Differences in Physical Fitness and Eating Attitude among Female University Students according to SPQ (Sasang Personality Questionnaire)

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ABSTRACT

OBJECTIVES The objective of this study is to investigate the difference in physical fitness and eating attitude (dieting, bulimia, food behavior) among 322 female university students according to SPQ (Sasang Personality Questionnaire).

METHODS Describe briefly the main methods or treatments applied; through the use of the Sasang Personality Questionnaire, Eat-26 questionnaire, and assessment of physical fitness (strength, agility, endurance, power, flexibility). SPQ is a 14-question self-report assessment tool for measuring temperament characteristics from the perspective of the Sasang typology. It is divided into three groups: So-Eum, Tae-Eum, So-Yang. Data analysis was performed by one-way ANOVA using statistical software SPSS version 18.0 program.

RESULTS As to the results, there was a difference in physical fitness and eating attitude according to the SPQ group. Among the variables of physical fitness, So-Yang was significantly higher in back strength (strength) and total fitness score than So-Eum and Tae-Eum. The bulimia and eating behavior were also significantly higher than those of the other groups.

CONCLUSIONS It was found that the So-Yang group had better physical fitness than the other constitutions but could have had a problem with eating attitude. The utilizing from the study that is able to provide a proper understanding of eating attitude and fitness in SPQ.

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Introduction

In the both of East and West, one would find the history of health and illness is long, divided into two sections, a physiology section and a psychology section. The physiology section is based on blood, yellow bile, black bile, and phlegm as suggested by Hippocrates, while the psychology section is based on mood and divided into four temperaments or constitutions:

sanguine, choleric, phlegmatic, and melancholic, as suggested by the Greek physician Galen and said to be closer to the stable-extrovert, neurotic-extrovert, stable-introvert, and neurotic introvert temperaments, respectively [1, 2, 3]. On the other hand, there is also a section on traditional medicine, such as Ayurveda, Tibetan medicine, and traditional Chinese constitution medicine together with Korean Sasang typology; furthermore, the first section has been a major concern for them [4]. Researchers have developed effective medical methods based on unique diagnosis, treatment, prevention and physiological pathology of their clinical application, taking into account the

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influence of philosophical and cultural foundations, because the provision of personalized medicine has been a major source of concern across cultures [1].

Sasang typology is a traditional Korean medicine that divides the human person into different types with the use of biopsychosocial characteristics based on Eum-Yang. While divided into four types within the quaternary nature of Neo-Confucianism (sadness, anger, gladness, and enjoyment), each type has its own emotionality profile, behavioral tendencies and patterns, a status of an organ system, logical thinking, pathological and physiological features, a specific illness of predisposition, response to particular treatments and physical characteristics, in addition to physical constitution and characteristic temperament [1, 5]. Individuals were classified into Tae-Yang(TY), So-Yang(SY), Tae-Eum(TE), and So-Eum(SE) types, recently has been demonstrated the usefulness of the Sasang typology in clinical medicine and in various fields such as food, nursing [6], education [7], and physical education [8].

In 1992, the peculiar personality traits of the Sasang classification were initiated and developed for use in various objective tools [2, 9]. There were several reports on the impact of personality traits on health [10, 11]. This correlation between personality, emotional state, and illness highlights the interaction between social, biological and psychological factors in determining the state of the person's health. The most recent theoretical framework with personal explanation also relies on such a psycho-social model. Impact measurement includes the dimensions of positive and negative effects [12, 13]. Given these findings regarding the role of personality in health based on the classification of Sasang, the SPQ (Sasang Personality Questionnaire) was used as a new objective tool to measure the relationship between physical fitness and eating attitudes [2].

In particular, the application of Sasang types to physical education and eating attitudes is very promising. In the physical fitness is modified the stereotyped practical skill teaching method by introducing personal abilities based on physical characteristics and temperament. This requires the application and development of an exercise program according to the Sasang type is would fit a patient's temperament, constitution, and physical characteristics. The previous studies have report-

ed differences between the Sasang types in physical fitness and body composition. However, there are some studies does not think about the differences between the Sasang types just in the body shape [8, 14, 15].

According to the physical characteristics of each Sasang type, the TE type is normally well built and tall, the TE type is solid and strong, the SE type has a small frame, weak, and thin, the SY type has a tidy appearance and small in stature, resembling the SE type. The body of the TE type is the largest among the Sasang types and the bodies of SE and SY are small and similar to each other [5]. Body shape is related to physical fitness and body composition [16, 17].

