



Prevalence of Mental Disorders and Associated Factors in Korean Adults: National Mental Health Survey of Korea 2021

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Objective Mental health is a global concern and needs to be studied more closely. We aimed to estimate the prevalence of mental disorders and their associated factors among the general population in Korea.

Methods The National Mental Health Survey of Korea 2021 was conducted between June 19 and August 31, 2021 and included 13,530 households; 5,511 participants completed the interview (response rate: 40.7%). The lifetime and 12-month diagnosis rates of mental disorders were made using the Korean version of the Composite International Diagnostic Interview 2.1. Factors associated with alcohol use disorder (AUD), nicotine use disorder, depressive disorder, and anxiety disorder were analyzed, and mental health service utilization rates were estimated.

Results The lifetime prevalence of mental disorders was 27.8%. The 12-month prevalence rates of alcohol use, nicotine use, depressive, and anxiety disorders were 2.6%, 2.7%, 1.7%, and 3.1%, respectively. The risk factors associated with 12-month diagnosis rates were as follows: AUD: sex and age; nicotine use disorder: sex; depressive disorder: marital status and job status; anxiety disorder: sex, marital status, and job status. The 12-month treatment and service utilization rates for 12-month AUD, nicotine use disorder, depressive disorder, and anxiety disorder were 2.6%, 1.1%, 28.2%, and 9.1%, respectively.

Conclusion Approximately 25% of adults in the general population were diagnosed with mental disorders during their lifetime. The treatment rates were substantially low. Future studies on this topic and efforts to increase the mental health treatment rate at a national level are needed.

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Keywords Mental health disorder; Epidemiological study; Prevalence, Republic of Korea; National Mental Health Survey of Korea.

INTRODUCTION

Mental health is a global burden, though there is insufficient information on this topic. The estimated number of mental disorder cases was 654.8 million cases in 1990, which

increased into 970.1 million cases in 2019.¹ Moreover, mental disorders are among the global top ten leading causes of burden.¹ In-depth studies on mental disorders including distribution, treatment utilization, and associated factors at the national and global levels are needed to ease this burden.²

Epidemiological studies help to investigate the distribution, undiagnosed cases, causes, and related factors of a disease/disorder in the community³ and are especially important in psychiatry, considering the high treatment gap in this field. According to a previous study,⁴ the global treatment gap for mental disorders ranged from 32.2% to 78.1% depending on the disorder type. This implies that it is important to investigate undiagnosed/untreated individuals with mental health prob-

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lems through community-based epidemiological studies.

The World Health Organization (WHO) launched the World Mental Health (WMH) Survey Initiative,⁵ to facilitate national epidemiological surveys of mental health in the general populations in the WHO regions and obtain cross-national information on mental health. This project also aimed to investigate the risk factors and barriers to service utilization for mental disorders. Currently, approximately 30 countries are included in the WHO-WMH survey consortium.⁶

Based on Article 10 of the Act on the Improvement of Mental Health and Support for Welfare Services for Mental Patients, the Korean government has been conducting national mental health surveys to estimate the distribution of mental health disorders among adults every five years since 2001.⁷ Until 2016, the following national epidemiological surveys were conducted with approximately 10 catchment areas in Korea based on this act: 2001 Korean Epidemiologic Catchment Area (KECA) study,⁸ 2006 KECA Replication (KECA-R),⁹ KECA-2011,¹⁰ and KECA-2016.¹¹ The prevalence and related factors of mental disorders have been investigated by numerous studies based on these data,¹²⁻¹⁴ and provide evidence for framing mental health policies. However, the current survey utilized a sampling frame that covered the entire nation rather than specific catchment areas, and thus was named the "National Mental Health Survey of Korea (NMHSK)."

This study aimed to estimate the community-based prevalence and demographic correlates of mental disorders and service utilization among Korean adults based on Article 10 of the Act on the Improvement of Mental Health and Support for Welfare Services for Mental Patients. The NMHSK 2021 is the 5th national epidemiological survey of its kind. This study aims to provide valuable information on the distribution of mental disorders and service utilization among the general population during coronavirus disease-2019 (COVID-19) pandemic.

METHODS

The National Center for Mental Health, Ministry of Health and Welfare supervised this study, and the survey was performed cooperatively by two institutions: Seoul National University and Gallup Korea. Seoul National University was in charge of planning and managing the survey, and Gallup Korea was in charge of the data collection, field supervision, and quality control.

Samples

The NMHSK 2021 was conducted between June 19, 2021 and August 31, 2021. Participants aged between 18 and 79 years during the study period as per the Population and Hous-

ing Census were included. Consistent with previous surveys, institutionalized individuals (those receiving inpatient care or incarcerated) and foreigners living in Korea were not included.

The sampling frame of the survey covered the entire nation of Korea. This study used a complex sample design and state(si)/province(do), dong/eup/myeon, and household type were used as the stratification variables. The primary sampling units and enumeration units were sampled using the probability proportional to size sampling method. A secondary sampling unit, households, was then selected through systematic random sampling. Finally, one adult per household was selected. The interviewers visited 13,530 households and 5,511 participants completed the interview (response rate: 40.7%).

