Relationship Between Unmet Dental Care Needs and Mental Health: Using Data From the 7th Korea National Health and Nutrition Examination Survey

Unmet Dental Care Needs and Mental Health

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Abstract

This study utilizes the data from the 7th Korea National Health and Nutrition Examination Survey (data from 2016-2017) to understand the relationship between unmet dental care needs and mental health to suggest policies to reduce proportions of unmet dental care needs, stress, and suicide rates.

The analysis was conducted using data from 9,294 respondents from a total of 16,277 respondents. Unmet dental care needs were surveyed using a self-reported questionnaire on requiring, but failing to receive, dental care; the data were analyzed using a chi-square test and multiple logistic regression analysis of the survey.

Individuals who had unmet dental care needs had 1.56 times higher perceived stress (OR: 1.56, CI: 1.282-1.893, p<0.001) and 2.11 times higher risk of suicidal ideation (OR: 2.11, CI: 1.296-3.431, p=0.003) compared to those who did not have unmet dental care needs. Because it was implemented through secondary data analysis, it was not possible to add correction variables other than those presented in the raw data.

There was a close relationship between unmet dental care needs and mental health. Therefore, to reduce perceived stress and risk of suicidal ideation, policy measures that reduce unmet dental care needs are necessary.

Keywords: Dental Care, Dental Health Survey, Mental Health

알기 쉬운 요약

이 연구는 왜 했을까? 한국에서 정신질환 환자는 지속적으로 증가하고 있고, 다양한 선행연구는 구강건강을 그 원인으로 지적하고 있다. 그러나 한국의 치과의료 미충족률은 OECD 국가들과 비교하였을 때 매우 높은 수준에 있어 사회적·정책적 관심이 필요하다.

새롭게 밝혀진 내용은? 2016~2017년도 국민건강영양조사자료 9,294명을 대상으로 치과의료 미치료 여부(all-cause) 및 미충족 치과의료(시간, 경제적, 교통 불편)와 정신건강(스트레스, 자살생각) 사이에 통계적으로 유의한 상관관계가 있음을 밝혀냈다. 미충족 치과의료가 존재할 경우, 자살생각 위험성의 크기가 스트레스 위험보다 더 큰 것을 확인할 수 있었다.

앞으로 무엇을 해야 하나? 미충족 치과의료가 발생하는 원인에 대한 면밀한 고찰과 구강건강 개선을 위한 정책적 지원이 필요하다.

Ⅰ. Introduction

While the stress perception rates of Korean people are on the decline, marking 66.5% in 2014, 54.8% in 2016, and 54.4% in 2018, majority of Korean people are still perceiving stress (KKSI, 2019). Chronic stress has been reported to raise suicidal impulses (Yoon et al., 2010), and experience of thinking about suicide shows a high correlation with actual suicide rates (Kim, 2018). With 24.6 suicides per 100,000 population as of 2019, Korea has maintained first or second place for the highest suicide rates among OECD member states from 2002 to 2019 for a total of 17 years, and is still disgraced with the title, “Republic of Suicide” (Welfare MoHa, 2019).

Existing studies indicate that mental health is deeply related to oral problems. Friedlander et al. (Friedlander, Rosenbluth, Rubin, 2012) reported that the risk of suicide was high in oral cancer patients and those patients who have had poor surgical outcomes. Lee (Lee, 2019) suggested that experiences of teeth brushing once or less per day, pains associated with mastication, tooth fracture, and halitosis were related to suicidal thoughts in adolescents. Furthermore, Choi (Choi, 2014) reported that discomfort caused by oral problems was related to stress, and Kim et al. (Kim, 2018) stated that groups with higher rates of disorders of temporomandibular joints, xerostomia, and halitosis were subject to more stress compared to groups with lower rates of such conditions in a study of college students. To resolve issues with mental health related to oral problems, such as stress and suicidal thoughts, it is important to receive timely dental care. However, being unable to receive timely care can lead to the creation of unmet dental care needs, followed by a more adverse impact on one’s mental health.

According to the 2015 national health statistics, the oral check-up rate for adults (35-44 years old) and the elderly (65-74 years old) is 40.4% and 26.9%, respectively, showing that it is reaching its planned goals. (Yoo et al., 2017). This is extremely high compared to the average rate of unmet dental care needs of the member states of Organization for Economic Co-operation and Development (OECD), which was around 10% in 2015, 8.7% in 2016, 6% in 2017, and 4.1% in 2018 for individuals aged 16 or over (Eurostat, 2019). The primary reasons why the rate of unmet dental care needs is in a grave situation in Korea were because in their 20s, Koreans pay little attention to oral problems; in their 30s, they are unable to leave their work or school absent, and in their 40s, owing to financial reasons (Kim & Kim, 2019).

