

The effect of the health type characteristics on the mental health in Korean adults experiencing COVID-19 pandemic

Min-Ju Kang¹, Seung-Woo Han^{2*}

¹Department of Paramedicine, Kyungil University, Gyeongsan-si, Gyeongsangbuk-do, South Korea

²Department of Nursing, Kwangju Women's University, Gwangsan-gu, Gwangju, South Korea

*Corresponding Author: Seung-Woo Han

Abstract

Background: This study is a descriptive survey study to identify the level of health type characteristics (drinking, smoking, sleep, and physical activity) of Korean adults and the factors affecting mental health symptoms. *Methods:* The entire subjects of this study were conducted using 224,864 raw data from the 2020 community health survey at 256 public health centers nationwide based on the Regional Health Act Community Health Survey. The collected data were analyzed using the IBM SPSS Statistics 23.0 software program. Stepwise multiple regression was used to identify the factors affecting the subject's mental health symptoms. *Results:* As a result of stepwise multiple regression analysis, all areas of yearly drinking frequency ($\beta=0.024\sim0.048$), $p<.001$), all areas of smoking ($\beta=0.037\sim0.072$, $p<.001$), average sleep time ($\beta=-0.128$, $p<.001$), physical activity ($\beta=-0.009$, $p<.001$) was identified as a factor affecting mental health symptoms. *Conclusion:* we would need a social atmosphere and system that maintains and manages infectious diseases in a society where the COVID-19 pandemic coexists, away from the past coping power to fight against infectious diseases.

Keywords: Korea; health type; mental health; adult

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I. Introduction

Coronavirus (COVID-19), spread rapidly with its first outbreak in Wuhan, China in 2019, had a huge impact on society as a whole since the first COVID-19 confirmed case occurred in Korea on January 20, 2020¹. This pandemic was the first environmental disaster experienced in Korea, fought the disease without knowing the fatality rate, transmission power, and treatment. difficult to estimate the extent of damage due to its persistence unlike typhoons, floods, and various incidents². Global infectious diseases such as COVID-19 are known to have a direct impact on mental and psychological health due to the social distancing policies preventing the spread such as self-quarantine and social distancing³. Infectious disease epidemics cause psychological problems such as anxiety, fear, helplessness, and post-traumatic stress to the general public as well as confirmed patients and work workers⁴.

In particular, the physical distancing experiences caused by COVID-19, self-quarantine or social distancing, have the potential to change the characteristics of Koreans' lifestyles and health patterns. Previous studies in Italian adults indicated that the quality of sleep (Pittsburg Sleep Quality Index) decreased during self-quarantine due to the pandemic, but the average sleep time was rather prolonged⁵. In terms of physical activity, there is a report that it dropped from 133 min/week before the pandemic to 95.5 min/week during the pandemic⁶. In addition, in the results of a study on drinking and smoking patterns among British adults, it was reported that there is a tendency to quit smoking and refrain from alcohol after the pandemic⁷. Changes in health type characteristics due to distancing are considered to affect mental health, and identifying the factors affecting mental health of various health type characteristics would contribute to early identification of health risk factors and promotion of health. The pandemic with no sign of an end in the absence of treatment could affect the mental health of all levels of society in various forms. Nevertheless, the reality is that the effect on mental health is overlooked, and no proper management plan was proposed. Therefore, this study aims to provide basic data for improving self-management capabilities to maintain healthy mental health in the event of new infectious diseases such as the pandemic by investigating the effects of health type characteristics such as drinking, smoking, sleep, and physical activity in Korean adults.

II. Methods

2.1. Research designs

This study is a descriptive survey study to identify the level of health type characteristics (drinking, smoking, sleep, and physical activity) of Korean adults and the factors affecting mental health symptoms.

