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A COMPARATIVE STUDY OF THE IMPACTS OF STRENGTH TRAINING AND YOGA ON FEMALE STUDENT'S BODY AWARENESS

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ABSTRACT

The purpose of this research was to compare the impact of strength training with that of yoga on female student's body awareness. 75 female students studying at Payam Noor University-Shiraz took part in this study. The participants were 18 to 26 years of age and their health status was approved by a medical doctor. They were randomly divided into three groups, namely strength, yoga and control groups. Body awareness was measured by Shields' body awareness questionnaire (1989). The groups exercised three sessions a week, and each session was 60 minutes long. They continued over 8 weeks. The participants were assessed before and after training. The results conveyed that there is a significant difference ($p \leq 0.05$) between strength training and yoga on body awareness of female students. The results of this study prove the positive psychosomatic effects of yoga on students' body awareness and, consequently, an improvement in their concentration.

Keywords: Strength Training, Yoga Training, Body Awareness, Female Students

INTRODUCTION

Body awareness has recently emerged as a major topic of scientific research in the field of health **[1]**. It includes sensory concentration, an awareness of internal feelings, and a concentration on bodily conditions and emotions **[2]**.

Body awareness is a multi-dimensional and complex concept. Mainly it refers to the relationship between the mind and body and includes bodily awareness and control, as well as feeling and cognition **[3]**. Body awareness depends on physical potential,

sensory perception, and discriminatory data collected from all sensory organs, including deep muscle and joint receptors. It often emphasizes the relationship between the body and the individual's perception of "his/her body" **[2]**.

Awareness of the body and its capabilities can be categorized at three levels: first, the general perception of one's body and its appearance, such as wrinkles, hair loss, abdominal bulge and wear fitness. Second, awareness of the internal organs and bodily functions, like sensing perceiving cardiovascular and gastro duodenal diseases, and hypertension. Third, awareness of corporeal capabilities that includes a subjective evaluation of physical ability to achieve one's physical goals. Therefore, this level is related to the level of self-efficacy **[4]**.

Some theorists like Ken Wheeler distinguish between different major physical feelings and tender feelings. Major physical feelings include the pain experienced in the muscles after exercising. Tender feeling is the awareness of body's energies and locating happiness in the body. The mode one's awareness of tender feelings, the more one is in control of the physical results **[5]**.

Yoga can harness the power of science and the science of mind control waves are thought to control all aspects of the is potential as that's why this knowledge is emphasized as away to control the powers of body and mind. Yoga can shows the direct influence of body and specific movements of the body through a series of different scenarios and to adjust the position of the body when it developed separately located and balanced builds **[6]**.

The effects of stretching in yoga asana that keep the body young and healthy take place with influencing the weakness of joints and reflexes**.** In yoga, stretching and movement is done by focusing that in it the mind allows the body to move in its range and thus increase the flexibility **[7]**. According to research conducted by Shields (1989) and Posadzki *et al.,* (2011) there is a high correlation between yoga and physical awareness **[8]**. Clance *et al.,* (1979) found that 2 months of training with yoga and body awareness, can improve the body acceptance among students **[9]**. Also Daubenmier (2005) in his study that investigate the relationship between yoga and body awareness and the body's ability to respond found that body awareness has increased in people who had practiced yoga more than people who do aerobics.

Power activities that have focused on increasing muscle strength and performing these activities to maintain healthy muscles and joints is essential for all people .It is proved the effect on human health and the exercise of power in muscle groups is

suitable to maintain a minimum level of normal and healthy life **[10]**. Studies about urban life have shown that in doing daily works no one of limbs have done similar and symmetric unbalanced of left and right limbs of body work and this position result in initially flooded and minor aches and pains after a serious erosion of the joints, diseases of the spine, shoulder and neck pain and gastrointestinal distress, pain and reduced **[11]**.