Unmet dental care needs can lead to stress, and chronic stress can lead to suicidal thoughts. Lee and Jin (Lee & Jin, 2015) reported that subjects who perceived their subjective oral health to be “bad” rather than “good” had higher unmet dental care needs, and Lee et al. (Lee et al., 2014) stated that the presence of unmet needs for medical services influenced suicidal ideation in a study of seniors aged 65 or more. Stress from unmet dental care needs may cause serious oral problems. A study by Mao (Mao et al., 2019) on American seniors aged 60 or more found that stress could directly or indirectly affect xerostomia, and Vasiliou et al. (Vasiliou et al., 2016) reported that perceived stress influenced poor oral environment. Ongoing progression of oral issues can lead to a growing need for dental treatment; however, the inability to see a dentist despite these needs may lead to a vicious cycle where unmet dental care needs increase again. However, few studies have attempted to analyze the relationship between unmet dental care needs and mental health. Thus, the purpose of this study is to utilize the data from the 7th Korea National Health and Nutrition Examination Survey (data from 2016-2017), a representative statistical data on the health and nutritional status of Korean citizens, to understand the relationship between unmet dental care needs and mental health, specifically perceived stress and suicidal ideation, to provide basic data for policies to reduce proportions of unmet dental care needs, stress, and suicide rates.

Ⅱ. Research data and subjects

This study used data from the 7th Korea National Health and Nutrition Examination Survey, of 2016 and 2017. The Korea National Health and Nutrition Examination Survey stratifies extraction framework considering regions, dong/eup/myeon administrative districts, and housing types (detached house, apartments), and utilized the ratio of residential area and proportions of educational levels of household owners as intrinsic stratification standards. The sample extraction method used was the stratified two-stage cluster sampling method where the survey unit and the households were used as 1st and 2nd extraction units. For the 1st and 2nd years of the 7th Korea National Health and Nutrition Examination Survey (2016-2017), 23 sample households were systematically sampled from a total of 192 sample survey units, excluding households such as nursing homes, army units, and prisons. In 2016, a total of 8,150 respondents out of 10,806 responded with a participation rate of 75.4%; for 2017, 8,127 respondents out of 10,430 responded with a participation rate of 77.9%. This study excluded 3,327 respondents who were aged below 19, as well as 2,905 respondents who did not require dental care and 701 respondents with missing responses, including a total of 9,294 respondents in the analysis.

1. Independent variables

1.1. Unmet dental care needs

The main independent variable in this study is the unmet dental care need. Unmet dental care needs were measured using the question, “In the past year, have you required dental treatment but been unable to receive it?” to which the respondents responded “yes” or “no.”

1.2. Oral check-up

Another major independent variable of this study is the oral check-up. Oral check-up was measured using the question, “In the past year, have you had an oral check-up to understand your oral health although you did not have specific oral issues?,” to which the respondents responded “yes” or “no.”

2. Dependent variables

2.1. Perceived stress

A dependent variable of this study is perceived stress. Perceived stress was measured using the question, “How much stress do you feel during your daily life?” and “I feel a very high level of stress” and “I feel a high level of stress” were categorized into “yes,” and “I feel a low level of stress,” and “I rarely feel stressed” were categorized into “no” for analysis.

2.2. Suicidal ideation

Another dependent variable in this study is suicidal ideation. Suicidal ideation was measured using the question, “In the past year, have you seriously considered suicide?” to which the response was recorded in “yes” or “no.”

2.3. Potential confounders

Potential confounders of this study included region, gender, age, income, educational level, marital status, subjective health, drinking, smoking, number of days per week of walking, and products used for oral health. The region variable categorized the respondents into Seoul, Metropolitan area (including Daejeon, Daegu, Busan, Incheon, Gwangju, and Ulsan), and other areas; the gender variable categorized the respondents into men and women. The age variable categorized the respondents to 29 or below, 30-39, 40-49, 50-59, 60-69, and 70 years or older; the household income variable categorized the respondents

into low, medium-low, medium-high, and high as proposed in the Korea National Health and Nutrition Examination Survey. Educational level was divided into elementary school or below, middle school, high school, and college or above. Marital status was classified into married or single (including divorced and bereaved), and subjective health was classified into good, average, and bad. Drinking variable classified the respondents to drinkers and non-drinkers, and smoking variable categorized the respondents into daily smokers, rare smokers, past smokers, and non-smokers. The number of days per week of walking classified the respondents to none, 1-2 days, 3-4 days, 5-6 days, and daily; as for the number of products used for oral health, the respondents were asked to answer the question, “Are there any other products outside of toothpaste and toothbrush for oral health?” by responding yes/no to products such as dental floss, interdental toothbrush, tooth brushing solution, electric toothbrush, waterpic/tongue cleaner/denture care products, after which the responses were categorized into 0 products, 1-2 products, and 3 or more products.