In the eating side, there is a difference in Sasang types, found obesity in TE linked to eating behaviors, rapid eating rate, and a strong appetite, whereas those attitudes contrast with those of the SE type. The SY type is similar to both TE and SE types [18].

In addition, the source of a healthy life is fitness and eating. On the physical fitness side, it was found that the physique focuses on shape while fitness focuses on function. Thus, physical fitness is divided into functional fitness (agility, balance, and power) for technical exertion while health-related physical fitness (strength, endurance, flexibility) is necessary for robust activity. By measuring different parts of the body such as back strength, muscular strength, grip strength can be attained in physical fitness, in addition to measuring sit-ups, muscular endurance, and flexibility. Hand tapping and agility were also measured, while power was measured via standing long jump [19]. These fitness factors comprise the ability to carry out one's day-to-day activities vigorously. On the other hand, we find that eating attitudes can be attained through "Eat-26"; the majority of practitioners have tend to sum up their responses to all items. Those partakers who manage are considered to be highly prone to clinical syndromes [19, 20]. "Eat-26" covers three related aspects: Dieting, Bulimia, and Behavior. These eating attitudes can be defined as follows:

1- Dieting It can be defined as the food is ingrained in an organized way to maintain or reduce body mass index [21].

2- Bulimia It can be defined as an eating disorder characterized by episodes of secretive excessive eating followed by inappropriate methods of weight control [22].

3- Behavior It can be defined as a complex interplay of psychological, physiologic, and social genetic factors that influence the quantity of food intake, meal timing, and food preference [23], in the questionnaire, use the negative eating behavior.

Thus, we find that there is a relationship between eating and fitness. In order to balance calories, one needs to properly maintain body weight or have it under control. In order to do this, calorie intake should be properly adjusted to the calories used to carry out normal bodily activity or fitness workout [24]. When feeling better physically, mental health is enhanced which leads to being able to take control of life automatically. Although some physical and psychological aspects are beyond the control of the individual, there are many aspects which, if one wishes, could enhance the general well-being of the individual [25]. Therefore, the purpose of this study was to investigate the eating attitude and physical fitness according to the SPQ among Korean university students.

Methods

The purpose of the experiment and contents and method of the test were presented to the participants through the announcement and the participants who voluntarily participated, the researcher reminded them in advance that their identity will be confidentiality, the participants agreed and signed the participation agreement. Participants in this study were 322 female university students from Seoul, South Korea, with an average age of 19.0 ± 25 . The data of 322 people collected to be analyzed. They were healthy, and they fully understood the content and method of exercise test and the subjects' knowledge in advance. It has been shown that the weight of each SPQ constitution was SE 52 kg, TE 55 kg, and

Table 1. General characteristics of subjects				(Mean±SE)
Variable	So-Eum (1)	Tae-Eum (2)	So-Yang (3)	F(p)
weight (kg)	52.45 (1.26)	55.06 (1.04)	55.41 (1.15)	1.727 (.183)
height (cm)	161.30 (1.09)	160.86 (.59)	161.44 (.38)	.150 (.860)

SY 55 kg, while the height was SE 161 cm, TE 160 cm, SY 161 cm. There were no differences in height and weight between each SPQ constitution (Table 1). The SPQ score was classified according to the SPQ score. In the classification of the SPQ, from lower score ~ 24 to SE, 24.1 to 31 score to TE, and 31.1 to higher scores to SY. However, in this study, after removing the overlapping score, the constitutional groups have been identified as follows: SE 33, TE 54, and SY 29 out of 322 persons (Figure 1).

Measures and Methods

The survey using the Sasang Personality Questionnaire, Eat-26 questionnaire, and assessment of fitness discussed the methods and tools for each of them in the following.

Eating attitudes

The method used for eating attitudes was based on the EAT-26 test, a questionnaire designed to determine eating habits and weight concerns. Participants assess both weights and eating habits. EAT-26 is a questionnaire consisting of 26 questions showing scale items and divided into 3 subscales by using the Cronbach's alpha, each subscale containing a set of scale items. The three EAT-26 subscales are 1- Dieting, 2- Bulimia, 3- Behavior. By summing these items the subscales scores are computed as follows [26]:

Figure 1. The score for SPQ group

Dieting scale items: 1, 6, 7, 11, 12, 14, 16, 17, 23

1. Am terrified about being overweight.
6. Aware of the calorie of foods that I eat.
7. Particularly avoid food with high carbohydrate content (i.e. bread, rice, potatoes, etc.).
11. Am preoccupied with a desire to be thinner.
12. Think about burning up calories when I exercise.
14. Am preoccupied with the thought of having fat on my body.
16. Avoid foods with sugar in them.
17. Eat diet foods.
23. Engage in dieting behavior.

