



Impact of yoga-walking-pilates, yoga-walking and yoga-pilates training regimens on physical, physiological and psychological elements among males

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General Note



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ABSTRACT

Objective: The study's purpose was to compare three methods of training on physical, physiological and psychological variables of sedentary males. **Method:** Eighty males 18-25 years divided into four groups. Yogic-Walking (YW, n = 20), Yogic-Pilates (YP, n = 20), Yogic-Walking-Pilates (YWP, n = 20) and a Control Group (CG, n = 20). The experimental groups trained for 12 weeks, 3 times per week 60 min per session. Tests were assessed before and after training on physical, physiological and psychological variables. ANOVA was used for analysis. **Findings:** In sit & reach, sit ups and BHT, the YWP and YW showed greater mean values than the YP (P < 0.05). All groups reported similar mean values in SBP, DBP and PR (P > 0.05). In self efficacy, the YWP indicated greater mean value than the YP (P < 0.001). In self esteem, the YW had significantly more mean value than the CG (P < 0.05). **Applications:** YWP and YW

groups showed a significant training effect in flexibility, muscular endurance and breath holding time. This apart, the combined YWP group had a greater training impact on self efficacy than the YP group.

Keywords: Yoga, pilates, walking, physical, physiological, psychological elements

1. INTRODUCTION

Physical activity is considered as close part of the lifestyle of individual right from the times of civilization (Min et al., 2017). But of late, there has been an extreme reduction in the physical activity levels of people due to many factors like the industrial development and automation (Ibrahim et al., 2020). Dereliction of physical activity results in heart related disorders and several conditions leading to less active and less fit people with a greater risk of developing high blood pressure (Ahmed et al., 2020). Literature has revealed that individuals who are physically active rarely experience cardiac problems when compared with sedentary persons (Darren et al, 2006). Further, it results in overweight or obese people, which can be reduced significantly the risk for disease with regular physical activity. Sixty percent of the universal population does not get the recommended amount of physical activity to encourage health (World Health Org, 2004). Lack of exercise causes muscle atrophy and increases susceptibility to physical injury (American College of Sport Medicine, 2006). Recently, (Phillips & Gardner, 2015) showed that it may be easier to accomplish a habit by focusing on indications that lead to the gym automatically. It is imperative that the most natural activity what a man does is walking, which is an action of traveling on foot. It is evident that involving in regular brisk walking is better than vigorous jogging. Regular walking is good for vascular activity strengthens the heart and lung muscles, raising total fitness (Morris & Hardman, 1997). Dam et al., (2005) a sports science faculty member at the University of Exeter is a strong supporter in the profits of walking, he indicated that walking may enhance muscle endurance and muscle power, particularly in the lower limbs. It is worthy for strengthening bones and improving the body's heart system thus boosting circulation. An individual need to keep walking strides at moderate to high intensity which could consume the similar quantity of calories as jogging or running. Providing the required oxygen source enhance the elimination of unuseful products. There are many individuals who are capable to walk at a steady pace than run; it is a more useful method of tissue-cleansing, mostly for the individuals above 50 years of age (Murphy et al., 2020). Walking exercise is also superior for the spinal column in comparison with running, as it locates reduced stress on the spinal column. Man is created to act rather than using the vehicles or sitting in front of the computers for hours, which harms the spinal cord. It is envisaged that walking at quick pace improves the fitness of heart and lungs, aids in maintaining normal blood pressure, enhances brain power and sleep, besides, scaling down stress levels & controls diabetes, lipid level, builds strong bones, reduces stroke, cancer risk and better longevity (Velumani & Jayalakshmi, 2005). Walking is also convenient and may be accommodated in occupational and domestic routines (Morris & Hardman, 1997).