3. Analysis methodology

To understand the relationship between unmet dental care needs and mental health, this study conducted a chi-square test ($\chi 2$) and multiple logistic regression analysis of the survey to analyze whether general characteristics, health status, and health risk behavior had a relationship with perceived health and suicidal ideation. Logistic regression analysis is a statistical technique for estimating the relationship between the dependent variable and the independent variable having only two values using a logistic function. It is not a direct prediction of an event that will occur, but rather a prediction of the probability that an event will occur. Table 2 shows the relationship between the absence of dental treatment and mental health, and Table 3 shows unmet caused by reasons such as (1) time, (2) economic reasons, and (3) transportation inconvenience among the reasons for not receiving dental treatment. This table shows the relationship between dental care needs and mental health. The organization and statistical analyses of collected data were done using SAS ver. 9.4 (SAS Institute Inc., Cary, NC, USA), and the significance level (α) of all analyses were set at 0.05 or below.

This terminology draws on a common specification of the Logistic regression analysis,

$$Y_{it}=\beta_0+\beta_1\times\text{Unmet dental care needs}_i+\beta_2\times X_i+e_i$$

where Y_i is the dependent variable (i.e. Mental health) for unit i.

Y_i is the dependent variables

β_0 is the intercept

Unmet dental care needsi is the interesting variable

X_i is the covariates

e_i is the error term

Ⅲ. Research results

1. General characteristics of research subjects

Table 1 shows the general characteristics of the research subjects according to their perceived stress and suicidal ideation, utilizing the data from 9,294 respondents of the 2016-2017 basic survey, and 2,591 people (28.9%) felt a lot of stress, of which 1,054 (35.7%) answered “yes” to non-use of dental treatment ($p<0.001$). In addition, it was significantly related to gender, age, education, marital status, subjective health status, drinking experience, smoking status, and the number of walking days for a week($p\leq0.001$).

Furthermore, 241 (2.5%) had suicidal ideation, of which 120 (3.8%) responded “yes” to non-use of dental treatment and 121 (1.8%) responded “no.” In addition, 170 people (3.0%) did not receive an oral check-up, and 71 people

(1.7%) received them (p<0.001). In addition, it was significantly related to age, income, education, subjective health status, smoking status, and the number of walking days for a week(p≤0.001).

3.2 Relationship between non-use of dental treatment and mental health (perceived stress, suicidal ideation)

Table 2 shows the relationship between perceived stress, suicidal ideation and non-use of dental treatment. Respondents who responded “yes” to presence of non-use of dental treatment had 1.46 times higher perceived stress (OR[Odds Ratio]: 1.46, CI[Confidence Interval]): 1.290-1.657, p<0.001) compared to those who responded “no.” Furthermore, women had 1.40 times higher perceived stress (OR: 1.40, CI: 1.207-1.621, p<0.001) compared to men.

Those who responded “yes” to non-use of dental treatment had 1.55 times higher risk of suicidal ideation (OR: 1.55, CI: 1.081-2.207, p<0.05) compared to those who responded “no,” and women had 1.80 times higher risk of suicidal ideation (OR: 1.80, CI: 1.116-2.896, p<0.05) compared to men.

3.3 Relationship between unmet dental care needs and mental health (perceived stress, suicidal ideation)

Table 3 shows the relationship between perceived stress, suicidal ideation and unmet dental care needs. Respondents who responded “yes” to the presence of unmet dental care needs were 1.56 times statistically significantly higher perceived stress (OR: 1.56, CI: 1.282-1.893, p<0.001) compared to those who responded “no.” Furthermore, women had 1.33 times higher perceived stress (OR: 1.33, CI: 1.025-1.721, p<0.05) compared to men.

