body measurements were used as data collection tools. A program of yoga exercises was applied to participants three times a week for 10 weeks. At the end of the study, a statistical difference in favor of the posttest was determined between the mean values of the pretest and posttest in the quality of life questionnaire ($p<0.05$). Similarly, statistically significant differences were obtained between the pre-measurements and post-measurements upon comparing the body composition measurements ($p<0.05$). As a result, it can be expressed that yoga exercises have a positive effect on life satisfaction and enable attaining positive results regarding body composition in sedentary women.

Keywords: Yoga, Sedentary Women, Quality of Life, Body Composition

Introduction

Yoga is an ancient discipline designed to bring balance and health to the physical, mental, emotional and spiritual dimensions of the individual. Yoga is often depicted as a metaphor of a tree and consists of eight aspects or "limbs": yama (universal ethics), niyama (individual ethics), asana (physical postures), pranayama (breath control), pratyahara (control of the senses), dharana (concentration), dyana (meditation), and samadhi (happiness). As a popular practice for a long time in India, yoga has become increasingly common in Western society. In a national, population-based telephone survey (n = 2055), 3.8% of respondents reported that they practiced

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yoga in the previous year and cited wellness (64%) and specific health conditions (48%) as motivations to do yoga (Iyengar, 1976; Saper et al., 2004). Yoga significantly reduces heart rate and systolic and diastolic blood pressure (Damodaran et al. 2002; McCaffrey et al. 2005).

Several literature reviews have been conducted examining the effect of yoga on certain health conditions such as cardiovascular disease (Raub, 2002), metabolic syndromes (Innes, Bourguignon, Taylor, 2005), diabetes (Upadhyay, Balkrishna, Upadhyay, 2008), cancer (Bower et al., 2005) and anxiety (Kirkwood et al., 2005). Galantino et al. published a systematic review of the effects of yoga on children. These reviews have contributed to numerous research results confirming the positive health benefits of yoga. Most studies have compared yoga to other treatment modalities, most commonly exercise, meditation, and traditional medicine. However, little has been written about what distinguishes yoga from other forms of treatment (Galantino et al., 2004).

In order for a person to continue his life, he must be able to do the exercises he needs to do in daily work. While movement is defined as a behavior or attitude that has a major role in human life, mobility is needed to ensure continuity of life, social relations and development (Tran et al., 2001). Mobility, which is the physical need of life; includes health, vitality, energy and many life activities (Godfrey et al., 2008).

People with a good standard of living are constantly trying to create a balance in order to maintain their current situation. Dundar states that the maintenance of this balance is achieved by the functioning of most systems in our body, especially the nervous and endocrine systems, and that these systems arise from the effort of establishing a balance in order to meet the structural and functional needs of our body in sports during any activity, movement or training (Dündar, 2017).

One of the indicators that increase the standard of living and satisfaction is body composition. Body composition can be shown between both objective and subjective indicators because people with proper body analysis will gain self-confidence, thus it can be said that their living standards are affected. Some studies have revealed a statistically significant relationship between body analysis, physical activity, and standard of living (Lasaite, Krasauskiene, 2009; Alexa et al., 2022).

The aim of this study is to reveal how yoga exercises affect the quality of life and body composition in women who do not do sports, and to make exercise

recommendations for maintaining a healthy life in the light of the findings. It is thought that these recommendations will benefit both individuals and life coaches.

Method

In this study, the effect of yoga exercises on quality of life and body composition in sedentary women was investigated. The experimental research design suitable for the purpose of the study was chosen, but since there was no control group, a single group pretest-posttest experimental design was used. In this research design, the effect of the application is tested with a study on a single group; There is no randomness and no matching. In other words, the independent variable is applied as in other experimental designs, but in this design it is applied to a single group. However, measurements are made both before and after the study (Büyüköztürk et al., 2013).

33 women who volunteered among the sedentary individuals who started to do sports since the end of the pandemic bans were included in the yoga practice. The age range of the participants ranged from 20 to 47. The purpose of the application was explained to the participants and they were asked to sign the Informed Consent Form stating that they participated in the study voluntarily.

