Association between employment status and suicidal ideation among Korean employees

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Abstract

Employment status is a key indicator of socioeconomic status. However, research in Asian cultures for the association between employment status and mental health have been limited. The current study investigated the association between employment status and suicidal ideation. Using data from the 2015, 2017, and 2019 Korea National Health and Nutrition Examination Survey, 6,509 participants aged ≥ 20 years were analyzed. Multivariable logistic regression and subgroup analysis were performed. Unemployed status demonstrated 1.85 times more suicidal ideation than employed (adjusted Odd Ratio (aOR) 1.85, 95% confidence interval (CI) 1.41–2.44, $p < .001$). Low educational attainment (aOR 2.12, 95% CI 1.51–2.98, $p < .001$), low income (aOR 1.61, CI 1.22–2.14, $p < .001$), presence of stress recognition (aOR 3.06, 95% CI 2.33–4.02, $p < .001$), and depression (aOR 13.0, 95% CI 10.0-16.9, $p < .001$) were also associated with suicidal ideation. In subgroup analysis, all covariates, except women and low BMI, have combined effects with employment status on suicidal ideation. This study showed the association between employment status and suicidal ideation. Suicidal ideation occurs in a complex manner due to various factors, it is important to provide support based on a comprehensive understanding of suicidal ideation related to employment status.

Introduction

Suicide is an important public health issue worldwide because it has various direct and indirect effects at both the individual and the societal level. South Korea (hereafter, Korea) has the highest suicide rate among the Organisation[1,2] for Economic Cooperation and Development (OECD) member countries, so social intervention is necessary for suicidal ideation[3].

Employment is an important factor influencing work performance[4,5]. Korea has seen difficulties in economic development due to the global economic downturn for the past few years. Economic downturns can exacerbate anxiety by appealing to feelings of isolation and uncertainty about the future due to corporate restructuring, early retirement, and job loss[6]. Employment-related studies in some countries have shown that precarious employment patterns increase suicide rates two- or three-fold at least, and even up to five-fold in certain countries[7]. The pace of social change is faster in Korea than in many countries, and can lead to suicidal ideation due to precarious employment[8].

The status of being unemployed is also a problem related to suicidal ideation. An irregular lifestyle after dismissal can lead to a strong tendency toward substance abuse, including alcohol consumption and smoking[9]. Unemployed people are also at risk of experiencing depression, anxiety, irritability, and aggression,[10] which are important risk factors for suicidal ideation.

Suicide has been viewed as a continuum of suicidal ideation, suicidal planning, and suicidal behavior[11]. Suicidal ideations are intricately associated with a variety of risk factors, including biological, psychological, and environmental factors, so a focus on preventing suicidal ideations can prevent suicidal behavior.

Previous studies found factors such as older age, female gender, low income, low education, and other sociodemographic aspects to be related to suicidal ideation[7,10,12–16]. Health behaviors such as smoking, physical activity, sleep, and chronic diseases have also been presented as factors related to suicidal ideation[17–21]. Furthermore, stress recognition, depression, and the lack of a sense of belonging are mental health factors related to suicidal ideation[22]. Previous research on suicidal ideation mostly focused on vulnerable groups such as older adults and adolescents. Unemployment and financial problems caused by the economic crisis were also studied[23]. Despite many researchers investigating employment status and suicidal ideation, there are limited studies subdividing the association between unemployment and suicidal ideation into sociodemographic factors, health behavior factors, and mental health factors[24].

To fill this gap, our study investigated the association between employment status and suicidal ideation in greater detail, using the Korea National Health and Nutrition Examination Survey (KNHANES) data from 2015, 2017, and 2019.

Results

Descriptive statistics

Descriptive statistics of the study participants are shown in Table 1. Unemployed participants expressed higher suicidal ideation than those currently employed (10.4% vs. 3.9%, $p < .001$). Regarding sociodemographic factors, women (11.5%, $p < .001$), participants over 60 years (7.1%, $p = 0.005$), those with educational attainment of high school and below (8.0%, $p < .001$), and those falling in the low equalized household income group (9.3%, $p < .001$) had higher suicidal ideation. In terms of health behavior factors, non-drinkers (9.5%, $p = .022$), smokers (7.1%, $p < .001$), those with non-physical activity (6.7%, $p < .001$), those with chronic (two or more) medical illnesses (8.3%, $p = .024$), those with poor subjective health conditions (15.1%, $p < .001$), and those with high body mass index (BMI) (5.8%, $p = .004$) had higher suicidal ideation. The mental health factors of stress (14.2%, $p < .001$) and depression (35.2%, $p < .001$) were related to higher suicidal ideation. There were no statistical differences in factors related to other living status ($p = .079$) and sleep ($p = .079$).