Diagnostic assessment tool

The Korean version of the Composite International Diagnostic Interview 2.1 (K-CIDI) (used in all previous KECA studies) was utilized as the diagnostic tool for this study. The CIDI¹⁵ is a fully structured diagnostic tool that diagnoses psychiatric disorders based on the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV)¹⁶ criteria. This tool is also utilized in various WHO-WMH surveys such as the National Survey of Mental Health and Wellbeing¹⁷ from Australia, the US National Comorbidity Survey Replication (NCS-R),¹⁸ and the World Mental Health Japan Survey,¹⁹ allowing for national comparison studies. Moreover, numerous studies²⁰⁻²³ have been conducted based on these data.

There were several updates or changes that were made in NMHSK 2021. First of all, unlike previous surveys that have utilized the paper version of the K-CIDI, the NMHSK 2021 was performed using a tablet-assisted personal interview (TAPI) version of the K-CIDI to improve the efficiency and accuracy of the interviewing process. Second, schizophrenia, bipolar disorder, and illicit drug use disorder were exempted due to their extremely low prevalence in the community. Based on the result of KECA 2016, the sample size of the survey was considered not sufficient to capture those with severe mental disorder with low prevalence rates (i.e., 12-month prevalence rates of schizophrenia spectrum disorder, bipolar disorder, and illicit drug use disorder were reported to be 0.2%, 0.1%, and 0%, respectively);¹¹ therefore, it was suggested that these mental disorders should be eliminated from the NMHSK 2021.²⁴ Also, diagnoses of severe mental disorders by lay interviewers showed incongruence with those by clinicians. This could be due to methodology problems or respondents denying their symptoms.²⁵⁻²⁸ Therefore, prevalence rate of severe mental disorders is suggested to be looked through various sources (e.g., epidemiological interview and case notes by clinician).²⁹ In this context, Australia conducts a separate national survey among those with psychosis (i.e., people living with

psychotic illness).³⁰ In Korea, the National Center for Mental Health is planning to conduct a separate study on severe mental disorders and illicit drug use disorders. Last but not least, previous KECA studies have investigated lifetime service utilization (or treatment rate). However, it is important to determine whether the patient has sought or received appropriate treatment when needed. Therefore, the 12-month treatment rate was estimated in addition to the lifetime treatment rate in the NMHSK 2021.

A total of 125 interviewers participated in the survey. Two-day interviewer training was held in seven different regions in Korea which include Seoul, Busan, Daegu, Gwangju, Daejeon, Gangwon, and Jeju Island. The trainers consisted of three psychiatrists including a supervisor who received certification at the CIDI training center of Michigan University (USA). The training was comprised with the overview of the survey (e.g., background, objective, process, survey contents, and methods), general interview skills, the interview tool, mock interviews, role-playing exercises, and TAPI practice.

Variables

The prevalence rates of the following four main categories of psychiatric disorders were estimated: 1) alcohol use disorder (AUD) (alcohol dependence and alcohol abuse), 2) nicotine use disorder (NUD) (nicotine dependence and nicotine withdrawal), 3) depressive disorder (major depressive disorder and dysthymic disorder), and 4) anxiety disorder (obsessive-compulsive disorder, posttraumatic stress disorder, panic disorder, agoraphobia, social phobia, generalized anxiety disorder, and specific phobia). In this study, AUD, NUD, depressive disorder, and anxiety disorder were defined as “any mental disorder.”

The demographic characteristics of the participants were recorded and included sex, age, marital status, education, income, job status, and area. The variables were categorized as follows: sex: male and female; age: 18–29, 30–39, 40–49, 50–59, 60–69, and 70–79 years; marital status: married, not living with partner (NLWP), and unmarried; education: middle school, high school, and college and above (participant’s highest education level); income level: high and low; job status further categorized into “permanent,” “contract,” and “no job”; area: “eup” and “dong.” Service utilization (i.e., treatment utilization) included treatment from mental health professionals (medical doctors other than psychiatrists, clinical psychologists, nurses specializing in mental health, and social workers specializing in mental health). A more detailed description of the demographic characteristics and other variables collected in NMHSK 2021 can be found elsewhere.³¹

Statistical analysis

Descriptive statistics were used to investigate the sample characteristics. Then, the lifetime and 12-month prevalence rates along with the relative standard error (RSE) were estimated for AUD, NUD, depressive disorders, and anxiety disorders. In addition, lifetime and 12-month service utilization rates were estimated. Multivariate logistic regression analysis was performed to investigate the variables associated with each disorder. A complex sample design was utilized for all analyses. Statistical Package for the Social Sciences (SPSS 28.0)³² was used for analyses, and a $p < 0.05$ was considered to be statistically significant. Prevalence rate reliability was defined as follows: RSE: <30% highly reliable; 30%–50%, needs to be cautiously interpreted; >50%, not very reliable.

Ethical considerations

This study was approved by the Seoul National University College of Medicine/Seoul National University Hospital Institutional Review Board (IRB no. 2008-176-1152). Before the interview, each respondent was informed of the objectives and methods of the survey; all respondents then signed an informed consent form that was collected through a tablet.

