



## EVALUATION OF PILATES TRAINING ON BODY AWARENESS AND SOCIAL APPEARANCE ANXIETY IN UNIVERSITY STUDENTS

**Mustafa Gulsen<sup>i</sup>**

Department of Therapy and Rehabilitation,  
Vocational School of Health Sciences,  
Baskent University,  
Ankara, Turkey

### **Abstract:**

**Purpose:** Pilates training is regarded as a mind–body practice that is characterized by gentle and mindful body movements. In contrast to the continuously growing evidence base supporting the beneficial effects of Pilates training on physical and mental well-being, studies investigating its underlying mechanisms are still scarce. The aim of this study is to evaluate the results of students' body awareness and social appearance anxiety from university students who participated in the Pilates training programme. **Material and method:** 80 university students who enrolled Pilates training programme participated in this study. Students were randomly allocated into two groups; a Pilates group (n=40), and a control group (n = 40). Pilates exercises were given to the first group. The second group was set as the control group and no application was made. Sociodemographic characteristics, body perception and social appearance were analyzed at before and after the aerobic training. All the statistical analyses were set a priori at an alpha level of  $p < 0.05$ . **Results:** In a comparison of the Pilates and control groups, statistically significant differences were found in both BAQ and SPAS scores (all  $p < 0.05$ ). **Conclusion:** This study demonstrated that Pilates programs increase body awareness and social appearance. This correction is important to be patient sample for physiotherapist. For this purpose, we believe that it is important to take part in the training of undergraduate education of aerobic exercise. It is concluded that similar studies should be made for more patients for future.

**Keywords:** Pilates, body awareness, flexibility, social appearance anxiety

### **1. Introduction**

Pilates has been used for rehabilitation aims increasingly over the last twenty years. Although there are some differences, Pilates uses a combination of approximately 50

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<sup>i</sup> Correspondence: email [mgulsen81@hotmail.com](mailto:mgulsen81@hotmail.com)

simple, repetitive exercises to create muscular exertion. Advocates of this system of exercise claim that exercises can be adapted to provide either gentle strength training for rehabilitation or a strenuous workout vigorous enough to challenge skilled athletes<sup>1</sup>. The exercises are designed to increase muscle strength, endurance, flexibility and to improve posture and balance; the exercises are relatively easy to initiate and maintain and fit well with the guidelines set forth by the U.S. Surgeon General and the American College of Sports Medicine<sup>2</sup>.

All pilates exercises flow from the “five essentials”– breathing, cervical alignment, rib and scapular stabilization, pelvic mobility and utilizing the transverses abdominis. Each exercise is started by stabilizing the core muscles, which includes the abdominal, gluteal, and paraspinal muscles in particular, and then proceeds through a controlled range of motion. Many methods of muscle conditioning require participants to perform maximal voluntary contractions. In pilates, the focus is on the most effective recruitment of motor units which places the emphasis on energy efficiency and quality of performance. Each exercise is repeated a few times, usually three to five, rarely more; so the body is constantly being exposed to new muscular and kinesthetic challenges<sup>3</sup>.

Pilates exercises can be performed both on a mat or on specialized on a reformer. In the mat class, participants sit or lie supine or prone and use gravity to help stabilize the core. On the reformer, a sliding horizontal platform which a person sits, stands, kneels or reclines; varying resistance to movement is provided via light springs attached to the moving platform and through a simple pulley system<sup>4</sup>.

Body weight is the main resistance that is used throughout the series of pilates mat exercises. Changes in body position occur (i.e., longer limb levers or increased extension) in individual exercises and changes in the lever lengths of limbs can continue to challenge participants as their fitness levels increase. The additional psychological element of pilates is evident in the additional focus on breathing and concentration during the execution of these exercises<sup>5</sup>.

Concerning psychological functioning, significant improvements in sleep- and life-quality were found among university students and the elderly population after pilates training. In two studies, pilates exercises significantly increased mindfulness, which mediated the connection between pilates and various psychological indices (e.g., self-efficacy, mood, perceived stress, sleep quality)<sup>6,7</sup>. The weekly frequency of these longitudinal pilates inquiries was two to three workout sessions per week with an overall length of 8–15 weeks. Therefore, the aim of this study is to evaluate the results of students’ body awareness and social appearance anxiety from students who participated in the pilates training programme.

