

Physical Activity, Drinking and Sleep Patterns by Chronic Disease Presence: A Population-Based Study

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Abstract

Background/Objectives: This study aimed to compare psychological factors and health behaviors according to chronic diseases using the Korea Health Panel (KHP).

Methods/Statistical analysis: Data were extracted from 2018 data among the KHP 2008-2018 annual data. After applying cross-sectional weighting, a total of 51,422,507 participants were selected for this study. Descriptive statistics were performed and chi-square or t-test was performed to compare the psychological factors and health behaviors between the presence and absence of chronic disease groups.

Findings: The prevalence of chronic diseases was 14.9% for all age groups in the Korea Health Panel. Psychological factors, such as depressive symptoms, poor perceived health status, and unmet healthcare needs, were higher in people with chronic disease than in those without chronic disease. The number of smokers was higher in people with chronic disease than in those without chronic disease, whereas those with moderate physical activity, sleep time, and drinking were lower in people with chronic disease than in those without chronic disease.

Improvements/Applications: It is necessary to identify health behaviors according to the type of chronic disease, and a wellness approach that considers the characteristics of each disease is needed.

Keywords: Chronic disease, Exercise, Health behaviors, Health status, Prevalence

1. Introduction

Along with economic development, noninfectious chronic diseases are becoming a major burden worldwide. According to the World Health Organization (WHO), in 2021, chronic diseases accounted for 80% of deaths from non-communicable diseases worldwide [1]. In South Korea, deaths from chronic diseases account for 81% of all deaths, and 7 of 10 causes of death were found to be chronic diseases [2].

Some chronic diseases, such as cardiovascular diseases, are highly related to health behaviors [3]. Tobacco use, low physical activity, and alcohol use are modifiable risk factors for cardiovascular diseases [4]. As such, optimal health behaviors can prevent chronic diseases or delay the worsening of symptoms [2,3]. Recently, a number of studies have reported that metabolic imbalance, one of the risk factors for chronic diseases, is related to insomnia, and there have been studies reporting that sleep quality improves with physical activity and exercise [5], but individuals' health behaviors do not exist as a single pattern, but rather tend to appear in a complex way [4]. Therefore, if one harmful health behavior is found, there is a high possibility that there will be another harmful health behavior, and the increased interrelationship between them adversely affects the health

of people with chronic diseases [4,5].

The long journey of chronic conditions affects not only individual lifestyle changes but also psychosocial aspects. Previous studies have reported that stress, depression, general anxiety, and low health perception are highly prevalent in people with chronic conditions [6,7]. In a chronic and stressful life, satisfactory support from healthcare providers can be a valuable resource [6]. However, people with chronic conditions often experience unmet healthcare needs owing to the frequent use of hospitals. Studies have reported that people with a chronic disease or distressed state and female tend to have high unmet healthcare needs [8]. South Korea, unlike other countries, has a National Health Insurance (NHI) system (National Health Insurance Corporation, NHIC) that provides for its citizens' healthcare. This particular system offers a different perspective on the unmet needs of health care research. Therefore, it would be meaningful to investigate whether unmet healthcare needs differ according to the presence or absence of chronic diseases.

Since 2008, the Korea Health Panel (KHP) has provided a wide range of data on the demographic characteristics, health-related factors, and health behaviors of target households and their members through face-to-face interview surveys [7]. The KHP data are representative sample survey data constructed longitudinally and used in important health policy decisions. Therefore, it is necessary to identify the health behaviors of people with chronic diseases based on the KHP.

The purpose of this study was to compare psychological factors and health behaviors between people with and without chronic diseases, using the KHP data. The specific aims were a) to identify the prevalence of chronic disease, b) to compare the psychological factors (depressive symptoms, perceived stress, perceived health status, and unmet healthcare needs) between people with chronic disease and those without, and c) to compare the health behaviors (smoking, alcohol drinking, physical activity, and sleeping) between people with chronic disease and those without chronic disease.

2. Methods

2.1. Design

This was a cross-sectional descriptive study design conducted to confirm the prevalence of chronic diseases and to compare psychological factors and health behaviors according to the presence of chronic diseases. Secondary data analysis was performed using the KHP data.