American College of Sports Medicine recommended at least 2 sessions per week for 8 to10 moves with 8 to 12 repetitions in a session for health purposes and Kenneth desert, the minimum time required for these movements has announced 10 minutes and recommends strength training and muscular endurance used after aerobic exercises **[12]**. According to the research of kaufman and Deniese (2007) effects of strength training on body awareness is significant **[11]**. The effective of strength training, a training program should be implemented in such a way that the human body will adapt to it and this approach for exercise can increase the body strength, size, speed, and reduce the rest time. Strengthening exercises can be done with body weight that can be carried out correctly, endurance, strength, and even to increase the flexibility of muscles that actually apart of the body act as a counterpoise **[10]**.

The main advantage is that they do not require expensive equipment and these exercises are applicable in more places. Since ages 18 to 40 years, are the years of body fitness and every person reach to his maturation and get his peak physiologic performance during these years, so, university years are the important period in the life of most people **[10]**.

The role of exercise in maintaining physical and mental health of students is obvious so, we decided to examine the strength of mind and body that deals with the relationship of the student body. The purpose of this research is to understand that physical exercise or mental exercises are effective on body awareness.

SUBJECTS AND METHODS

75 female students were selected from PNU shiraz that their age range was 18 to 26 years and they has been divided randomly into experimental and control groups**.** Before the study, the participants were aware of the test method, procedures and objectives of the study were and written consent was completed by all of them. All participants were asked during the research project would not participate in any activities outside of sports. Participants divided randomly into three groups: yoga (n=25) strength training group (n=25) and control group (n=25) groups. Having the same physical and mental conditions for

participation in the experimental groups. The best way to gather information for this study was diagnosed using a questionnaire.

After numerous studies and interviews with experts, in order to collect data in this study, shields body awareness questionnaire (1989) was used **[8]**. The questionnaire was developed in 1989 by shields and research on body awareness and self-assessment survey designed by Wolf *et al.,* (2009) have been used previously. It is consist of 18 questions about four-component including the exercise of reactions forecasting, sleep-wake cycle, and predict the beginning of illness and physical changes **[1]**. The subscales of Physical changes include the followings: reactions to foods, food and energy, seasonal rhythms, fatigue response, response to climate and energy and practice. Potential body reactions subscale includes items such expect anticipation of muscle pain, predicting the effects of sleep deprivation, predicting of energy levels, predicting the quality of sleep, predicting the need for sleep, exercise and energy levels. Sleep-wake cycle includes the following scale: detection of the fatigue caused by starvation, exhaustion, lack of sleep, anticipating the effects of lack of sleep, daily activity cycle, anticipating the need to sleep, sleep, and response to starvation.

Recognition the scale of the disease such as: flu prediction, diagnosis, fever, fatigue detection starvation versus boredom is caused by lack of sleep and seasonal rhythms **[8]**. How the scoring with a 7-point Likert scale score of 1 (not at all true of me) to 7 (totally about me is true) is used. Shields (1989) and Mehling *et al.,* (2009) have reported the internal consistency based on Cronbach's alpha coefficient that was 89% **[8]**. Daubenmier (2005) reported test-retest reliability 82% **[6]**. Menzel (2010) reported acceptable validity of this scale **[13]**. The reliability of the questionnaire used in this study was assessed using Cronbach's alpha 0.69 to 0.93, respectively.

Training program was three-session in week and 8 weeks had continued. Duration of each session was 60 minutes and number of sessions in this study was considered in accordance with Dittmann and Freedman studies (2009) that used the second month of practice yoga to increase physical awareness in their study **[14]**. The number of sessions intended for strength training sessions is according to the research survey Hickson (1994) **[12]**. He investigates the strength training in adults and found that most of the increase in power occurs in 6 to 8 weeks.

Yoga training session was consist of 5 minutes of awareness rotation (relaxation at the beginning of class to calm focus and an

awareness of the outside world into the classroom and prepare mentally and physically for the start of training participants),20 minutes of stretching exercises to prepare the body for asana began with a focus on inhalation and exhalation,25 minutes of asana includes yoga exercise movements and 10 minutes shavasana (relaxation at the end of class in which the body is abandoned) and each session of strength exercise was included 10 minutes of warm-up, 35 minutes of strength training and 15 minutes back to the initial.10 minutes warm-up includes stretching and movement to circulation and general body warm-up, participants were given respectively.