## **2. Materials and Methods**

### **2.1 Research Design**

The study protocol was approved by the Baskent University Ethics Committee (62310886-605.01), and written consent was obtained from all the participants of the

study also including parental permission. Students were randomly divided into two groups a pilates (n=40), and a control group (n = 40). In this research, the pilates exercise program consisted of three sessions per week for a period of 8 weeks. Each session was again composed of a 5-min warm-up, a 40-min main program, and a 5-min cool-down. For the warming up and cooling down routines, static stretching was performed to relax muscles, while for the main program, pilates moves were performed in sync with matching tunes. The second group was set as the control group and no application was made.

## 2.2 Participants

Eighty subjects with the mean age of  $20.55 \pm 2.44$  years (n=40) for the pilates group and  $19.6 \pm 2.48$  years (n=40) for the control group from Baskent University participated in this study. Permissions were also taken from the university rectorate about the inclusion of their students in our study. University students between the age of 18 and 24 were included in our study. Students that had the previous injury on extremities were excluded from the study.

## 2.3 Questionnaires

### A. Body Awareness Questionnaire

Participants' awareness of the internal changes and events of their body was assessed using the 18-item Body Awareness Questionnaire (BAQ)<sup>9,10</sup>. Items are answered on a 7-point Likert scale with the anchor points of 1 ("not at all true about me") to 7 ("very true about me"). Higher scores refer to higher levels of body awareness. Internal consistency of the scale was 0.88 at both (i.e., baseline and follow-up, see below) measurements.

### B. Social Physique Anxiety Scale

This self-report scale of 12 items assesses the anxiety of individuals when they perceive others to be observing and evaluating their physiques. The items are scored on a scale using anchors of 1: not at all true for me and 5: extremely true for me. The test-retest reliability over two months was .82, and the interitem reliability of this scale was reported as. All subjects were administered the Social Physique Anxiety Scale after receiving appropriate instructions. The inventory was deemed appropriate for use since participants were all college or university faculty (mostly with terminal degrees)<sup>11</sup>.

## 2.4 Data Analysis

The power analysis indicated that 31 participants for each group were needed with 80% power and a 5% type 1 error. The power analysis of our study showed a power of 80% with postural stability as the primary outcome<sup>8</sup>. The data were analyzed using the statistical software (SPSS version 18, Inc., Chicago, IL, USA). All the statistical analyses were set a priori at an alpha level of  $p < 0.05$ . The tests for homogeneity (Levene's test) and normality (Shapiro-Wilk) were used to determine the appropriate statistical

methods to apply for comparison between the groups. According to the test results, the parametric paired sample T-test was used to compare between baseline and post treatment within a group, while independent sample T-test for equality of means was used for comparison between the groups.

### 3. Results and Conclusions

The groups showed no difference in demographic and clinical characteristics (Table 1;  $p>0.05$ ). In a comparison of the pilates and control groups, statistically significant differences were found in both BAQ and SPAS scores (all  $p<0.05$ ) (Table 2).

In this study, we investigated the effects of pilates training on body awareness and social appearance anxiety in university students and found that pilates training may have significant improvements more than the control group.

Pilates training, that is mildly challenging even for adolescent girls<sup>12</sup>, requiring only 60- min time investment a week, could be the first step toward a more active lifestyle. While this hypothesis needs to be tested in future research, the current findings clearly demonstrate the pilates exercise performed only once a week has clear physical and psychological benefits. According to this research, we have significant improvements in psychological benefits with body awareness and social appearance anxiety.

The psychological benefits disclosed in the current study, after twelve weeks of single weekly sessions of pilates workouts, emerged in increased body awareness and decreased negative affect. While claims that Pilates training increases body awareness exist in the literature<sup>13</sup>, this psychological factor was not tested directly either earlier<sup>14</sup> or to date. Therefore, the current study supports empirically the extant claims that Pilates training increases body awareness, and shows that even a low frequency, once-a-week, training over a 12-week period is sufficient to generate such changes. These favorable changes may be ascribed to the mechanism by which pilates exercises activate multiple interoceptive channels (i.e., proprioception from the locomotor and vestibular system, and also visceroreception through controlled breathing) that substantially contribute to the development and/or maintenance of the first person representation of the body, known as body awareness<sup>15</sup>.

Caldwell et al. found greater positive mood after 15-weeks of pilates training in male and female university students. Likely, this study, we had found greater positive mood in body awareness and social appearance anxiety<sup>16</sup>.

Benedek et al. made a study aimed to improve body awareness with five sports (ballroom dance, aerobic, kung fu, yoga, and Pilates) and found that pilates practice were connected to higher levels of body awareness. In our study, we have seen that pilates improves body awareness parallelly to this study<sup>17</sup>.