Those responding “yes” to unmet dental care needs had 2.11 times higher risk of suicidal ideation (OR: 2.11, CI: 1.296-3.431, p<0.01) compared to those responding “no,” and those who responded that they had poor subjective health had 3.74 times higher risk of suicidal ideation (OR: 3.74, CI: 1.571-8.882, p<0.01) compared to those who responded that they had good subjective health.

Ⅳ. Discussion

This study utilized the data from the 7th Korea National Health and Nutrition Examination Survey (data from 2016-2017), representative statistical data on the health and nutritional status of Korean citizens, to understand the relationship between unmet dental care needs and mental health, specifically perceived stress and suicidal ideation.

Among the responses from the 7th Korea National Health and Nutrition Examination Survey for 8 reasons for non-use of dental treatment, reasons such as time, money, and poor transit were defined as unmet dental care needs. This study analyzed the relationship between unmet dental care needs and mental health and found that individuals with unmet dental care needs had higher levels of perceived stress and higher risk of suicidal ideation.

This study indicated that 28.9% of individuals felt a high level of perceived stress. An existing study that relied on the 2014-2015 Korea National Health and Nutrition Examination Survey showed that this ratio was 31% in 2015 (Bae, 2017). While there has been a numerical decline, it is difficult to conclude that stress levels have decreased as approximately 3 in 10 Korean people still feel stressed. The causes of stress perception include personality, neurosis (Huang et al., 2015), and physical problems (Abdulghani et al., 2011). A study by Rong et al. (Rong et al.,2019) reported that factors that influenced work stress included marital status, real monthly income, educational level, work experience, and average working hours. Furthermore, 2.5% of all respondents had suicidal ideation; this is a significant decline from the 14.1% from Kim et al. (Kim et al., 2014), which utilized the year 3 data (2012) of the 5th Korea National Health and Nutrition Examination Survey. However, the actual suicide rates in Korea still remain the highest among the OECD member states, which indicates the continued gravity of the problem (Welfare MoHa, 2019). Factors influencing suicidal ideation have been reported to include depression, alcohol and drug abuse, schizophrenia, unemployment, frequent address

changes, hostility, and living alone (Gill et al., 2018). A number of existing studies have suggested various causes influencing stress and suicidal ideation; however, there have been very few studies that covered the influence of oral cavity. The oral cavity is an organ that plays an integral role in human lives, including nutrient intake. Oral health affects quality of life (Butten et al., 2019), and when oral diseases occur, unbearable pain may result, sometimes even leading to tooth extraction. Extracting multiple teeth reduces the range of consumable foods, reducing the quality of meals; if this subsequently develops into inability in proper nutrient intake, this may result in problems with systematic body health (Yang & Jang, 2020). Therefore, to search for methods to reduce the level of stress and suicidal ideation in Korea, this study aimed to identify their relationship with unmet dental care needs.

This study analyzed the relationship between mental health and unmet dental care needs, and found that those with unmet dental care needs had 1.56 times higher perceived stress and 2.11 times higher risk of suicidal ideation compared to those without unmet dental care needs. Butten et al. (Butten et al., 2019) found that oral health influenced stress, and Choi (Choi, 2014) reported a relationship between oral health and mental health(β =0.278, $p<0.01$). The occurrence of unmet dental care needs signifies the potential for oral disease to be neglected or grow in severity, leading to associated pains. Pain in the oral cavity may lead to difficulties with food consumption, reduced enjoyment of eating (Yang & Jang, 2020), and difficulties with daily life activities (Souza & Martins, 2016). Furthermore, it may lead to lower confidence in interpersonal relationships, given facial changes and pronunciation disorders (Yang & Jang, 2020). These problems lead to higher perceived stress, which is an emotional pain that induces mental disorders such as depression and anxiety (Colman et al., 2014) with close ties to suicidal ideation (Zhang et al., 2018), indicating that it may even relationship suicidal ideation.

To reduce perceived stress and suicidal ideation in Korea, it is necessary to reduce unmet dental care needs. The unmet dental care needs in this study was found to be 31.4%. This shows an increase over Moon et al. (Moon & Song, 2016), which studied factors influencing unmet dental care needs using the 6th Korea National Health and Nutrition Examination Survey data and put the ratio at 27.4%. Existing studies in Korea have indicated that reasons for unmet dental care needs were “financial burden,” “lack of time,” and “because I feel that these issues are less important than others (Lee & Jin, 2015; Moon & Song, 2016).” Gupta et al. (Gupta et al., 2011) utilized 2011-2016 NHANES data from the US and found that women with lower educational levels and lack of insurance were more likely to not receive required dental care. As dental care in Korea includes many elements that are uninsured, the rate of non-covered individual payments is at 88%, leading to higher burden of medical fees (Kim et al., 2015). Lower-income classes who found it more difficult to bear the medical fees were reported to have poorer oral health (Singh et al., 2018). The continued existence of unmet dental care needs can lead to higher perceived stress.(Butten et al., 2019).