Yoga is an activity of Indian origin and a philosophy promoting balance between body and mind and harmony between individual and cosmos (Ananda, 2006). It develops a strange sense of consciousness in the participants of an approaching health condition or infection. Further, it allows the individual to take preventative helpful action and its cleansing practices have demonstrated to be exceptionally effective for several complaints. Yoga integrates the physical with the mental aspect ensuring bodily well-being (Birdee et al., 2008). Many studies have recognized that the conviction of mind facilitates individuals to accomplish remarkable physical feats that validate the association between brain and brawn. It is believed that yoga increases flexibility, thereby lubricates the joints, ligaments and tendons (Krishna, 1998). It also helps in massaging of all organs of the body, in completing detoxification and also as an excellent activity for toning the muscles (Berger et al., 2009). (Pilates, 1998) originated a method, called Contrology, in which the brain cells, electrical impulses excite the central nervous system. In recent times, science has validated that exercise enhances understanding precisely, executive purpose (Tompsonski, 2008). Pilates drills are an exercise method of repetitive actions and is a complete style to well-being and a permanent procedure of improvement (Isacowitz, 2006). It progresses every part of physical fitness called strength, flexibility, coordination, speed, agility and endurance (Keane, 2005). Development of Pilates drills is accomplished by controlling the effects of gravity, base of support, length of the levers, and center of gravity. Spring action workout the muscles dynamically on concentric and eccentric type and isometrics are also a portion of each work out design in Pilate training. To our knowledge, there are no studies comparing the impact of three different training protocols on physical, physiological and psychological variables of sedentary males. Therefore, the aim of the current study was to compare three methods of training on physical, physiological and psychological variables of sedentary males.

2. METHODS

Eighty sedentary males were selected randomly from King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia to serve as subjects. Their age ranged between 18 -25 years and they were divided into four groups. Yogic-Walking (YW, n = 20),

Yogic-Pilates (YP, n = 20), Yogic-Walking-Pilates (YWP, n = 20) and a Control Group (CG, n = 20). The experimental groups undertook a training program lasting for 12 weeks, 3 times per week for 60 min per training session, while the control group did no exercise but continued their regular activity.

Physical Elements

The physical elements that were assessed at before and after training period were age, height, body mass and body mass index. A stadiometer was used to assess the height to the nearest cm. Seca balance-Germany was used to find out the body mass to the nearest 0.1 kg. The calculation of body mass index was carried out by dividing the body mass in kg by the height in meters squared.

Physical fitness Elements

The physical fitness elements measured were sit and reach (flexibility), 12 min Cooper run/walk test (cardio respiratory endurance) and sit ups (muscular endurance). The sit and reach was measured by a flexibility box to the nearest cm. The 12 min Cooper run/walk test was administered in an athletic track of 400m to the nearest distance in meters for the cardio respiratory endurance. The muscular endurance was tested via the completed number of sit ups in 30 sec.

Physiological Elements

The physiological elements measured were pulse rate, breath holding time and blood pressure. The pulse rate and blood pressure were assessed by (the Omran monitor, BP 710 N, China). While, the breath holding time was measured by a Casio standard stopwatch (HS 30 W, China) in Suez until the subject cannot hold the breath any longer.

Psychological Elements

The stress, self-efficacy and self-esteem were the psychological element that were measured in this study. The stress was assessed by Perceived Stress Scale (PSS) developed by (Cohen et al., 1983) which consisted of 10 questions about the feelings, thoughts and activities of the subjects during the last month including the day which the subjects fill up the questionnaire. The feedback of all the ten questions was aggregated to arrive at the score of PSS. The high score indicted will be the more stressed item on the subject. The General Self-Efficacy Scale (GSES) established by (Schwarzer & Jerusalem, 1995) was administered. This self-efficacy scale is usually self – administered which consisted of 10 items. The answers were elicited on a 4-point scale and combined to obtain the final cumulative score, which was between 10 to 40. The subjects were asked to circle one of these four responses to each question. A higher score indicates that the subject has more self-efficacy. The Self-esteem scale established by (Rosenberg, 1965) was applied to find out the self-esteem which consisted of ten statements dealing with general feelings about themselves. The subjects were asked to circle their responses as given and points were marked against each response. The sum of the scores for all the ten items was calculated and a higher score indicated that the subject had high self-esteem.

