International Journal of
BioScience and Applications

ISSN : 2619-8363
Volume 3, Number 4, December 2021
https://doi.org/10.22662/IJBSA.2021.3.4.007

Correlation analysis between Subjective Body Shape Perception, Body Weight Control, and Dietary Supplements among Korean

Hae-Ryoung Park, Eun Hee Park*
Department of General Education, Kwangju Women's University, Republic of Korea
Department of Nursing, Kwangju Women's University, Republic of Korea

Abstract[1]

Background/Objectives: The purpose of this study was to provide basic data for determine the relationship between Koreans' subjective body shape perception and weight control method in the intake of health functional food and exercise has an influencing factor. **Methods/Statistical analysis**: This study was a secondary data analysis study using raw data from the 8th National Health and Nutrition Examination Survey. Data analysis was performed using IBM SPSS/WIN 21.0 program, and statistically significant results were presented. **Findings**: In subjective body shape perception, very obese was 7.7%, slightly overweight was 28.9%, very skinny was 12.3% and very skinny was 4.3%. The results of a correlation analysis of the recent experience with whether you have taken dietary supplements for 2 weeks or more in the past year, it was found that 60.1% of them were commonly, 58.4% of slightly overweight, and 56.4% of a little skinny people. **Improvements/Applications**: Based on this study, it was used as a guideline for education for a correct understanding of subjective body shape perception. In addition, it was intended to be used as a guideline for follow-up studies on guidelines for dietary intake and weight control methods.

Index Terms

Body weight control, Dietary supplements, Inheritance, Somatotype, Subjective body shape perception

***Corresponding author : Eun Hee Park**
juliana@kwu.ac.kr

• Manuscript received October 15, 2021.
• Revised November 10, 2021 ; Accepted December 1, 2021.
• Date of publication December 30, 2021

I. INTRODUCTION

Organogenesis in the early stages of animal development refers to the process by which ectoderm, mesoderm, and endoderm develop into internal organs in the body. The germ layer refers to a group of cells during embryonic development in animals [1].

The ectoderm was the tissue that covers the surface of the body. The ectoderm first appeared in the germ layer and forms the outermost surface. The ectoderm was involved in the formation of the central nervous system, the lens of the eye, the skull and the senses, the ganglion and nerves, the pigment cells, the hair connective tissue, the epidermis, the body hair, and the mammary glands [1].

Endoderm was a type of germ that was produced during embryogenesis in animals. Cells migrate into the gastrulation to form endoderm. The endoderm was initially composed of squamous cells. The endoderm covered the entire digestive tube, excluding the last parts of the mouth, pharynx, and rectum. The endoderm also forms the glands of the digestive tract, which included the liver and pancreas.

The endoderm forms the stomach, colon, liver, pancreas, bladder, urethra, epidermis of the airways, lungs, pharynx, thyroid gland, parathyroid gland, and intestine [2].

Mesoderm was made from embryos of triodes. During gastrulation, some cells are brought in. Between the endoderm and the ectoderm, an additional layer was the mesoderm. The structure of the mesoderm leads to the development of the body cavity. Organs that arisen within the body cavity were free to move, grow and develop, with body fluids protecting them from impact. Mesoderm forms skeletal muscle, skeleton, dermis, connective tissue, genitourinary system, heart, blood (lymphocytes), kidney, and spleen [2].

In this way, a person was created components that function during embryogenesis. In a recent interesting study, it was found that body types were classified by embryogenesis.

When body types were classified by physique classification, they were divided into ectoderm, endoderm, and mesoderm [3].

The extreme ectoderm has a thin face with a high forehead and a receding chin. It consists of a narrow chest and abdomen, rather long and thin arms and legs, some body fat and some muscle, but a large skin surface and a large nervous system. No matter how well you eat, you will not gain weight easily.

The human body with extreme endoderm characteristics was almost spherical. The characteristics of the human body are a round head, large and round abdomen, large intestines for their size, short arms and legs, fat forearms and thighs, but thin wrists and ankles. Under normal conditions, the endoderm has a lot of body fat but is not simply obese [3].

In body structure, mesoderm was classified as mesoderm if it predominates over endoderm and ectoderm. The extreme mesoderm has a large, square head. He has broad, muscular chest and shoulders, muscular arms and legs, and minimal fat body. Characteristics tend to develop muscles easily [3].

In this way, the functions of the body were determined genetically from the embryonic period. Therefore, due to the subjective body type awareness personally recognized, I would like to study the method of weight control, intake of health functional food, and recognition of nutrition labeling among the forms of lifestyle.

In order to determine the terms related to subjective body shape perception, the terms were summarized and used by referring to the dictionary meanings and terms of the Encyclopædia Britannica.

In the encyclopedia, somatotype was defined as human body shape and physique type [3] as presented in figure 1. Therefore, in this study, it was used as a term for subjective body shape perception.

