

## **The Effect of Preferred Physical Activity on Emotion, Stress and Happiness of University Student**

**Han-Woo Lee<sup>1</sup>**

*Donggeui University, Republic of Korea, Professor*

**Jung-Taek Shin<sup>2\*</sup>**

*Donggeui University, Republic of Korea, Professor*

The purpose of this study was to analyze the effect of preferred physical activity on emotion, stress and happiness in university students. The participants of this study consisted of 23 university students and the measures were the profile of mood state (POMS), the stress scale and the happiness inventory. Participants in this study were randomly assigned to the preferred physical activity group (n=12) and the non-preferred physical activity group (n=11). Participants in the study were physically active twice a week for 60 minutes per session. The collected data were analyzed through the SPSS 23 version, and  $p$ -value<.05 was set. The results of this study were as follows. First, the group participating in the preferred physical activity significantly decreased total mood disturbance (TMD). Second, participation in the preferred physical activity significantly reduced the participants' stress symptoms. Third, there was a significant increase in happiness in the preferred physical activity group. However, there were no significant changes in TMD, stress and feelings of happiness in the non-favored physical activity group.

Key words: Preferred physical activity, Total mood disturbance, Stress, Happiness

---

\* Corresponding author.

Email address: [sjt2001@deu.ac.kr](mailto:sjt2001@deu.ac.kr)

## **Introduction**

International Society of Sport Psychology (1992) examined that physical activity and exercise had a positive effect on the prevention and treatment of depression, anxiety and stress of participants. Also, physical activity had a positive effect on self-efficacy (Welch, Hulley & Beauchamp, 2010), self-esteem (Elavsky, 2010), resilience (Biddle, Mutrie, & Gorely, 2015), and self-regulation (Oaten & Cheng, 2006). Previous studies on exercise and physical factors indicated that regular physical activity had positive effects on hypertension, blood lipids and diabetes on obesity and circulatory system (Fortier, Sweet, O'Sullivan, & Williams, 2007).

However, despite the positive effects of regular sports activities, the rate of physical activity participation gradually decreased from the 50% range from 1990s to recent and the response of 'not participating at all' of regular physical activities was 41.8% (Ministry of Culture, Sports & Tourism, 2013). In addition, the obesity rate is increasing in all age groups and the probability of obese adolescents becoming obese adults is 80%, and obesity increases risk factors such as insulin resistance, hyperlipidemia, high blood pressure, high blood sugar, and arteriosclerosis, leading to cardiovascular disease, diabetes and non-alcoholic liver disease (Cook, 2003).

Relating to facilitate exercise for one's health, Parfitt, Rose and Markland (2000) reported that the choices of exercising intensity increase individual autonomy and satisfaction with self-determination. They also suggested that higher self-determination increase intrinsic motivation and the increase of intrinsic motivation could continue exercise more strongly. Moon (2011) examined that the preferred exercise type group had higher positive emotional experiences and lower negative emotional experiences than the non-preferred exercise type group. Also, in the same exercise intensity, the preferred exercise type group had lower perceived fatigue level and exercise intensity perception than the non-preferred exercise type group (Moon, 2011).

In other words, it was confirmed that physical activity preference could affect participants' motor emotions. However, the effects of physical activity preference on other psychological factors such as stress and happiness could not be identified, and there was a limitation in not being able to use objective indicators for measuring exercise intensity (e.g., use of VO<sub>2</sub>max). In this respect, this study aimed to analyze the effect of exercise preference on emotion, stress and happiness by controlling exercise intensity and exercise time using objective indicators.

## **Methods**

### **Participants**

The participants of this study consisted of 23 university students, and the measures were the profile of mood state (POMS), the stress scale and the happiness inventory. Participants in this study were randomly assigned to the preferred physical activity group (n=12) and the non-preferred physical activity group (n=11). The gender of the participants was 14 males and 9 females. The grades were 19 in 2nd grade and 4 in 3rd grade.

### **Measures**

The emotions of the research participants were used after modifying the Profiles of Mood States (POMS) developed by McNair (1971) to suit the research purpose. The mood test paper was composed of six sub-factors: tension, depression, anger, fatigue, confusion, and vigor. In this study, TMD (total mood disturbance) was used as the sum of tension, depression, anger, fatigue, and confusion minus vitality. POMS scales consisted of 64 items (Cronbach  $\alpha = .90$ ).