In accordance with the purpose of the study, the Quality of Life (Short Form 36) Form developed by Ware and Sherbourne (Ware and Sherbourne, 1992) and adapted into Turkish by Koçyiğit was used to obtain data on the quality of life of the participants (Koçyiğit et al., 1999). The reliability coefficient of the data collection tool used in the study was analyzed with the Cronbach Alpha test. The formula required to calculate the sub-dimensions of the Quality of Life (SF36) Form is as follows (Demiral et al., 2006).

Table 1. Formula to find the values of the sub-parameters

SF36 subparameter	Calculation formula
Physical Function	(3+4+5+6+7+8+9+10+11+12) / 10
Physical Role Difficulty	(13+14+15+16) / 4
Emotional Role Difficulty	(17+18+19) / 3
Energy	(23+27+29+31) / 4
Mental Health	(24+25+26+28+30) / 5
Social Functionality	(20+32) / 2
Pain	(21+ 22) / 2
General Health	(1+33+34+35+36) / 5

Training Protocol

A 10-week yoga practice program was prepared for this study, which we conducted to examine the effects of yoga exercises on body composition and quality of life in sedentary women. This prepared yoga program was applied to the volunteer participants 3 days a week at one-day intervals. Participants were given information about how to eat, but no special nutrition program was given.

A yoga program consisting of 20 movements was given to the participants and 5-15 minutes of routine warm-up, breathing, stretching and stretching movements were performed before each training. In the training program, 10 movements, which are the basis of yoga, were performed in the first four weeks; In the next six weeks, mid-level practice exercises were performed. The training was done three days a week with one-day intervals.

Statistical Analysis

The descriptive statistics of the data sets obtained as a result of the study are given with mean, standard deviation for numerical data, and frequency and percentage analysis for categorical variables. Paired t-test was used in the pretest/posttest comparison of the obtained variables. Analyzes were carried out with the help of SPSS 22.0 program. $p<0.05$ Significance level was chosen.

Results

Table 2. Demographic characteristics of the participants

Variables		N (%)
Age	20-25	5 (15,15)
	26-30	10 (30,3)
	31-35	7 (21,21)
	26-40	8 (24,24)
	41 and above	3 (9,09)
Sports history (Mean±Standard Deviation (min-max))		4,27 ± 1,75 (2-6)

15.15% (n=5) of the participants were in the 20-25 age range, 30.3% (n=10) were in the 26-30 age range, 21.21% (n=7) were 31-35 age range, 24.24% (n=8) are in the 26-40 age range and 9.09% are 41 and over. In addition, the average of the participants' sports history was determined as 4.27±1.75 (Table 2).

Table 3. Pretest-posttest comparison of participants' body parameters

Variables	Pre-test (Mean±Standard Deviation)	Post-test (Mean±Standard Deviation)	p
Weight	63,15 ± 10,58	61,47 ± 9,91	0,001*
BMI	22,98 ± 3,3	22,36 ± 3,11	0,001*
Fat rate	27,45 ± 6,61	25,93 ± 6,64	0,001*
Fat mass	17,85 ± 6,73	16,43 ± 6,37	0,001*
Lean mass	45,27 ± 5,08	45,03 ± 4,73	0,281
Waist	76,33 ± 10,52	74,42 ± 10,43	0,001*
Belly	81,42 ± 11	79,3 ± 10,6	0,001*
Hip	100,27 ± 8,39	98,21 ± 7,76	0,001*
Basin	100,61 ± 9,32	98,79 ± 8,86	0,001*
Leg	57,97 ± 7,21	56,7 ± 6,83	0,001*
Arm	28,03 ± 3,11	27,58 ± 2,57	0,017*

*p<0.05; Paired t test

When Table 3 is examined, the comparison of the pre-test and post-test body parameters of the participants is given. Accordingly, a statistically significant difference was determined between pretest and posttest values of weight, BMI, fat rate, fat mass, waist, belly, hip, basin, leg and arm measurements (p<0.05). Participants' weight, BMI, fat rate, fat mass, waist, belly, hip, basin, leg and arm measurements decreased after the applied training program. On the other hand, no statistically significant difference was found in the comparison of the pre-test and post-test in the lean mass of the participants (p>0.05).

