Journal of Digital Convergence
Vol. 20. No. 4, pp. 747-758, 2022

ISSN 2713-6434 / eISSN 2713-6442
https://doi.org/10.14400/JDC.2022.20.4.747

Factors Influencing Depression in Stressed Adults by Age

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스트레스 인지 성인의 나이에 따른 우울 영향 요인

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Abstract This study aimed to identify the factors that influence depression in stressed adults by age. Data were extracted from the 7th Korea National Health and Nutrition Examination Survey, covering 3,333 adults aged 20 to 59 years who were highly aware of stress. Linear regression analysis was performed using the IBM SPSS 25.0 program. The study found that in the case of people in their 20s, education level, health-related quality of life, obesity, weight change, smoking, and subjective body type were significant influencing factors, with an explanatory power of 60.3%. In the case of people in their 30s, gender, household income level, living with spouse, economic activity, health-related quality of life, food intake, obesity, alcohol consumption, smoking, and subjective health were significant influencing factors, with an explanatory power of 30.3%. For people in their 40s, household income level, living with spouse, economic activity, health-related quality of life, smoking, aerobic exercise, and subjective health were significant influencing factors, with an explanatory power of 34.4%. For people in their 50s, gender, education level, income, economic activity, health-related quality of life, protein intake, fat intake, high blood pressure, diabetes, weight control, aerobic exercise, subjective health, and subjective body type were significant influencing factors, with an explanatory power of 42.3%. Therefore, as it was found through this study that the factors affecting depression in stressed adults differ by age, it is necessary to establish an intervention strategy for each age when trying to lower depression in stressed adults.

Key Words : Stress, Age, Adults, Depression, Influence factor

요 약 본 연구는 국민건강영양조사 제 7기 자료를 활용하여 스트레스를 받는 20-50대 성인 3,333명을 대상으로 우울에 미치는 영향 요인을 알아보기 위해 실시되었다. 자료는 IBM SPSS 25.0 프로그램을 이용하여 회귀 분석을 실시하여 분석하였다. 20대의 경우 학력, 건강 관련 삶의 질, 비만, 체중변화, 흡연, 주관적 체형이 유의한 영향요인으로 나타났으며, 설명력은 60.3%였다. 30대의 경우 성별, 가구소득 수준, 배우자와 동거, 경제활동, 건강 관련 삶의 질, 음식섭취량, 비만, 음주, 흡연, 주관적 건강이 유의한 영향요인으로 나타났으며 설명력은 30.3%이었다. 40대는 가구소득 수준, 배우자 동거, 경제활동여부, 건강 관련 삶의 질, 흡연, 유산소 운동, 주관적 건강이 유의한 영향요인이었으며 설명력이 34.4%이었다. 50대에서는 성별, 학력, 소득, 경제활동, 건강 관련 삶의 질, 단백질 섭취, 지방 섭취, 고혈압, 당뇨병, 체중조절, 유산소운동, 주관적 건강, 주관적 체형이 유의한 것으로 나타났고 설명력은 42.3%이었다. 따라서, 본 연구를 통하여 스트레스를 받는 성인의 우울에 영향을 미치는 요인이 연령별로 차이가 있음이 밝혀졌으므로 스트레스를 받는 성인의 우울을 낮추고자 할때 연령별 중재전략 수립이 필요하다.

주제어 : 스트레스, 나이, 성인, 우울, 영향요인

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Received February 4, 2022
Revised March 19, 2022
Accepted April 20, 2022
Published April 28, 2022

1. Introduction

Depression, a mood disorder, is accompanied by feelings of loss, frustration, guilt, numbness, and dysfunction [1]. Depression is not just an individual mental health problem, but a global health crisis as well. Therefore, protection and promotion of mental health is a global health goal [2].

The World Health Organization reported in 2015 that depression was the single largest cause of disability [3]. More than 350 million people worldwide suffer from depression, which has a negative impact on their lives [4].

A previous study found that socioeconomic problems are one of the main causes of an increase in the prevalence of depression [5]. There are a wide variety of socioeconomic factors, including disease status [6,7], marital status [8], sex [9,10], environmental and financial problems [11], and stressful life [12]. Depression is associated with quality of life [13] and is affected by regular exercise [14], changes eating habits and individual attitudes toward eating [15], and acts as a risk factor for nutrient intake [16]. In addition, it was found that subjects with past smoking experience and current smokers were more associated with depression than non-smokers [17], and that drinking was also associated with depression [18]. Subjective perceptions of self, such as subjective health and subjective body imag, are related to depression [19].