RESULTS

Sample characteristics

The response rate was 40.7%; 5,511 individuals from the 13,530 households surveyed agreed to participate in the survey. The sample characteristics, number of respondents, and the weighted percentages for each characteristic are shown in Table 1.

Lifetime prevalence of mental disorders

The lifetime and 12-month prevalence rates of mental disorders in the general population in Korea are presented in Table 2. The lifetime prevalence rate of any mental disorder was 27.8% (males: 32.7% and females: 22.9%), and that for each category was as follows: AUD, 11.6%; NUD, 9.5%; depressive disorder, 7.7%; and anxiety disorder, 9.3%. Females showed higher prevalence rates for depressive and anxiety disorders and lower prevalence rates for AUD and NUD compared to men. In turn, the lifetime prevalence rates of any disorder except for NUD were 23.3% and 22.4% in males and females, respectively. The lifetime prevalence rates of any disorder except for NUD and AUD were 9.0% and 19.8% in males and females, respectively.

12-month prevalence of mental disorders

The overall 12-month prevalence of any mental disorder was 8.5%. The 12-month prevalence rates of AUD, NUD, depres-

Table 1. Demographic characteristics of the participants

	Participants (N=5,511)	Weighted* (N=42,039,186)
Sex		
Male	2,757 (50.0)	21,180,152 (50.4)
Female	2,754 (50.0)	20,859,034 (49.6)
Age		
18–29 yr	754 (13.7)	7,719,590 (18.4)
30–39 yr	899 (16.3)	6,753,189 (16.1)
40–49 yr	1,111 (20.2)	8,192,793 (19.5)
50–59 yr	1,231 (22.3)	8,598,568 (20.5)
60–69 yr	1,053 (19.1)	7,072,000 (16.8)
70–79 yr	463 (8.4)	3,703,046 (8.8)
Marital status		
Married	3,645 (66.1)	26,489,012 (63.0)
NLWP	645 (11.7)	4,190,268 (10.0)
Unmarried	1,221 (22.2)	11,359,906 (27.0)
Job status		
Permanent	2,851 (51.7)	21,871,055 (52.0)
Contract	1,111 (20.2)	7,815,303 (18.6)
Student/housewife	1,549 (28.1)	12,352,828 (29.4)
Income level		
Low	2,528 (45.9)	18,082,127 (43.0)
High	2,936 (53.3)	23,549,343 (56.0)
Education		
Middle school or lower	841 (15.3)	6,099,776 (14.5)
High school	2,326 (42.2)	17,264,946 (41.1)
College or above	2,340 (42.5)	18,640,263 (44.3)
Area		
Dong	4,359 (79.1)	34,032,403 (81.0)
Eup	1,152 (20.9)	8,006,783 (19.0)

Values are presented as number (%). The total proportion may not add up to 100% as not all individuals responded. NLWP, not living with partner

sive disorder, and anxiety disorder were 2.6%, 2.7%, 1.7%, and 3.1%, respectively. Similar to the lifetime prevalence rate, males showed a higher 12-month prevalence rate of AUD and NUD than females; the 12-month prevalence rates of depressive disorder and anxiety disorder were higher in females than in males.

Demographic characteristics associated with the risk for mental disorders

The main finding of this study is the 12-month prevalence rate of mental disorder among the general population in 2021. Therefore, statistics regarding the lifetime prevalence rate and associated factors will be presented in the table of this manu-

script, it will mainly focus on the 12-month prevalence rate and associated factors.

AUD

The factors associated with 12-month AUD were sex and age. Females (adjusted odds ratio [AOR]=0.45, 95% confidence interval [CI]=0.28–0.72) had lower odds of having AUD than males. Those in the 60–69 years age group (AOR=0.35, CI=0.14–0.90) and 70–79 years age group (AOR=0.06, CI=0.01–0.74) had a lower risk of AUD compared to those in the 18–29 years age group. Factors associated with lifetime AUD was sex, marital status, and income which could be found in Table 3.

NUD

Only sex was associated with 12-month NUD; females (AOR= 0.10, CI=0.05–0.19) had lower odds of having a 12-month NUD diagnosis than males. Demographic characteristics which were associated with NUD were sex and age.

Depressive disorder

Demographic characteristics associated with the risk of lifetime and 12-month psychiatric disorders are shown in Table 3. The factors associated with a 12-month depressive disorder diagnosis were marital status and job status. Those with a “NLWP” status (AOR=2.10, CI=1.15–3.84) showed higher odds of having a 12-month depressive disorder compared to those who were married. Also, those with a contract job (AOR=2.84, CI=1.27–6.38) and “no job” (AOR=6.06, CI=2.68–13.69) had a higher risk of depressive disorder compared to those with a permanent job. Sex, marital status, and job status were associated with a lifetime depressive disorder diagnosis.