Table 4. Pretest-posttest comparison of participants' quality of life scale scores

Variables	Pre-test (Mean±Standard Deviation)	Post-test (Mean±Standard Deviation)	p
Physical Function	77,27 ± 16,91	94,09 ± 11,76	0,001*
Physical Role Difficulty	82,58 ± 21,18	96,21 ± 11,04	0,001*
Emotional Role Difficulty	80,81 ± 34,39	87,88 ± 29,84	0,228
Energy	64,85 ± 13,89	75,3 ± 15,51	0,001*
Mental Health	71,03 ± 12,08	73,94 ± 12,09	0,015*
Social Functionality	75,38 ± 14,14	78,41 ± 16,32	0,211
Pain	80,83 ± 13,25	89,85 ± 12,05	0,001*
General Health	66,52 ± 14,71	77,88 ± 15,71	0,001*
SF36 Total	74,91 ± 9,1	84,2 ± 10,61	0,001*

*p<0.05; Paired t test

The pretest/posttest comparison of the participants' scores on the sub-dimensions of the quality of life scale is given in Table 3. Accordingly, the physical function, physical role difficulty, energy, mental health, pain, general health and SF36 total score averages of the participants showed a statistically significant difference in the pre-test post-test comparison (p<0.05). Participants' post-test physical function, physical role difficulty, energy, mental health, pain, general health and SF36 total score averages increased compared to pre-test mean scores. On the other hand, no

statistically significant difference was found in the pretest/posttest comparison in the emotional role difficulty and social functionality scores of the participants (p>0.05).

Discussion

Considering the analysis of the data obtained from the Quality of Life (SF36) Form after the 10-week program applied in the study, the mean scores of physical function, physical role difficulty, energy, mental health, pain, general health and SF36 show statistically significant differences in the comparison of the pretest and posttest (p). <0.05). Participants' post-test physical function, physical role difficulty, energy, mental health, pain, general health and SF36 total score averages increased compared to pre-test mean scores. On the other hand, no statistically significant difference was found in the pretest/posttest comparison in the emotional role difficulty and social functionality scores of the participants (p>0.05).

According to the comparison of the pretest posttest body parameters of the participants, a statistically significant difference was determined between the pretest posttest values of weight, BMI, fat rate, fat mass, waist, belly, hip, basin, leg and arm measurements (p<0.05). Participants' weight, BMI, fat rate, fat mass, waist, belly, hip, basin, leg and arm measurements decreased after the applied yoga exercise program. On the other hand, no statistically significant difference was found in the comparison of the pre-test and post-test in the lean mass of the participants (p>0.05).

In the review of Ross et al. about the health benefits of yoga, the most common intervention used as a comparison is exercise. Twelve studies were found in this study comparing the effects of yoga and exercise, of which nine focused on adults and three on the elderly. Excluding studies with no gender information or involving only one gender (menopausal subjects), 597 (68.4%) of the 873 subjects included in the 12 studies were female (Ross and Thomas, 2010). Most of the studies involved some form of aerobic exercise: walking, running, dancing or riding a stationary bike, as well as some form of stretching (West et al., 2004; Hagins et al., 2007; Sinha et al., 2007). Two studies compared yoga with light, non-aerobic exercises and stretching (Chattha et al., 2008; Yurtkuran, Alp, Yurtkuran, Dilek, 2007).

Yoga appears to be equal to or superior to exercise in relieving certain symptoms associated with diabetes, multiple sclerosis, menopause, kidney disease, and schizophrenia (Ross and Thomas, 2010).