2.2. Research data and subjects

The target population of this study is adults aged 20 or older living in cities, counties, and districts across the country and an average of 900 people per health center were extracted and selected by a multi-stage probability sampling method, and data were collected by a computer-assisted personal interviewing (CAPI) method using a built-in laptop. The entire subjects of this study were conducted using 224,864 raw data from the 2020 community health survey at 256 public health centers nationwide based on the Regional Health Act Community Health Survey, started in 2008 by the Korea Centers for Disease Control and Prevention,

2.3. Research tools

Independent variable

The yearly drinking frequency was measured as a categorical scale with seven questions; "I haven't drunk in the last year," "less than once a month," "about once a month," "about 2-4 times a week," "about 2-3 times a week," "more than four times a week," and "haven't drunk in my life." Smoking was also measured with four questions: 'I smoke every day,' 'smoke occasionally,' and 'smoked in the past, but do not smoke now.' 'have never smoked in my life.' The average sleep was measured as the average sum of 'How many hours do you sleep during the week?' and 'How many hours do you sleep on the weekend?'. Physical activity (days) was measured as the average sum of "How many days have you done intense (high intensity) physical activity and moderate (medium intensity) physical activity for more than 10 minutes in the past week?" and "How many days have you walked for at least 10 minutes in the past week?".

Dependent variable

The mental health symptom scale consists of a 9-item, 4-point Likert scale with the question, "How often have you suffered from mental health symptoms in the past two weeks?". Each item has 0 points "not at all" to 3 points "almost every day", indicating that the higher the score, the more frequent the mental health symptoms are experienced.

2.4. Data analysis

The collected data were analyzed using the IBM SPSS Statistics 23.0 software program (IBM Corp, Armonk, NY, USA). The general characteristics of the subjects were analyzed using descriptive statistics. The mean, standard deviation, and frequency of drinking, smoking, average sleep, and physical activity were analyzed. In order to compare the difference in the degree of mental health symptoms according to general characteristics, the mean, standard deviation, t-test, and one-way ANOVA were used. Stepwise multiple regression was used to identify the factors affecting the subject's mental health symptoms.

2.5. Ethical consideration

The community health survey was conducted to calculate statistical data determining the health status of local residents for establishing and evaluating evidence-based health policies. In the survey, consent was obtained from all subjects prior to data collection, and the data was released after approval by the Bioethics Review Committee of the Korea Centers for Disease Control and Prevention (approval-no.-117075). This study prepared a pledge to use raw data from the Korea Centers for Disease Control and Prevention and used after obtaining approval. The data were analyzed after receiving data with deleted personally identifiable information.

III. Result

3.1. General characteristics of the subject

The general characteristics of the subjects are as follows. In terms of gender, females accounted for 54.7%, which was higher than males with 45.3%. In terms of age, 'over 50' was the highest at 62.5%, and for marriage, 'yes' was 83.3%. In terms of education level, 'high school diploma or less' showed the highest at 62.7%, and 'good' in terms of general health showed the highest at 47.7%. In terms of the current job status, 61.2% answered 'Yes', 75.6% of the current residence period was '20 years or more', and 58.5% of the recent vaccinations were "yes" (Table 1).

Table 1. General characteristics of the subject

Variable	Category		
		n	%
	Total	224,864	100.0
Gender	Male	101,879	45.3
	Female	122,985	54.7
Age	20-29	23,438	10.4
	30-39	25,158	11.2
	39-40	35,727	15.9
	50 \leq	140,541	62.5
Marriage	Yes	187,347	83.3
	No	37,517	16.7
Education level	High school diploma or less	141,020	62.7
	Junior college diploma	24,999	11.1
	4-year university diploma	50,790	22.6
	More than graduate school	8,055	3.6
General health	Good	107,346	47.7
	Normal	87,195	38.8
	Bad	30,323	13.5
Current job status	Yes	137,641	61.2
	No	87,223	38.8
Current residence period	Less than 10 years	30,690	13.7
	10 years - less than 20 years	24,112	10.7
	20 years or more	170,062	75.6
Recent vaccinations	Yes	131,424	58.5
	No	93,440	41.6

3.2. Drinking, smoking, sleep, and physical activity

For the yearly drinking frequency of the subjects, 54,689 people (24.3%) answered “never in the past year”. In terms of smoking, 146,532 people (65.2%) answered “never”. The average sleep time was 6.91 (\pm 1.29) hours and physical activity was 1.88 (\pm 1.47) hours (Table 2).

