

# Evaluation of Health Information System to Reduce Overweight and Abdominal Fat

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**Abstract** This study is to evaluate the health information system for reducing weight and abdominal obesity patients. This survey analyzed 102 patients who visited family medicine in the metropolitan area. Data were collected through questionnaires and interviews. The basic information of the study subjects was conducted by the Chi-square test. T-test was conducted to compare the application of the information system to reduce overweight and abdominal obesity. T-test was performed for overweight and abdominal obesity status before the information system and after 8, 16, 24 and 32 days. The research results are as follows. Firstly, in the case of BMI, if it was  $30\text{m}^2/\text{kg}$  or higher, it was significantly higher than 86.3% in the experimental group than 19.6% in the control group ( $X^2=11.57$ ,  $p<.01$ ). Secondly, fecal habits increased significantly after application than before the health information system was applied ( $t=5.13$ ,  $p<.05$ ). Thirdly, jogging habits increased significantly after application compared to before and after application of the information system. In conclusion, it was confirmed that this information system has the effect of reducing overweight and abdominal obesity. This is expected to contribute to building infrastructure in the field of health information systems.

## 1. Introduction

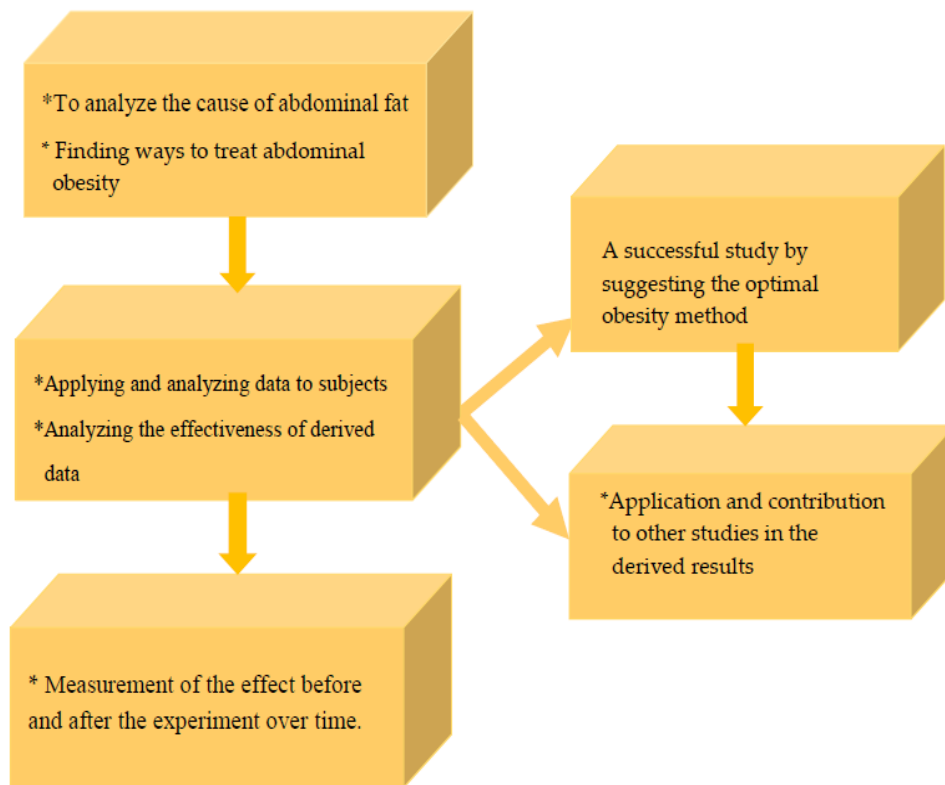
Abdominal obesity is a condition in which excessive fat is accumulated in the abdomen. It's more important than obesity such as arms, legs, and so on. This applies to cases of 90cm for men and 85cm for women based on waist circumference of Koreans [1],[2]. The cause of abdominal obesity is basically an imbalance between the energy consumed and the energy consumed. It occurs when people consume more energy than people consume. Specifically, excessive food intake and decreased physical activity are the main causes. Genetic factors, changes in intestinal microorganisms, menopause, endocrine diseases that cause obesity and side effects of various drugs. There are few symptoms of abdominal obesity itself, but various symptoms may appear due to various complications [3]. Typically, reflux esophagitis can cause symptoms such as nausea. If knee arthritis occurs due to abdominal obesity, knee pain may occur. Abdominal fat can be divided into subcutaneous and abdominal fat according to its distribution [4],[5]. Severe accumulation of abdominal fat increases the risk of complications such as high blood pressure, diabetes, hyperlipidemia, and cardiovascular disease. Measures are needed to prevent abdominal obesity [6],[7].

