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Factors and help-seeking behaviors associated with depression in Korean adults: Review of data from 2014 and 2016 Korea national health and nutrition examination surveys

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ABSTRACT

As a health problem in Korea, the prevalence of depression is continuously increasing. This study examines factors and help-seeking behaviors associated with depression in Korean adults. Data was extracted from Korea National Health and Nutrition Examination Surveys (2014 and 2016) using the PHQ-9 depression screening instrument. Among 10,459 participants (weighted frequency = 36,418,292) over 19 years old, 7.2% were classified as having depression including depressive symptoms (PHQ-9 scores ≥ 10) or depressive disorders diagnosed by psychiatrists. Among those with depression, 58.6% responded that they had never sought help. Statistically high odds ratios for being at risk for depression include being female, aged 19–39, living alone, low household income, low level of education (middle school or lower), occupation (unemployed/inactive), an ex- or current smoker, having a chronic disease, and being underweight. Statistically low odds ratios for seeking counselling, age ≥ 60 and lower than high household income; for seeing doctor, age 19–39 or ≥60; and for treatment, age 19–39, lower than middle household income, and more than once per week drinking frequency. Overall, there is a need to find persons having these risk factors and to develop tailored strategies that will encourage help-seeking behavior with help-seeking intention.

1. Introduction

Depression is a global health problem, and its prevalence has increased by more than 18% compared to 10 years ago. According to 2015 statistics, the World Health Organization (WHO) has worked to improve the access to professionals and treatment of patients with depression through a global campaign "*Depression: Let's talk*" (World Health Organization, 2017). As suicide due to depression has increased in Korean society in recent years, depression is now being considered as a major health issue (Cho, 2011; Korean Statistical Informtaion Service, 2017; Shin et al., 2017). Patients tend to seek help when their depression has been prolonged. However, the longer a patient has suffered from depression, the less likely their recovery or remission rates (Blom et al., 2007; Boerema et al., 2016). Unfortunately, treatment for depression in Korea occurs at a notably lower rate than in other countries (Cho, 2011), and even patients who receive specialized psychiatric treatment continue to show symptoms. For example, from within one year of reporting initial symptoms, the current rate of treatment is 57.9%, which is significantly lower than the 72.6% in Japan (Ki et al., 2014; Oguchi et al., 2014).

Continued research has identified factors associated with the help-seeking behavior of patients or reasons for delayed treatment (van Beljouw et al., 2010: Oguchi et al., 2014; Boerema et al., 2016; Magaard et al., 2017; Fine et al., 2018). In a previous study, symptoms of depression were reduced more rapidly in patients who received treatment than in patients who needed treatment but did not receive any. However, when the severity was high, symptoms were found to remain despite treatment (van Beljouw et al., 2010). Help-seeking behavior has been associated with sociodemographic factors, and thus related factors should be further explored (Schomerus et al., 2013). Patients who have suicidal thoughts or display suicidal behavior due to depression need to seek a suitable health service (Trueland, 2014). For these reasons, there is a need to identify factors associated with depression and help-seeking behavior in data collected from Koreans, using the Korea National Health and Nutrition Examination Survey (KNHANES).

From the KNHANES report in 2014, depression was investigated once every two years using the Patient Health Questionnaire-9 (PHQ-9), a useful screening tool for depression and whose reliability and validity have been verified (Moriarty et al., 2015). A study that analyzed depression using 2014 PHQ-9 data, an initial investigation, suggested that cumulative data should be used to ensure a more accurate analysis because the research data for a single year has a limited number of investigation participants (Shin et al., 2017). Thus, this study analyzes

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the combined data for two years, 2014 and 2016.

Although Koreans tend not to seek psychiatrists for treatment, previous studies in Korea defined depression using a clinical diagnosis (Ki et al., 2014; Park and Lee, 2011). Without considering the possibility that seeing doctors and treatment might be lower than the PHQ-9 scores, previous studies in Korean defined depression using PHQ-9 scores (Kim et al., 2017; Shin et al., 2017). Accordingly, this study analyzed using two distinct categories, depression diagnoses by a psychiatrist and PHQ-9 scores, in order to include participants not currently seeing a psychiatrist and those not being treated but who have symptoms of depression.

This study investigates the rates of depression and help-seeking behaviors of Korean adults, and associated factors. Specifically, the following factors are investigated: (1) differences in sociodemographic characteristics across depression and PHQ-9 scores; (2) differences in suicidal plans and attempts and help-seeking behaviors across depression and PHQ-9 scores; (3) differences in help-seeking behaviors by sociodemographic characteristics among participants having depression; (4) factors associated with depression; and (5) factors associated with the help-seeking behaviors of participants having depression. Based on results of these analyses, this study aims to identify groups that are likely to delay treatment and thereby provide a basis for determining intervention methods in order to promote help-seeking behaviors.

2. Method

2.1. Data source and participants

As research using a descriptive survey to investigate patterns of depression and help-seeking behaviors in Koreans, and factors associated with depression and help-seeking behaviors, this study analyzed data from the 2014 and 2016 KNHANES, a survey implemented by the Korea Centers for Disease Control and Prevention (KCDC). The KNHANES reports extract investigation participants using systematized sampling that considers residential area, sex, and age, and collects individual general characteristics, health checkup data, clinical examination data, interview data pertaining to lifestyle, and data related to diseases and treatment using standardized examination methods and trained investigation staff. Furthermore, the survey applied a quality control program to the KNHANES data to ensure analytical values satisfy international standards and an overall response rate (75%) (Kim, 2014).

The inclusion criteria for this study were participants aged 19 or older, and adults having PHQ-9 scores. Overall, 15,700 people participated in the 2014 and 2016 KNHANES (7550 in 2014; 8150 in 2016), and this study extracted the data of 10,459 people (weighted frequency = 36,418,292) for use in the analysis; the study excluded 3342 participants who were aged under 19, 1648 participants who did not respond to the PHQ-9 screening instrument, 179 participants who gave insufficient data on demographic characteristics, and 72 pregnant women.

2.2. Variables

Inclusion criteria for depression in this study include participants scoring ≥10 points using the PHQ-9 depression screening instrument, or participants who replied they have been diagnosed with a depressive disorder by psychiatrists and are being treated at the time of the survey (Nguyen et al., 2017). The PHQ-9 depression screening instrument is a self-report survey tool that screens for depressive symptoms and consists of nine items. Participants are instructed to mark how often they suffered from symptoms over the last two weeks based on a four-point scale: “none,” “for a few days,” “over one week,”, and “almost every day” were scored as 0 point, 1 points, 2 points, and 3 points, respectively. Here, PHQ-9 scores of ≤4 points, 5–9 points, 10–14 points, 15–19 points, and ≥20 points were classified as normal, mildly depressive symptoms, moderate symptoms, moderately severe symptoms, and severe symptoms; participants scoring ≥10 were designated as subjects who need clinical treatment (Moriarty et al., 2015). Participants who were previously diagnosed as having a depressive disorder and are currently receiving treatment could have a low PHQ-9 score at the time of investigation due to remission; however, they were also included in the research results. In the analysis, depression and PHQ-9 scores were set as dependent variables, and through these results, factors and effects associated with help-seeking behavior could be analyzed from multiple angles.