Association between employment status and suicidal ideation

Results of multivariable logistic regression analysis on the association between employment status and suicidal ideation are presented in Table 2. Unemployed status was associated with suicidal ideation

Table 1. Sociodemographic and clinical characteristics of study participants by presence of suicidal ideation

		Suicidal ideation		p-value
		Yes	No	
Employment status				
Employed		178 (3.9)	4350 (96.0)	**<.001**
Unemployed		206 (10.4)	1775 (98.6)	
Sociodemographic factors				
Gender	Men	270 (4.9)	5245 (95.1)	**<.001**
	Women	114 (11.5)	880 (88.5)	
Age (years)	20–30	84 (5.0)	1573 (94.9)	**0.005**
	40–50	137 (5.3)	2448 (94.7)	
	over 60	163 (7.1)	2104 (92.8)	
Educational attainment	High school or below	328 (8.0)	3765 (91.9)	**<.001**
	University or above	56 (2.3)	2360 (97.6)	
Equalized household income	Low	118 (9.3)	2568 (90.6)	**<.001**
	High	266 (3.2)	3557 (96.7)	
Living status	Living together	305 (5.6)	5079 (94.3)	0.079
	Living alone	79 (7.0)	1046 (92.9)	
Health behavior factors				
Alcohol use	No	20 (9.5)	189 (90.4)	**0.022**
	Yes	364 (5.7)	5936 (94.2)	
Smoking	No	180 (4.9)	3481 (95.0)	**<.001**
	Yes	204 (7.1)	2644 (92.8)	
Physical activity	No	239 (6.7)	3291 (93.2)	**<.001**
	Yes	145 (4.8)	2834 (95.1)	
Chronic medical disease	None	312 (5.5)	5281 (94.4)	**0.024**
	One	54 (7.7)	646 (92.2)	
	Two or more	18 (8.3)	198 (91.6)	

	Subjective health conditions	Good	202 (3.8)	5109 (96.2)	**<.001**
		Poor	182 (15.1)	1016 (84.4)	
	BMI	Low	24 (6.2)	180 (88.2)	**0.004**
		Normal	149 (5.6)	2484 (94.3)	
		High	110 (5.8)	1778 (94.1)	
		Obesity	101 (5.6)	1683 (94.3)	
	Sleep (hours/day)	Less than 6 hours	230 (6.5)	3308 (93.5)	0.079
		6 to less than 8 hours	92 (5.1)	1707 (94.8)	
		8 hours or more	62 (5.2)	1110 (94.7)	
Mental health factors					
	Stress recognition	No	125 (2.6)	4561 (94.3)	**<.001**
		Yes	259 (14.2)	1564 (85.7)	
	Depression	No	122 (2.1)	5644 (97.8)	**<.001**
		Yes	262 (35.2)	481 (64.7)	
Participants			384	6125	
Categorical variables are presented as numbers and percentages. BMI, body mass index.					

(adjusted odds ratio (aOR) 1.85; 95% confidence interval (CI) 1.41–2.44; $p < .001$). Among the sociodemographic factors, educational attainment of high school or below (aOR 2.12; 95% CI 1.51–2.98; $p < .001$) and low income levels (aOR 1.61; 95% CI 1.22–2.14; $p < .001$) were associated with suicidal ideation. For health behavior factors, subjective poor health condition was related with suicidal ideation (aOR 1.79; 95% CI 1.37–2.33; $p < .001$). However, alcohol consumption, smoking, physical activity, chronic medical disease, BMI, and sleep were not associated with suicidal ideation.