Anxiety disorder

Sex, marital status, and job status were associated with a 12-month anxiety disorder diagnosis. Females (AOR=2.90, CI=1.94–4.34) had higher odds of having anxiety disorder than males. Those classified as “NLWP” (AOR=1.91, CI=1.16–3.15) had higher odds of a 12-month anxiety disorder compared to those who were married. Additionally, those with a contract job (AOR=1.73, CI=1.11–2.67) had a higher risk of having a 12-month anxiety disorder than those with a permanent job. The factors associated with lifetime anxiety disorder were sex, marital status, and job status.

Service utilization (12-month)

The 12-month service utilization or treatment rate for mental disorders is presented in Table 4. Among those with a lifetime history of any mental disorder, only 4.4% received treat-

Table 2. Lifetime and 12-month prevalence of mental disorders (weighted*)

Type of disorder	Prevalence (%)					
	Lifetime			12-Month		
	Total (RSE)	Male (RSE)	Female (RSE)	Total (RSE)	Male (RSE)	Female (RSE)
AUD	11.6 (5.6)	17.6 (5.6)	5.4 (10.7)	2.6 (13.2)	3.4 (13.8)	1.8 (21.4)
Alcohol dependence	6.2 (8.0)	9.5 (8.1)	3.0 (14.2)	1.5 (19.2)	2.0 (19.5)	1.0 (29.0)
Alcohol abuse	5.3 (7.3)	8.2 (7.6)	2.4 (15.8)	1.1 (16.9)	1.4 (19.4)	0.8 (30.4)
NUD	9.5 (6.0)	17.7 (6.0)	1.1 (19.5)	2.7 (11.2)	4.9 (11.6)	0.5 (30.9)
Nicotine dependence	8.1 (6.7)	15.0 (6.7)	1.1 (20.5)	2.4 (12.4)	4.2 (12.9)	0.5 (31.4)
Nicotine withdrawal	4.7 (8.0)	8.9 (8.0)	0.5 (29.7)	1.0 (14.9)	1.7 (15.5)	0.1 (50.9)
Depressive disorder	7.7 (6.6)	5.7 (9.6)	9.8 (7.6)	1.7 (12.7)	1.1 (20.1)	2.4 (15.6)
Major depressive disorder	7.7 (6.7)	5.7 (9.6)	9.8 (7.6)	1.7 (12.8)	1.1 (20.5)	2.4 (15.6)
Dysthymic disorder	0.5 (22.0)	0.3 (32.5)	0.6 (27.1)	0.2 (32.8)	0.1 (58.7)	0.2 (39.7)
Anxiety disorder	9.3 (6.2)	5.4 (11.0)	13.4 (6.5)	3.1 (8.8)	1.6 (15.4)	4.7 (10.3)
Obsessive-compulsive disorder	0.2 (27.4)	0.1 (70.9)	0.4 (28.7)	0.1 (32.9)	0.0 (100.0)	0.3 (34.8)
Disorder						
Posttraumatic stress disorder	1.5 (13.8)	1.3 (19.0)	1.6 (17.5)	0.3 (28.5)	0.2 (40.9)	0.3 (40.0)
Panic disorder	0.4 (24.8)	0.5 (29.6)	0.4 (37.0)	0.1 (38.3)	0.2 (41.5)	0.0 (100.0)
Agoraphobia	0.3 (27.7)	0.2 (44.6)	0.4 (35.7)	0.2 (33.6)	0.1 (59.3)	0.3 (40.4)
Social phobia	0.6 (21.8)	0.2 (49.5)	1.0 (23.5)	0.2 (35.4)	0.1 (60.0)	0.4 (41.3)
Generalized anxiety disorder	1.7 (13.5)	1.2 (20.8)	2.1 (15.4)	0.4 (21.3)	0.4 (30.7)	0.4 (30.0)
Specific phobia	6.3 (7.8)	2.6 (16.7)	10.0 (7.7)	2.1 (11.1)	0.7 (23.3)	3.6 (12.0)
Any disorder	27.8 (3.6)	32.7 (3.8)	22.9 (5.0)	8.5 (6.5)	8.9 (7.8)	8.0 (8.6)
Any disorder except for NUD	22.9 (4.1)	23.3 (4.9)	22.4 (5.1)	6.4 (7.4)	5.2 (10.3)	7.6 (8.8)
Any disorder except for NUD+AUD	14.4 (5.1)	9.0 (8.0)	19.8 (5.3)	4.4 (7.8)	2.2 (13.6)	6.6 (9.1)

*weighted by city/province, age, and sex of the general population in Korea. RSE, relative standard error; AUD, alcohol use disorder; NUD, nicotine use disorder

ment from a mental health professional (psychiatrist, other medical doctors, clinical psychologists, mental health social workers, and mental health nurses). Among those with a 12-month diagnosis of any mental disorder, 7.2% received help from a mental health professional. Moreover, different disorders had different 12-month treatment rates. The 12-month treatment rates of those diagnosed with AUD, NUD, depressive disorder, and anxiety disorder were 2.6%, 1.1%, 28.2%, and 9.1%, respectively. Detailed information on the lifetime treatment rate can be found elsewhere.³¹