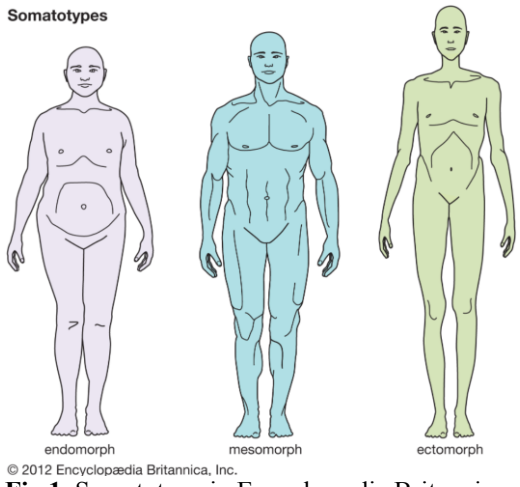

Fig 1. Somatotype in Encyclopædia Britannica

In subjective body shape perception, the subjective health status of the group who felt skinny or obese was worse than the group with subjective body shape perception. And the quality of life score of the group perceived to be obese compared to the group perceived as normal decreased significantly [4].

Many people in the United States have taken dietary supplements to maintain or improve their health. However, many studies have failed to prove the efficacy of numerous supplements in disease prevention. Concerns have been raised about the safety of high-dose supplements [5].

People had a tended to subjectively perceive their body shape as distorted, and this can provide an opportunity to take wrong weight control methods and dietary supplements. Therefore, this study aimed

to analyze the correlation between subjective body shape perception, weight control method, dietary supplement intake or not, and nutrition labeling recognition. Also, based on this study, it was intended to be used as basic data for health policy for the development of health promotion programs.

The purpose of this study was to investigate whether subjective body shape perception affects weight control method, intake of health functional food, and nutrition labeling recognition.

If subjective body shape perception affects weight control method, intake of health functional food, and nutrition labeling recognition. It was affected by certain items, and the effect was intended to be used as basic data in future research and development.

The purpose of this study was to investigate whether there was a relationship between Koreans' subjective body shape perception and weight control method based on the data from the 8th Korea National Health and Nutrition Examination Survey.

In addition, the purpose of this study was to investigate whether the recognition of nutrition labeling affects the intake of health functional food, and to provide the result as basic data for the analysis of the intake of health functional food.

II. Research Method

This study used raw data from the 8th Korea National Health and Nutrition Examination Survey (KNHANES VIII-1). The Korea National Health and Nutrition Examination Survey was conducted in accordance with Article 16 of the National Health Promotion Act. It was a legal survey on the health behavior of the people, the prevalence of chronic diseases, and the actual state of food and nutrition intake. The raw data of the 8th Korea National Health and Nutrition Survey was downloaded from the National Health and Nutrition Survey website, excluding information that could be identified by individuals and used.

The National Health and Nutrition Examination Survey was conducted every three years from 1998, the first period, to 2005, the third period. Since then, it has been reorganized into a year-round survey system, and has been conducted every year from the 4th period (2007-2009) to the present.

This investigation was conducted with the approval of the Research Ethics Review Committee of the Korea Centers for Disease Control and Prevention [8th (2019-2021), IRB No. 2018-01-03-C-A]. This study was conducted by downloading raw data from the website of the Korea National Health and Nutrition Examination Survey. The data from the Korea National Health and Nutrition Examination Survey were data obtained through the sampling method.

A. Research design

This study was a secondary data analysis study using raw data obtained through the 8th Korea National Health and Nutrition Examination Survey (KNHANES VIII-1) to determine the relationship between Koreans' subjective body shape perception and weight control method and whether the nutritional labeling recognition in the intake of health functional food has an influencing factor.

B. General Characteristics and Analysis Method

For the analysis of general characteristics, the paper in was cited [6].

The data were analyzed the data using IBM SPSS 21.0 program. Frequency Analysis and chi-square test method was conducted. The significance level was set at $p < .01$.

C. Ethical considerations

This study was conducted after receiving approval from the Bioethics Review Committee of Kwangju Women's University (IRB No. 1041465-202109-HR-002-32). The raw data of the Korea National Health and Nutrition Examination Survey provides de-identified data so that individuals cannot be estimated.

III. Results

A. Relationship with dietary supplement intake according to subjective body shape perception

The results regarding the subjective body shape perception of the study subjects were as follows. The total number of participants is 8107, and each item was the result of excluding missing values. Figure 2 showed the results of the very skinny, a little skinny, commonly, slightly overweight, and very obese of the subjects were expressed through frequency analysis. In subjective body shape perception, very obese was 7.7%, slightly overweight was 28.9%, a little skinny was 12.3% and very skinny was 4.3%.