Stress symptoms scales were designed and assessed for validity and reliability (Ozeki, 1993). Participants were asked whether they had experienced such stressful event in the last 1 months. They were asked to circle one answer indicating how much pain they felt when they experienced such stressful events, choosing from 1 for “not at all” to 5 for “very.” Stress symptoms scales consisted of 10 items (Cronbach  $\alpha = .85$ ).

This study utilized happiness test (Fordyce, 1977) in order to test the happiness of participants. The happiness scale composed of 1 item with 11 scale (0 for “not at all” to 10 for “very”)

### **Procedures**

The group who preferred physical activity participated in the desired physical activity and the group who did not prefer physical activity participated in the physical activity that they did not want. With the help of one exercise physiology expert, only the exercise preference type was set differently and exercise intensity, exercise time and exercise frequency were set identically. Through a preliminary examination, the validity of the control variable was confirmed and the problematic part was supplemented. Exercise time (60 minutes), exercise intensity (VO<sub>2</sub> Max 60% level) and exercise frequency (twice a week) were applied equally to both groups.

### **Data analysis**

All statistical computations were performed using SPSS/PC Version 23.0. The values were

expressed as average  $\pm$  standard deviations. Descriptive analyses were performed on physical characteristics of participants. To examine the effects of preferred physical activity on emotion, stress symptoms and happiness, 2 $\times$ 2 ANOVAs with repeated measures were performed. Independent t-tests were conducted to investigate the significant difference between preferred physical activity group and non-preferred physical activity group in each time. Also, contrast tests were conducted to investigate the significant difference between pre and post-time each group. The statistical significance level of all analysis was  $p < .05$ .

## Results

### Preliminary analysis

Independent t-test was used to test for pretreatment difference between groups (Preferred PA group VS Non preferred PA group). Emotion (TMD), stress symptoms and happiness were not significantly different at the pretest ( $p > .05$ ). These results meant prior homogeneity between groups.

### Emotion (TMD)

Table 1. Mean and standard deviation of emotion(TMD)

	pre-test		post-test	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
The preferred PA group	54.67	31.40	47.42	24.48
The non-preferred PA group	54.91	18.52	60.64	18.79

Table 1 illustrated the average of TMD on group and time. There was a significant interaction between groups and times ( $F=6.037, p < .05$ ). The TMD score of the preferred PA group significantly decreased ( $p < .05$ ). However, the non-preferred PA group was not significantly changed in the TMD ( $p > .05$ ).

### Stress symptoms

Table 2. Mean and standard deviation of stress symptoms

	pre-test		post-test	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
The preferred PA group	3.24	0.51	3.08	0.39
The non-preferred PA group	3.31	0.28	3.34	0.26

Table 2 illustrated the average of stress symptoms on group and time. There was a significant interaction between groups and times ( $F=8.206$ ,  $p<.01$ ). The stress symptoms of the preferred PA group was significantly lower ( $p<.05$ ). However, the non-preferred PA group was not significantly changed in stress symptoms ( $p>.05$ ).

### Happiness

Table 3. Mean and standard deviation of happiness

	pre-test		post-test	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
The preferred PA group	5.50	2.11	6.67	1.23
The non-preferred PA group	5.27	0.79	4.91	0.94

Table 3 illustrated the average of happiness on group and time. There was a significant interaction between groups and times ( $F=11.657$ ,  $p<.01$ ). The happiness of the preferred PA group was significant decreased ( $p<.05$ ). However, the non-preferred PA group was not significantly changed in happiness ( $p>.05$ ).

### Discussion

The purpose of this study was to analyze the effect of preferred physical activity on emotion, stress and happiness in university students. Participants in this study were randomly assigned to the preferred physical activity group and the non-preferred physical activity group. Participants had physical activity twice a week for 60 minutes per session. The results of this study indicated that the group participating in the preferred physical activity significantly decreased negative total mood disturbance (TMD), stress and increased happiness of participants.

The result of this study showed that regular physical activity reduced stress (Stefanie & Mary, 2018), improved positive emotions (Brosse, Sheets, Lett & Blumenthal, 2002; Taylor, 2000) and a sense of happiness (Berger & Owen, 1988). However, the results of this study were not consistent with previous studies (Lim & Lee, 2014) that physical activity participation did not affect stress reduction in college students.

Previous study (Lazarus & Folkman, 1984) on stress indicated that the perception of stressful events is closely related to coping strategies not to a stressful condition itself. The construct of coping was defined as the behavioral and cognitive efforts of an individual to manage the internal and external demands encountered during a specific stressful situation. Since the results of studies on the effect of physical activity on stress were inconsistent, it was necessary to analyze whether physical activity could be used as a stress coping strategy in subsequent studies. In this study, participation in physical activity reduced negative emotions and increased happiness in college students. These results supported that physical activities improved the enjoyment and interest (Snyder & Spreizer, 1973), social interaction (Cockerham, Kunz & Lueschen, 1998), and feelings of happiness (Berger & Owen, 1988; Fordyce, 1983).