DISCUSSION

Any mental disorder

The lifetime prevalence of having at least one mental disorder among Korean adults was 27.8%. This implies that about one in four Korean adults experienced a psychiatric disorder during their lifetime. According to a previous study³³ which estimated the lifetime prevalence rate of seventeen countries included in the World Health Organization's World Mental

Health Survey Initiative, the median and inter-quartile range (IQR) of having any core diagnoses assessed was 12.0%–47.4% (IQR: 18.1%–36.1%). The core diagnoses that were estimated for most of the countries were anxiety disorders, mood disorders, impulse control disorders, and substance use disorders. However, the diagnostic coverage of countries in the aforementioned literature was not congruent. For instance, impulse control disorders were only three countries including United States and Western European countries have not assessed bipolar disorders and drug dependence. Considering this, Korea has a higher lifetime prevalence rate of psychiatric disorders compared to Japan (18.0%), People's Republic of China (13.2%), Italy (18.1%), and Spain (19.4%), and a lower lifetime prevalence rate than Netherlands (31.7%), New Zealand (39.3%), and the United States (47.4%). Additionally, 32.7% of males and 22.9% of females experienced at least one mental disorder during their lifetime. Females showed a much higher lifetime prevalence rate of depressive and anxiety disorders than men. Males showed a higher lifetime prevalence rate for AUD and NUD. This is consistent with a previous study³⁴ which

Table 3. Adjusted odds ratio (AOR) and 95% confidence interval (CI) of lifetime and 12-month for four major mental disorder categories by demographic characteristics (weighted*)

Characteristics	Lifetime				12-Month			
	Depressive disorder	Anxiety disorder	AUD	NUD	Depressive disorder	Anxiety disorder	AUD	NUD
Sex								
Male	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Female	1.43 (1.11–1.84) [†]	2.51 (1.91–3.31) [†]	0.24 (0.19–0.30) [†]	0.05 (0.03–0.08) [†]	1.32 (0.77–2.27)	2.90 (1.94–4.34) [†]	0.45 (0.28–0.72) [†]	0.10 (0.05–0.19) [†]
Age								
18–29 yr	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
30–39 yr	1.57 (0.90–2.76)	1.05 (0.67–1.63)	1.04 (0.69–1.58)	1.59 (0.99–2.56)	1.68 (0.57–4.91)	1.12 (0.57–2.19)	0.76 (0.37–1.55)	0.99 (0.49–2.03)
40–49 yr	1.30 (0.71–2.35)	1.02 (0.65–1.58)	1.31 (0.87–1.97)	1.85 (1.16–2.97) [†]	1.74 (0.51–5.95)	0.90 (0.45–1.80)	0.71 (0.36–1.38)	1.23 (0.61–2.46)
50–59 yr	1.58 (0.89–2.82)	1.18 (0.74–1.86)	1.20 (0.78–1.83)	1.90 (1.16–3.13) [†]	1.94 (0.58–6.50)	1.21 (0.60–2.44)	0.62 (0.29–1.34)	0.99 (0.45–2.20)
60–69 yr	1.52 (0.78–2.97)	1.08 (0.65–1.78)	1.04 (0.65–1.65)	1.47 (0.86–2.51)	1.64 (0.42–6.35)	0.46 (0.19–1.08)	0.35 (0.14–0.90) [†]	0.53 (0.20–1.44)
70–79 yr	0.91 (0.40–2.09)	0.69 (0.35–1.34)	0.70 (0.38–1.29)	1.77 (0.95–3.28)	2.37 (0.57–9.77)	0.33 (0.11–1.00)	0.06 (0.01–0.74) [†]	0.41 (0.11–1.45)
Marital status								
Married	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
NLWP	2.92 (2.13–4.00) [†]	1.58 (1.15–2.16)	1.53 (1.13–2.05) [†]	1.23 (0.85–1.76)	2.10 (1.15–3.84) [†]	1.91 (1.16–3.15) [†]	1.35 (0.69–2.63)	1.30 (0.71–2.39)
Not married	1.14 (0.72–1.80)	1.25 (0.86–1.80)	0.83 (0.61–1.12)	0.89 (0.61–1.29)	1.09 (0.41–2.87)	1.70 (0.99–2.91)	0.95 (0.54–1.67)	1.18 (0.69–2.01)
Job status								
Permanent	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Contract	1.41 (1.00–1.99)	1.37 (1.03–1.83) [†]	1.14 (0.89–1.47)	1.06 (0.79–1.43)	2.84 (1.27–6.38) [†]	1.73 (1.11–2.67) [†]	0.82 (0.49–1.38)	0.86 (0.50–1.46)
No job	1.94 (1.36–2.78) [†]	1.38 (1.04–1.82) [†]	1.14 (0.84–1.54)	1.02 (0.69–1.49)	6.06 (2.68–13.69) [†]	1.57 (1.00–2.45)	1.54 (0.89–2.67)	0.96 (0.50–1.85)
Area								
Dong	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Eup	0.96 (0.69–1.32)	1.03 (0.75–1.41)	1.23 (0.94–1.62)	1.09 (0.78–1.53)	0.69 (0.34–1.40)	1.01 (0.66–1.52)	1.03 (0.64–1.67)	1.11 (0.69–1.80)
Education								
Middle school	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
High school	1.25 (0.84–1.87)	1.01 (0.71–1.42)	0.92 (0.65–1.32)	1.38 (0.94–2.04)	1.74 (0.74–4.08)	0.79 (0.43–1.44)	1.12 (0.43–2.89)	0.89 (0.41–1.93)
College and above	1.27 (0.78–2.07)	0.94 (0.61–1.47)	0.80 (0.53–1.21)	1.06 (0.68–1.67)	2.18 (0.69–6.88)	0.90 (0.48–1.68)	0.99 (0.35–2.80)	0.73 (0.31–1.74)
Income								
Low	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
High	1.11 (0.87–1.42)	0.89 (0.70–1.13)	1.33 (1.08–1.63) [†]	1.08 (0.84–1.39)	1.15 (0.65–2.04)	0.68 (0.46–1.00)	1.37 (0.83–2.27)	1.09 (0.70–1.70)