In subjective body shape perception, very obese and slightly overweight showed higher results than the perception that they were a little skinny and very skinny as shown in Figure 2.

The result of a correlation analysis on the recent experience of whether you have taken dietary supplements according to subjective body type recognition.

According to the results of a correlation analysis of the recent experience with whether you have taken dietary supplements, it was found that 60.1% of them were commonly, 58.4% of slightly overweight, and 56.4% of a little skinny people, regardless of their subjective body shape perception as shown in Table 1.

Fig 2. Subjective body shape perception

B. Relationship with dietary supplement intake according to weight change for 1 year

The result of a correlation analysis on the recent experience of whether you have taken dietary supplements according to weight change for 1 year. According to the results of a correlation analysis of the recent experience with whether you have taken dietary supplements, it was found that 61.9% of them were no change, 58.3% of weight loss, and 58.2% of weight gain people, regardless of their weight change for 1 year as shown in Table 2.

In the case of dietary supplement intake according to body weight change for one year, there was an interest in taking dietary supplements regardless of whether there was a change in body weight, decreased or increased body weight.

C. Relationship with dietary supplement intake according to weight control method

The result of a correlation analysis on the recent experience of whether you have taken dietary supplements according to weight control for 1 year.

According to the results of a correlation analysis of the recent experience with whether you have taken dietary supplements for 2 weeks or more in the past year, it was found that 61.9% of them were weight loss efforts, 60.9% of weight maintenance effort, and 52.7% of weight gain effort people, regardless of their weight change for 1 year as shown in Table 3.

According to the results of a correlation analysis of the recent experience with whether you have taken dietary supplements for 2 weeks or more in the past year, it was found that 77.8% of yes in health functional food of weight control method. Whether you have taken dietary supplements for 2 weeks or more in the past year according to weight control method: health functional food as shown in Table 4.

Whether you have taken dietary supplements for 2 weeks or more in the past year according to weight control method: exercise as shown in Table 5. The results of the recent experience with whether you have taken dietary supplements, it was found that 62.6% of yes in exercise of weight control method.

Table 1. Whether you have taken dietary supplements for 2 weeks or more in the past year according to subjective body shape perception

Characteristics	Categories	Whether you have taken dietary supplements for 2 weeks or more in the past year			
		Yes		No	
		N	%	N	%
Subjective body shape perception	very skinny	147	48.2	158	51.8
	a little skinny	495	56.4	382	43.6
	commonly	1558	60.1	1034	39.9
	slightly overweight	1186	58.4	846	41.6
	very obese	294	54.5	245	45.5
	Unmatched	247	73.1	91	26.9
	Unknown	30	45.5	36	54.5
Total		3957	58.6	2792	41.4
χ 2(p)		55.327 (<.000) ***			

p***<.001

Table 2. Whether you have taken dietary supplements for 2 weeks or more in the past year according to weight change for 1 year

Characteristics	Categories	Whether you have taken dietary supplements for 2 weeks or more in the past year			
		Yes		No	
Weight change for 1 year	no change	2068	59.9	1383	40.1
	weight loss	430	58.3	308	41.7
	weight gain	703	58.2	504	41.8
	Unmatched	726	56.5	558	43.5
	Unknown	30	43.5	39	56.5
Total		3957	58.6	2792	41.4
χ 2(p)		11.338 (<.023) *			

p*0.05

Table 3. Whether you have taken dietary supplements for 2 weeks or more in the past year according to weight control for 1 year

Characteristics	Categories	Whether you have taken dietary supplements for 2 weeks or more in the past year			
		Yes		No	
		N	%	N	%
Weight control for 1 year	weight loss efforts	1456	61.9	896	38.1
	weight maintenance effort	728	60.9	467	39.1
	weight gain effort	270	52.7	1101	47.3
	never tried to lose weight	247	73.1	91	26.9
	Unknown	30	46.2	35	53.8
Total		3957	58.6	2792	41.4
χ 2(p)		80.534 (<.000) ***			

p***<.001

Table 4. Whether you have taken dietary supplements for 2 weeks or more in the past year according to weight control method: health functional food

Characteristics	Categories	Whether you have taken dietary supplements for 2 weeks or more in the past year			
		Yes		No	
		N	%	N	%
Weight control method: health functional food	No	1942	60	1293	40
	Yes	242	77.8	69	311
	Unmatched	1743	55.6	1394	44.4
	Unknown	30	45.5	36	54.5
Total		3957	58.6	2792	41.4
χ 2(p)		66.696(<.000) ***			

Table 5. Whether you have taken dietary supplements for 2 weeks or more in the past year according to weight control method: exercise

Characteristics	Categories	Whether you have taken dietary supplements for 2 weeks or more in the past year			
		Yes		No	
		N	%	N	%
Weight control method: exercise	No	523	58.6	370	41.4
	Yes	1661	62.6	992	37.4
	Unmatched	1743	55.6	1394	44.4
	Unknown	30	45.5	36	54.5
Total		3957	58.6	2792	41.4
χ 2(p)		34.206(<.000) ***			

p***<.001

IV. CONCLUSION AND DISCUSSION

Studies have shown that there was a strong association between diet-health behaviors (supplement consumption) and obesity. The study also found that people who took dietary supplements had lower BMIs than those who did not. It was important to take nutritional supplements in consideration of healthy behaviors and dietary quality when consuming large or small amounts of fruits and vegetables [6].