Help-seeking behaviors were divided into four categories: (1) participants did not receive any counselling or treatment during the last year, (2) participants received counselling for depression through the internet, phone, and/or a consulting center, (3) participants received counselling from a psychiatrist, and (4) participants received counselling through the internet, phone, consulting center, and a psychiatrist. These categories were classified as “never,” “counselling,” “seeing doctor,” and “both counselling and seeing doctor,” respectively. In terms of current treatment, the case in which participants replied they had been diagnosed and were receiving treatment (e.g., receiving medication or regular counselling from a psychiatrist) was classified as “yes.” Suicidal plans and attempts were classified according to the responses, “yes” or “no” to the question asking if they had specifically planned to attempt suicide or if they had tried to attempt suicide during the last year.

Based on earlier studies (Boerema et al., 2016; Magaard et al., 2017; Shin et al., 2017), the present study extracted the following factors as potential confounding variables. Demographic characteristics extracted included: sex, age, familial structure (alone or with someone), living area (urban or rural), household income (low, low-middle, middle-high, high), education attained (university or higher, high school, middle school or lower), and occupation (non-manual, manual, unemployed/inactive). In addition, health behavior and status factors were extracted, such as drinking frequency (never or < 1 per month, 1–4 per month, ≥1 per week), smoking status (never, ex-smoker, current smoker), aerobic physical exercise (no, yes), presence of chronic disease (no, yes), stress (no, yes), and BMI (kg/m^2) [underweight (< 18.5), normal (≥18.5 and < 25.0), obese (≥25.0)].

2.3. Statistics

The Rao–Scott χ^2 test (χh) was used to assess differences of participants’ sociodemographic characteristics, help-seeking behavior, suicidal plans, and suicidal attempts due to depression and PHQ-9 scores. In addition, the Rao–Scott χ^2 test (χh) was used to explore differences between participants’ sociodemographic characteristics having depression and any help-seeking behavior. To calculate the odds ratios for depression and help-seeking behavior due to depression, a logistic regression was used. The weighted frequency and percent were estimated in order to generalize the results of the KNHANES data to the whole population. Data were analyzed using SAS 9.4 (SAS Institute, Cary, NC) and the significance was set to $P < 0.05$, calculated using a weighted percentage.

3. Results

3.1. Differences in sociodemographic characteristics across depression and PHQ-9 scores

Table 1 presents differences in the prevalence of depression and PHQ-9 score ranges according to participants’ sociodemographic characteristics. A total of 804 participants (weighted frequency = 2,621,963), comprising 7.7% of the sample (weighted 7.2%), were classified as having depression, and 679 participants (weighted frequency = 2,221,405), comprising 6.5% of the sample (weighted

Table 1
Differences in sociodemographic characteristics across depression status and PHQ-9 scores (n = 10,459, N = 36,418,292).