Combined effects of employment status and individual covariates on suicidal ideation

The subgroup analysis of employment status and covariates for suicidal ideation are presented in Table 3. Unemployed status was significantly associated with suicidal ideation in men (aOR 3.22; 95% CI 2.51–4.21; $p < .001$), in the 40s–50s age group, (aOR 5.24; 95% CI 3.67–7.49; $p < .001$), in those with education of university or above (aOR 2.75; 95% CI 1.60–4.75; $p < .001$), low income groups (aOR 2.31; 95% CI 1.78-3.00; $p < .001$), and those living together (aOR 2.98; 95% CI 2.36–3.76; $p < .001$), and showed higher odds ratios (ORs) than the associations with other variables. Interestingly, employment status was not associated with suicidal ideation in women. In health behavior factors, unemployment status with alcohol use (aOR 2.84; 95% CI 2.29–3.51; $p < .001$), smoking (aOR 3.49; 95% CI 2.61–4.66; $p < .001$),

Table 2. Results of the multivariable logistic regression analysis for the association between employment status and suicidal ideation

		Suicidal ideation			p-value
		OR	95% CI		
Employment status					
Employed		1.00			
Unemployed		**1.85**	**1.41**	**2.44**	**<.001**
Sociodemographic factors					
Gender	Men	1.00			
	Women	1.24	1.24	0.92	0.160
Age (years)	20–30	1.00			
	40–50	1.30	1.32	0.89	0.164
	over 60	1.40	0.89	2.21	0.142
Educational attainment	**High school or below**	**2.12**	**1.51**	**2.98**	**<.001**
	University or above	1.00			
Equalized household income	**Low**	**1.61**	**1.22**	**2.14**	**<.001**
	High	1.00			
Living status	Living together	1.00			
	Living alone	1.13	0.76	1.66	0.545
Health behavior factors					
Alcohol use	No	1.00			
	Yes	1.79	1.23	2.33	0.478
Smoking	No	1.00			
	Yes	1.21	0.93	1.56	0.151
Physical activity	No	1.00			
	Yes	1.20	0.92	1.55	0.176
Chronic medical disease	None	1.00			
	One	0.94	0.64	1.37	0.749
	Two or more	0.74	0.40	1.38	0.347

Subjective health conditions	Good	1.00			
	Poor	**1.79**	**1.37**	**2.33**	**<.001**
BMI	Low	1.19	0.68	2.10	0.546
	Normal	1.00			
	High	1.14	0.84	1.54	0.398
	Obesity	1.06	0.77	1.45	0.729
Sleep (hours/day)	Less than 6 hours	1.25	0.93	1.68	0.145
	6 to less than 8 hours	1.00			
	8 hours or more	0.92	0.63	1.36	0.678
Mental health factors					
Stress recognition	No	1.00			
	Yes	**3.06**	**2.33**	**4.02**	**<.001**
Depression	No	1.00			
	Yes	**13.0**	**10.0**	**16.90**	**<.001**
BMI, body mass index; OR, odds ratio; CI, confidence interval.					

physical inactivity (aOR 3.07, 95% CI 2.35–4.01, $p < .001$), one chronic disease (aOR 3.39, 95% CI 1.85–6.21, $p < .001$), poor subjective health condition (aOR 3.16, 95% CI 2.24–4.45, $p < .001$), obesity (aOR 4.21, 95% CI 2.79–6.35, $p < .001$), and 6–8 hours of sleep (aOR 3.13, 95% CI 2.05–4.78, $p < .001$) were significantly associated with suicidal ideation. In mental health factors, the combined effects of stress recognition and unemployment status on suicidal ideation was significant (aOR: 4.30; 95% CI: 3.27–5.65; $p < .001$). Depression with unemployment status also showed significant association with suicidal ideation (aOR: 2.61; 95% CI: 1.82–3.74; $p < .001$), and these ORs were higher than those in other variables. Suicidal ideation was not significant among women, those who do not consume alcohol, and those with low BMI.