Moreover, a history of past depression is related to late-life depression [20,21]. Therefore, people who experience depression in early or middle adulthood are more likely to experience depression in old age. Early detection and appropriate treatment can recover the depression of the elderly at a very high rate, and the longer the period, the more difficult the treatment [22]. This is why intervention for depression should take place before old age.

Adults are responsible for their family's economic standing. Adulthood is significant as a time when people find the meaning of life and restructure the identity of their life [23]. Uncontrolled depression in early or middle adulthood is expected to have a negative impact on adult developmental tasks, which in turn will negatively affect later life.

Leading a stressful life and facing demanding situations are the main causes of depression.

The strong relationship between stress and depression is evident: high levels of stress serve as a trigger for depression. However, there are only a few studies that have examined the combination of stress and depression, that is, the factors that affect depression in people experiencing stress.

Previous studies have not consistently reported the results of whether age is related as a risk factor for depression [24]. Depression increased with age in five patients and decreased with age in three patients, while there was no difference according to age in four patients. In addition, recent studies have found that there are differences in stress and response to stress by age [25]. Existing studies have used stress as a dependent variable and confirmed the stress change caused by each independent variable. Because stress acts as an important variable that causes depression, stress has more than just a dependent variable. Stress can be an important reference point for classifying subjects. In other words, it is necessary to classify subjects according to criteria such as whether they perceive stress as high or not, and establish a depression intervention strategy suitable for each characteristic. However, to date, few studies have been found that consider both stress and age. In addition, subjects who perceive that they are under high stress and those who do not perceive that they are under high stress are expected to have very different characteristics. The mental health problems of subjects who perceive relatively high stress are expected to have a high

priority, so research on them is necessary.

The variables used in this study were demographic and sociological factors, disease-related characteristics, and cognitive factors that were found to be related to depression in previous studies. This study aimed to identify factors that affect depression, which can cause additional mental health problems, targeting adults under high stress.

People who perceive themselves as being under a lot of stress have relatively more risk factors for depression than general subjects. Thus, the results of this study can provide meaningful basic data for establishing intervention strategies for at-risk groups.

2. Method

2.1 Study Design

This was a descriptive research study carried out to identify factors influencing depression in stressed adults according to age using data from the Seventh Korea National Health and Nutrition Examination Survey (KNHANES VII) conducted in 2014, 2016, and 2018.

2.2 Participants

KNHANES, implemented by the Korean Centers for Disease Control and Prevention (KCDC), is a nationally representative cross-sectional survey that collects information on the health status, health behavior, and food and nutrition intake of participants. The results are used as basic data for framing health policies, including setting and evaluating the goals of the national comprehensive health promotion plan and developing health promotion programs. All subjects participated in the study after giving their informed consent.

In this study, data on 3,333 adults aged 20 to 59 years who were highly aware of stress were extracted (the total number of subjects was 23,692 in KNHANES conducted in 2014, 2016, and 2018). There were 666 participants in their 20s, 1,013 in their 30s, 892 in their 40s, and 762 in their 50s.

2.3 Measurements

2.3.1 Demographic Characteristics

The following demographic characteristics of the participants were used from the data:

Age (20s, 30s, 40s, 50s), gender (male, female), household income (upper, middle, lower), education level (≤ middle school, high school, ≥ college), living with spouse (yes, no), economic activity (yes, no), QOL (score on EuroQol-5 Dimension [EQ-5D]), food intake (grams per day), protein intake (grams per day), fat intake (grams per day), and carbohydrate intake (grams per day).

2.3.2 Physical and Psychological Factors

The following physical and psychological characteristics of the participants were used from the data:

Obesity (BMI: kg/m^2, underweight <18.5, normal 18.5-24.9, obese ≥25), weight change (gain, loss, no change for 1 year), weight control (reduction, maintenance, increase, no effort for 1 year), alcohol drinking (yes, no), smoking (yes, no), aerobic physical activity (yes: when you perform medium-intensity physical activity for 2 hours and 30 minutes or more, high-intensity physical activity for 1 hour and 15 minutes or more, or a mixture of medium-intensity and high-intensity physical activity [1 minute for high intensity is about the same as 2 minutes for medium intensity], no: when you do not participate), depression (score on Patient Health Questionnaire-9 [PHQ-9]), subjective health (healthy, moderate, unhealthy), and subjective body image (thin, moderate, obese).