		Depression						PHQ-9 Scores							
		No (n = 9655, 92.3% N = 33,796,329, 92.8%)		Yes (n = 804, 7.7% N = 2,621,963, 7.2%)				< 4(n = 8237, 78.8% N = 28,771,195, 79.0%)		≥5 and < 9(n = 1543, 14.8% N = 5,425,692, 14.9%)		≥10(n = 679, 6.5% N = 2,221,405, 6.1%)			
	Categories	n (%)	W%	n (%)	W%	χh	p-value	n (%)	W%	n (%)	W%	n (%)	W%	χh	p-value
Sex	Male	4238 (95.0)	95.1	223 (5.0)	4.9	51.55	< 0.001	3774 (84.6)	84.2	497 (11.1)	11.6	190 (4.3)	4.2	112.60	< 0.001
	Female	5417 (90.3)	90.5	581 (9.7)	9.5			4463 (74.4)	73.9	1046 (17.4)	18.1	489 (8.2)	8.0		
Age (years)	19–39	2826 (92.7)	92.8	222 (7.3)	7.2	36.48	< 0.001	2299 (75.4)	75.7	542 (17.8)	17.6	207 (6.8)	6.7	66.77	< 0.001
	40–59	3673 (94.4)	94.3	219 (5.6)	5.7			3192 (82.0)	82.5	519 (13.3)	13.0	181 (4.7)	4.5		
	≥ 60	3156 (89.7)	90.0	363 (10.3)	10.0			2746 (78.0)	78.1	482 (13.7)	13.9	291 (8.3)	8.0		
Familial structure	Alone	921 (84.8)	85.6	165 (15.2)	14.4	68.78	< 0.001	742 (68.3)	68.8	195 (18.0)	18.3	149 (13.7)	12.9	89.98	< 0.001
	With someone	8734 (93.2)	93.5	639 (6.8)	6.5			7495 (80.0)	80.0	1348 (14.4)	14.6	530 (5.6)	5.5		
Living area	Urban	7856 (92.5)	92.9	640 (7.5)	7.1	0.69	0.407	6695 (78.8)	79.1	1260 (14.8)	14.9	541 (6.4)	6.0	0.78	0.679
	Rural	1799 (91.6)	92.2	164 (8.4)	7.8			1542 (78.6)	78.5	283 (14.4)	14.8	138 (7.0)	6.7		
Household income	Low	1632 (83.8)	83.8	316 (16.2)	16.2	170.64	< 0.001	1332 (68.4)	67.9	338 (17.4)	17.9	278 (14.3)	14.3	201.38	< 0.001
	Middle-low	2398 (92.2)	92.7	204 (7.8)	7.3			2032 (78.1)	77.1	395 (15.2)	16.5	175 (6.7)	6.4		
	Middle-high	2797 (94.7)	95.1	155 (5.3)	4.9			2405 (81.5)	81.7	413 (14.0)	14.1	134 (4.5)	4.2		
	High	2828 (95.6)	95.0	129 (4.4)	5.0			2468 (83.5)	83.2	397 (13.4)	13.0	92 (3.1)	3.7		
Education attained	University or higher	3450 (95.1)	94.8	177 (4.9)	5.2	64.74	< 0.001	2969 (81.9)	81.5	506 (14.0)	14.1	152 (4.2)	4.5	65.41	< 0.001
	High school	3187 (93.4)	93.5	225 (6.6)	6.5			2708 (79.4)	79.5	516 (15.1)	15.0	188 (5.5)	5.5		
	Middle or lower	3018 (88.2)	88.6	402 (11.8)	11.4			2560 (74.9)	74.4	521 (15.2)	16.0	339 (9.9)	9.6		
Occupation	Non-manual	2326 (96.1)	96.2	94 (3.9)	3.8	112.20	< 0.001	2018 (83.4)	83.3	321 (13.3)	13.5	81 (3.3)	3.2	112.53	< 0.001
	Manual	3561 (94.4)	94.5	211 (5.6)	5.5			3062 (81.2)	80.8	526 (13.9)	14.5	184 (4.9)	4.7		
	Unemployed/ inactive	3768 (88.3)	88.6	499 (11.7)	11.4			3157 (74.0)	74.1	696 (16.3)	16.4	414 (9.7)	9.6		
Drinking frequency	Never or < 1 per month	4405 (90.7)	91.5	450 (9.3)	8.5	13.85	0.001	3754 (77.3)	83.3	738 (15.2)	13.5	363 (7.5)	6.8	10.02	.040
	1–4 per month	3112 (94.0)	94.0	197 (6.0)	6.0			2655 (80.2)	80.8	481 (14.5)	14.5	173 (5.2)	5.3		
	≥1 per week	2138 (93.2)	93.2	157 (6.8)	6.8			1828 (79.7)	74.1	324 (14.1)	16.4	143 (6.2)	6.1		
Smoking status	Never	5879 (92.2)	92.9	494 (7.8)	7.1	19.35	< 0.001	4989 (78.3)	78.6	986 (15.5)	15.7	398 (6.2)	5.8	45.34	< 0.001
	Ex-smoker	1985 (94.2)	94.8	123 (5.8)	5.2			1758 (83.4)	84.3	243 (11.5)	11.2	107 (5.1)	4.5		
	Current smoker	1791 (90.5)	90.9	187 (9.5)	9.1			1490 (75.3)	75.4	314 (15.9)	16.2	174 (8.8)	8.3		
Aerobic physical exercise	No	4899 (91.3)	92.1	467 (8.7)	7.9	5.11	0.024	4182 (77.9)	78.3	789 (14.7)	14.9	395 (7.4)	6.8	5.24	0.073
	Yes	4756 (93.4)	93.5	337 (6.6)	6.5			4055 (79.6)	79.6	754 (14.8)	14.9	284 (5.6)	5.5		
Presence of chronic disease	No	7313 (93.9)	94.1	472 (6.1)	5.9	81.54	< 0.001	6288 (80.8)	80.5	1094 (14.1)	14.4	403 (5.2)	5.1	82.46	< 0.001
	Yes	2342 (87.6)	87.7	332 (12.4)	12.3			1949 (72.9)	72.8	449 (16.8)	17.0	276 (10.3)	10.2		
Stress	Low	7541 (96.7)	97.0	260 (3.3)	3.0	584.59	< 0.001	6805 (87.2)	87.6	811 (10.4)	10.4	185 (2.4)	2.0	1112.48	< 0.001
	High	2114 (79.5)	81.0	544 (20.5)	19.0			1432 (53.9)	55.1	732 (27.5)	27.4	494 (18.6)	17.5		
BMI (kg/m^2)	Underweight														
(< 18.5)	374 (86.8)	86.0	57 (13.2)	14.0	25.96	< 0.0-01	281 (65.2)	66.2	100 (23.2)	21.2	50 (11.6)	12.7	42.20	< 0.0-01	
	Normal (≥18.5, < 25.0)	6075 (92.9)	93.5	467 (7.1)	6.5			5179 (79.2)	79.4	965 (14.8)	15.0	398 (6.1)	5.6		
	Obese (≥25.0)	3206 (92.0)	92.3	280 (8.0)	7.7			2777 (79.7)	79.9	478 (13.7)	13.8	231 (6.6)	6.3		
Year	2014	4423 (92.2)	92.5	373 (7.8)	7.5	0.57	0.451	3746 (78.1)	78.2	724 (15.1)	15.2	326 (6.8)	6.6	2.74	0.254
	2016	5232 (92.4)	93.0	431 (7.6)	7.0			4491 (79.3)	79.7	819 (14.5)	14.6	353 (6.2)	5.7		

Note. n: unweighted sample size; N: weighted sample size to generalize the results of the KNHANES data to the whole population; W%: weighted percent to generalize the results of the KNHANES data to the whole population; PHQ-9: Patient Health Questionniare-9; BMI: body mass index; p-value was obtained using a Rao-Scott χ^2 test based on weighted percentage.

6.1%), were found to have depressive symptoms, as shown by PHQ-9 scores of ≥10 points. Statistically significant differences in the prevalence of depression (left side of Table 1) were found for the following variables, with the prevalence of depression in the most strongly associated categories indicated in parentheses: sex (9.7% of female participants [weighted 9.5%]), age (10.3% of participants aged ≥ 60 [weighted 10.0%]), familial structure (15% of participants who lived alone [weighted 14.4%]), household income (16.2% of low-income participants [weighted 16.2%]), education attained (11.8% of participants with middle school or lower education [weighted 11.4%]), occupation (11.7% of unemployed/inactive participants [weighted 11.4%]), drinking frequency (9.3% of participants who reported drinking never or < 1 time per month [weighted 8.5%]), smoking status (9.5% of current smokers [weighted 9.1%]), presence of a chronic disease (12.4% of participants with a chronic disease [12.3%]), stress (20.5% of participants who reported high stress [weighted 19.0%]), and BMI (13.2% of underweight participants [weighted 14.0%]) (all $p > 0.05$, based on weighted percentages).

The variables that displayed a statistically significant difference in the distribution of PHQ-9 scores ≥10 (right side of Table 1) were as follows, with the prevalence of PHQ-9 scores ≥10 in the most strongly associated categories given in parentheses: sex (8.2% of female participants [weighted 8.0%]), age (8.3% of participants aged ≥ 60 [weighted 8.0%]), familial structure (13.7% of participants who lived alone [weighted 12.9%]), household income (14.3% of low-income participants [weighted 14.3%]), education attained (9.9% of participants with middle school or lower education [weighted 9.6%]), occupation (9.7% of unemployed/inactive participants [weighted 9.6%]), drinking frequency (7.5% of participants who reported drinking never or < 1 time per month [weighted 6.8%]), smoking status (8.8% of current smokers [weighted 8.3%]), presence of a chronic disease (10.3% of participants with a chronic disease [weighted 10.2%]), stress (18.6% of participants who reported high stress [weighted 17.5%]), and BMI (11.6% of underweight participants [weighted 11.6%] (all $p > 0.05$, based on weighted percentages).

3.2. Suicide plans, suicide attempts, and help-seeking behaviors

Table 2 presents differences in the rates of suicide plans and suicide attempts according to the presence of depression (left side of the table) and PHQ-9 scores (right side of the table). Importantly, a lower percentage of help-seeking behavior was found among participants with PHQ-9 scores ≥ 10 points than among those with depression (left side). Among participants with depression, 5.6% (weighted 5.1%) had developed a specific plan for suicide during the previous year, in contrast to 5.9% (weighted 5.7%) of those with PHQ-9 scores ≥ 10 points. Turning to suicide attempts, 2.5% (weighted 2.7%) of the participants with depression and 2.5% (weighted 3.0%) of the participants with PHQ-9 scores ≥ 10 points were found to have attempted suicide during the past year. Focusing more specifically on PHQ-9 scores, 0.6% (weighted 0.5%) of participants with PHQ-9 scores of 5–9 points and only 0.1% (weighted 0.1%) of participants with PHQ-9 scores ≤ 4 points had attempted suicide during this period, indicating that suicide attempts were less common among participants with lower PHQ-9 scores (all $p < 0.05$ based on weighted percentage).