In this study, data were analyzed by descriptive and inferential statistical methods. In descriptive statistics, frequency tables and percentages mean and standard deviation and inferential statistics kulumugruf smirnovf test for normality of variables and independent-test were used. Also, the significance level of 0.05 was considered and version 16 of SPSS was used.

RESULTS

The results showed that at the end of training, a significant difference in favor of yoga's group was on body awareness of the female students (P=0.004). Based on research findings, the effects of yoga on the physical interaction was significant (P=0.003). According to the results there is no significant difference between the effect of yoga and the strength training on the sleep-wake cycle of body awareness of the female students (P=0.055) . According to the results of research the effects of yoga on the early onset subscale (P=0.021) and predict of physical changes (P=0.007) has been significant. According to the research results the effect of strength training on the body awareness of the students is significant (P=0.004). Also, according to the results of research, the effects of strength training on physical reactions subscales (P=0.013), predict of physical changes (P=0.04) and early onset (P=0.023) was significantly. About comparison the effect of yoga and strength training on the body awareness of students, it should be noted that the results of the study showed that yoga training has more effect than strength training on the body awareness of the students (P=0.004).

Table 1: Data Descriptions of Strength Training, Yoga and Control on Body Awareness and its Components

Variable	Group	Test procedures	Mean	SD	Difference
Body awareness	Strength training	Pre-test	81.36	15.61	-11.84
		Post-test	93.2	14.56	
	Control	Pre-test	84.24	9.07	-3.52
		Post-test	80.72	6.35	

	Group yoga	**Pre-test**	**79.48**	**16.01**	**-13.6**
		Post-test	**93.09**	**14.95**	
	Control	**Pre-test**	**84.24**	**9.07**	**-3.52**
		Post-test	**80.72**	**6.35**	
Predicting physical reactions	**Strength training**	**Pre-test**	**30.92**	**7.76**	**-5.08**
		Post-test	**36**	**6.01**	
	Control	**Pre-test**	**31.9**	**7.67**	**-0.81**
		Post-test	**31.03**	**6.18**	
	Group yoga	**Pre-test**	**31.9**	**7.67**	**-5.12**
		Post-test	**37.07**	**6.18**	
	Control	**Pre-test**	**31.9**	**7.67**	**-0.81**
		Post-test	**31.03**	**6.18**	
Sleep-wake cycle	**Strength training**	**Pre-test**	**21.08**	**4.03**	**-2.36**
		Post-test	**23.4**	**3.49**	
	Control	**Pre-test**	**22.24**	**1.98**	**-2.04**
		Post-test	**20.2**	**1.78**	
	Group yoga	**Pre-test**	**20.57**	**4.72**	**-3.03**
		Post-test	**23.6**	**3.44**	
	Control	**Pre-test**	**22.24**	**1.98**	**-2.04**
		Post-test	**20.2**	**10.78**	
Onset	**Strength training**	**Pre-test**	**16.04**	**5.44**	**-2.12**
		Post-test	**18.16**	**5.84**	
	Control	**Pre-test**	**13.76**	**2.44**	**-0.24**
		Post-test	**13.52**	**2.99**	
	Group yoga	**Pre-test**	**14.48**	**4.67**	**-2.15**
		Post-test	**16.63**	**4.71**	
	Control	**Pre-test**	**13.76**	**2.44**	**-0.24**
		Post-test	**13.52**	**2.99**	
Predicting changes in physical	**Strength training**	**Pre-test**	**23**	**5.4**	**-2.48**
		Post-test	**25.48**	**5.43**	
	Control	**Pre-test**	**21.56**	**2.68**	**-0.04**
		Post-test	**21.52**	**2.28**	
	Group yoga	**Pre-test**	**21.54**	**5.29**	**-3.66**
		Post-test	**25.21**	**5.22**	
	Control	**Pre-test**	**21.56**	**2.68**	**-0.04**
		Post-test	**21.52**	**2.27**	