2.2. Data source

We analyzed 2018 data among the KHP 2008-2018 Annual Data (Version 1.7), jointly conducted to investigate health service usage patterns and what factors affect health service usage and cost, by the National Health Insurance Corporation and the Korea Institute for Health and Social Affairs. Survey data were collected from households and their members through self-reported questionnaires and face-to-face interviews and have been collected every year since 2008.

The dataset was merged with a) household member (all age) data from the 2018 data, b) disease data, c) medical use data, and d) health behavior data. In the final dataset of this study, 51,422,507 data points were used when applying the cross-sectional weights to the KHP after eliminating the missing data.

2.3. Measurement

Chronic diseases included hypertension/diabetes, cardiovascular disease, liver disease, respiratory disease, joint disease, thyroid dysfunction, malignant neoplasm, depression, dementia, and renal failure. Participants were categorized into two groups based on their responses to the question, "Do you have any of the following chronic diseases currently diagnosed by a doctor?" Participants who answered 'yes' to any of the chronic diseases were classified into the "yes" group.

The demographic characteristics used in this study included sex, age, marital status, and educational level. Marital status was classified into those living with a spouse, including common-law marriage/marriage, and those not living with a spouse, such as separated/divorced/widowed or single. Educational level was categorized as college, high school, middle school, elementary school, and preschool or uneducated.

This study included psychological factors, depressive symptoms, perceived stress, perceived health status, and unmet healthcare needs. For depressive symptoms, participants responded with yes or no to the following question: "During the past year, have you felt sad or hopeless for more than two weeks to the extent that it affected your daily activities?" Perceived stress was classified according to the question "During the past

month, have you ever felt that life was too difficult mentally/physically?" or whether there was any stress. Perceived health status was questioned as "What do you think of your current health condition?" on a Likert scale, ranging from very poor (1) to very good (5). Unmet needs in healthcare were asked by "Have you not received the necessary hospital treatment or examination in the past year?" If you had experienced it even once, it was divided into yes or no.

Smoking, alcohol consumption, moderate physical activity, and sleeping hours were included in this study as health behaviors. Smoking was asked as whether they currently smoked, and the response to daily or occasional smoking was measured as smoking; the response to smoking in the past but not currently or never smoked was measured as non-smoking. Alcohol consumption was measured by checking the frequency of drinking by answering the question, "How often have you been drinking in the past year?" and were divided into the following three groups: abstinence, more than once a month, and more than once a week. Moderate physical activity refers to physical activity that consumes approximately 3-5 times more energy than stable conditions [9]. Moderate physical activities included playing badminton, volleyball, calisthenics, table tennis, double tennis, moving light things, swimming or bicycling (at a slow pace), and brisk walking. Walking slowly or at a moderate pace for the use of public transportation and brisk walking were included in the walking category. Participants were asked how many days they performed physical activity for more than 10 minutes in which breathing and heartbeat were slightly faster than usual in the past week. According to the response, subjects who performed at least one day were classified as Yes and those who had never done it as No. Sleep was measured by the question, "How many hours did you sleep on average per day in the past week?" and writing down their sleep times.

2.4. Data analysis

Descriptive statistics were used to identify demographic data, such as sex, age, education level, and living with a spouse. To confirm the prevalence of chronic diseases, the frequency and percentage were analyzed. The chi-square test and independent t-test were performed to compare psychological factors and health behaviors between the two groups. The cross-sectional sampling weight of household members was applied. All data were analyzed by applying weighting using IBM SPSS 26.0 version program, and the statistical significance level was set to $p = .05$.

3. Results and Discussion

3.1. Demographics of participants and prevalence of chronic disease

As a result of analysis by applying cross-sectional weighting, the total number of participants was 51,422,507; males accounted for 50.1%, and the mean age was 45.54 years (SD: ± 21.18 , range: 5–109). In addition, 50.2% of participants were living with their spouses, 42.0% were educated above college level, 28.7% were high school, 9.2% were middle school, 12.8% were elementary school, and 7.3% were preschool or had no education. As shown in **Figure 1**, 14.9% of the participants were currently diagnosed with a chronic disease by a doctor.