Differences in help-seeking behaviors according to depression and PHQ-9 scores are also presented in Table 2. Never seeking help was the most common response, which was reported by 60.4% (weighted 58.6%) of the participants with depression and 71.6% (weighted 69.2%) of those with PHQ-9 scores ≥ 10 points. Among the participants with depression (left side of Table 2) 16.0% (weighted 17.1%) and 19.2% (weighted 19.1%) reported seeing a doctor and both counselling and seeing a doctor, respectively, whereas only 11.2% (weighted 12.7%) and 12.1% (weighted 12.1%) of the participants with PHQ-9 scores ≥ 10 did so, respectively. It was found that 212 participants with depression were currently receiving treatment, of whom 58 had PHQ-9

Table 2
Differences in suicide plans, suicide attempts, and help-seeking behaviors across depression status and PHQ-9 scores (n = 10,459).

Categories		Depression						PHQ-9 Scores							
		No		Yes				≤ 4		≥ 5 and ≤ 9		≥ 10			
		n (%)	*W*%	*n* (%)	*W*%	χ^2	*p*-value	*n* (%)	*W*%	*n* (%)	*W*%	*n* (%)	*W*%	χ^2	*p*-value
Suicide plan	No	9598 (99.4)	99.6	759 (94.4)	94.9	189.06	< 0.001	8199(99.5)	99.7	1519 (98.4)	98.8	639 (94.1)	94.3	221.89	< 0.001
	Yes	57 (0.6)	0.4	45 (5.6)	5.1			38(0.5)	0.3	24 (1.6)	1.2	40 (5.9)	5.7		
Suicide attempt	No	9640 (99.8)	99.9	784 (97.5)	97.3	127.83	< 0.001	8228(99.9)	99.9	1534 (99.4)	99.5	662 (97.5)	97.0	135.21	< 0.001
	Yes	15 (0.2)	0.1	20 (2.5)	2.7			9(0.1)	0.1	9 (0.6)	0.5	17 (2.5)	3.0		
Help-seeking behavior	Never	9285 (96.2)	96.3	486 (60.4)	58.6	1329.20	< 0.001	7947 (96.5)	96.7	1338 (86.7)	86.9	486 (71.6)	69.2	712.81	< 0.001
	Counseling	135 (1.4)	1.3	35 (4.4)	5.1			82(1.0)	1.0	53 (3.4)	3.3	35 (5.2)	6.0		
	Seeking Doctor	201 (2.1)	1.9	129 (16.0)	17.1			166(2.0)	1.9	88 (5.7)	5.0	76 (11.2)	12.7		
	Counseling + Seeking Doctor	34 (0.4)	0.5	154 (19.2)	19.1			42(0.5)	0.5	64 (4.1)	4.8	82 (12.1)	12.1		
Current treatment	No	9655 (100.0)	100.0	592 (73.6)	74.3	–	–	8179(99.3)	99.3	1476 (95.7)	96.1	592 (87.2)	87.8	362.75	< 0.001
	Yes	0 (0)	0.0	212 (26.4)	25.7			58(0.7)	0.7	67 (4.3)	3.9	87 (12.8)	12.2		

Note. n: unweighted sample size; *W*%: weighted percent to generalize the results of the KNHANES data to the whole population; PHQ-9: Patient Health Questionniare-9; *p*-value was obtained using a Rao-Scott χ^2 test based on weighted percentage.

Table 3
Differences in help-seeking behaviors by sociodemographic characteristics among participants with depression (n = 804).