2.4 Ethical Considerations

The KNHANES data collection process was carried out with the approval of the KCDC Research Ethics Review Committee. The Institutional Review Board number of the 2014 data was 2013-12EXP-03-5C. After 2016, the review did not proceed in accordance with the opinion of the KCDC Research Ethics Review Committee.

Data were provided in a form that could not be personally identified. Limited use was allowed for academic research purposes only. Accordingly, the researchers carried out the analysis as per the "Guidelines for Using KNHANES" and "Guidelines for the Analysis of Raw Data of KNHANES."

2.5 Statistical Analysis

Linear regression analysis was performed using the IBM SPSS 25.0 program (IBM Corp., Armonk, NY, USA). The data used in this study were extracted using a stratified cluster sampling method, and a composite sample analysis method was used by applying weights according to KCDC recommendations. Data pertaining to adults aged 20-59 years who felt a lot of stress were extracted, and factors influencing depression were identified. The significance level was set to 0.05. Chi-square tests were performed to determine the difference in general characteristics by age, and regression analysis was performed to identify factors influencing depression.

3. Results

3.1 Comparison of general characteristics according to age

There were differences between the groups with respect to all of the general characteristics (Table 1). Many men were in their 40s and women were in their 20s. Household income was higher in those in their 50s. With respect to educational levels, the prevalence of college graduates was the highest among people in their 30s, as was the rate of living with spouse. The age group that was engaged the most in economic activity was those in their 40s, and the

Table 1. General Characteristics by Age Groups (N=3,333)

Characteristics		20's n(weight %)	30's n(weight %)	40's n(weight %)	50's n(weight %)	x^2/t(p)
Gender	Male	228(43.0)	429(50.7)	404(52.7)	310(49.1)	17.98(<.001)
	Female	438(57.0)	584(49.3)	488(47.3)	452(50.9)	
Household income	Upper	217(31.5)	342(33.6)	299(33.8)	265(35.6)	55.84(<.001)
	Middle	371(55.0)	617(61.1)	513(56.7)	387(50.3)	
	Lower	77(13.5)	51(5.3)	78(9.5)	107(14.1)	
Education level	≤ Middle school	13(2.7)	27(3.0)	45(5.0)	267(35.1)	610.12(<.001)
	High school	321(51.7)	274(27.4)	352(40.2)	265(37.6)	
	≥ College	312(45.6)	676(69.7)	456(54.8)	187(27.3)	
Living with spouse	Yes	94(95.1)	764(97.8)	733(90.3)	624(85.4)	86.37(<.001)
	No	5(4.9)	20(2.2)	82(9.7)	116(14.6)	
Economic activity	Yes	399(61.2)	703(74.4)	664(79.3)	529(73.8)	70.08(<.001)
	No	247(39.8)	275(25.6)	189(20.7)	191(26.2)	
Quality of life		.95	.96	.95	.92	208.37(<.001)
Food intake (g)		1617.36	1729.92	1775.80	1626.34	50.50(<.001)
Protein intake (g)		79.31	80.20	77.80	69.89	44.37(<.001)
Fat intake (g)		62.52	57.18	53.46	41.16	32.83(<.001)
Carbohydrate intake (g)		286.92	295.51	307.05	310.62	57.23(<.001)

quality of life was lowest in people in their 50s. Food intake was the highest among people in the 40s, protein intake among those in the 30s, fat intake in people in the 20s, and carbohydrate intake in people in the 50s ($p<.001$).

3.2 Comparison of physical and psychological factors of participants according to age

There were differences between the groups in terms of physical and psychological characteristics (Table 2). The prevalence of obesity was high in subjects in their 40s and low in those in their 20s. The group with the highest weight gain was people in their 20s, and the group with the most weight loss effort was also people in their 20s. Drinking was most common in people in their 20s and smoking in people in their 40s. Aerobic physical activity was most common in people in their 20s. Depressive symptoms were also most common in those in their 20s, followed by those in their 50s, 30s, and 40s. The perception of being healthy was highest among subjects in their 20s and lowest among those in their 50s. The subjective body image of being obese was highest in people in their 40s and 30s ($p<.05$).