Gordon et al. compared the effects of 6 months of weekly classes and home yoga practice with aerobic exercise and stretching. Compared with baseline measures and a control group, both yoga and exercise resulted in significant decreases in fasting blood glucose at 3 and 6 months (29.48% and 27.43%, respectively, $p < 0.0001$). Both the exercise and yoga groups exhibited improvements in total serum cholesterol ($p < 0.0001$) and very low-density lipoprotein ($p=0.036$) compared with controls. Malondialdehyde, an indicator of oxidative stress, decreased significantly in the yoga and exercise groups (19.9% and 18.1%, respectively, $p<0.0001$) for both, and superoxide dismutase, a measure of oxidative status, increased by 24.08% in the yoga group and 20.18% in the exercise group ($p < 0.05$) for both (Gordon et al., 2008).

Yoga is effective in the prevention and management of stress and stress-related disorders (Davendra, 2014). Yoga has been shown to be effective in relieving symptoms of mental illness, including depression (Shapiro et al., 2007; Krishnamurthy and Telles, 2007; Woolery, Myers, Sternlieb, Zeltzer, 2004), anxiety (Smith et al., 2007), obsessive-compulsive disorder (Shannahoff-Khalsa et al., 1999) and schizophrenia (Duraiswamy et al., 2007). Duriswamy et al. compared the effects of 4 months of daily yoga asana and pranayama exercise on psychosis symptoms in 61 schizophrenic patients receiving antipsychotic treatment. Exercise intervention included walking, running, sitting and standing, and relaxation (activities very similar to yoga). Both the yoga and exercise groups showed significant reductions in psychotic symptoms, but the yoga group showed significantly better improvement ($F = 5.0$, $p = 0.03$). The yoga group scored significantly better than the exercise group on social and occupational functioning ($F=7.98$, $p<0.01$) and psychological, social, and environmental subscales of quality of life as measured on the World Health Organization Quality of Life BREF form (all $p < 0.01$), (Duraiswamy et al., 2007).

Other studies using exercise interventions that closely simulate yoga actions have found clear differences between yoga and exercise. Yurtkuran et al. conducted a single-blind, randomized study comparing the effects of mild range-of-motion exercises and yoga on hemodialysis-related symptoms in 37 renal failure patients. After twice-weekly 3-month sessions of predominantly standing and sitting asanas and meditation, the yoga group showed significant reductions in pain (37%), fatigue (55%), and sleep disturbance (25%) as measured by visual analog scales. ; these changes were significantly better than those in the exercise group ($p = 0.03$, $p = 0.008$, $p = 0.04$, respectively). The yoga group also showed strength in grip strength (+15%) and urea

(29%), creatinine (-14%), alkaline phosphatase (15%), total cholesterol (15%), erythrocytes (þ11%), and hematocrit (þ13%). These changes were also better than those in the control group (all $p < 0.05$) (Yurtkuran et al., 2007).

Chattha and colleagues compared the effects of an 8-week regimen of daily asana and pranayama with an intervention that mimics yoga activities using non-strenuous walking and stretching exercises. The yoga group scored significantly better in vasomotor symptoms ($p < 0.05$) and neuroticism ($p < 0.05$) compared to those who exercised. Analysis of the data from the Greene Climacteric Scale revealed that the yoga group showed significant improvement in all three factors: psychological, somatic, and vasomotor ($p < 0.001$), while the exercise group showed significant improvement in only the psychological factor ($p < 0.05$). The yoga group also exhibited a significantly greater reduction in stress levels measured by the Perceived Stress Scale (PSS) than the exercise group ($p < 0.0001$, effect size ¼ 1.10 and 0.27, respectively) (Chattha et al., 2008). When we look at these findings, which are similar to the results of our study, it is seen that both exercise and sports and doing yoga make the subjects feel better, but it can be said that yoga seems to be more successful in alleviating physical symptoms and stress perceptions.

Although this study shows that long-term yoga and exercise may have similar cardiac benefits, it can be said that they have several methodological weaknesses, including the use of an appropriate sample and the failure to control physical activity in the yoga group (Ross and Thomas, 2010; Duren et al., 2008).