The chronic diseases in the KPH data were coded as hypertension, diabetes, hyperlipidemia, arthropathy, tuberculosis, ischemic heart disease, and cerebrovascular disease, which are based on the Korean Standard Classification of Diseases, and other diseases were recorded as "other diseases" in a self-reported manner. As a result, 14.9% of the total population is chronically ill. Previous studies on patterns of multimorbidity among Korean adults over the age of 18 using KHP data in 2014 reported that 40.8% of women and 28.6% of men had multimorbidity, and among them, hypertension was found to have the highest prevalence [10]. As such, chronic diseases are a major problem in adults, but the prevalence of chronic diseases among adolescents also needs attention. A previous study of children over three months old estimated the prevalence of children with chronic diseases due to congenital disorders or metabolic diseases to be 15–20% [11].

The limitation of this study was that it is not possible to distinguish the types of chronic disease prevalence by generation, as data were analyzed for all age groups. However, this prevalence rate can be used to compare the prevalence of chronic diseases by age group. Moreover, this finding can be used to compare the prevalence by year or chronic disease type.

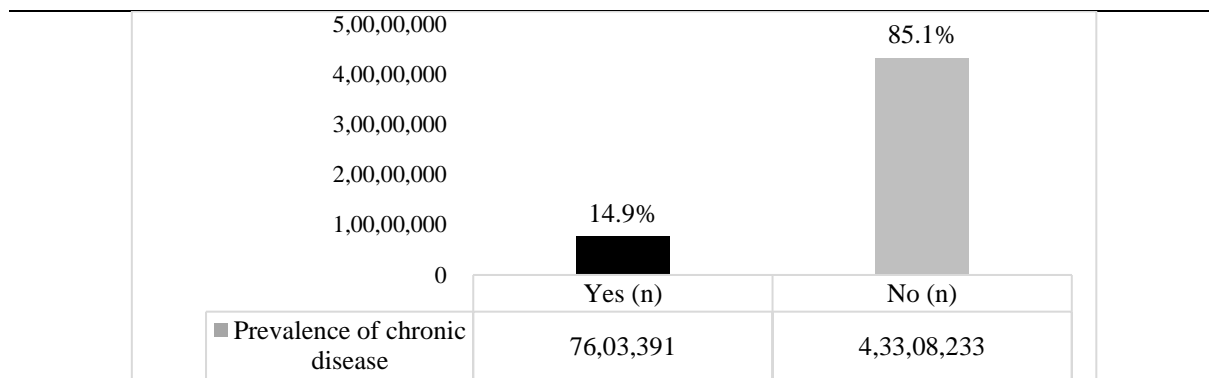


Figure 1. Prevalence of chronic disease

3.2. Comparison of psychological factors according to the presence of chronic disease

Table 1 shows the comparisons of psychological factors between people with and without chronic diseases.

The prevalence of depressive symptoms was significantly higher in people with chronic diseases than in those without ($p < .001$). However, perceived stress was significantly lower in people with chronic disease than in those without ($p < .001$). The mean score for perceived health status was lower in people with chronic disease than in those without chronic disease ($p < .001$). This means that people with chronic diseases perceived a poorer health status as compared to the control group. The number of people with unmet healthcare needs was significantly higher among people with chronic disease than among those without chronic disease ($p < .001$).

Results of this study indicate the proportions of individuals with depression, stress, unmet healthcare needs, and poor health perception were greater in people with chronic disease than those in the control group. These findings are consistent with previous studies that chronic disease patients have low subjective health status and show symptoms of depression because of complex physical/psychological/social problems [12-14]. Therefore, various psychological interventions, as well as medical support, are needed for people diagnosed with chronic diseases.

Table 1. Comparison of psychological factors between the groups

Characteristic	Category	Chronic disease		χ^2 or t	p-value
		Yes n (%) or M (\pm SD)	No n (%) or M (\pm SD)		
Depressive symptom	Yes	484,330 (6.7)	1,473,279 (4.8)	43565.65	<.001
	No	6,764,629 (93.3)	29,356,485 (95.2)		
	Total	7,248,959	30,829,764		
Perceived stress	Yes	3,862,667 (50.8)	27,594,466 (63.7)	456892.53	<.001
	No	3,740,724 (49.2)	15,713,766 (36.3)		
	Total	7,603,391	43,308,232		
Perceived health status	Range: 1 (very poor) – 5 (very good)	2.96 (\pm 0.80)	3.45 (\pm 0.75)	-1492.67	<.001
Unmet needs in healthcare	Yes	993,515 (13.4)	3,615,888 (11.7)	17123.05	<.001
	No	6,412,471 (86.6)	27,355,328 (88.3)		
	Total	7,405,986	30,971,216		