Table 2: Independent test to Compare Differences Between Pre-Test and Post-Test of Strength Training, Yoga and Control on Body Awareness and its Components

Variable	**Group**	**Difference**	**S.D**	**Leven test**		**T -test.**		
				F	**Sig.**	**T**	**df**	**Sig.**
Body awareness	**Strength training**	**-11.84**	**15.04**	**11.56**	**0.001**	**-4.58**	**35.02**	**0.004**
	Control	**-3.52**	**7.416**					
	Group yoga	**-13.6**	**17.84**	**18.57**	**0.000**	**-4.97**	**45.13**	**0.001**
	Control	**-3.52**	**7.42**					
Predicting physical reactions	**Strength training**	**-5.08**	**7.82**	**13.86**	**0.000**	**-3.69**	**50.65**	**0.013**
	Control	**-0.81**	**0.523**					
	Group yoga	**-5.12**	**7.523**	**10.54**	**0.002**	**-3.20**	**35.56**	**0.003**
	Control	**-0.81**	**0.523**					
Sleep-wake cycle	**Strength training**	**-2.36**	**4.58**	**19.406**	**0.000**	**-5.55**	**42.2**	**0.22**
	Control	**-2.04**	**1.74**					

	Group yoga	**-3.03**	**4.85**	**15.87**	**0.000**	**-4.49**	**30.81**	**0.055**
	Control	**-2.04**	**1.74**					
Onset	**Strength training**	**-2.12**	**5.47**	**15.06**	**0.000**	**-1.90**	**48.52**	**0.023**
	Control	**-0.24**	**3.045**					
	Group yoga	**-2.15**	**6.33**	**6.94**	**0.000**	**-1.88**	**37.56**	**0.021**
	Control	**-0.24**	**3.045**					
Predicting changes in physical	**Strength training**	**-2.48**	**6.028**	**20.06**	**0.000**	**-2.82**	**39.26**	**0.048**
	Control	**0.04**	**2.13**					
	Group yoga	**-3.66**	**7.13**	**19.44**	**0.000**	**-1.97**	**29.90**	**0.007**
	Control	**0.04**	**2.13**					

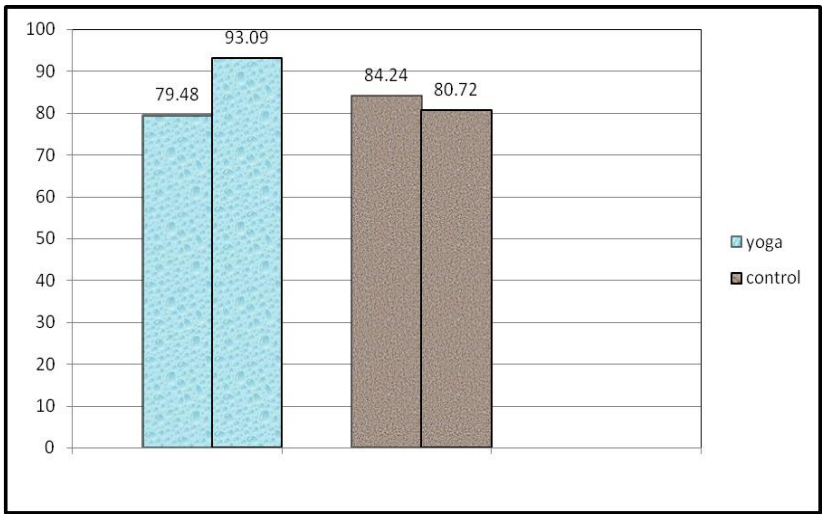

Figure 1: Comparison of Body Awareness, Pre-Test and Post-Test Yoga and Control Groups