Previous studies are limited to the prevention of obesity, and no non-treatment studies have been conducted for visceral spleen [8],[9]. Therefore, this study is to evaluate health information system to reduce overweight and abdominal obesity.

## 2. Materials and Methods

### 2.1 Strategies of information systems for obesity and weight loss

Figure 1 presents the strategy of the information system for obesity and weight loss. Firstly, it performs the effect of obesity treatment through the application of the health care information system. Secondly, an experiment is applied to treat obesity in the study subjects. Thirdly, after analyzing the derived results, it is applied to other studies.



**Figure 1.** Strategies of information systems for obesity and weight loss

## 2.2 Materials

This study was conducted on 102 people from June 8th to August 6th, 2021, at the family medicine department located in Metropolitan Area. 51 people who mediated in the health information system were classified as patients and 51 people who did not mediate as controls. Data were collected through questionnaires and interviews.

## 2.3 Methods

The basic information of the study subjects was conducted by the Chi-square test. The status before and after the application of the information system of the abdominal obesity experiment was performed by t-test. Abdominal obesity was measured before and after the application of the information system, 8, 16, 24 and 32 days later.

## 3. Results

### 3.1. Basic information about the subjects

Table 1 presents basic information on the subjects. In the case of irregular stool habits, 82.4% of the experimental group was found to be significantly higher than 52.9% of the control group ( $X^2=4.18$ ,  $p<.05$ ). In the case of BMI, if it was  $30\text{m}^2/\text{kg}$  or higher, it was significantly higher than 86.3% in the experimental group than 19.6% in the control group ( $X^2=11.57$ ,  $p<.01$ ).

**Table 1.** Basic Information About the Subjects

Variables	Experimental	Control.	X <sup>2</sup>
	group	group	
	N(%)	N(%)	
Stool habits			
regular	9(17.6)	24(47.1)	4.18*
irregular	42(82.4)	27(52.9)	
Gender			
men	31(60.8)	22(43.1)	2.63
women	20(39.2)	29(56.9)	
Exercise			
regular	18(35.3)	22(43.1)	1.76*
irregular	33(64.7)	29(56.9)	
Food intake			
meat diet	32(62.7)	20(39.2)	6.92
vegetarian diet	19(37.3)	31(60.8)	
Eating instant food			
often	34(66.7)	29(56.9)	2.44
rarely	17(33.3)	22(43.1)	
BMI(m <sup>2</sup> /kg)			
<24.9	2(3.9)	24(47.1)	11.57**
25-29.9	5(9.8)	17(33.3)	
≥30	44(86.3)	10(19.6)	
Total	51(100.0)	51(100.0)	

\*p<.05    \*\* p<.01

### 3.2 The condition before and after the experiment for abdominal obesity treatment

Table 2 shows before and after the health information system for abdominal obesity treatment. Fecal habits increased significantly after application than before the health information system was applied( $t=5.13$ ,  $p<.05$ ). Regular jogging increased significantly after application compared to before the information system( $t=1.46$ ,  $p<.05$ ).

Table 2. The condition before and after the experiment for abdominal obesity treatment

Variables	Before	After	t
	Mean±S.D.	Mean±S.D.	
Diabetes mellitus	35.2±0.64	30.6±1.30	1.75
Eating sweet food	38.6±0.75	27.6±0.81	4.21*
LDL cholesterol	40.5±2.83	32.1±2.46	2.69
Fecal habits	23.4±1.62	41.7±1.73	5.13*
Abdominal acupressure	19.6±0.75	48.2±0.69	-3.47**
r-GTP	39.2±3.61	31.4±2.72	1.82
Regular jogging	25.4±0.53	39.2±0.16	1.46*
Drinking puer tea.	12.7±1.29	43.6±1.81	-3.28**
Eating vegetables regularly	38.2±4.64	47.3±3.25	-1.93
Drinking water often	30.1±0.76	49.2±0.93	2.61*