Although exercise has been shown to definitively improve fitness parameters, only a few studies have examined the fitness effects of yoga (Hagins et al., 2007; Tran et al., 2001). Tran et al. reported significant increases in strength, muscular endurance, flexibility, and VO2max in 10 healthy volunteers after 8 weeks of asana and pranayama practices twice a week (Tran et al., 2001). The metabolic expenditure of experienced yoga practitioners during a yoga session was similar to walking on a treadmill at 3.2 km=hour; this is lower than the moderate physical activity recommendations recommended by the American College of Sports Medicine at the time of the study. However, the authors concluded that more strenuous yoga practices involving continuous movement were comparable to walking 4.8 km=hour on a treadmill and could provide sufficient intensity to improve cardiorespiratory fitness in sedentary individuals (Hagins et al., 2007).

Yurtaydın investigated the effects of 8-week hatha yoga exercises on some physiological and motoric parameters in sedentary women. As a result of the study consisting of 30 participants (experimental group: 15, control group: 15), it was reported that sedentary women who had hatha yoga exercise improved in flexibility, balance, leg strength, back strength and hand grip strength parameters (Yurtaydın, 2016). Akbulut investigated the effects of yoga on balance and physical fitness of obese women. In the study conducted with 55 participants, 30 women in the experimental group were subjected to a two-month yoga program. As a result of the study, it was stated that yoga had positive effects on balance and physical fitness in obese women (Akbulut, 2016).

Overweight and obesity are strong risk factors for diabetes, hypertension, and ischemic heart disease. Yoga has been found to be helpful in the management of obesity. It has been reported that three months of yoga asanas and pranayama exercises every day for three months under the supervision of a yoga specialist cause a decrease in body weight, body mass index (BMI), waist and hip ratio (Balaji, Smitha, Sadat, 2011).

In the study of Baş, which examined the effects of yoga and exercise on healthy young individuals, 33 young individuals were divided into two groups as experimental and control groups. While the experimental group (N: 17) received hatha yoga training, the control group (N: 16) was subjected to classical exercises. It was reported that physical fitness characteristics improved in both the yoga group and the exercise group. However, it was observed that the group who received yoga training improved more in balance, flexibility, anaerobic power, muscular endurance and agility. For this reason, it was stated that yoga was more effective than the classical exercise training method and suggested that the hatha yoga variety could be applied as an effective training model for healthy people (Baş, 1998). In his study on 51 volunteers, Taşpınar recorded significantly positive changes in the development of psycho-social factors of the hatha yoga group and the resistance exercises group, which were subjected to 50 minutes of training for 7 weeks and three days a week. While no change was observed in the control group, which was not subjected to any study, it was reported that there was no superiority between the yoga and exercise groups (Taşpınar, 2010).

Yağlı examined the effects of aerobic and yoga exercises on quality of life and functional capacity in patients diagnosed with breast cancer. In the study, 40 patients were randomly divided into two groups. In the 6-week, three days a week, one hour

studies, the experimental group received yoga training in addition to aerobic exercises, while the control group worked only with aerobic exercises. As a result, a statistically significant difference was found in peripheral muscle strength, six-minute walk test distance and perception of quality of life in both groups. In addition, more significant improvements were found in the experimental group in terms of symptoms such as posture, muscle shortness, pain, anxiety and depression levels, fatigue and constipation compared to the aerobic exercise group (Yağlı, 2012). The SF36 Quality of Life Scale was used in the study of Bardakçı and Biçer in which they examined the effects of exercises performed with functional sports equipment on the quality of life of sedentary women. As a result of the study, when the pretest and posttest averages of the data obtained from the quality of life scale were compared, it was found that there was a statistically significant difference in favor of the posttest (Bardakçı and Biçer 2022).

In our study, we examined the effects of yoga on quality of life and body composition in sedentary women. Studies in the literature examining the effects of yoga on the perception of quality of life, mental health, life satisfaction and physical fitness support our findings. In this context, we think that yoga will positively affect life satisfaction and body composition in sedentary individuals and can be preferred as an exercise model. We think that studies with different sample groups and different experimental groups will be beneficial.

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