		Help-seeking behavior										Current treatment					
		Never		Counselling		Seeing doctor		Counselling + Seeing doctor				No		Yes			
		n (%)	*W*%	*n* (%)	*W*%	*n* (%)	*W*%	*n* (%)	*W*%	χh	*p*-value	*n* (%)	*W*%	*n* (%)	*W*%	χh	*p*-value
Sex	Male	143 (64.1)	59.4	14 (6.3)	7.8	30 (13.5)	15.1	36 (16.1)	17.6	4.35	0.227	170 (76.2)	75.5	53 (23.8)	24.5	0.18	0.672
	Female	343 (59.0)	58.2	21 (3.6)	3.7	99 (17.0)	18.2	118 (20.3)	19.9			422 (72.6)	73.8	159 (27.4)	26.2		
Age (years)	19–39	152 (68.5)	65.6	18 (8.1)	8.6	22 (9.9)	11.9	30 (13.5)	13.9	27.92	< 0.0-01	189 (85.1)	84.5	33 (14.9)	15.5	20.61	< 0.0-01
	40–59	118 (53.9)	49.6	7 (3.2)	3.5	39 (17.8)	21.2	55 (25.1)	25.7			150 (68.5)	67.0	69 (31.5)	33.0		
	≥ 60	216 (59.5)	59.6	10 (2.8)	2.4	68 (18.7)	19.4	69 (19.0)	18.7			253 (69.7)	69.6	110 (30.3)	30.4		
Familial structure	Alone	104 (63.0)	57.2	7 (4.2)	5.0	19 (11.5)	11.5	35 (21.2)	26.2	5.63	0.131	126 (76.4)	72.6	39 (23.6)	27.4	0.26	0.613
	With someone	382 (59.8)	59.0	28 (4.4)	5.1	110 (17.2)	18.3	119 (18.6)	17.6			466 (72.9)	74.7	173 (27.1)	25.3		
Living area	Urban	392 (61.3)	59.9	30 (4.7)	5.5	101 (18.6)	15.9	117 (18.3)	18.6	3.97	0.265	477 (74.5)	75.4	163 (25.5)	24.6	1.57	0.210
	Rural	94 (57.3)	52.3	5 (3.0)	3.1	28 (17.1)	23.1	37 (22.6)	21.6			115 (70.1)	69.4	49 (29.9)	30.6		
Household income	Low	183 (57.9)	52.3	11 (3.5)	4.5	64 (20.3)	24.0	58 (18.4)	19.2	21.55	0.010	227 (71.8)	70.1	89 (28.2)	29.9	8.52	0.036
	Middle-low	129 (63.2)	63.5	11 (5.4)	5.0	33 (16.2)	17.1	31 (15.2)	14.4			159 (77.9)	80.3	45 (22.1)	19.7		
	Middle-high	107 (69.0)	68.7	6 (3.9)	3.4	17 (11.0)	12.1	25 (16.1)	15.8			123 (79.4)	80.1	32 (20.6)	19.9		
	High	67 (51.9)	53.5	7 (5.4)	7.9	15 (11.6)	11.1	40 (31.0)	27.6			83 (64.3)	68.7	46 (35.7)	31.3		
Education attained	University or higher	117 (66.1)	64.1	11 (6.2)	6.7	15 (8.5)	8.2	34 (19.2)	20.9	15.77	0.015	134 (75.7)	74.4	43 (24.3)	25.6	1.68	0.432
	High school	130 (57.8)	56.2	12 (5.3)	6.3	44 (19.6)	21.0	39 (17.3)	16.4			171 (76.0)	77.3	54 (24.0)	22.7		
	Middle or lower	239 (59.5)	56.9	12 (3.0)	2.8	70 (17.4)	20.1	81 (20.1)	20.2			287 (71.4)	71.8	115 (28.6)	28.2		
Occupation	Non-manual	64 (68.1)	63.1	7 (7.4)	8.3	9 (9.6)	10.3	14 (14.9)	18.3	10.36	0.110	76 (80.9)	77.8	18 (19.1)	22.2	7.77	0.021
	Manual	140 (66.4)	64.5	7 (3.3)	3.4	34 (16.1)	19.1	30 (14.2)	13.0			173 (82.0)	81.9	38 (18.0)	18.1		
	Unemployed/inactive	282 (56.5)	54.8	21 (4.2)	5.1	86 (17.2)	17.8	110 (22.0)	22.3			343 (68.7)	69.9	156 (31.3)	30.1		
Drinking frequency	Never or < 1 per month	245 (54.4)	52.3	19 (4.2)	4.6	84 (18.7)	20.9	102 (22.7)	22.2	10.77	0.096	300 (66.7)	66.2	150 (33.3)	33.8	15.09	0.001
	1–4 per month	133 (67.5)	64.9	6 (3.0)	4.0	29 (14.7)	15.1	29 (14.7)	16.1			159 (80.7)	81.5	38 (19.3)	18.5		
	≥1 per week	108 (68.8)	64.0	10 (6.4)	7.6	16 (10.2)	11.9	23 (14.6)	16.5			133 (84.7)	82.3	24 (15.3)	17.7		
Smoking status	Never	288 (58.3)	58.0	15 (3.0)	3.6	86 (17.4)	17.9	105 (21.3)	20.5	5.82	0.444	344 (69.6)	71.5	150 (30.4)	28.5	4.68	0.097
	Ex-smoker	76 (61.8)	56.3	8 (6.5)	5.1	18 (14.6)	18.0	21 (17.1)	20.6			95 (77.2)	72.5	28 (22.8)	27.5		
	Current smoker	122 (65.2)	61.1	12 (6.4)	7.9	25 (13.4)	15.3	28 (15.0)	15.7			153 (81.8)	80.7	34 (18.2)	19.3		
Aerobic physical exercise	No	282 (60.4)	58.4	17 (3.6)	4.2	78 (16.7)	16.7	90 (19.3)	20.7	1.99	0.575	337 (72.2)	71.8	130 (27.8)	28.2	2.30	0.129
	Yes	204 (60.5)	58.9	18 (5.3)	6.1	51 (15.1)	17.6	64 (19.0)	17.4			255 (75.7)	77.2	82 (24.3)	22.8		
Presence of chronic disease	No	294 (62.3)	61.4	27 (5.7)	6.1	63 (13.3)	14.5	88 (18.6)	18.0	8.71	0.034	358 (75.8)	76.2	114 (24.2)	23.8	2.51	0.113
	Yes	192 (57.8)	53.4	8 (2.4)	3.1	66 (19.9)	22.4	66 (19.9)	21.2			234 (70.5)	70.6	98 (29.5)	29.4		
BMI (kg/m^2)	Underweight (< 18.5)	33 (57.9)	56.1	4 (7.0)	10.2	10 (17.5)	16.1	10 (17.5)	17.6	11.52	0.074	44 (77.2)	84.3	13 (22.8)	15.7	12.44	0.002
	Normal (≥18.5, < 25.0)	292 (62.5)	63.2	18 (3.9)	3.9	71 (15.2)	17.2	86 (18.4)	15.6			352 (75.4)	77.5	115 (24.6)	22.5		
	Obese (≥25.0)	161 (57.5)	52.0	13 (4.6)	5.8	48 (17.1)	17.2	58 (20.7)	25.0			196 (70.0)	66.9	84 (30.0)	33.1		
Year	2014	237 (63.5)	62.3	13 (3.5)	3.2	56 (15.0)	15.6	67 (18.0)	18.8	5.26	0.154	288 (77.2)	77.9	85 (22.8)	22.1	3.14	0.077
	2016	249 (57.8)	55.1	22 (5.1)	6.9	73 (16.9)	18.6	87 (20.2)	19.4			304 (70.5)	71.0	127 (29.5)	29.0		

Note. n: unweighted sample size; *W*%: weighted percent to generalize the results of the KNHANES data to the whole population; PHQ-9: Patient Health Questionniare-9; BMI: body mass index; *p*-value was obtained using a Rao-Scott χ^2 test based on weighted percentage.

scores ≤ 4 points, 67 had PHQ-9 scores 5–9 points, and 58 had PHQ-9 scores ≥ 10 points.

3.3. Differences in help-seeking behaviors by sociodemographic characteristics

Table 3 presents differences in help-seeking behaviors and current treatment according to sociodemographic characteristics for the 804 participants who had depression. The statistical significance of differences in help-seeking behaviors across sociodemographic categories was investigated by comparing the percentage of participants who reported never seeking help. Significant differences were found for the following variables, with the categories that demonstrated the highest frequencies of never seeking help shown in parentheses: age (68.5% of participants aged 19–39 [weighted 65.6%]), household income (69.0% of middle-high income participants [weighted 68.7%]), education attained (66.1% of participants with a university or higher education [weighted 64.1%]), and presence of a chronic disease (62.3% of participants with no chronic disease [weighted 61.4%]) (all $p > 0.05$, based on weighted percentage).

Statistically significant differences in terms of whether participants with depression were currently receiving treatment were found for the following variables, with the categories for which participants reported the lowest percentages of current treatment shown in parentheses: age (14.9% of participants aged 19–39 [weighted 15.5%], household income (22.1% of participants with middle-low income [weighted 19.7%]), occupation (18.0% of participants with a manual occupation [weighted 18.1%], drinking frequency (15.3% of participants who reported drinking ≥1 time per week [weighted 17.7%]), BMI (22.8% of underweight participants [weighted 15.7%]) (all $p > 0.05$, based on the weighted percentages).