3.3 Factors influencing depression in stressed adults according to age

For individuals in their 20s, education level, health-related quality of life, obesity, weight change, smoking, and subjective body type were significant influencing factors, with the explanatory power being 60.3% ($p<.001$).

The lower the level of education, the lower was the level of depression. The higher the health-related quality of life a person experienced, the lower was their level of depression. It was found that people who were

Table 2. Physical and Psychological Factors of the Groups (N=3,333)

Characteristics		20's n(weight %)	30's n(weight %)	40's n(weight %)	50's n(weight %)	x^2/t(p)
Obesity	Underweight	70(12.3)	74(7.3)	31(4.0)	21(2.7)	84.71(<.001)
	Normal	389(63.4)	522(58.5)	449(57.8)	398(60.5)	
	Obese	132(24.2)	289(34.2)	281(38.1)	236(36.8)	
Weight change	Gain	253(38.4)	389(37.2)	288(31.1)	161(20.0)	95.08(<.001)
	Loss	120(17.8)	140(14.8)	115(14.1)	103(14.6)	
	No change	293(43.7)	484(48.0)	489(54.8)	497(65.4)	
Weight control	Decrease	334(48.4)	498(47.8)	431(46.7)	329(41.9)	23.10(.004)
	Maintain	37(6.4)	59(6.8)	42(5.4)	40(4.8)	
	Increase	113(17.3)	133(13.5)	137(14.6)	151(19.0)	
	No effort	182(27.8)	323(31.9)	282(33.2)	242(34.3)	
Alcohol drinking	Yes	643(96.6)	993(98.1)	847(95.2)	696(92.2)	36.14(<.001)
	No	23(3.4)	20(1.9)	45(4.8)	66(7.8)	
Smoking	Yes	253(41.5)	472(51.4)	447(55.8)	334(50.0)	36.17(<.001)
	No	413(58.5)	541(48.6)	445(44.2)	428(50.0)	
Aerobic physical activity	Yes	408(64.0)	494(52.5)	372(44.9)	293(43.1)	83.44(<.001)
	No	237(36.0)	482(47.5)	481(55.1)	427(56.9)	
Depression		5.62	4.77	4.17	4.97	29.04(<.001)
Subjective health	Healthy	159(24.1)	205(22.3)	163(20.2)	108(15.7)	50.13(<.001)
	Moderate	340(50.8)	564(56.5)	492(58.1)	368(50.4)	
	Unhealthy	147(25.1)	209(21.2)	199(21.7)	246(33.9)	
Subjective body image	Thin	134(21.7)	156(16.0)	117(13.9)	100(12.7)	48.90(<.001)
	Moderate	236(33.2)	305(29.1)	288(31.1)	287(39.5)	
	Obese	296(45.1)	552(54.9)	487(55.0)	375(47.8)	

underweight were more depressed than obese people, and depression was reduced when weight increased. Depression was lower in non-smokers than smokers and in those who thought they had a thin body compared to those who thought they were obese.

For people in their 30s, gender, household income level, living with spouse, economic activity, health-related quality of life, food intake, obesity, alcohol consumption, smoking, and subjective health were significant influencing factors, with the explanatory power being 30.3% ($p<.001$).

Men had lower levels of depression than women. The higher the household income, the lower was the level of depression. The levels of depression were also low when living with the spouse and engaging in economic activities. The higher the health-related quality of life, the lower the depression, while the higher the food intake, the higher the depression. People who were underweight were more depressed than obese people. Subjects who drank and smoked were more depressed than those who did not. It was found that when the subjective perception of being healthy was higher, the levels of depression.

For people in their 40s, household income level, living with spouse, economic activity, health-related quality of life, smoking, aerobic exercise, and subjective health were significant influencing factors, with the explanatory power being 34.4% ($p<.001$).

Depression was found to be lower when living with the spouse and performing economic activities. The higher the health-related quality of life, the lower the depression. Subjects who drank and smoked were more depressed than those who did not, and when the subjective perception of being healthy was higher, the levels of depression were lower.

For people in their 50s, gender, education level, income, economic activity, health-related quality of life, protein intake, fat intake, high blood pressure, diabetes, weight control, aerobic exercise, subjective health, and subjective body type were significant influencing factors. The explanatory power was 42.3% ($p<.001$).