Training Program

The period of the training program was 12 weeks, 3 days per week for 60 min per workout. The training program consisted of three methods of Yogic-Brisk Walking, Yogic-Pilates and Yogic-Brisk Walking-Pilates. Before and after each training session a 5 min warm ups and a 5 min cool down were given to the subjects. They were allowed to practice one week before the start of the training program for familiarization purpose.

Yogic and Walking Training

The yogic practices that were administered in this training method were raised arm pose, standing forward bend, lunge pose, plank pose, seated forward bend and head to knee pose. The walking training was performed intermittently on a 400m track for a 60 sec at a high speed followed by 60 sec of light walking for a total duration of 25min. In each training day, the subjects exercised both yogic (25 min) and walking (25 min) modes consequently.

Yogic and Pilates Training

The yogic practices that were used in this training method as mentioned above. The Pilates drills were the rollover, one leg circle, rolling like a ball, single leg stretch, spins stretch and open leg rocker. The yogic training lasted for 25 min followed by 25 min of Pilates drills.

Yogic-Pliates and Walking Training

This training regimen consisted of three combined modes of yogic-pilates and walking training as indicated above. The subjects performed 15 min for each activity.

Statistical Tools

Mean and standard deviations were utilized for all study elements. To find the difference among the groups, ANOVA was used. 0.05 was fixed as the significant level.

3. RESULTS

Table 1 Indicating the physical elements in 4 groups assessed at pre, post and post minus pre-tests.

Groups		YW	YP	YWP	CG	
Elements	Tests	Mean±SD	Mean±SD	Mean±SD	Mean±SD	P-Values
Height (cm)	Pre	176.36±4.08	173.75±4.65	173.25±2.66	174.33±2.06	0.242
	Post	62.91±2.43	65.38±1.19	64.25±1.75	64.00±1.6	60.060
BM (kg)	Post	62.73±2.10	64.62±1.41	63.88±2.30	63.89±1.1	70.168
	Post-Pre	-0.18±0.98	-0.75±0.89	0.38±0.74	-0.11±1.05	0.502
	Pre	20.29±1.50	21.70±1.22	21.42±0.50	21.07±0.84	0.052
BMI (kg/m ²)	Post	20.03±1.10	21.46±1.31	21.54±0.62	21.03±0.7	40.007
	Post-Pre	-0.26±0.77	-0.23±0.31	-0.11±0.89	-0.03±0.32	0.567

ANOVA revealed that no significant mean differences (post minus pre-test) were seen in Table 1 with regard to the BM and BMI between the groups ($P > 0.05$).