Discussion

This study identified the association between employment status and suicidal ideation using national

Table 3. Subgroup analysis of the association between employment status and the presence of suicidal ideation stratified by sociodemographic and clinical variables

		No	Yes			*p-value*
		OR	OR	95% CI		
Sociodemographic factors						
Gender	**Men**	**1.00**	**3.22**	**2.51**	**4.12**	**<.001**
	Women	1.00	1.38	0.94	2.05	0.104
Age (years)	**20–30**	**1.00**	**1.95**	**1.23**	**3.07**	**0.004**
	40–50	**1.00**	**5.24**	**3.67**	**7.49**	**<.001**
	over 60	**1.00**	**2.18**	**1.54**	**3.07**	**<.001**
Educational attainment	**High school or below**	**1.00**	**2.35**	**1.87**	**2.95**	**<.001**
	University or above	**1.00**	**2.75**	**1.60**	**4.75**	**<.001**
Equalized household Income	**Low**	**1.00**	**2.31**	**1.78**	**3.00**	**<.001**
	High	**1.00**	**1.92**	**1.29**	**2.87**	**0.001**
Living status	**Living together**	**1.00**	**2.98**	**2.36**	**3.76**	**<.001**
	Living alone	**1.00**	**2.33**	**1.47**	**3.69**	**<.001**
Health behavior factors						
Alcohol use	No	1.00	2.12	0.78	5.76	0.140
	Yes	**1.00**	**2.84**	**2.29**	**3.51**	**<.001**
Smoking	**No**	**1.00**	**2.54**	**1.88**	**3.43**	**<.001**
	Yes	**1.00**	**3.49**	**2.61**	**4.66**	**<.001**
Physical activity	**No**	**1.00**	**3.07**	**2.35**	**4.01**	**<.001**
	Yes	**1.00**	**2.41**	**1.72**	**3.37**	**<.001**

Chronic medical disease	None	1.00	2.69	2.14	3.39	<.001
	One	1.00	3.39	1.85	6.21	<.001
	Two or more	1.00	3.16	1.01	9.95	0.049
Subjective health conditions	Good	1.00	1.72	1.31	2.33	<.001
	Poor	1.00	3.16	2.24	4.45	<.001
BMI	Low	1.00	2.29	0.93	5.61	0.071
	Normal	1.00	2.30	1.65	3.21	<.001
	High	1.00	2.60	1.77	3.84	<.001
	Obesity	1.00	4.21	2.79	6.35	<.001
Sleep (hours/day)	Less than 6 hours	1.00	2.86	2.19	3.75	<.001
	6 to less than 8 hours	1.00	3.13	2.05	4.78	<.001
	8 hours or more	1.00	2.51	1.49	4.23	<.001
Mental health factors						
Stress recognition	No	1.00	2.72	1.90	3.89	<.001
	Yes	1.00	4.30	3.27	5.65	<.001
Depression	No	1.00	2.15	1.59	2.93	<.001
	Yes	1.00	2.61	1.82	3.74	<.001

BMI, body mass index; OR, odds ratio; CI, confidence interval.

representative data. The results showed that unemployed individuals were 1.85 times more likely to have suicidal ideation than employed individuals. This was consistent with the findings of an American study by Kposowa et al. (2019), indicating that unemployment was significantly associated with suicidal ideation. Employment status is a means of securing economic power, which is a resource that can satisfy various needs. Kposowa et al. (2019) also found that employed persons have a higher quality of life than the unemployed. It can be interpreted that suicidal ideation increases when individual needs are not

satisfied by their employment status. Therefore, various types of support should be provided to prevent suicidal ideation by identifying its specific causes among the unemployed.

We showed that suicidal ideation is a complex element associated with a variety of factors, including sociodemographic, health behavior, and mental health factors. Consistent with the findings of Liu et al. (2017) that educational attainment is associated with suicidal ideation, our results indicated that low educational attainment (high school or below) had a 2.12 times higher likelihood of suicidal ideation than high educational attainment. This could be explained by lower education levels leading to income inequality, which, in turn, can lead to suicidal ideation. Furthermore, the study showed that low income groups were 1.61 times more likely to have suicidal ideation. To reiterate, lower education levels can lead to financial difficulties, poorer quality of life, and health inequality, all of which can lead to suicidal ideation.[26,27] Given that subjective health conditions can affect quality of life and well-being, they are also an influential factor in suicidal ideation; according to the results, poor subjective health condition was 1.79 times more likely to be related to suicidal ideation than good subjective health condition. Similarly, mental health is also related to suicidal ideation, as confirmed by Arri et al. (2009). Among mental health factors, our study found that stress recognition was 3.06 times more likely to cause suicidal ideation, while depression was 13.0 times more likely to cause it. Previous research has noted the important effects of mental health on suicidal ideation[1,15]. Therefore, suicide prevention should consider factors regarding individuals' unemployment status, low education and income, poor subjective health condition, and the presence of stress and depression.