Men were less depressed than women, and high school graduates were found to have lower depression levels than college graduates and others with higher educational attainments. The higher the quality of life and economic activity, the lower was the depression. Depression increased as protein intake increased, and depression decreased as fat intake increased. Subjects who maintained their weight were less depressed than those who did not control weight, and those who drank and smoked were more depressed than those who did not. Subjectively, the healthier they perceived themselves to be, the lower was their depression. Subjects who perceived their body shape as obese had lower depression levels than those who perceived their body shape as normal.

4. Discussion

This study was conducted to identify the factors influencing depression in stressed adults according to age. Data were extracted from the 7th Korea National Health and Nutrition Examination Survey (KNHANES VII).

The main research results are as follows. Educational background, health-related quality of life, obesity, weight change, smoking, and subjective body type in their 20s were significant influencing factors. In their 30s, gender, household income level, living with a spouse, economic activity, health-related quality of life, food Intake, obesity, drinking, smoking, and subjective health were found to be significant influencing factors. In the case of 40s, household income level, cohabitation with spouse, economic activity, health-related quality of life,

smoking, aerobic exercise, and subjective health were significant influencing factors. In 50s, gender, educational background, income, economic activity, health-related quality of life, protein Intake, fat intake, high blood pressure, diabetes, weight control, aerobic exercise, subjective health, and subjective body type were found to be significant. In all age groups, health-related quality of life was a significant influencing factor for depression. Smoking was a common influencing factor in the 20s, 30s, and 40s, but smoking was not a significant influencing factor in the 50s. Moreover, the intake of nutrients such as protein and fat and chronic diseases such as high blood pressure and diabetes mellitus were significant influencing factors in the 50s, suggesting that age characteristics such as the pursuit of dietary changes due to the increase in diseases were reflected [26].

The discussion focuses on the major research results. Most of the previous studies have identified the risk factors for depression in general subjects by age and gender, but none of them have focused only on subjects under stress, which is the subject of this study. Therefore, the discussion is challenging because the characteristics of the study subjects are different. The study findings showed that quality of life was lowest in those in their 50s. In countries other than South Korea, it appears to show a "U-shape," reflecting an increase in the quality of life in younger people, a decrease in middle-aged people, and then a slight increase in old age [27]. However, these results may differ by country. In particular, in South Korea, although findings vary by study, quality of life has been shown to continuously decrease as age increases [28]. The results are similar to those of the present study. Cultural differences could be the cause of these results. In order to improve the quality of life in middle and old age, economic stability and health are important. The level of preparedness influences the quality of life in old age: if you are not prepared, quality of life will inevitably deteriorate. However, the main purpose of this study was to identify the influencing risk factors for depression rather than deterioration of quality of life; therefore, further research is suggested.

As a result of this study, a significant influencing factor of depression in the 20's and 50's was educational background. The lower the education level, the lower the depression, and this result is contrary to the previous research [29] that the depression increases when the education level is low. In previous studies [29], depression was high when the level of education was low throughout the life cycle, and the socioeconomic status of subjects with low level of education was also relatively low, so it was discussed that it was related to health inequality. Because the participants of this study recognized that they were under stress, it is considered that they were affected by the precondition of stress perception. In addition, the 20's and 50's are considered to have different characteristics from adults in their 30's and 40's as they enter the early adulthood and old age. However, as this study is a cross-sectional study, it has the disadvantage that it cannot confirm the change trend according to the change of age. Therefore, it is necessary to reconfirm it through future longitudinal studies.

There was a difference in food intake according to age. Fat intake was highest in people in their 20s, protein in people in their 30s, and carbohydrates in those in their 50s. The results of this study are similar to previous research findings that young people with a high frequency of eating out mainly eat foods that are high in protein and fat but low in carbohydrates [30].