Values are presented in AOR (CI). *weighted by the city/province, age, and sex of the general population in Korea; [†]p<0.05, adjusted for all of the variables mentioned above. AUD, alcohol use disorder; NUD, nicotine use disorder; NLWP, not living with partner

Table 4. Service utilization of those with mental disorders (12-month)

Diagnosis	Overall utilization of mental health experts*		Psychiatrist	
	Lifetime diagnosis	12-Month diagnosis	Lifetime diagnosis	12-Month diagnosis
	% (RSE)	% (RSE)	% (RSE)	% (RSE)
AUD	3.4 (24.6)	2.6 (55.8)	3.2 (25.4)	2.6 (55.8)
NUD	2.0 (31.6)	1.1 (79.5)	2.0 (31.6)	1.1 (79.5)
Depressive disorder	12.5 (15.3)	28.2 (18.8)	11.9 (15.9)	27.4 (19.3)
Anxiety disorder	6.2 (18.5)	9.1 (24.7)	5.5 (19.4)	9.1 (24.7)
Any disorder	4.4 (13.8)	7.2 (19.2)	4.0 (14.6)	7.0 (19.6)

*psychiatrists, other medical doctors, clinical psychologists, mental health social workers, and mental health nurses. RSE, relative standard error; AUD, alcohol use disorder; NUD, nicotine use disorder

reported that internalizing disorders (depressive, anxiety, and somatoform disorders) were more prevalent in females than in males, and AUD and NUD were more prevalent in males than in females.

Korea has universal insurance coverage provided by the National Health Insurance Service, which makes it possible to retrieve the treatment rate (i.e., service utilization rate) of mental disorders for the entire population; however, these data only pertain to patients who have sought treatment. The NMHSK studies also include individuals with mental disorders who have not received treatment; such individuals may not have a full understanding of mental disorders or fear the stigma associated with mental disorders and may not seek help. Some people may have sought help, but were hesitant to provide an honest response to during the NMHSK interview. Therefore, it is important to monitor both community-based and registry-based prevalence rates of mental disorders in Korea. A recent study that compared the registry-based and community-based prevalence rates of mental disorders in Korea showed lack of agreement between the two.³⁵ The legislation and healthcare system in Korea are structured to enable such studies, and should therefore be properly utilized to evaluate the registry-based and community-based prevalence rates and associated factors of mental health; this will help in framing appropriate policies to ease the burden of mental health.

AUD

The 12-month prevalence rate of AUD was 2.6% in 2021. The prevalence rate of AUD has shown a decreasing trend since 2001 (6.8%, 5.6%, 4.7%, 4.1%, and 3.0% in 2001, 2006, 2011, 2016, and 2021, respectively).³⁴ The prevalence rate for AUD in males showed a decreasing trend similar to that of the overall AUD prevalence in Korea from 2001 to 2021. This was mainly due to alcohol dependence until 2016; however, in 2021, the decrease in AUD among males was attributable to a 0.3% decrease in alcohol dependence and 1.6% decrease in alcohol abuse compared to that in 2016.³⁶ The prevalence of AUD in females was much lower than that in males. Howev-

er, the prevalence of alcohol dependence in females increased slightly in 2021 (from 1.1% in 2016 to 1.2% in 2021). Taken together, the above data show that alcohol dependence, a more severe form of alcohol abuse, showed a different pattern for both males (a more gradual decrease compared to alcohol abuse, which showed a sharp decrease) and females (a slight increase) in 2021 compared to that in previous years. This may be due to the limited social activities during the COVID-19 pandemic. Recent studies³⁷ have shown that an increase in risky drinking and alcohol dependence is associated with the COVID-19 pandemic-related lockdown. Moreover, according to logistic regression analysis, sex and age were associated with a 12-month alcohol use disorder diagnosis. Females had a lower risk of having a 12-month alcohol use disorder diagnosis than males. In addition, those in the 60–69 and 70–79 years age groups had a lower risk of having alcohol use disorder than those in the 18–29 years age group. This is consistent with the findings of a previous study³⁸ which found an association between male sex and younger age and alcohol consumption during the COVID-19 pandemic.