The Ministry of Culture, Sports and Tourism (2013) argued that despite the various benefits of physical activity, the participation rate in physical activity continued to decrease. In this regard, future research is needed to improve the participation rate of physical activity among university students. It is judged that there is a need for research on the development and promotion of various intervention strategies that can improve participation and continuation of exercise. In particular, it is judged that there is a need for research on teacher education to improve the participation rate of physical activities in school sports and daily sports (Kwon, 2017; Kwon, Kulinna, 2017; Yi & Lee, 2017).

## References

- Berger, B. G., & Owen, D. R.(1988). Stress reduction and mood enhancement four exercise model: Swimming, body conditioning, hatha yoga and fencing. *Research Quarterly for Exercise and sport*, 59, 148-159.
- Biddle, S. J. H., Mutrie, N., & Gorely, T. (2015). *Psychology of physical activity: Determinants, well-being and interventions (3rd Edition)*. London, England: Routledge.
- Cook, S. (2003). Prevalence of a metabolic syndrome phenotype in adolescents: findings from the third National Health and Nutrition Examination Survey, 1988-1994. *Arch Pediatr Adolesc Med*, 157, 821-827.
- Elavsky, S. (2010). Longitudinal examination of the exercise and self-esteem model in middle-aged

- women. *Journal of Sport & Exercise Psychology*, 32(6), 862-880.
- Fordyce, M. W. (1983). A program to increase happiness: Future studies. *Journal of Counseling Psychology*, 30, 483-498.
- Fortier, M. S., Sweet, S. N., O'Sullivan, & Williams, G. C. (2007). A self-determination process model of physical activity adoption in the context of a randomized controlled trial. *Psychology of Sport and Exercise*, 8, 741-757.
- International Society of Sport Psychology. (1992). Physical activity and psychological benefits: International Society of Sport Psychology position statement. *The Physician and Sports medicine*, 20(10), 179-184.
- Kwon, E. H. (2017). How to reconceptualize physical education teacher education curriculum for successful training toward inclusion. *Research in Dance and Physical Education*, 1(1), 13-28.
- Kwon, J. Y., & Kulinna, P. H. (2017). Expanded roles of physical education teacher education in United States and Korea. *Research in Dance and Physical Education*, 1(1), 45-51.
- Lazarus, R., & Folkman, S. (1984). *Stress, coping, and appraisal*. New York: Springer.
- Lim, T., & Lee, Y. (2014). Effect of College Students' Physical Activity on Stress and Happiness: Focused on the Mediating Effect of Positive Psychological Capital. *Journal of the Korean Sports Association*, 53(1), 155-166.
- Ministry of Culture, Sports and Tourism (2013). *Survey on participation in national life sports*. Ministry of Culture, Sports and Tourism.
- Moon, C. I. (2011). The Effects of Preference Mode and Intensity of Exercise on Participants' Psychological and Physiological Responses. *Korea Journal of Sports Psychology*, 22(2), 149-169.
- Oaten, M., & Cheng, K. (2006). Longitudinal gains in self-regulation from physical exercise. *British Journal of Health Psychology*, 11(4), 717-733.
- Ozeki, Y. (1993). Refining the stress self-rating scale for university students- Toward a transactional analysis. *The Annual of the Graduate School of Comparative Studies of International Cultures and Societies*, 1, 95-114.
- Snyder & Spreitzer. (1974). Family influence and involvement in sports. *Research quarterly*, 44(3), 243-249.
- Stefanie, M., & Mary, L. (2018). Physical Activity, Stress, and Academic Performance in College: Does Exposure to Stress Reduction Information Make a Difference. *College Student Journal*, 52(4), 452-457.
- Welch, A. S., Hulley, A., & Beauchamp, M. R. (2010). Affect and self-efficacy responses during moderate-intensity exercise among low-active women: The effect of cognitive appraisal. *Journal of Sport and Exercise Psychology*, 32, 154-175.

Yi, K. J., & Lee, W. I. (2017). Community-based physical and health education teacher education (PHETE). *Research in Dance and Physical Education*, 1(1), 1-12.

Received: October 30, 2020  
Reviewed: December 13, 2020  
Accepted: December 14, 2020