In the case of people in their 30s and 40s, alcohol consumption and smoking were linked to depression. In a previous study of adults over 40

Table 3. Factors Influencing Depression in Stressed Adults according to Age (N=3,333)

Characteristics		20's		30's		40's		50's	
		B	t(p)	B	t(p)	B	t(p)	B	t(p)
Gender (Female)	Male	0.284	0.22(.820)	−1.013	−2.56(.011)	−0.771	−1.88(.060)	−2.704	−5.41(<.001)
Household income (Lower)	Upper	−0.843	−1.06(.288)	−1.733	−2.30(.022)	−0.717	−1.08(.277)	−0.155	−0.29(.770)
	Middle	−0.134	−0.13(.889)	−1.532	−2.26(.024)	0.270	0.43(.665)	0.212	0.41(.681)
Education level (≥ College)	≤ Middle school	−3.636	−3.03(.003)	−0.802	−1.42(.155)	−0.114	−0.16(.872)	−0.255	−0.62(.533)
	High school	−0.980	−1.16(.246)	−0.077	−0.24(.810)	0.226	0.88(.378)	−0.803	−2.25(.025)
Living with spouse (No)	Yes	0.458	0.29(.772)	−1.809	−3.79(<.001)	−1.221	−2.00(.047)	−0.489	−1.05(.291)
Economic activity (No)	Yes	−0.781	−1.10(.270)	−1.255	−3.95(<.001)	−0.858	−2.47(.014)	−1.347	−3.69(<.001)
Quality of life		−22.70	−5.12(<.001)	−21.474	−10.42(<.001)	−16.490	−8.99(<.001)	−13.651	−11.52(<.001)
Food intake(g)		−0.001	−0.92(.357)	0.001	2.12(.034)	−0.001	−1.46(.145)	−0.001	−1.20(.230)
Protein intake(g)		−0.007	−0.27(.781)	−0.004	−1.02(.308)	0.001	0.06(.948)	0.018	3.01(.003)
Fat intake(g)		0.101	0.61(.536)	−0.001	−0.13(.891)	0.005	1.06(.286)	−0.014	−2.60(.010)
Carbohydrate intake(g)		−0.004	−1.50(.134)	−0.002	−1.14(.255)	−0.001	−0.14(.883)	0.002	1.64(.102)
Obesity (Obese)	Underweight	4.002	2.17(.030)	2.201	2.74(.006)	1.040	1.61(.108)	0.750	0.99(.321)
	Normal	1.862	1.90(.058)	0.172	0.55(.582)	0.524	1.54(.125)	0.708	1.96(.051)
Weight change (No change)	Gain	−1.932	−1.97(.049)	0.056	0.18(.854)	1.054	1.61(.108)	0.518	1.20(.231)
	Loss	1.041	1.03(.302)	0.231	0.68(.493)	0.844	1.54(.125)	0.162	0.42(.672)
Weight control (No effort)	Decrease	−0.835	−0.89(.374)	−0.442	−1.51(.132)	−0.097	−0.29(.770)	−0.081	−0.21(.827)
	Maintain	3.312	1.64(.100)	0.119	0.14(.884)	0.146	0.30(.763)	−1.114	−2.20(.029)
	Increase	1.532	1.22(.222)	−0.793	−1.79(.074)	−0.414	−1.02(.304)	−0.208	−0.60(.546)
Alcohol drinking (Yes)	No	1.446	0.93(.348)	−0.933	−2.58(.010)	0.617	0.90(.368)	−0.985	−1.83(.067)
Smoking (Yes)	No	−1.984	−2.35(.019)	−1.100	−3.42(.010)	−0.930	−2.51(.013)	−1.780	−3.71(<.001)
Aerobic physical activity (Yes)	No	0.874	1.12(.264)	−0.183	−0.68(.492)	−0.500	−2.07(.039)	−0.579	−2.24(.026)
Subjective health (Unhealthy)	Healthy	−2.013	−1.60(.109)	−2.098	−5.81(<.001)	−1.395	−2.96(.003)	−2.137	−5.16(<.001)
	Moderate	1.026	1.15(.250)	−1.308	−4.04(<.001)	−1.017	−2.81(.005)	−1.458	−4.10(<.001)
Subjective body image (Obese)	Thin	−7.226	−4.15(<.001)	−0.261	−0.58(.557)	−0.910	−1.63(.104)	0.248	0.46(.644)
	Moderate	−2.082	−1.69(.092)	−0.603	−1.90(.057)	−0.386	−0.99(.332)	−0.823	−2.22(.027)
R^2/F/p		R^2=.603, F=119.09, p<.001		R^2=.303, F=15.15, p<.001		R^2= .344, F=16.78, p<.001		R^2= .423, F=26.83, p<.001	