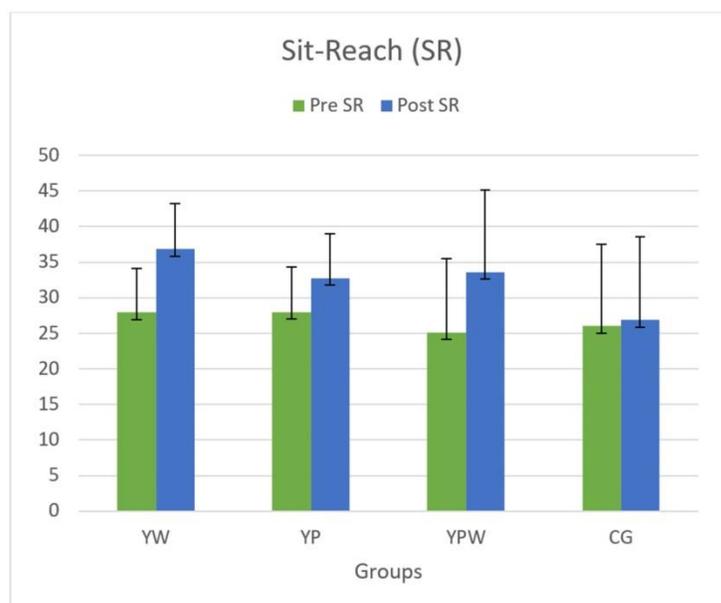


Figure 1 Pre and post-test Sit-Reach for all groups

It can be seen from Figures 1, 2 and 3 that there were remarkable changes in sit & reach, sit ups and Cooper run/walk between the experimental groups and the CG ($P < 0.05$) when the post-tests were subtracted from the pre-tests. In sit & reach the YW showed significantly greater mean difference value than the YP ($P < 0.05$). It is also reported that the YWP had meaningful mean difference value than the YP (8.91 ± 2.07 , 4.75 ± 1.04 cm, respectively, $P < 0.001$). The sit ups revealed that the YW had significantly greater mean difference value with the YP (9.00 ± 2.05 , 4.88 ± 1.13 counts, respectively, $P < 0.001$). The YWP indicated more mean different value than the YP (8.62 ± 2.13 , 4.88 ± 1.13 counts, respectively, $P < 0.001$). In cooper run/walk, there were no changes between groups ($P > 0.05$).