3.4. Associations between participants' characteristics and depression

We next calculated the odds ratios for depression, as shown in Table 4. Compared to males, females had a significantly increased risk of depression, with an odds ratio of 2.77 (95% confidence interval [CI] = 2.06–3.71). In terms of familial structure, participants who lived alone were found to have an odds ratio of 1.52 (95% CI = 1.18–1.92) compared to participants who lived with someone. Participants with a low household income level were found to have an odds ratio of 2.20 (95% CI = 1.64–2.95) compared to participants with a higher household income. In terms of occupation, unemployed/inactive participants were found to have an odds ratio of 2.21 (95% CI = 1.58–3.08) compared to participants in non-manual occupations. Current smokers were found to have an odds ratio of 3.03 (95% CI = 2.25–4.09) compared to participants who never smoked. Finally, underweight (BMI < 18.5 kg/m^2) participants were found to have an odds ratio of 2.05 (95% CI = 1.41–2.98) compared to normal (BMI ≥18.5 kg/m^2, < 25.0 kg/m^2) participants (all $p > 0.05$).

Table 4
Odds ratios for depression (n = 10,459).

Classifications	OR (95% CI)	p-value
Sex		
Male	1.00	
Female	2.77 (2.06–3.71)	< 0.001
Age		
19–39	1.52 (1.21–1.92)	< 0.001
40–59	1.00	
≥ 60	0.76 (0.60–0.98)	0.033
Familial structure		
Alone	1.51 (1.18–1.92)	0.001
With someone	1.00	
Residential area		
Urban	1.00	
Rural	0.95 (0.73–1.25)	0.730
Household income		
Low	2.20 (1.64–2.95)	< 0.001
Low-middle	1.17 (0.88–1.55)	0.281
Middle-high	0.88 (0.66–1.18)	0.390
High	1.00	
Education attained		
University or higher	1.00	
High school	1.01 (0.77–1.31)	0.967
Middle or lower	1.40 (1.03–1.90)	0.032
Occupation		
Non-manual	1.00	
Manual	1.23 (0.89–1.70)	0.206
Unemployed/inactive	2.21 (1.58–3.08)	< 0.001
Drinking frequency		
Never or < 1 per month	1.00	
1–4 per month	0.92 (0.73–1.15)	0.451
≥1 per week	1.08 (0.83–1.41)	0.548
Smoking status		
Never	1.00	
Ex-smoker	1.54 (1.13–2.11)	0.007
Current smoker	3.03 (2.25–4.09)	< 0.001
Aerobic physical exercise		
No	1.00	0.931
Yes	0.99 (0.82–1.20)	
Presence of chronic disease		
No	1.00	
Yes	1.88 (1.51–2.34)	< 0.001
BMI (kg/m^2)		
Underweight (< 18.5)	2.05 (1.41–2.98)	< 0.001
Normal (≥18.5, < 25.0)	1.00	
Obese (≥25.0)	1.18 (0.98–1.42)	0.074
Year		
2014	1.00	
2016	0.87 (0.72–1.05)	0.140

Note. OR: Odds ratio; CI:confidence interval; BMI: body mass index.

3.5. Associations between help-seeking behaviors and the characteristics of participants with depression

We further calculated odds ratios to estimate the associations between the sociodemographic characteristics of participants with depression and help-seeking behaviors, as shown in Table 5. Age was the variable with the strongest statistically significant association with counselling, seeing a doctor, and current treatment in participants with depression. Using participants aged 40–59 as a reference, participants aged 19–39 and ≥60 were less likely to seek help. The odds ratio for counselling in the participants aged ≥60 was 0.59 (95% CI = 0.36–0.94), and the odds ratios for seeing a doctor in the participants aged 19–39 and ≥60 were 0.46 (95% CI = 0.27–0.79) and 0.55 (95% CI = 0.33–0.91), respectively, compared to the participants aged 40–59. The odds ratio for current treatment in the participants aged 19–39 was found to be 0.33 (95% CI = 0.17–0.61), indicating a clear discrepancy by age (all $p < 0.05$).

For other factors related to counselling, the odds ratios for familial structure (alone), occupation (non-manual/manual), and BMI (> 25 kg/m^2) were 1.94 (95% CI = 1.16–3.27), 1.66 (95% CI = 1.08–2.58), and 1.79 (1.18–2.71), respectively. In contrast, the odds ratios for low household income, low-middle household income, and middle-high household income were 0.31 (95% CI = 0.15–0.65), 0.38 (95% CI = 0.19–0.74), and 0.42 (95% CI = 0.21–0.84), respectively. For other factors related to currently receiving treatment, the odds ratios for low household income and low-middle household income were 0.50 (95% CI = 0.26–0.97) and 0.41 (95% CI = 0.21–0.78), respectively, compared to a high household income. The odds ratio for

Table 5
Odds ratios for counselling, seeing a doctor, and current treatment (n = 804).

Classifications	Counselling OR (95% CI)	*p*-value	Seeing doctor OR (95% CI)	*p*-value	Current treatment OR (95% CI)	*p*-value
Sex						
Male	1.00		1.00		1.00	
Female	0.92 (0.51–1.65)	0.768	1.06 (0.62–1.80)	0.842	0.77 (0.42–1.44)	0.418
Age						
19–39	0.69 (0.40–1.20)	0.190	0.46 (0.27–0.79)	0.005	0.33 (0.17–0.61)	< 0.001
40–59	1.00		1.00		1.00	0.747
≥ 60	0.59 (0.36–0.94)	0.028	0.55 (0.33–0.91)	0.021	0.92 (0.53–1.57)	
Familial structure						
Alone	1.94 (1.16–3.27)	0.013	0.96 (0.57–1.63)	0.883	1.00 (0.57–1.76)	0.994
With someone	1.00		1.00		1.00	
Residential area						
Urban	1.00	0.590	1.00	0.172	1.00	0.324
Rural	1.18 (0.65–2.14)		1.44 (0.85–2.42)		1.31 (0.77–2.25)	
Household income						
Low	0.31 (0.15–0.65)	0.002	0.82 (0.43–1.56)	0.547	0.50 (0.26–0.97)	0.040
Low-middle	0.38 (0.19–0.74)	0.004	0.60 (0.33–1.09)	0.093	0.41 (0.21–0.78)	0.007
Middle-high	0.42 (0.21–0.84)	0.014	0.59 (0.31–1.13)	0.112	0.51 (0.26–1.02)	0.056
High	1.00		1.00		1.00	
Education attained						
University or higher	1.00		1.00		1.00	
High school	0.75 (0.42–1.31)	0.305	1.30 (0.82–2.06)	0.269	0.74 (0.43–1.28)	0.283
Middle or lower	0.92 (0.47–1.79)	0.794	1.16 (0.64–2.12)	0.619	0.65 (0.33–1.31)	0.228
Occupation						
Non-manual/Manual	1.66 (1.08–2.58)	0.022	1.17 (0.80–1.70)	0.427	1.52 (0.99–2.33)	0.057
Unemployed/inactive	1.00		1.00		1.00	
Drinking frequency						
Never or < 1 per month	1.00		1.00		1.00	
1–4 per month	0.67 (0.39–1.16)	0.151	0.73 (0.44–1.20)	0.208	0.58 (0.34–1.00)	0.050
≥1 per week	0.91 (0.52–1.60)	0.735	0.61 (0.34–1.08)	0.087	0.47 (0.25–0.89)	0.021
Smoking status						
Never	1.00		1.00		1.00	
Ex-smoker	1.11 (0.58–2.13)	0.758	1.08 (0.62–1.88)	0.785	0.96 (0.52–1.76)	0.891
Current smoker	0.95 (0.51–1.78)	0.883	0.88 (0.49–1.59)	0.668	0.77 (0.39–1.53)	0.452
Aerobic physical exercise						
No	1.00		1.00		1.00	
Yes	0.92 (0.61–1.38)	0.681	1.03 (0.70–1.51)	0.890	0.83 (0.55–1.27)	0.393
Presence of chronic disease						
No	1.00		1.00		1.00	
Yes	0.94 (0.54–1.64)	0.822	1.17 (0.71–1.91)	0.536	0.73 (0.44–1.19)	0.206
BMI (kg/m^2)						
Underweight (< 18.5)	1.74 (0.83–3.66)	0.145	1.25 (0.55–2.86)	0.591	0.73 (0.36–1.49)	0.389
Normal (≥18.5, < 25.0)	1.00		1.00		1.00	
Obese (≥25.0)	1.79 (1.18–2.71)	0.006	1.33 (0.91–1.95)	0.140	1.58 (1.03–2.41)	0.037
Suicidal plan						
No	1.00		1.00		1.00	
Yes	1.67 (0.57–4.85)	0.348	1.16 (0.41–3.25)	0.783	1.75 (0.61–5.04)	0.297
Suicidal attempt						
No	1.00		1.00		1.00	
Yes	1.39 (0.39–4.98)	0.616	2.56 (0.73–8.95)	0.140	1.22 (0.32–4.60)	0.770