years of age, subjects who were current or formers smokers were found to have significantly higher depression levels compared to those who did not smoke [31], which is in line with the results of this study. In addition, it has been reported that drinking is not only linked to depression, but also has a dose-response relationship in that the worse the alcohol drinking problem is, the more severe is the depression [32]. In other words, it can be seen that representative elements of health behavior such as smoking and alcohol drinking are important influencing factors of depression. The results of this study confirm the possibility of controlling depression by changing health behaviors such as smoking and alcohol drinking. Therefore, it can be predicted that improving the smoking and alcohol drinking habits of people in their 30s and 40s will improve not only physical health but also mental health. In addition, it is thought that it will be meaningful to measure depression as an outcome variable when

conducting health behavior intervention studies of smoking and alcohol drinking in the future, and a greater impact can be expected by implementing a program to manage depression alongside smoking and drinking prevention.

Among subjects in their 20s, those who perceived themselves to be thin had lower levels of depression, while those who perceived themselves as being obese were more depressed. The finding is consistent with that of previous studies on adolescents, which showed that subjects who perceive themselves to be obese feel more depressed [33]. However, this study also found that subjects who were thin based on their BMI were actually more depressed than the obese subjects. In other words, there was distortion between the actual body shape represented by BMI, which is the objective data, and the subjective body image. Distortion between the actual body shape and subjective body image causes depression and decreases self-esteem. Depression and decreased self-esteem are important because they can be linked to other mental health problems. However, the relationship between obesity and depression has not been consistent in previous studies. While previous studies have reported that there is a relationship between obesity and depression [34] contradictory results have been reported that there is no or weak association [35]. Therefore, repeated studies or intervention studies that can verify causality are needed.

However, among subjects in their 30s and 50s, those who perceived themselves to be thin or normal had lower levels of depression than those who perceived themselves to be obese. Among people in their 20s, depression is low when they perceive themselves to be thin, reflecting their preference for a slim body. However, subjects in their 50s appeared to prefer the normal condition rather than the thin condition. In a previous study of people aged 50 to 64 years, depression was high in those who perceived themselves as being thin [36]. In South Korea, people in their 50s and over have had the experience of living in a period when they had relatively little to eat compared to younger people, so they thought that a body that was not thin was beautiful [37]. A thin body may have an image linked to poverty. However, with the rise in awareness of health problems related to obesity, the preference for obese body types is gradually decreasing. In addition, in previous studies of people aged 60 years or older and 65 years or older, it was found that underweight subjects not only perceived their health to be the worst, but also felt most depressed [38,39]. These perceptions of weight and health have a similar context for those in their 50s, so it can be assumed that they start in the 50s. To prevent depression in old age, it is meaningful to control depression through physical intervention, which adjusts the weight of subjects in their 50s to the normal range, and psychological intervention, which improves the subjective body image. This study found that there was distortion between their actual body shape and subjective body image. In reality, the thin subjects were more depressed, but psychologically, they exhibited a contradiction in favoring a thin body. The preference for a lean body can be associated with an effort to lose weight even further, and since leanness is linked to depression, such weight loss efforts can actually increase depression. In addition, people in their 30s also had higher depression levels when the actual body type was thin, so it is necessary to develop a problem-solving intervention from the same perspective as that for those in their 20s.

This study has several limitations. As a cross-sectional study, it does not reflect long-term changes. In addition, there is a limit to the selection and adjustment of variables in secondary data analysis, thereby restricting the expansion of the research results. And, it is a study that extracts and analyzes only adults who

perceive stress, and it has the advantage of being different from previous studies as it can be seen that the condition of stress perception acts on the depressive influencing factors. In the future, it is necessary to verify the results through a study that compares and analyzes those who perceive stress and those who do not. However, despite these limitations, there is an advantage in that the findings can be applied to the development of a subject-centered intervention program for depression targeting only stressed people.

5. Conclusion

This study was conducted to identify the influencing factors of depression according to age from 20s to 50s in adults who are highly aware of stress. Unlike previous studies, this study extracted only adults who perceived stress high among general adults and analyzed them by age. As a result, the same and non-identical influencing factors by age were identified. Depression influencing factors in their 20s, 30s, 40s, and 50s revealed through this study will serve as basic data for interventions for prevention and management of depression in adults. Moreover, before applying the program to mediate adult depression, it is necessary to distinguish between those who perceive that they are stressed and those who do not recognize that they are under stress by going through the process of checking whether they are stressed or not. Depression can be controlled more effectively by providing interventions to differentiated subjects in consideration of the influencing factors.

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