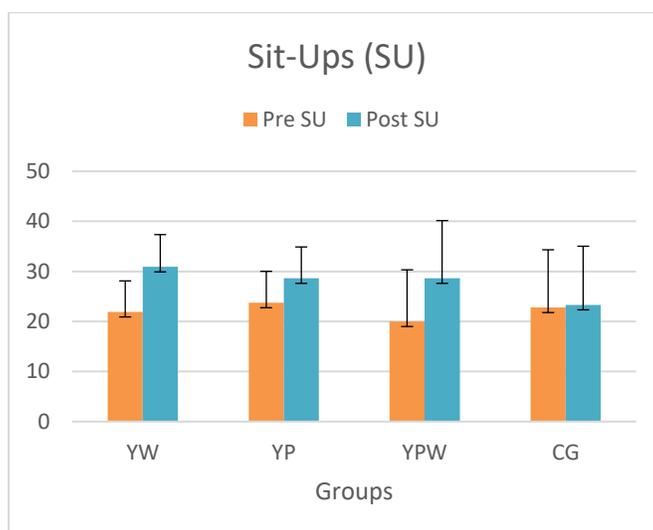


Figure 2 Pre and post-test Sit-Ups for all groups

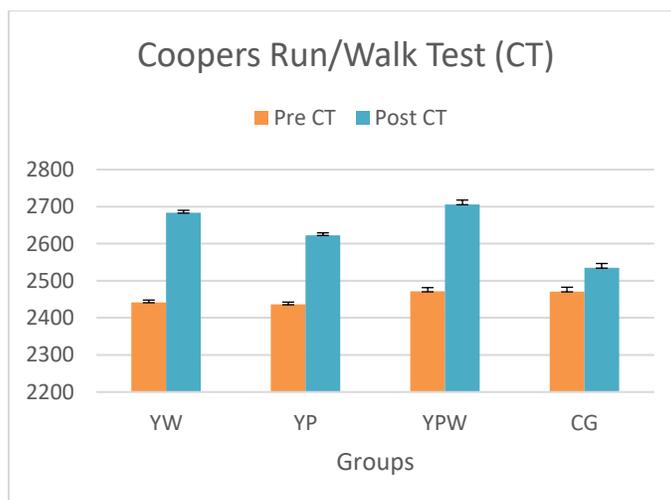


Figure 3 Pre and post-test Coopers Run/Walk for all groups

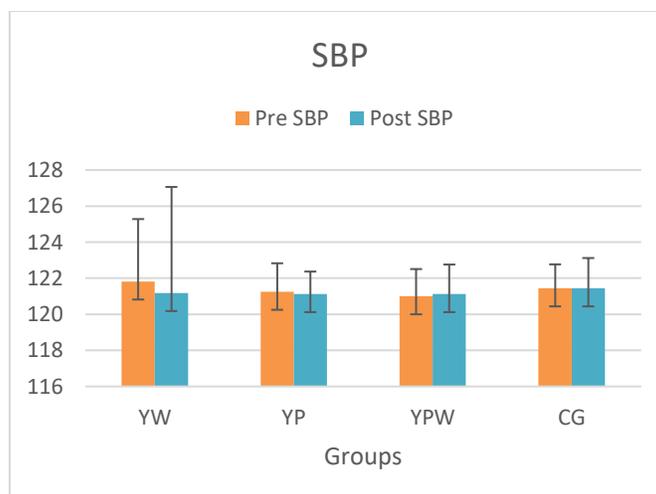


Figure 4 Pre & post-test Systolic Blood pressure

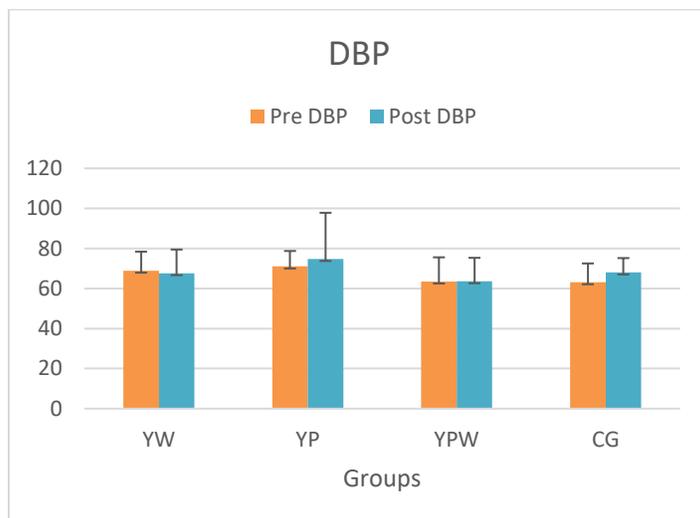


Figure 5 Pre & post-test Diastolic Blood Pressure

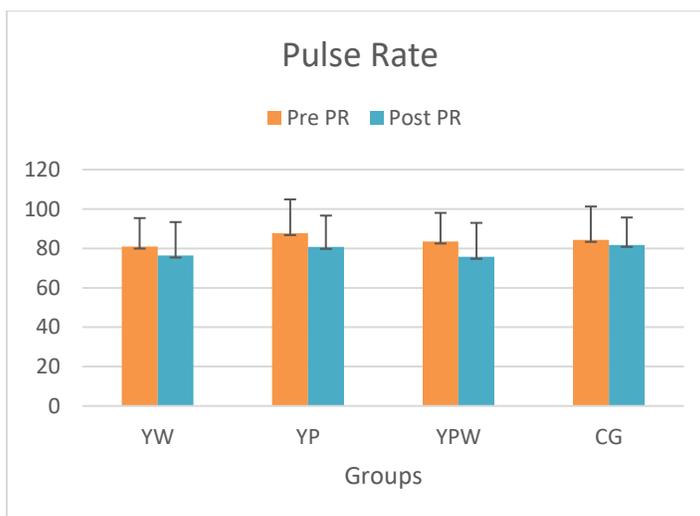


Figure 6 Pre & post-test Pulse Rate

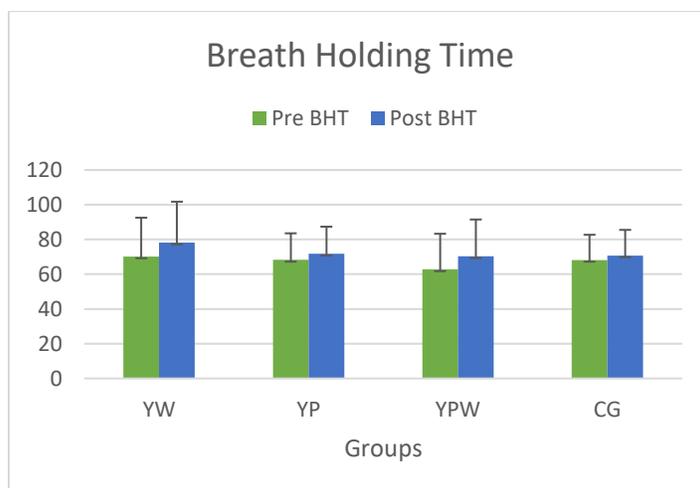


Figure 7 Pre & post-test Breath Holding Time

It can be observed from Figures 4, 5, 6 and 7 that all study groups reported similar mean different values in SBP, DBP and PR ($P > 0.05$). However, in the BHT the YW and the YWP showed significantly greater mean different values than the CG ($P < 0.05$). The YW had a greater mean different value than the YP (8.00 ± 1.61 and 3.50 ± 0.93 sec, respectively, $P < 0.001$). The YWP had remarkable greater mean difference value than the YP (7.50 ± 1.60 , 3.50 ± 0.93 sec, respectively, $P < 0.001$).