Bulimia scale items: 3, 4, 10, 18, 21

3. Find myself preoccupied with food.
4. Have gone on eating when I feel that I may not be able to stop.
10. Feel extremely guilty after eating.
18. Feel that food controls my life
21. Give too much time and thought to food.

Behavior scale items: 9, 26

9. Vomit after I have eaten.
26. Enjoy trying new rich foods

By finding the Cronbach's alpha values for each question factor, standardization and validity of the 26-item questionnaire was validated, wherein the following were found: .816 for dieting, .809 for bulimia, and .862 for behavior, which was the highest value.

Physical Fitness

The method of fitness was based on measuring muscle strength, agility, flexibility, power, and muscle stress as follows:

1. Grip strength: The hand dynamometer (TKK 5401, Japan) was used to gauge the grip strength (muscle strength) by lifting the dynamometer of the body around a quarter degree and then pull with full force the hand force meter. The test is held twice which selected the highest grade from two measurements [27].

2. Back strength: To perform a back strength (muscle

strength) measurement, grasping the rear muscle force gauge handle (TKK5402, Japan) was used, which is done by the user grasping the handle with both hands while standing on it, and then with a straight back extended to exert force displaying the measurement. The test is held twice and selects the highest grade from two measurements [28].

3. Tapping: To measure hand tapping (agility) by using pen tapping type equipment, and recording the number achieved after tapping on the device for 10 seconds [29].

4. Sit up: Lie on a floor with feet flat on the ground, with your knees bent at approximately right angles. Your hands should be behind the neck. Squeeze your stomach, push your back flat, and raise it high enough for your hands to slide along your thighs to touch the tops of your knees, then return to the starting position. The test is conducted for one minute to measure sit up (muscle endurance) [30].

5. Standing long jump: To measure standing long jump (power) on the plate, one should stand straight with the top of one's toes on the starting line. Bend the knees and swing the arms backward to take off, then jump forward as far as possible. One should land on both feet. The scoring will be the distance of heel landing. The test is held twice and selects the highest score from the two measurements [31].

6. Trunk flexion: To measure trunk flexion (flexibility), one needs to sit on the floor, while the legs should be stretched out in front. Shoes should be taken off. The soles of the feet are placed flat against the box. Knees should be touching the floor and should be together, and the administrator should help keep the knees down. Then the subject tries to reach forward along the measuring line as far as possible. After some practice, the subject reaches out and holds that position for one-two seconds while the distance is recorded. The subject should remain still. The process is then repeated [32].

7. Total fitness score: Is the sum of all the physical fitness factors such as grip strength, back strength, tapping, Sit up, Standing long jump, and trunk flexion.

Sasang Personality Questionnaire (SPQ)

SPQ is a 14-question self-report assessment tool to measure temperament's characteristics from the perspective of the Sasang typology. It is divided into three groups: SE, TE, SY. By selecting 1, 2 or 3 from each question, all SPQ scores were

Table 2. Difference in physical fitness according to SPQ

		SPQ			F	P	post-hoc
Variables		So-Eum (n=33) (1)	TaeEum (n=54) (2)	SoYang (n=29) (3)			
Fitness	Grip strength	24.40(.83)	25.31(.53)	25.87(.88)	.887	.415	-
	Back strength	44.83(2.25)	50.26(2.08)	56.89(4.11)	4.024	.020*	1.2 < 3
	Tapping (Agility)	71.53(1.12)	69.07(.96)	71.75(1.18)	2.111	.126	-
	Sit up (Endurance)	30.96(1.88)	31.81(1.60)	36.55(1.71)	2.383	.097	-
	Standinglong(Power)	135.84(3.37)	144.12(2.61)	148.41(6.91)	2.090	.128	-
	Trunkflexion(Flexibility)	17.33(1.44)	18.11(1.11)	19.08(1.63)	.338	.714	-
	Cardiopulmonary endurance	98.78(2.61)	102.31(2.05)	104.49(3.01)	1.138	.324	-
	Total fitness score	-.59(.55)	.23(.48)	1.95(.67)	4.420	.014*	1.2 < 3

Table 3. Differences in eating attitudes according to SPQ

		SPQ			F	P	post-hoc
Variables		So-Eum (n=33) (1)	Tae-Eum (n=54) (2)	So-Yang (n=29) (3)			
Eating attitudes	Dieting	21.57(1.02)	23.00(.85)	24.85(1.26)	2.100	.127	-
	Bulimia	11.33(.71)	12.01(.53)	14.31(.74)	4.756	.010*	1.2 < 3
	Behavior	2.24(.15)	2.27(.12)	3.48(.41)	8.688	.000*	1.2 < 3

summed up by addition of overall content to SPQ groups, while people who score between the groups were deleted as their constitutionality may overlap, and so the scoring results were as follows: from the lower to 21 were in SE, 27, 28, and 29 were in TE, 36 or higher were in the SY group. So out of 322 persons, 33 are SE, 54 are TE, and 29 are SY.