NUD

The overall 12-month prevalence of NUD was 2.7%. NUD showed a decreasing trend from 2001 to 2016 (6.7%, 6.0%, 4.1%, and 2.9% in 2001, 2006, 2011, and 2016, respectively), but increased in 2021 (3.1%).³⁶ The prevalence of this disorder showed a decreasing trend in males from 2011 to 2016, but increased in 2021 (12.1%, 10.8%, 7.0%, 4.9%, and 5.4% in 2001, 2006, 2011, 2016, and 2021, respectively).³⁴ For females, nicotine dependence showed a decreasing trend from 2001 to 2011 (1.7% in 2001 to 1.0% in 2011), but an increasing trend from 2016 to 2021 (1.1% in 2016 to 1.2% in 2021).³⁴ This may be a response to the stress caused by the COVID-19 pandemic. A recent study³⁹ reported that about 50% of the participants showed increased smoking during the COVID-19 lockdown and this was related to their subjective COVID-19 pandemic-associated stress levels. Considering that COVID-19 is a respiratory disease, it is important to formulate a

strategy for combating the effects of an increase in NUD. The demographic characteristic associated with the 12-month NUD diagnosis was sex. Females had a lower risk of being diagnosed with NUD during the past 12 months. This result is in line with that of a recent study which found that the proportion of smokers was much higher among males than among females.⁴⁰ As smoking is a predictive factor for worse prognosis in COVID-19,⁴¹ interventions for those with NUD are crucial.

Depressive disorder

The 12-month prevalence of depressive disorder was 1.7%. This is similar to the results from 2016 in which the prevalence of mood disorders (major depressive disorder, dysthymic disorder, and bipolar disorder) was 1.9%.¹¹ Considering that bipolar disorder (prevalence rate of 0.1%) was excluded in the 2021 survey, the prevalence of depressive disorder in 2021 was comparable to that in 2016. The prevalence of major depressive disorder in 2021 remained similar to that in the 2016 KECA study (1.1% in 2016 and 2021) among males, while it increased slightly compared to that in 2016 (2.0% to 2.4%) among females. A report by the Organization for Economic Cooperation and Development revealed that compared with other countries, Korea reported the highest prevalence of depressive symptoms (36.8%) in early 2020. According to a previous study⁴² the prevalence of high-risk depression (>10 in the Patient Health Questionnaire-9) among Korean adults has increased compared to that before the COVID-19 pandemic (4.9% vs. 5.3%). However, according to our data, the prevalence of depressive disorder in 2021 was comparable to that in 2016. This implies that while the depressive symptoms in the general population in Korea increased during the pandemic, they may not have been clinically significant to support a diagnosis of depressive disorder. As females have a higher risk of depression, the prevalence of major depressive disorder in females may have increased during the COVID-19 pandemic.³⁴

Marital status and job status were associated with a 12-month depressive disorder diagnosis. Those with a NLWP status (divorced, separated, widowed) had a higher risk of being diagnosed with a 12-month depressive disorder than those who were currently married. In response to the COVID-19 pandemic, the Korean government implemented important measures such as rigorous testing and mandatory quarantine of high-risk populations (contact with COVID-19-positive individuals and those who traveled abroad) to circumvent the need for a nationwide lockdown.⁴³ Strict regulations regarding social distancing have negatively impacted the economy.⁴⁴ In a recent survey, approximately 80% of the respondents reported that they were economically affected due to the COVID-19 pandemic.⁴⁵ Another study revealed that employment status and marital status were associated with depressive

symptoms.⁴⁶ Economically inactive individuals had a higher risk of depressive symptoms than salaried workers. Moreover, divorced or widowed individuals had a higher risk of depressive symptoms than those who were married. Our study shows that job status and marital status are not only associated with depressive symptoms but also with clinically significant depressive disorders.

Anxiety disorder

The 12-month prevalence of anxiety disorders was 3.1%. This rate was lower than the prevalence rate in 2016 (5.7%).¹¹ This decrease was evident in both sexes and could be attributed to the decreased prevalence of specific phobias in anxiety disorders. The prevalence of specific phobias in 2016 was 4.2%,¹¹ which decreased to 2.1% by 2021. The symptoms of a specific phobia include intense fear or anxiety when exposed to a specific object or situation.⁴⁷ There are various types of phobias such as animal, natural environment, situational, and blood phobias. Due to the consequences of the COVID-19 pandemic (e.g., quarantine, less outdoor activities), individuals with specific phobias may have had less exposure to the fear-inducing object or situation, leading to a decrease in the prevalence of specific phobias.