Note. OR: Odds ratio; CI:confidence interval; BMI: body mass index.

drinking frequency (≥1 time per week) was 0.47 (95% CI = 0.25–0.89) compared to drinking frequency (never or < 1 time per month), and the odds ratio for obesity (BMI ≥ 25.0 kg/m^2) was 1.58 (95% CI = 1.03–2.41) compared to normal (BMI ≥18.5 kg/m^2, < 25.0 kg/m^2), indicating a notable association.

Overall, suicide plans and attempts were not found to be associated with receiving counselling, seeing a doctor, or receiving current treatment.

4. Discussion

The purpose of the present study was to investigate the status of depression and help-seeking behaviors of Korean adults and related factors. This study showed that 7.7% (weighted 7.2%) of Korean adults had some degree of depression, with primary at-risk contributing factors being: women, aged between 19 and 39, living alone, with low household income, and no occupation. Other risk factors included: for those aged between 19 and 39 or ≥60, not seeing a doctor, as help-seeking behavior; and for those aged between 19 and 39, factors included not currently receiving treatment, and having a low level of household income.

This study analyzed data from the 2014 and 2016 KHNANES, and the proportion of participants having PHQ-9 scores ≥ 10 points was found to be 6.5% (weighted 6.1%), which was similar to the 6.7% reported in a previous study that analyzed only the 2014 KHNANES (Shin et al., 2017). Expanding upon the previous study, this study added participants displaying a PHQ-9 score of ≥10 points and participants having a PHQ-9 score of ≤10 points but were currently receiving treatment for depression into the inclusion criteria for depression (Nguyen et al., 2017). Previous studies in Korea used a single criterion as inclusion criteria for depression; the prevalence of depression based on PHQ-9 scores or depression diagnoses by a psychiatrist

were 6.5%–6.7% (Kim et al., 2017; Shin et al., 2017) and 4.2%–4.9% (Park and Lee, 2011; Yang and Je, 2018), respectively. Therefore, the result of this study was higher than reported in previous studies, as the present study more rigorously reflects the prevalence of depression at the time of the investigation.

In this study, the help-seeking behaviors for those facing depression was found to be lacking. Overall, 71.6% (weighted 69.2%) having PHQ-9 scores of ≥10 points did not seek help related to depression; it was higher than the 60.4% (weighted 58.6%) for those classified with depression. These results confirmed the need for various screening tests in public and preventive healthcare in Korea, to use PHQ-9 scores to actively seek out people who have symptoms of depression but who are not looking for help-seeking behavior.

Sociodemographic variables that revealed differences in help-seeking behaviors in this study included age, household income, and education attained. In differences related to age, the group aged 19–39 had the highest proportion of not conducting help-seeking behavior or counselling from among all participants with depression. In contrast, the group had the lowest proportion of having seen a doctor, including participants who had both received and not received counselling. Here, 212 participants were currently receiving treatment, the lowest proportion being 14.9% (weighted 15.5%) for those 19–39 years old. In addition, the odds ratio for depression in participants in this study aged between 19 and 39 was 1.52 (95% CI 1.21–1.92) higher than for participants aged between 40 and 59, those seeing doctors and receiving treatment had the lowest odds ratios, and those having mild PHQ-9 scores (≥5 and < 9). Participants aged between 20 and 39 having more than moderate PHQ-9 scores (≥10) had the highest odds ratio. These results are similar to a study that found the help-seeking behavior rate to be higher in middle-aged adults than in younger and older adults, and also higher in people having a higher education and more severe depression (Schomerus et al., 2013; Magaard et al., 2017). However, this result is different from a US result study in which the prevalence of depression was higher in younger participants, with the odds ratios for treatment remaining high (Wittayanukorn et al., 2014).

A major factor related to help-seeking behaviors in those diagnosed with depression in a previous study included social stigma (Clement et al., 2015; Doblyte and Jiménez-Mejías, 2017). Young adults were found to only share symptoms of depression with family members for fear of the stigma attached to talking to others and the worry about employment discrimination due to medical records (Clement et al., 2015; Doblyte and Jiménez-Mejías, 2017). A key difference from previous results is that younger cohorts who were already receiving treatment for a depressive disorder were associated with more positive attitudes toward all mental health utilization measures (Ki et al., 2014). Overall, a positive attitude change might occur from before they get help to after they get help. This study did not include social stigma because the KHNAES did not investigate this point. Thus, further research relative to this variable, of how social stigma affects youth, is recommended.