Thompson and colleagues<sup>18</sup> suggested that a lack of body awareness is one of several factors related to the development of body dissatisfaction, because individuals are unable to recognize and respond to their body's sensations and cues effectively.

Consistent with this we found that pilates training was associated with increases in body satisfaction in university students.

Not surprisingly, our results showed that a group exercise (pilates, yoga or resistance) reduced state social physique anxiety, consistent with previous research in similar samples<sup>19,20</sup>. These findings reinforce the powerful influence of exercise on reducing negative affect, but extend this research to other types of exercise.

The mechanisms attributed to this change can only be speculated upon in the current study. It is possible that successful completion of both the pilates class led to increases in self-efficacy, which may help to reduce anxiety<sup>21</sup>. It is also possible that the focus on internal sensations of the body for the pilates class versus physical appearance may lead to reductions in negative state body image. Specifically, during pilates, participants are encouraged to focus on their body sensations; thus, participants may be less inclined to focus on how others perceive their body.

We found that the magnitude of changes for body image were larger after the pilates training. The reason for pilates's greater effectiveness may be the shift in attention from physical appearance to embodiment. Although there can be a shift in attention from physical appearance, it still involves an outward monitoring of the body, perhaps limiting the magnitude of the change in negative body image and having no effect on body satisfaction. Alternatively, the differing motives for resistance training versus pilates may be influential.

The greater magnitude of changes found for the pilates class may be due to the philosophy and instruction provided during pilates. Pilates emphasizes the mind-body connection through linking breath to movement and asking participants to simply experience them sensations in the body, without trying to change them. The emphasis on deep breathing and clearing the mind from outside distractions could help reduce the cognitive and somatic symptoms of anxiety, which could contribute to a reduction in state social physique anxiety and promote an overall sense of well-being. It may also be that the concentration and effort required to listen to the body while maintaining a pose and breathing simply does not allow participants to pay attention to their appearance or what others are thinking.

It was hypothesized that competitive athletes and exercisers would report less social physique anxiety than non-exercisers. The data obtained from this study provided strong evidence to support this hypothesis, since participants' involved pilates group had lower social physique anxiety scores than control group. It would seem that pilates trainers would benefit from participation in sports and exercise and therefore, participants (competitive and exercise) differ from non-participant counterparts with respect to self-presentational concerns about their physique. It may be said that pilates contribute to positive perceptions of body through improved physical fitness, functional status, increased muscle tone, stamina, and reduced body weight and fat content. Improved functional capacity or interactions of these changes may help individuals to view their bodies more positively, and thus, reduce negative body cognitions<sup>22</sup>.

While a negative relation was observed in a study between SPAS and physical activity level in adult women who have middle and high level of self-presentation, no relation was found between physical activity level and SPAS level in women having low self-presentation<sup>23</sup>. In our study, a significant difference occurred in SPAS as a result of the pilates exercise program applied. It is possible to state that the exercise program applied by our participants affected their social physique anxiety conditions positively.

Crawford & Eklund (1994) found in a study they performed among university student women that exercise environments, which emphasize physical appearance or do not prioritize physical appearance, are significantly associated with SPAS<sup>24</sup>. In our study, we can say that pilates exercises are significantly associated with SPAS.

#### **4. Conclusion**

This work has revealed that pilates training three times a week, over a 8-week period, results in significant improvements in body awareness and social physique anxiety. This correction is important to be patient sample for physiotherapist. For this purpose, we believe that it is important to take part in the training of undergraduate education of pilates. It is concluded that similar studies should be made for more patients for future.

#### **Conflict of Interests**

The author(s) declare that there is no conflict of interests regarding the publication of this article.

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## Appendix

**Table 1:** Sociodemographic features of Patients

	Pilates Group	Control Group
Gender (n)		
Male	19	8
Female	21	32
Height (m)	1,58±7,22	1,69±1,47
Weight (kg)	64±11,78	75±15,91

**Table 2:** Results

	n		BAQ Score	SPAS Score
Pilates Group	40	Pre	89,97±15,71	29,17±7,89
		Post	99.12±17.46	21,77±6,14
		<b>p</b>	<b>0.000*</b>	<b>0.000*</b>
Control Group	40	Pre	90,27±13,78	28,72±11,93
		Post	90.85±14,26	29,10±12,64
		<b>p</b>	0.366	0.259

**Notes:** Data are expressed as means±standard deviations; \*p<0.05,  
BAQ: Body Awareness Questionnaire, SPAS: Social Physique Anxiety Scale.

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