Table 2. Drinking, smoking, sleep, and physical activity

Variable	n/M	%/SD
Yearly drinking frequency		
Not at all over the past year	40,553	18.0
Less than once a month	28,931	12.9
Once a month	20,369	9.1
Twice-Four times a month	39,831	17.7
Twice-Three times a week	27,776	12.4
More than four times a week	12,715	5.7
Never in the past year	54,689	24.3
Smoking		
Every day	33,000	14.7
Sometimes	3,833	1.7
Did it in the past but not in the present	41,499	18.5
Never	146,532	65.2
Average sleep time	6.91	1.29
Physical activity	1.88	1.47

3.3. Mental health symptoms according to the general characteristics

As a result of analyzing the difference in mental health symptoms according to the general characteristics of the subject, there was a statistically significant difference in all areas (Table 3) with gender ($t=-53.13, p<.001$), age ($F=59.57, p<.001$), marriage ($t=-6.02, p<.001$), education level ($F=232.50, p<.001$), general health ($F=12,106.75, p<.001$), current job status ($t=-48.15, p<.001$), current residence period ($F=16.77, p<.001$), recent vaccination ($t=8.02, p<.001$) (Table 3).

Table 3. Mental health symptoms according to the general characteristics

Variable	Category				
		n(%)	M(SD)	t/F	p
Gender	Male	101,879(45.3%)	1.18(0.29)	-53.13	<.001
	Female	122,985(54.7%)	1.25(0.35)		
Age	20-29 ^a	23,438(10.4%)	1.22(0.35)	59.57	<.001 (b>a,d>c)
	30-39 ^b	25,158(11.2%)	1.24(0.33)		
	39-40 ^c	35,727(15.9%)	1.20(0.30)		
	50≤ ^d	140,541(62.5%)	1.22(0.33)		
Marriage	Yes	187,347(83.3%)	1.22(0.32)	-6.02	<.001
	No	37,517(16.7%)	1.23(0.35)		
Education level	High school diploma or less ^a	141,020(62.7%)	1.23(0.34)	232.50	<.001 (a>b>c>d)
	Junior college diploma ^b	24,999(11.1%)	1.21(0.32)		
	4-year university diploma ^c	50,790(22.6%)	1.19(0.29)		
	More than graduate school ^d	8,055(3.6%)	1.18(0.28)		
General health	Good ^a	107,346(47.7%)	1.14(0.23)	12,106.75	<.001 (c>b>a)
	Normal ^b	87,195(38.8%)	1.23(0.31)		
	Bad ^c	30,323(13.5%)	1.45(0.50)		
Current job status	Yes	137,641(61.2%)	1.19(0.28)	-48.15	<.001
	No	87,223(38.8%)	1.26(0.38)		
Current residence period	Less than 10 years ^a	30,690(13.7%)	1.23(0.34)	16.77	<.001 (a,b>c)
	10 years - less than 20 years ^b	24,112(10.7%)	1.22(0.33)		
	20 years or more ^c	170,062(75.6%)	1.22(0.33)		
Recent vaccinations	Yes	131,424(58.5%)	1.22(0.33)	8.02	<.001
	No	93,440(41.6%)	1.21(0.32)		

3.4. Factors affecting mental health symptoms

The mean, standard deviation, and frequency of drinking, smoking, average sleep, and physical activity were analyzed. In order to compare the difference in the degree of mental health symptoms according to general characteristics, the mean, standard deviation, t-test, and one-way ANOVA were used. Stepwise multiple regression was used to identify the factors affecting the subject's mental health symptoms.

The results of stepwise multiple regression analysis to identify factors affecting the mental health symptoms of Korean adults are as follows (Table 4). In the case of multicollinearity between independent variables, the tolerance limit was 0.580 to 0.953, which was 0.1 or higher, the Variation Inflation Factor (VIF) was 1.050 to 1.725, which was less than the reference value 10, ignoring multicollinearity, and the Durbin-Watson value was 1.672, ensuring the independence of the residuals.

As a result of stepwise multiple regression analysis, all areas of yearly drinking frequency ($\beta=0.024\sim0.048, p<.001$), all areas of smoking ($\beta=0.037\sim0.072, p<.001$), average sleep time ($\beta=-0.128, p<.001$), physical activity ($\beta=-0.009, p<.001$) was identified as a factor affecting mental health symptoms (Table 4).