In terms of help-seeking behavior, those currently receiving treatment was 26.4% (weighted 25.7%) for participants having depression, but only 12.8% (weighted 12.2%) in participants showing depressive symptoms (PHQ-9 scores ≥ 10 points). This finding is notably different from previous studies, in which 38%–60% of participants received treatment from a psychiatric health professional or took antidepressant medication (Shim et al., 2011; Wittayanukorn et al., 2014). PHQ-9 scores change according to the treatment (Löwe et al., 2004), PHQ-9 scores correspond to an increase in both suicidal thoughts and attempts (Simon et al., 2013). In this study, for PHQ-9 scores of 5–9 points, suicidal thoughts and attempts were 1.6% (weighted 1.2%) and 0.6% (weighted 0.5%), respectively; when the PHQ-9 scores increased to ≥10 points, suicidal thoughts and attempts increased to 5.9% (weighted 5.7%) and 2.5% (weighted 3.0%). However, as cases in which the suicide attempt led to death were not counted in this investigation, the actual rate of suicide attempts is actually estimated to be much higher. In this study, 212 participants with depression were currently receiving treatment. In terms of PHQ-9 scores, 125 participants had ≤ 9 points and 87 participants had ≥10 points. Since it can be assumed that PHQ-9 scores will decrease through treatment, there is also a need to actively develop and apply measures for initiating treatment and counselling to participants having lower PHQ-9 scores (Löwe et al., 2004).

The results of this study, that the odds ratios for the prevalence of depression were high in participants who lived alone and were inactive/unemployed, are in line with the results of previous studies conducted in other countries (Fujise et al., 2016; Magaard et al., 2017; Shin et al., 2017). Important findings include the fact that the ratios were higher in younger adults or the elderly who have low income and/or no job. In a previous study (Magaard et al., 2017), a low level of household income had double the odds ratio for depression and half the odds ratios for help-seeking behaviors, including treatment, compared to the group having a higher level of household income. Based on this result, this risk group is also highly unlikely to conduct help-seeking behaviors, including reaching out for treatment. Participants having mental illness tend to perceive professional help-seeking as a last resort (Magaard et al., 2017). In a previous study, among those receiving treatment for depressive disorder, the average number of a non-psychiatric medical institution that participants first visited was 0.8, and 58% of participants started to receive treatment within one year after being diagnosed with depressive symptoms, similar to the results for Korean adults (Ki et al., 2014). The most at-risk group in this study was the young adult group, as though the counselling rate was high, the rate of seeking doctors was low. In contrast, in Japan, almost 70% of participants received treatment within one year after the start of symptoms, starting treatment within 4 months (Oguchi et al., 2014), a notable difference from Korean participants. Given that the recovery from depression can be prolonged and that the recurrence rate is high if treatment is delayed, there is a strong need to improve help-seeking behavior—including receiving treatment (Burcusa and Iacono, 2007).

For counselling and treatment for those with depression, those being obese (BMI $^{>}$ 25) were associated with a high odds ratio. In a previous study, in participants having depression with a certain disease, the awareness and treatment rate were higher than for those without a certain disease; it is thus recommended that further research into the help-seeking behaviors of people relative to health status be conducted (Kim and Kim, 2019). Through this finding, it is also recommended that the help-seeking behavior of people without a stated disease or existing conditions need follow-up during their entire life. Therefore, it might also be necessary to increase the help-seeking behavior of people having a healthy status, even though they actually are not.

In this study, although the odds ratios for counselling, seeing a doctor, and treatment in participants who have planned or attempted suicide were higher than in the participants who did not, the difference was not statistically significant. In a retrospective cohort study of 361 people who died of suicide over a two-year period, 87% were found to have sought help in a General Practice institute for one year before they attempted suicide (Leavey et al., 2016). Through this finding, there is a need to consider whether help-seeking behaviors properly prevents suicide, and that there is also a need for intervention by type and group, not taking one-size-fits-all approach, by analyzing from angles such as a high-risk suicide group prospective cohort study, because risk factors that affect suicide are diverse (Lee et al., 2018).

Based on this discussion, there is also a need to look further into two critical points to improve help-seeking behavior related to depression. First, counselling services should be enhanced within the Korean medical system. Other countries have a system in which participants displaying symptoms of depression are referred to specialists through a family doctor or primary physician. Efforts are made to enhance the role of primary medicine and for preventive services by suggesting guidelines to screen those at risk of suicide in primary care (Shim et al., 2011; LeFevre, 2014). In contrast, in the health services system in

Korea, participants can visit specialized doctors without a referral. Accessibility to a psychiatric provider is actually lower in a such system, thus why it takes an average of 3.4 years for participants to get treatment for depression (Ki et al., 2014). This study recognized that the high-risk younger age group requires access to counselling. Taking this into consideration, services such as supportive counselling or nurse-led group Cognitive Behavioral Therapy should be developed (Sheldon et al., 2014; Tanoue et al., 2018). Second, to help younger adults who often avoid help-seeking behavior based on characteristics of Korean society, the *"Depression: Let's Talk"* campaign of the WHO should be referenced. The core concept of their campaign is, "the stigma surrounding mental illness, including depression, remains a barrier to people seeking help throughout the world" (World Health Organization, 2017). The target groups of this campaign include adolescents and young adults, women of childbearing age, and older adults, which is in line with the primary high-risk groups identified in this study. Past campaigns in Korea include: the "*Seeing, listening, and talking*" campaign, the *"How are you?"* campaign, and *"Gate-keeper training"*, which encouraged people to find acquaintances to talk to about suicidal thoughts, show continuous interest, and refer them to resources that provide appropriate help (e.g., institutions or specialists) (Korean Suicide Prevention Center, 2018). To obtain greater effects in Korea, a follow-up study is expected, one that would work to develop a model to more efficiently identify people in the high-risk and super-risk groups who have suicidal plans and/or have already attempted suicide. This model would apply a tailored strategy that encourages people to seek help, with no stigma attached.

One limitation of this study was its use of a cross-sectional design, which made it difficult to infer causality between the occurrences of depression and help-seeking behaviors. We recommend further study to identify the causal relationship, in terms of which help-seeking behavior works to prevent depression. An additional limitation includes the use of the criterion of treatment for depressive disorder, which inherently includes the possibility that we missed participants having a depression diagnosis but who were not being treated at the time of the survey, despite using PHQ-9 scores as a different criterion. Nevertheless, from two years of cumulative data, the large data size used in this study well reflected the characteristics of Korean adults. In a future study, more rigorous results could likely be attained by including participants not seeing a psychiatrist but having depressive symptoms based on PHQ-9 scores of ≥ 10 points. We recommend that mental health practitioners and health care professionals should consider this risk group when developing screening based on the PHQ-9 screening instrument and care plan for depression, as this group is not likely to seek help.

Ethical disclosures

Approval to use the original data was obtained through the KNHANES homepage, and approval from the Institutional Review Board of Eulji University (EU18-62) was received before the study began. Written informed consent for the KNHANES was obtained from all study participants for secondary use. This study was conducted in accordance with the Ethical Principles for Human Subjects, as defined by the Helsinki Declaration. In addition, all analyses were performed using de-identified data, in which all personally identifiable information was removed.

Disclosures

The authors confirm that the manuscript has not been published or submitted for publication elsewhere. All authors approve the content of the manuscript and have contributed significantly to the research involved and the writing of the manuscript. K.Y contributed to the research questions and data analysis, and wrote the manuscript. K.H contributed to the research questions and wrote and edited the manuscript. J. S also contributed to writing and editing the manuscript.

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