Adolescents' weight perception did not match their actual weight. This discrepancy was more pronounced in female students using a variety of weight-control behaviors. These behaviors were motivated by perceived body weight rather than actual body mass index. Overweight adolescents should be encouraged to implement appropriate weight control measures according to their health needs [7].

A study on the effect of subjective body type perception on the selection of a weight control method was analyzed using data from the 2012 National Health and Nutrition Examination Survey.

As a result, exercise and diet control showed the highest selection frequency. This means that subjective body type recognition affects the motivation for weight control and the choice of weight control method [8].

Similar to the previous study, this study also showed the result of taking food supplements along with exercise as a weight control method.

The lower the age, the higher the percentage of women who recognized a normal body shape despite being underweight. Regardless of age, women tended to evaluate their body shape based on subjective body shape rather than actual body shape, and it was said that incorrect body shape recognition and indiscriminate weight control cause nutritional problems [9].

In a study of Korean adults over 19 years of age, body shape index and subjective body recognition were reported on subjective health status and quality of life. As a result of the analysis, it was found that the negative risk of subjective health status was increased in the group that had a high body type index or did not perceive normal body shape, such as obesity or skinny body in subjective body shape recognition. In particular, it was found that the quality of life score was also statistically significantly decreased in the group in which subjective body type recognition was said to be obese [4].

What I was interested in during the course of this study was that the terms for the three primary germ layers created during gastrulation and the terms for classifying body types into somatotypes were the same. It was an opinion that the embryo inherits the genes from the parents, so the probability of inheriting the parent's inheritance was somewhat higher. In order to correctly recognized the subjective body shape, it was better to first consider the body shape of the parents who gave birth to me.

In particular, it was believed that if we subjectively recognize the body shape as slightly overweight or overweight, and find out and adjust the body shape, diet, and exercise type of our parents before incorrect eating habits, exercise, and habits occur, it will save money and time. It was also believed that the perception of the wrong body type will be improved.

Based on this study, it was used as a guideline for education for a correct understanding of subjective body shape perception. In addition, it was intended to be used as a guideline for follow-up studies on guidelines for dietary intake and weight control methods.

REFERENCES (APA STYLE)

[1] Gilbert, Scott F.〈The Epidermis and the Origin of Cutaneous Structure〉. 《Developmental Biology》. 2003.

[2] European Food Safety Authority, European Commission. 2009.
https://www.efsa.europa.eu/en/topics/topic/food-

supplements.
[3] Encyclopædia Britannica.
https://www.britannica.com/science/ectomorph
[4] Jae-Hyun Kim. Association between Body Shape Index,Perceived Body Shape and Self-Rated Health, Quality of Life in Korean Adults population Using Sixth Korea National Health and Nutrition Examination Survey. *Health and Social Welfare Review*. 2018;38(4):323-40.
[5] Ranjani R. Starr. Too Little, Too Late: Ineffective Regulation of Dietary Supplements in the United States. *Am J Public Health*. 2015;105(3):478-85.
[6] Hae-Ryoung Park. Analysis of Recognition of Nutrition Labeling in Korean: Report Based on 2019 Korea National Health and Nutrition Examination Survey Data. *International Journal of BioScience and Applications*. 2021;3(2):10-23
[7] Patrick CH Cheung, Patricia LS Ip, ST Lam, Helen Bibby. A study on body weight perception and weight control behaviours among adolescents in Hong Kong. *Hong Kong Med J.* 2007;13:16-21.
[8] Jeong-Eun Yoo, Dal-Seok Oh, Nam-Kwen Kim. How Does Body-Shape Perception Affect the Weight Control Practices: 2012 Korea National Health and Nutrition Examination Survey. *J Korean Med Obes Res.* 2014;14(1):29-35.
[9] Young-Suk Lim, Na-Ri Park, Su-Bin Jeon, So-Yeon Jeong, Zuunnast Tserendejid, Hae-Ryun Park. Analysis of Weight Control Behaviors by Body Image Perception among Korean Women in Different Age Groups: Using the 2010 Korea National Health and Nutrition Examination Survey Data. *The Korean Society of Community Nutrition*. 2015: 20(2): 141-50.