To reduce unmet dental care needs, it is important to increase dental healthcare insurance benefits to reduce the economic burden at the national level, and engage in education and promotion to habituate preventive care and treatment, which are less burdensome. Another approach to raise the accessibility of dental care services would be to have the dental specialists visit those who have difficulty in movement or have no time for dental services to deliver visiting dental care. At the same time, it is necessary to emphasize the importance of oral cavity and lead people to prioritize oral health improvements through oral health education. Furthermore, it is necessary to implement policy measures by increasing education to prevent oral diseases, leading to lower levels of concerns and burdens for oral health, and engage with dental treatment with a comfortable mindset.

A limitation of this study is that it is a cross-sectional

study that utilized only the data from the 7th Korea National Health and Nutrition Examination Survey. Therefore, it is difficult to accurately identify the causal relationship between unmet dental care needs and mental health. Moreover, as the analysis was conducted with a self-reported questionnaire, it is difficult to objectively determine elements relating to independent variables such as differences in the understanding of the independent variable of unmet dental care needs; furthermore, as it involved secondary data analysis, this study was unable to include adjusting variables other than which were presented in the raw data. Nevertheless, this study has utilized samples from the Korea National Health and Nutrition Examination Survey, a large-scale dataset which represents the health and nutritional status of Korean people, making it generalizable for Korean adults. This study is significant as it was the first study using Korea National Health and Nutrition Examination Survey data to analyze the relationship between unmet dental care needs and mental health and provided basic data.

Those subject to unmet dental care needs had higher levels of stress perception and suicidal thoughts than those who did not, showing a close relationship between unmet dental care needs and mental health. There is a need for policy measures that can positively affect not only oral health but also mental health by reducing unmet dental care needs, and more detailed studies on various causes and mental health problems of unmet dental care needs to be conducted in the future.

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Reference

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Table 1. General characteristics of the subjects