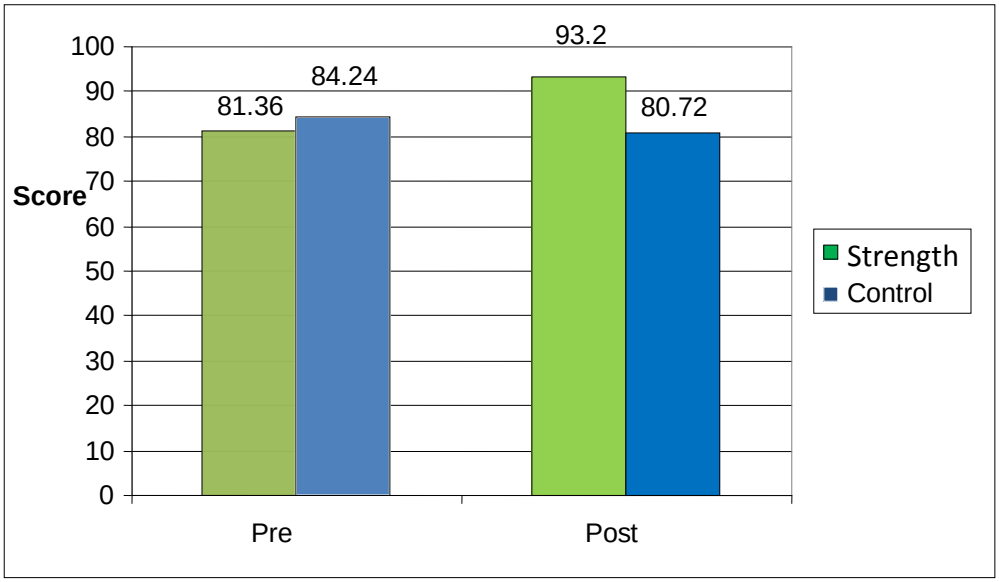

Figure 2: Comparison of Body Awareness, Pre-Test and Post-Test Strength and Control Groups

DISCUSSION AND CONCLUSION

The results showed that at the end of 8 week training of yoga, body awareness of students were significantly increased (P=0.004), these results are consistent with the results of Wolf *et al.,* (2009), which showed that participating in yoga class creates a positive psychological benefits through increase of body awareness **[1]**. It is also consistent with results of Rani and Rao (1994) who found that participation in yoga class increases the congruence of self-perceived **[15]**. Considering the results of the investigation, increased student's body awareness as result of yoga indicate their need to attention on the moods and emotions and focus on creating a stronger relationship between their mind and body.

As a result of according to the positive effects of yoga on the mind and body this result is normal and indicates the relationship between mind and body and students to be more attentive. One of the scales of body awareness, is physical reactions that are based on research findings, the effects of yoga on the physical reactions is significant (P=0.003) and is consistent with Cynthia Price's research (2007) **[16]**.This subscale includes such factors as predicting bruises, Predicting muscle aches, predicting the effects of sleep deprivation, predicting energy levels ,predicting sleep quality, forecast the need for sleep, exercise and energy levels which are the second level of body awareness that is inner awareness of the body and its functions **[4]**. Due to the effects of yoga on inner states and the gradual development of awareness and physical abilities, yoga training can have a positive effect on this level of the body awareness and this result is consistent with the results of Dittmann (2009) **[14]**. But according to the results of the study the effect of yoga is not significant on sleep-wake cycle of females students (P=0.055) which is contradicts with the results of Vera *et al*., (2009) **[17]**. They investigated the influence of long-term practice of yoga on sleep subject's quality and the significant effect of exercise on sleep quality is realized. Perhaps the lack of practice time is one reason for the discrepancy with the results of previous research in this area, Because of yoga training must be accompanied by awareness and meditation to be able to affect the internal systems and the body's physiological and psychological.