Data analysis

The data of this study were analyzed using SPSS 18.0 statistical program. First, the Cronbach's Alpha values were obtained to measure the reliability of the EAT-26 questionnaire, and physical fitness through descriptive statistics. To determine the difference in eating attitude and fitness factors according to SPQ, a one-way ANOVA analysis was conducted. In addition, post-hoc was performed using Scheffe's to determine if there is homogeneity in contrast.

Results

The differences in physical fitness and eating attitude variables according to SPQ groups are as follows:

Differences in physical fitness according to SPQ

The difference in physical fitness according to SPQ was assessed are presented in Table 2, which showed in the back strengths of fitness were significantly different between 1(SE), 2 (TE), <3(SY). And in the total fitness score, there were significant differences between 1, 2, <3. However, there were no significant differences in other variables (grip strengths, agility, endurance, power, flexibility).

Differences in eating attitudes according to SPQ

There was a significant difference between SPQ groups in bulimia and eating behavior in order of the 1 (SE), 2 (TE), <3 (SY). On the other hand, there were no significant differences

in dieting (Table 3).

Discussion

There are a number of studies on the Sasang type specific social and psychological characteristics and symptoms, as well as interventions with diverse experiences. However, most studies have focused on clinical groups while taking into consideration the difference in sex or age [33, 34, 35], so the lifestyle was explored on the basis of psychological and biological changes in all types of Sasang using SPQ and BMI as measures of psychosocial characteristics of the Sasang classification. The correlation analysis between SPQ and BMI showed only a weak correlation, stressing that these two aspects of temperament and constitution represent for the most part independent psychological and biological characteristics from the Sasang classification [36].

This study corresponds to previous studies on correlation in the SPQ and BMI on Sasang classification [37, 38] which support the ranking of SE, TE, and SY axis to the total SPQ score. In this study, according to SPQ, there was a difference between fitness and eating attitude. Among the variables of fitness, SY was significantly higher in back strength and total fitness score than SE and TE. While regarding bulimia and eating behavior, these were also significantly higher in SY than in the other groups. It was found that the SY group had better back muscles, and fitness in total than other constitutions but could have a problem with eating behavior and bulimia such as due to rapid eating, and vomit after eating.

Therefore, the urge to promote physical activities along with the nutrition leads to results that enable us to bridge the gap between both eating and fitness, thereby providing empirical evidence of a relationship between fitness and eating attitude according to SPQ groups. This leads to the reduction of obesity, especially given the current high rates of obesity around the world [39]. This study was conducted on a group of students. It considered the impact of dietary habits and fitness practices on their bodies by validating eating attitude and fitness in the SPQ groups. Previous studies have shown how critical body image is by indicating that they need to educate themselves on how to behave correctly without developing eating disorders, thereby strengthening the physical

body [40]. The SPQ groups presented a list of physical activities and then empirically investigated each one of them using a list of eating attitudes and the extent of the impact on the three sections of the SPQ. Thus, we can emphasize that exercises aimed at developing back strength are crucial accordance to SPQ groups.

We can thus emphasize that fitness is crucial in addition to a healthy diet, by prevention of dysfunctional dietary behaviors, and maintaining a healthy body weight [41]. It is, therefore, necessary to strengthen them for the general public in order to maintain a healthy lifestyle. Since the diet varies according to the location of the cultural environment, it is worth applying such a study to the same category all over the world [42].

Conclusions

While proper eating and fitness activities are now linked to a healthy life, the causes of high rates of obesity and eating disorders are manifold. These topics are being discussed and promoted continuously. This study presented a pilot analysis of the relationship between eating attitudes and fitness trends as they relate to SPQ groups, as well as filling the gap between fitness and eating attitude insofar as they lead to a healthy life. Thanks to these results, the promotion of fitness and eating attitudes can be achieved through the provision of fitness management, taking into consideration the behavior and eating habits based on the groups of SPQ.

These findings can help provide an empirical basis for future research on the interrelationship between SPQ, physical fitness and eating attitude. It will also help in understanding the cause, especially among female university students who are most at risk of these health hazards.

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Conflicts of Interest

The authors declare no conflict of interest.

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