	Perceived stress										Suicidal ideation						
	Total			Felt less			Felt more				Yes			No			
	N	%	%*	N	%	%*	N	%	%*	P-value	N	%	%*	N	%	%*	P-value
Presence of unmet dental care needs										<.0001							<.0001
Yes	3,022	32.5	31.4	1,968	65.1	64.3	1,054	34.9	35.7		120	4.0	3.8	2,902	96.0	96.2	
No	6,272	67.5	68.6	4,735	75.5	74.3	1,537	24.5	25.7		121	1.9	1.8	6,151	98.1	98.2	
Oral checkup										0.389							0.000
No	5,406	58.2	57.3	3,881	71.8	70.7	1,525	28.2	29.3		170	3.1	3.0	5,236	96.9	97.0	
Yes	3,888	41.8	42.7	2,822	72.6	71.7	1,066	27.4	28.3		71	1.8	1.7	3,817	98.2	98.3	
Products used for oral health (number of products)										0.138							0.138
0	4,253	45.8	44.1	3,107	73.1	72.3	1,146	27.0	27.7		132	3.1	2.9	4,121	96.9	97.1	
1-2	4,632	49.8	51.2	3,306	71.4	70.2	1,326	28.6	29.8		103	2.2	2.2	4,529	97.8	97.8	
3 or more	409	4.4	4.7	290	70.9	69.4	119	29.1	30.6		6	1.5	1.5	403	98.5	98.5	
Region										0.729							0.746
Seoul	1,814	19.5	19.8	1,303	71.8	70.6	511	28.2	29.4		38	2.1	2.1	1,776	97.9	97.9	
Metropolitan area	2,412	26.0	27.6	1,738	72.1	70.8	674	27.9	29.2		62	2.6	2.6	2,350	97.4	97.4	
Other	5,068	54.5	52.6	3,662	72.3	71.5	1,406	27.7	28.5		141	2.8	2.6	4,927	97.2	97.4	
Gender										0.001							0.074
Male	3,989	42.9	48.7	2,975	74.6	72.9	1,014	25.4	27.1		98	2.5	2.1	3,891	97.5	97.9	
Female	5,305	57.1	51.3	3,728	70.3	69.4	1,577	29.7	30.6		143	2.7	2.8	5,162	97.3	97.2	
Age										<.0001							<.0001
29 or less	1,013	10.9	16.7	627	61.9	64.0	386	38.1	36.0		26	2.6	2.6	987	97.4	97.4	
30-39	1,433	15.4	17.3	905	63.2	62.9	528	36.9	37.1		26	1.8	2.1	1,407	98.2	97.9	
40-49	1,753	18.9	20.9	1,240	70.7	71.4	513	29.3	28.6		20	1.1	1.1	1,733	98.9	98.9	
50-59	1,871	20.1	21.4	1,383	73.9	73.7	488	26.1	26.3		48	2.6	2.3	1,823	97.4	97.7	
60-69	1,653	17.8	13.2	1,304	78.9	79.5	349	21.1	20.5		55	3.3	3.5	1,598	96.7	96.5	
70 or more	1,571	16.9	10.6	1,244	79.2	79.6	327	20.8	20.4		66	4.2	4.4	1,505	95.8	95.6	
Income										0.728							<.0001
Low	1,816	19.5	15.8	1,312	72.3	71.7	504	27.8	28.3		111	6.1	6.5	1,705	93.9	93.5	
Medium-Low	2,222	23.9	22.8	1,599	72.0	71.2	623	28.0	28.8		64	2.9	2.6	2,158	97.1	97.4	
Medium-High	2,506	27.0	29.0	1,797	71.7	70.2	709	28.3	29.8		34	1.4	1.4	2,472	98.6	98.6	
High	2,750	29.6	32.4	1,995	72.6	71.6	755	27.5	28.4		32	1.2	1.3	2,718	98.8	98.7	
Education										0.001							<.0001
Elementary school or below	1,956	21.1	14.7	1,433	73.3	72.8	523	26.7	27.2		91	4.7	5.0	1,865	95.4	95.0	
Middle school graduate	959	10.3	9.1	729	76.0	74.6	230	24.0	25.4		35	3.7	3.7	924	96.4	96.3	
High school graduate	2,906	31.3	34.4	2,095	72.1	72.4	811	27.9	27.6		78	2.7	2.7	2,828	97.3	97.3	
College or higher	3,473	37.4	41.8	2,446	70.4	68.7	1,027	29.6	31.3		37	1.1	1.1	3,436	98.9	98.9	
Marital status										<.0001							0.056
Married	7,876	84.7	78.2	5,795	73.6	72.7	2,081	26.4	27.3		192	2.4	2.3	7,684	97.6	97.7	
Single	1,418	15.3	21.8	908	64.0	65.5	510	36.0	34.5		49	3.5	3.2	1,369	96.5	96.8	
Subjective health										<.0001							<.0001
Good	2,542	27.4	28.8	2,122	83.5	82.5	420	16.5	17.5		30	1.2	1.2	2,512	98.8	98.8	
Average	4,833	52.0	52.7	3,499	72.4	70.9	1,334	27.6	29.1		93	1.9	1.9	4,740	98.1	98.1	
Bad	1,919	20.7	18.5	1,082	56.4	54.0	837	43.6	46.0		118	6.2	5.9	1,801	93.9	94.1	
Drinking experience										0.000							0.130
None	1,096	11.8	9.5	841	76.7	76.5	255	23.3	23.5		41	3.7	3.4	1,055	96.3	96.6	
Yes	8,198	88.2	90.5	5,862	71.5	70.6	2,336	28.5	29.4		200	2.4	2.4	7,998	97.6	97.6	
Smoking										<.0001							0.005
Current smoker	1,642	17.7	21.3	1,059	64.5	64.8	583	35.5	35.2		61	3.7	3.6	1,581	96.3	96.4	
Past smoker	1,991	21.4	21.4	1,510	75.8	73.7	481	24.2	26.3		49	2.5	2.1	1,942	97.5	97.9	
Non-smoker	5,661	60.9	71.1	4,134	73.0	72.5	1,527	27.0	27.5		131	2.3	2.2	5,530	97.7	97.8	
Number of days per week of walking										0.000							<.0001
None	1,758	18.9	17.0	1,190	67.7	67.3	568	32.3	32.7		76	4.3	4.1	1,682	95.7	95.9	
1-2	1,546	16.6	16.8	1,084	70.1	69.3	462	29.9	30.7		45	2.9	3.0	1,501	97.1	97.0	
3-4	1,885	20.3	20.6	1,408	74.7	74.0	477	25.3	26.0		32	1.7	1.8	1,853	98.3	98.2	
5-6	1,542	16.6	17.6	1,105	71.7	70.2	437	28.3	29.8		22	1.4	1.2	1,520	98.6	98.8	
Daily	2,563	27.6	28.0	1,916	74.8	73.0	647	25.2	27.0		66	2.6	2.4	2,497	97.4	97.6	
Total	9,294	100.0	100.0	6,703	72.1	71.1	2,591	27.9	28.9		241	2.6	2.5	9,053	97.4	97.5	