\* $p < .05$  \*\* $p < .01$

### 3.3 Abdominal obesity status according to time changes

Figure 2 shows the state of abdominal obesity over time. Abdominal obesity continued to decrease compared to before the health information system was applied. It slightly increased from the 16th day of application of the health information system. Then, abdominal obesity decreased again through the health information system from the 24th. It needs to be continuously managed through a health information system

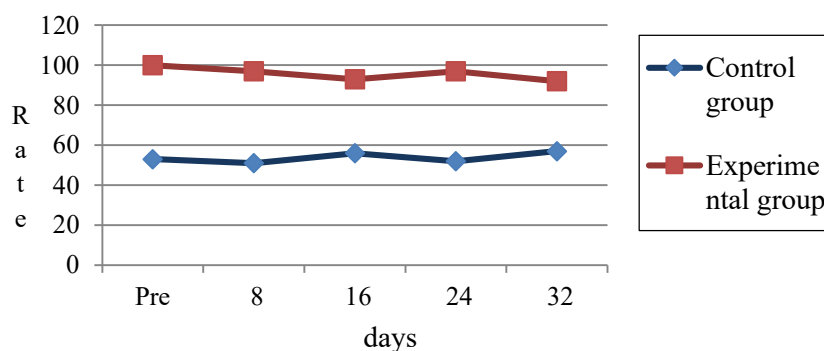


Figure 2. Changes in obesity status over time after application of the system

### 3.4 Jogging effect to reduce abdominal obesity

Figure 3 shows the effect of jogging to reduce abdominal obesity. It shows the state of abdominal obesity over time. Jogging habits increased significantly after application compared to before and after application of the information system. However, jogging decreased after the 16th. It increased again after the 24<sup>th</sup>

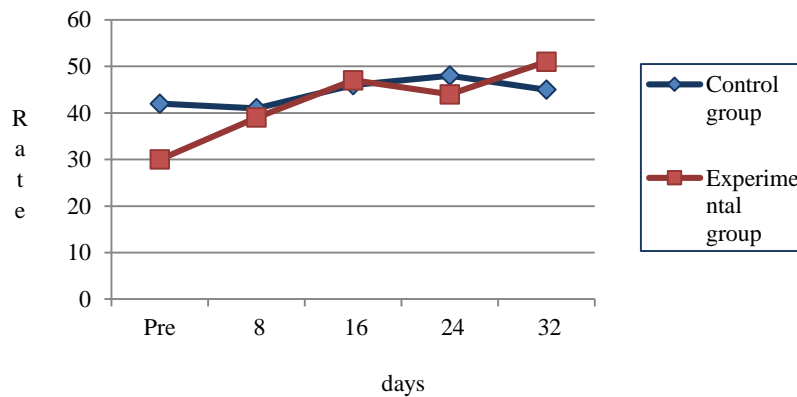


Fig 2. Eye condition of subjects by date

Figure 3 Jogging's health practice after applying the information system

#### 4. Discussion

This study is to evaluate the information system to reduce overweight and abdominal obesity. As a result of this study, abdominal fats decreased after application compared to before health information management was applied.

In particular, abdominal fat showed that daily abdominal acupuncture was effective. Therefore, abdominal fat is proposed to be managed steadily through the health information system. The results of this study showed that drinking puer tea every day significantly reduces abdominal obesity. These results were similar to those of obese patients in previous studies[10],[11].

The higher the body mass index, the worse the bone health. So, for obese people, it needs to change their eating habits such as greasy foods, sugar and keep their diet. In order to reduce abdominal obesity, it is recommended to consume fruits, vegetables, whole grains, puer tea, etc. In this study, it is suggested that diet be adjusted to control abdominal obesity. Previous studies have shown that jogging significantly reduces abdominal obesity[12],[13]. The results of this study were found to be consistent with previous studies. In obese people, it is preferable to lower the intensity of exercise to 50-60% and increase the exercise time to 60 minutes or more.

It was confirmed that the application of the health information system to obese patients in this study was effective. Through the derived results, the reduction of abdominal obesity can be extended to other studies. This study is expected to contribute to the prevention of adult diseases and other diseases

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