3.3. Comparison of health behaviors according to the presence of chronic disease

Table 2 presents comparisons of health behaviors between people with and without chronic diseases. Health behaviors, such as smoking, alcohol consumption, moderate physical activity, and sleep time on weekdays, were surveyed in the KHP. The number of smokers was statistically higher among people with

chronic diseases than in those without ($p < .001$). However, those who consumed alcohol more than once a week were statistically lower in people with chronic diseases than in those without ($p < .001$). The number of non-drinkers was also significantly higher in people with chronic diseases than in those without ($p < .001$). The number of those who performed moderate physical activity was lower in people with chronic diseases than in those who did not ($p < .001$). The mean sleep time on weekdays was 6.3 hours in people with chronic disease, while 6.6 hours in those without chronic disease ($p < .001$).

The relationship between poor health behaviors and chronic diseases is well known. Among health behaviors, smoking is known to be the leading cause of death among adults; however, according to a 2015 survey, it was estimated that 15.2% of adults aged 18 years and older were smokers [15,16]. When compared to United States (US) data, the smoking rate in Korea was similar for both with the chronic and without chronic disease groups regardless of age group. However, it is noteworthy that the proportion of smokers among participants with chronic diseases was lower than that in the non-chronic disease group. This emphasizes the importance of quitting smoking through individual efforts in chronic disease management, education of healthcare providers, and national publicity. The dose and frequency of alcohol consumption can be associated with certain chronic conditions, and the WHO classifies alcohol as a toxic and psychoactive substance that induces dependence [17]. In the KHP data, 42.6% of people with chronic diseases did not drink, but 57.4% of the chronic disease group were drinkers. In the 2007-2012 data from the Korean National Health and Nutrition Examination Survey for cancer survivors, 49.1% of adults drank alcohol [18]. Comparing the two data, it can be interpreted as an increase in the drinking rate, so an active non-drinking policy is required for chronic conditions. On the other hand, the proportion of chronic disease patients who were physically active was lower than the proportion of non-chronic conditions and lower than the proportion of cancer survivors (50.7%) in a previous study [18].

People with chronic conditions have been reported to experience poor sleep. For example, a study reported that up to one-third of patients with diabetes experience sleep disturbances [19]. In the KHP data, sleep hours on weekdays of participants with chronic disease were shorter than those of participants without chronic disease. However, estimating the relationship with chronic diseases is limited because sleep quality cannot be determined simply from these data. However, if sleep is included in a comprehensive analysis of health behaviors, it will be helpful for lifestyle changes and health education for people with chronic diseases.

Table 2. Comparison of health behaviors between the groups

Characteristic	Category	Having chronic disease		χ^2 or t	p-value
		Yes n (%) or M (\pm SD)	No n (%) or M (\pm SD)		
Smoking	Yes	1,097,129 (14.8)	65,86,794 (20.4)	121859.38	<.001
	No	6,325,752 (85.2)	25,712,738 (79.6)		
	Total	7,422,881	32,299,532		
Alcohol drinking	More than once a week	2,626,206 (35.4)	15,116,178 (46.8)	870469.93	<.001
	More than once a month	1,633,615 (22.0)	8,961,017 (27.7)		
	No	3,163,060 (42.6)	8,222,337 (25.5)		
	Total	7,422,881	32,299,532		
Moderate physical activity	Yes	1,819,406 (24.5)	9,792,214 (30.3)	98263.34	<.001
	No	5,603,476 (75.5)	22,510,498 (69.7)		
	Total	7,422,882	32,302,712		
Sleep time on weekdays	Min–Max 1–19(hour)	6.35 (\pm 1.34)	6.60 (\pm 1.16)	-471.943	<.001

4. Conclusion

In conclusion, the prevalence of chronic diseases, such as hypertension, diabetes, hyperlipidemia, arthropathy, tuberculosis, ischemic heart disease, cerebrovascular disease, and others, was estimated to be 14.9% in the Korean population. People with chronic diseases had more depressive symptoms, stress, poor health perception, and unmet healthcare needs than those without chronic diseases. People with chronic diseases also have less physical activity and sleep time than those without chronic diseases. Therefore, tailored strategies and psychological support should be applied to improve health behaviors and empower people with chronic diseases. Furthermore, political support and resources to promote physical activity in chronic diseases should be assessed and provided.

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