Note: * Weighted %

Table 2. Relationship between non-use of dental treatment and mental health (perceived stress, suicidal ideation)

	Perceived stress				Suicidal ideation			
	OR	95%CI		P-value	OR	95%CI		P-value
Non-use of dental treatment								
Yes	1.462	1.290	1.657	<.0001	1.545	1.081	2.207	0.017
No	1.000				1.000			
Oral checkup								
No	0.918	0.813	1.037	0.169	1.107	0.786	1.559	0.561
Yes	1.000				1.000			
Products used for oral health (number of products)								
0	0.829	0.625	1.098	0.190	0.932	0.377	2.305	0.879
1-2	0.897	0.684	1.176	0.432	1.120	0.439	2.859	0.812
3 or more	1.000				1.000			
Region								
Seoul	1.090	0.944	1.258	0.242	0.991	0.580	1.691	0.972
Metropolitan area	1.044	0.916	1.190	0.517	1.021	0.608	1.716	0.937
Other								
Gender								
Male	1.000				1.000			
Female	1.398	1.207	1.621	<.0001	1.798	1.116	2.896	0.016
Age								
29 or less	4.698	3.375	6.538	<.0001	0.795	0.349	1.812	0.584
30-39	3.592	2.747	4.696	<.0001	1.217	0.563	2.634	0.616
40-49	2.378	1.837	3.079	<.0001	0.568	0.269	1.200	0.138
50-59	2.023	1.586	2.582	<.0001	1.059	0.619	1.812	0.833
60-69	1.227	0.982	1.534	0.072	1.248	0.842	1.852	0.269
70 or more	1.000				1.000			
Income								
Low	1.011	0.810	1.261	0.925	2.794	1.482	5.267	0.002
Medium-Low	0.981	0.835	1.152	0.812	1.448	0.797	2.629	0.223
Medium-High	0.996	0.864	1.149	0.960	0.893	0.485	1.645	0.717
High	1.000				1.000			
Education								
Elementary school or below	1.141	0.895	1.454	0.285	1.838	0.942	3.586	0.074
Middle school graduate	0.879	0.700	1.105	0.269	2.072	1.073	4.004	0.030
High school graduate	0.808	0.709	0.921	0.001	1.938	1.222	3.074	0.005
College or higher	1.000				1.000			
Marital status								
Married	1.156	0.945	1.416	0.159	0.425	0.253	0.714	0.001
Single	1.000				1.000			
Subjective health								
Good	1.000				1.000			
Average	1.997	1.716	2.325	<.0001	1.369	0.818	2.290	0.231
Bad	4.702	3.887	5.688	<.0001	2.920	1.633	5.221	0.000
Drinking experience								
None	0.969	0.803	1.170	0.744	1.052	0.613	1.806	0.854
Yes	1.000				1.000			
Smoking								
Current smoker	1.625	1.357	1.947	<.0001	2.149	1.271	3.636	0.005
Past smoker	1.334	1.124	1.583	0.001	1.611	0.958	2.709	0.072
Non-smoker	1.000				1.000			
Number of days per week of walking								
None	1.243	1.059	1.459	0.008	1.248	0.804	1.938	0.323
1-2	1.074	0.905	1.274	0.414	1.310	0.835	2.055	0.239
3-4	0.885	0.752	1.042	0.143	0.745	0.446	1.244	0.260
5-6	1.066	0.898	1.265	0.464	0.502	0.286	0.882	0.017
Daily	1.000				1.000			

Note: Adjusted for oral checkup, products used for oral health, socioeconomic status (region, gender, age, income, education and marital status) and health stats and behavior (subjective health, drinking experience, smoking and number of days per week of walking) variables

Table 3. Relationship between mental health (perceived stress, suicidal ideation) and unmet dental care needs