About the scale of the disease (P=0.021) and predicted physical changes (P=0.007), according to the results of research the effects of yoga on this subscales is significant. According to the components of these subscales It can be concluded that the psychological effects of yoga on the ability of recognition, Increasing concentration,

producing positive changes in behavior, increasing awareness of mental and physical conditions, Facilitating positive feelings and optimism, development of cognitive processes and enhance their effectiveness for pain management and pain management can be effective on ability to detect early disease **[1]**.

Yoga can treat and recover the body awareness through the normal structure, balance, proper breathing and muscular tension favorable and these conditions is experienced and evident in motor behavior **[5]** and all of these cases is effective on predicting physical changes that are aligned with results of Daubenmier (2005) and Posadzki *et al.,* (2011) **[6,18]**.

According to the results of research**,** the effect of strength training on body awareness of the female students is significant (P=0.04).Strength training through changes in muscle strength, neuromuscular coordination and motor function and neural adaptations and changes related to the stimulation of the body's internal organs will be improve the body plan which is the relationship of body with environment. As well as the increases of muscle activation through strength training, can reinforce the irritability through muscular and nervous adaptations that improve body awareness and motor skills, which these results are consistent with the results Kaufman (2007) **[11]**.

Also, according to the results of research, effects of the strength training was significant on physical reactions subscales (P=0.001), to predict changes in physical (P=0.007) and early onset (P=0.049). In general we can conclude that because one of the best ways to assess neural adaptations-muscle is utilize the strength training and this compatibility is created through the effects on motor units so it cause the coordination of nerve-muscle, run smoother motions and resulting in injury prevention **[14]**. Strength training can increase a positive self-conception people especially adults because of the individuals participating in regular physical activity increase their self-perception of their physical fitness or abilities. Also, performing of physical exercise and strength training likely is more effective than visual on features such as sports merit, fitness and power **[19]**.

It seems that participation in activities has a mediator role on increasing confidence and self esteem as well as positive attitude. Further participation in this exercise increase fitness levels and abilities of the person and this in turn alters the assessment of individual capabilities and mentally able to feel good about one's self so this relationship has been far from positive and

ultimately lead to increased self-esteem and more positive attitude and as a result of increasing the body awareness, the results of the research is consistent to that Ghasemi *et al.,* (2009).

About comparison of yoga and strength training on body awareness of students, it should be noted that the results of the study showed that yoga exercises has a greater effect than the strength training on the student's body awareness (P=0.004).It could be mentioned the superiority of yoga exercises in the management and control of thought waves and control of mind's power to control all aspects of their potential **[6]**.

The psychological effects of yoga on the power of concentration, producing positive changes in behavior, increasing awareness of mental and physical conditions, enhance positive feelings and optimism and development of cognitive processes so it may also be another reason why this type of training is more primacy than the strength training of this study **[18]**. While motivation and interest of student sand individual differences cannot be ignored. Since most students had no experience with yoga classes, so they participate with more motivation in yoga exercises. But because the students did not have advanced equipment's and had to play most of their strength training with using body weight, sometimes they were so bored but this problem was controlled to some extent by the variation in performance.

In general, it seems that this is due to the weakness of the body awareness and it weak the rest of its substructure such as mental sense of appearance(body image), the inner consciousness of the body(such as feeling the symptoms) and subjective evaluation of the ability of the body's own(self-efficacy) **[4]** and the results of the study of yoga effects on body awareness is positive and significant so, you can do yoga to prevent the weakness and impaired body awareness and the other it's substructure in female student and strengthening their body awareness. As a student training is an important time for fitness throughout life and since most of them get on their time in classrooms, studying, extracurricular activities, work and other responsibilities that be tired them from physically-mentally, and therefore most of them forget their need to mental and physical fitness.

So according to the positive effects of yoga on the body awareness of students it is suggested that teaching this sport as a student's general education unit teaching. Also according to the positive effects of long-term practice of yoga exercises than the short-term training it is recommended that similar studies must be performed in a longer period of time. Similar studies can also be performed on men and the role of

these exercises can be assessed on gender differences.

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