Table 4. Factors affecting mental health symptoms

Variable	B	SE	β	t	p
	1.692	0.006	-	282.56	<.001
Yearly drinking frequency					
Not at all over the past year	0.035	0.002	0.041	17.18	<.001
Less than once a month	0.034	0.002	0.035	14.90	<.001
Once a month	0.028	0.003	0.024	10.57	<.001
Twice-Four times a month	0.029	0.002	0.034	13.14	<.001
Twice-Three times a week	0.040	0.002	0.040	16.11	<.001
More than four times a week	0.068	0.003	0.048	21.22	<.001
More than four times a week	ref				
Smoking					
Every day	0.067	0.002	0.072	28.55	<.001
Sometimes	0.094	0.005	0.037	18.27	<.001
Did it in the past but not in the present	0.048	0.002	0.057	22.28	<.001
Never	ref				
Average sleep time	-0.032	0.001	-0.128	-63.04	<.001
Physical activity	-0.002	0.000	-0.009	-4.66	<.001
Durbin-Watson				1.672	
Tolerance Limit				0.580~0.953	
VIF				1.050~1.725	
R ²				0.1375	
Adjusted R ²				0.1374	
F				1433.52	
p				<.001	

IV. Discussion

Only a few people maintain their daily life patterns prior to COVID-19 during the pandemic, various changes in daily life occurred. This study investigated the effect of health type characteristics such as drinking, smoking, sleep, and physical activity on mental health symptoms in Korean adults.

As a result of this study, average sleep was found to be a factor affecting mental health symptoms. The average sleep time of Koreans was 6.8 hours before COVID-19⁸. In this study, the average sleep time during the pandemic was 6.91 hours/day, which was lower than the 7.2 hours/day study of 5,525 Canadian adults. However, it showed the same context as previous studies⁹ that the average sleep pattern was a factor affecting mental health. In the future, it will be necessary to expand research in various areas, such as sleep quality, beyond factors affecting mental health due to fragmentary changes in average sleep.

Physical activity was found to be a factor affecting mental health symptoms. In this study, physical activity was 1.88 hours/day, higher than the average physical activity of Koreans before COVID-19¹⁰. However, previous studies showed that overall physical activity of adults decreased than before, and decrease in a physical activity closely affected negative mental health symptoms such as stress and depression^{11,12}. Therefore, it will be necessary to examine several factors that led to the increase in Korean physical activity during the pandemic, to understand specifically how the increased physical activity relates to mental health.

Both yearly drinking frequency and smoking experience were found to be factors affecting mental health symptoms. In previous studies¹³, drinking and smoking were negatively correlated with mental health symptoms. In other words, as COVID-19 continues, it is considered a tendency to relieve mental pain and dissatisfaction through coping resources such as drinking and smoking. Another study also found no difference between drinking and smoking during the pandemic¹⁴. However, due to the negative lifestyle changes, the more time spent passively at home, the more negatively it affects mental health. Therefore, it is necessary to examine

the relationship between changes in drinking and smoking and mental health in various demographic and sociological aspects in future studies. The limitations of this study are as follows. First, the drinking and smoking as tools of categorical measures suggested by the Community Health Survey were limited to applying the actual difference of drinking and smoking amount. Second, this survey is an annual community health survey conducted by the Korea Centers for Disease Control and Prevention, and the types of variables presented were limited. In the future, it will be necessary to conduct a research by suggesting various demographic factors affecting mental health from various angles. Based on this study, future studies will need to improve awareness of infectious diseases, find and develop various health type characteristics affecting mental health, and provide resources to cope with the new pandemic environment at the government level.

V. Conclusion

This study is a descriptive research study to identify the factors affecting mental health symptoms. In this study, the factors affecting mental health were found to affect all factors such as yearly drinking frequency, smoking, average sleep, and physical activity. Living in an era where the COVID-19 pandemic is prevalent around the world, we would need to proactively prevent new infectious diseases and develop physical and mental resistance. As of January 2022, the reality in Korea nearly 7,000 COVID-19 confirmed cases occur every day, it is necessary for the Korean government to prevent the spread of COVID-19 as well as the new mutant¹⁵. As uncertain as to know when and where the new mutant transmission will occur in the future, we would need a social atmosphere and system that maintains and manages infectious diseases in a society where the COVID-19 pandemic coexists, away from the past coping power to fight against infectious diseases.

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Declaration of Conflicting Interests

The author reports no conflicts of interest in this work.

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