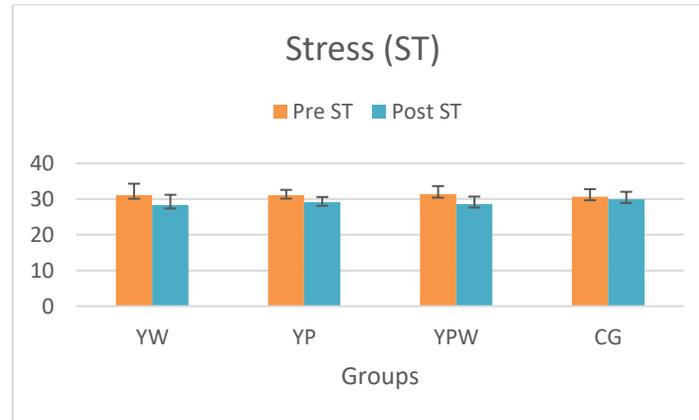


Figure 8 Pre & post-test for Stress

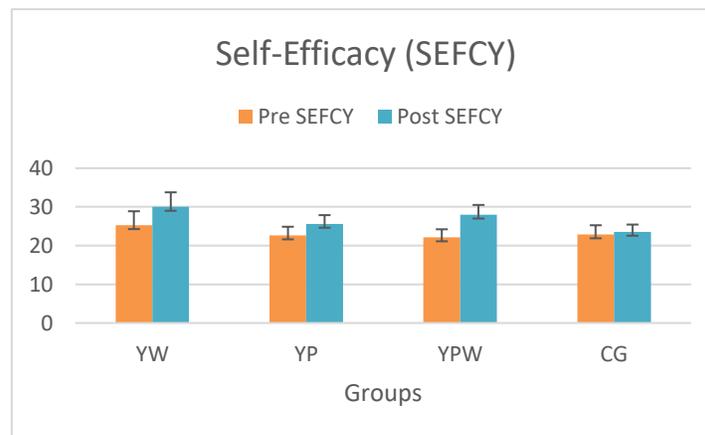


Figure 9 Pre & post-test for Self-efficacy

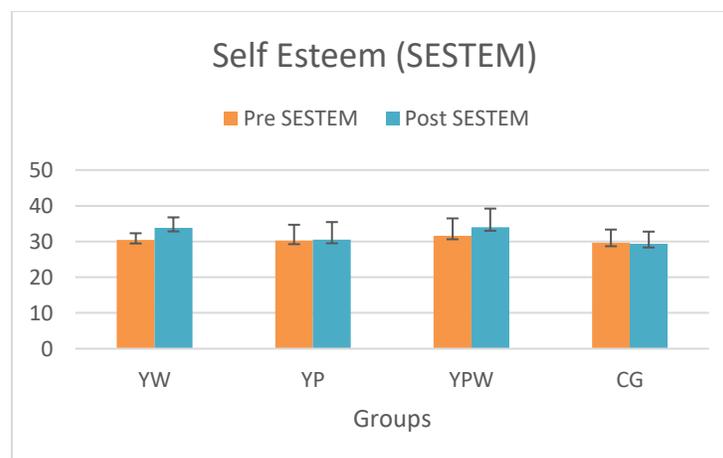


Figure 10 Pre & Post-test for Self-esteem

It can be shown from Figures 8, 9 and 10 that there were remarkable mean different values between the experimental groups and the CG in stress and self efficacy elements ($P < 0.05$). The YWP indicated greater mean difference value than the YP (5.88 ± 1.81 ,

3.00±0.00 scores, respectively, $P=0.000$) in self efficacy. In the self-esteem, the YW had significantly more mean difference value than the CG ($P < 0.05$).