	Perceived stress				Suicidal ideation			
	OR	95%CI		P-value	OR	95%CI		P-value
Unmet dental care needs								
No	1.000				1.000			
Yes	1.558	1.282	1.893	<.0001	2.109	1.296	3.431	0.003
Oral checkup								
No	0.906	0.726	1.130	0.380	0.880	0.518	1.493	0.634
Yes	1.000				1.000			
Products used for oral health (number of products)								
0	1.039	0.581	1.858	0.898	0.768	0.215	2.736	0.683
1-2	1.028	0.575	1.839	0.925	0.646	0.176	2.367	0.509
3 or more	1.000				1.000			
Region								
Seoul	1.040	0.786	1.376	0.784	0.996	0.531	1.868	0.991
Metropolitan area	1.058	0.837	1.339	0.635	0.828	0.413	1.659	0.594
Other								
Gender								
Male	1.000				1.000			
Female	1.328	1.025	1.721	0.032	0.968	0.506	1.853	0.922
Age								
29 or less	4.895	2.757	8.692	<.0001	0.797	0.225	2.825	0.725
30-39	3.001	1.917	4.697	<.0001	1.697	0.582	4.948	0.332
40-49	2.224	1.450	3.412	0.000	0.463	0.150	1.430	0.180
50-59	1.968	1.335	2.902	0.001	1.026	0.504	2.087	0.944
60-69	1.298	0.896	1.878	0.167	1.713	0.880	3.335	0.113
70 or more	1.000				1.000			
Income								
Low	0.999	0.712	1.403	0.997	2.944	1.288	6.729	0.011
Medium-Low	0.952	0.731	1.240	0.716	0.855	0.392	1.864	0.693
Medium-High	0.963	0.745	1.245	0.774	0.579	0.267	1.256	0.166
High	1.000				1.000			
Education								
Elementary school or below	1.074	0.732	1.576	0.713	0.666	0.261	1.695	0.393
Middle school graduate	0.936	0.655	1.337	0.716	1.145	0.442	2.966	0.779
High school graduate	0.948	0.758	1.186	0.638	1.368	0.721	2.595	0.336
College or higher	1.000				1.000			
Marital status								
Married	1.272	0.905	1.788	0.165	0.762	0.323	1.794	0.532
Single	1.000				1.000			
Subjective health								
Good	1.000				1.000			
Average	2.196	1.701	2.834	<.0001	1.913	0.814	4.495	0.136
Bad	4.829	3.530	6.606	<.0001	3.735	1.571	8.882	0.003
Drinking experience								
None	1.115	0.802	1.551	0.517	1.357	0.712	2.587	0.353
Yes	1.000				1.000			
Smoking								
Current smoker	1.547	1.126	2.126	0.007	1.027	0.468	2.257	0.947
Past smoker	1.438	1.068	1.937	0.017	1.146	0.510	2.575	0.741
Non-smoker	1.000				1.000			
Number of days per week of walking								
None	1.375	1.033	1.829	0.029	1.495	0.818	2.731	0.191
1-2	1.077	0.802	1.446	0.621	1.827	0.904	3.692	0.093
3-4	0.735	0.554	0.974	0.032	0.676	0.313	1.458	0.317
5-6	0.970	0.724	1.299	0.837	0.841	0.376	1.881	0.672
Daily	1.000				1.000			

Note: Adjusted for oral checkup, products used for oral health, socioeconomic status (region, gender, age, income, education and marital status) and health stats and behavior (subjective health, drinking experience, smoking and number of days per week of walking) variables

치과진료 요구와 정신건강의 상관관계:
제7회 국민건강영양조사 자료 활용

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초 록

본 연구는 제7기 국민건강영양조사자료(2016-2017)를 활용하여 미충족 치과진료와 정신건강과의 관련성을 파악하고자 수행되었다.

전체 16,277명의 대상자 중 9,294명의 참여자를 활용하여 분석을 실시하였다. 미충족 치과진료는 자가설문으로 조사되었으며, 카이제곱검정과 다중로지스틱 회귀분석을 활용하여 분석하였다. 미충족치과진료가 존재하는 사람의 스트레스 인지도는 미충족치과진료가 존재하지 않는 사람과 비교하여 1.56배(OR: 1.56, 95% CI: 1.282-1.893, p<0.001) 더 높았고, 자살생각의 위험은 2.11배(OR: 2.11, 95% CI: 1.296-3.430 p=0) 더 높았다.

본 연구는 미충족치과진료와 정신건강과의 밀접한 관련성을 발견하였다. 그러므로 인지된 스트레스와 자살생각의 위험을 줄이기 위해서는 미충족치과진료의 감소 방안이 고려되어야 함을 시사한다.

주요 용어: 구강보건, 구강보건조사, 정신건강