Demographic characteristics associated with a 12-month anxiety disorder diagnosis were sex, marital status, and job status. It is generally known that anxiety disorder is more prevalent and more burdensome in females than in males.⁴⁸ Our data showed that having a contract job was associated with a 12-month anxiety disorder diagnosis. It is possible that those with a contract job may feel more stressed about losing their job due to a perceived economic crisis during the COVID-19 pandemic than those with a permanent job.⁴⁵ Additionally, specific phobias account for a large proportion of anxiety disorders. A previous study indicated that those with a specific phobia showed severe role impairment in their daily life.⁴⁹ Another study⁵⁰ found that those with a job status of "other" (looking for a job or disabled) had higher odds of having a specific phobia than those classified as "employed." Therefore, those with a specific phobia may have difficulty in adjusting to a permanent job. Regarding marital status, a recent study⁵¹ found that those who were unmarried, separated, divorced, or widowed had higher anxiety symptoms than those who were married. As a higher level of perceived social support is associated with a lower risk of mental disorders,⁵² it is possible that social support from spouses during the COVID-19 pandemic may have been helpful.

Service utilization

The treatment gap for mental disorders is a global problem.⁵³ This was also observed in the present study. The per-

centage of service utilization among those who qualified for a 12-month diagnosis of AUD, NUD, depressive disorder, and anxiety disorder was 2.6%, 1.1%, 28.2%, and 9.1%, respectively, while that among those with any mental disorder (12-month diagnosis) was only 7.2%. This shows that those with a recent clinically significant mental health problem did not seek help or receive treatment.

When compared to the global treatment rate, the overall treatment rate of mental disorders in Korea was low. The global 12-month treatment rate for depression was approximately 50% in high-income countries and 20% in lower-middle-income countries.⁵⁴ For anxiety disorders, the global 12-month treatment rate was 27.6% (high-income countries: 36.3%; upper-middle-income countries: 20.4%; lower-middle-income countries: 7.9%).⁵⁵ Moreover, according to a meta-analysis,⁵⁶ the pooled estimate for those with AUD who received treatment was approximately 17.3%. Lastly, there is little information regarding the treatment rate of NUDs. However, the treatment rate for substance use disorder, which includes NUD, is very low,⁵⁷ implying that the treatment rate for nicotine use disorder is a global problem.

The treatment rate for mental disorders is associated with various factors such as mental health literacy, stigma, and discrimination.⁵⁸⁻⁶⁰ We found that the top three reasons for not receiving treatment for a mental disorder were “I thought I could solve that problem by myself,” “I thought I didn’t have a mental disorder,” and “I thought the problem would improve on its own” (data not shown). This implies that the mental health literacy of the general population in Korea is low, and there is room for improvement. Moreover, the stigma against mental disorders is common in Asia including Korea, which may be a barrier to receiving adequate treatment for mental disorders.⁶⁰ Governmental effort is needed to improve the mental health literacy of the general population and lower the stigma against mental disorders to increase service utilization.

Limitations

Despite the meaningful results, this study has several limitations. While the DSM was updated to Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5) in 2013, we used a tool based on the DSM-IV criteria. The WHO-WMH consortium has developed an updated version of the CIDI which coordinates with the DSM-5 criteria in 2019. The CIDI 5.0, which is based on the DSM-5 diagnostic criteria, was not utilized as it is not yet standardized in Korean. There was insufficient time to translate and validate the tool to be utilized in the NMHSK 2021. However, the Korean version of CIDI 5.0 is currently being translated into Korean by the National Center for Mental Health; this version will be utilized in the subsequent NMHSK studies. Another limitation is that when

the disorders were analyzed separately, the prevalence rates of some disorders were associated with high RSE. This may be due to the relatively small sample size. Therefore, the sample size needs to be increased in the future NMHSK studies to increase the accuracy of the prevalence rate findings. Moreover, NMHSK 2021 has eliminated bipolar disorder, schizophrenia, and illicit drug use disorder due to the small sample size and the possibility of generating biased results. However, considering the disease burden of patients with severe mental disorders, a separate study that focuses on severe mental disorder or illicit drug use disorder should be performed. Finally, demographic characteristics were collected to investigate the factors associated with mental disorders. However, future surveys need to include individual correlates of mental disorders such as childhood experience, social network, and personality characteristics.

Conclusions

This study presents the results of the NMHSK 2021. Overall, the prevalence of AUDs has decreased consistently since 2001. For NUD, there was a decreasing trend from 2001 to 2016, but an increase in 2021. The prevalence rates of depressive and anxiety disorders are lower in 2021 than in 2016. The 12-month treatment rate of those with mental disorders (12-month diagnosis) was 7.2%, which is substantially low. Mental health surveillance is available through national surveys and national registry data in Korea. There needs to be constant effort in mental health surveillance at a national level to grasp the full picture of mental health in Korea using both datasets, as the two datasets are complementary to each other. Moreover, national-level surveys targeting topics that are not included in the NMHSK (disorders of childhood and adolescence, severe mental disorders, and substance use) need to be conducted in the future.

Availability of Data and Material

The datasets generated or analyzed during the current study are available in the Mental Health Survey of Korea repository, <https://mhs.ncmh.go.kr/front/index.do>.

Conflicts of Interest

Hong Jin Jeon, a contributing editor of the *Psychiatry Investigation*, was not involved in the editorial evaluation or decision to publish this article. All remaining authors have declared no conflicts of interest.

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