4. DISCUSSION

The aim of this study was to assess the impact of three training modes on physical, physiological and psychological components of males. The outcomes of the current investigation revealed that combined YWP and the YW groups had a training effect on SR, SU, BHT in comparison with YP and the control groups. There are also training impact on stress, self efficacy and self esteem between all the training groups and the control group. But no training influence was found on SBP, DBP, PR between them. The interpretation of the optimistic results of SR in the current investigation can be due to the fact that the combined YWP and YW training groups profited from the concentration and relaxation features that provided by Yogic practices. It may also be promoted by the dynamic enhancement of muscles of back thigh and back muscles during brisk walking exercises. Further, (Krishna, 1998) believed that yoga increases flexibility, thereby lubricates the joints, ligaments and tendons. (Berger et al., 2009) also reported that Yoga helps massaging all organs of the body, completing detoxification and it is an excellent activity for toning the muscles. The SU outcomes possibly due to that the brisk walking may develop muscle endurance as well as muscle strength, particularly in the lower body (Dam et al., 2005). Pilates training improves every part of physical fitness specifically strength, flexibility, coordination, speed, agility and endurance (Keane, 2005). The consequences of Cooper run/walk are hard to rational but might be outstanding to the limitation of the current study. One of these restriction factors could be the use of inappropriate walking intensity, especially the walking training program took place in a track and there was no method controlling the training speed. The result of SBP is in disagreement with (Nelson et al., 2015) who found a significant training effect after 16 weeks of yoga practices and is corresponding with the same study in DBP. The result of the pulse rate and the BP may be due to the fact that these two variables are not belonging to the effectiveness of training exercises, but to a genetic factor. The interpretation of the result of BHT is the increase in flexibility and strength of the lungs muscles in the brisk walking process, yoga practices and Pilates exercises. It is well known that Yoga positively reduces stress (Kimberlee & David, 2009) increases self efficacy and enhances self esteem (Elavsky & McAuley, 2005). These outcomes can be explained by several aspects. First, stress tends to raise blood circulation, which increases heart rate and blood pressure. Second, Yoga has been known to yield a meaningful impact on mental and physical health by down regulating the hypothalamic-pituitary-adrenal axis and sympathetic nervous system (Ross & Thomas, 2010). The decreased function of sympathetic nervous system causes a reduction in the concentration of catecholamines (epinephrine and norepinephrine), a drop in heart beat rate and a decrease in stroke volume, and therefore lower SBP (Koeppen & Stanton, 2008). In addition, yoga practices involving supine positions permit the heart rate to slow down and in this manner assisting the reduction of SBP.

5. CONCLUSION

It was concluded that the combined Yoga-Walking-Pilates training method and combined Yoga-Walking training method showed significant training effects in flexibility, muscular endurance and breath holding time after 12 weeks of training periods. It was also concluded that the combined Yoga-Walking-Pilates training mode had a greater training impact on self efficacy than the combined Yoga-Pilates training method.

Abbreviations

YW	-	Yogic-Walking
YP	-	Yogic-Pilates
YWP	-	Yogic-Walking-Pilates
CG	-	Control Group
ANOVA	-	Analysis of variance
BHT	-	Breath Holding Time
SBP	-	Systolic Blood Pressure
DBP	-	Diastolic Blood Pressure
PR	-	Pulse Rate
PS	-	Perceived Stress Scale
GSES	-	General Self-Efficacy Scale
BM	-	Body Mass
BMI	-	Body Mass Index
SR	-	Sit & Reach

SU	-	Sit Ups
CT	-	Coopers Run/Walk Test
ST	-	Stress
SEFCY	-	Self-Efficacy
SESTEM	-	Self Esteem

Contribution

I am the sole author of this article responsible for research, analysing, compiling results and composing this research work.

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This research received no external funding.

Conflicts of Interest

The author declare no conflict of interest.

Informed consent

Written & Oral consent was obtained from all individual participants included in the study.

Ethical approval

The study was approved by the Ethics Committee of King Fahd University of Petroleum & Minerals.

Data and materials availability

All data associated with this study are present in the paper.

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