The subgroup analysis presented the combined effects of employment status and individual covariates on suicidal ideation. Except the categories of women, no alcohol use, and low BMI, all other covariates showed significant association with suicidal ideation when unemployed. In comparing the ORs, men aged between 40 and 50 years, currently smoking, obese, and with stress recognition showed higher likelihood for suicidal ideation. In sociodemographic factors, men and those aged between 40 and 50 years showed a higher association between unemployed status and suicidal ideation compared to other covariates. These findings are in line with Kposowa et al (2019) work noting that middle-aged people had a high association with suicidal ideation. This can be highly related with external conditions such as financial imbalance and interpersonal relationships[28], both of which can be negatively affected by unemployment. Moreover, middle-aged individuals are likely to have considerable responsibilities as the center of the family economy, such as supporting children's education and retirement preparation. Under these circumstances, any unemployment environment threatening the family economy might increase their possibility of suicidal ideation.

Dutton et al. (2013) explored the association between obesity and suicidal ideation. Obesity can be said to be a secondary cause of suicidal ideation, rather than a primary cause[30]. Obesity increases the risks of chronic disease experience, depression due to physical dissatisfaction, and the burden on others, all of which can lead to suicidal ideation[29,30]. Obesity is a factor closely associated with metabolic syndrome,[31] and financial support is needed to treat any such illnesses. Unstable financial circumstances

due to unemployment can hence lead to potential suicidal ideation. The association between smoking and suicidal ideation has already been investigated in many studies[32,33].

Our study has several strengths. First, the study is composed of a nationally representative sample data, and it will help to indicate future directions for unemployment welfare in Korea. Second, this study combined various sociodemographic, physical, and mental health factors to show whether employment status was associated with suicidal ideation when controlling those covariates. As suicide is a complex factor associated with a variety of components, it is important to appropriately synthesize such factors to comprehensively interpret suicidal ideation.

However, this study also has several limitations. Although the association between employment status and suicidal ideation is shown in this cross-sectional study, the causal association cannot be confirmed. In addition, because the institutionalized population was excluded, severe psychological symptoms related with suicidal ideation might not have been addressed adequately. Further research is necessary to investigate causal association between employment status and suicidal ideation using various sample data.

This study showed the association between employment status and suicidal ideation using the 2015, 2017, and 2019 KNHANES data. While unemployment is associated with suicidal ideation, it is confirmed that suicidal ideation is not caused by a single cause, but by various causes, including physical and mental health factors. Based on these results, policy interventions and financial support will have to be provided to prevent suicide of unemployed persons.

Methods

Participants

This study was conducted using data from the 2015, 2017 and 2019 Korea National Health and Nutrition Examination Survey. The KNHANES is a nationwide population-based cross-sectional survey of the health and nutritional status of Koreans to monitor trends in health risk factors along with the prevalence of major chronic diseases. Details on the sampling design of the KNHANES are available on the KNHANES webpage (https://knhanes.kdca.go.kr/knhanes/sub03/sub03_01.do). KNHANES targets non-institutionalized Korean citizens living in Korea. A multi-stage clustered probability design was used to sample the survey participants. Our study focused on the three years 2015, 2017, and 2019, as these years assessed measures relating to suicidal ideation. From a total of 23,617 people, participants without a valid answer for employment status (n = 5,940), without a valid answer for suicidal ideation (n = 1,401), and missing covariate values (n = 9,767) were excluded. Hence, 6,509 participants aged ≥ 20 years were included in this study (Fig. 1).

Measures

Employment status

Participants were asked about their current employment status and classified into two groups. “Have you recently worked more than an hour per week for income?” Responses of “Yes” and “No” were selected for analysis, and other answers were excluded.

Suicidal ideation

The participants were asked about their suicidal ideation. “Have you ever considered serious suicide in the past year?” The responses of “yes” or “no” were selected, while other responses including “not applicable” and “don’t know, no answer” were excluded from the analysis.

Covariates

Sociodemographic factors included five variables: gender, age, education attainment, equalized household income, and living status. There were seven health behavior factors: alcohol use, smoking, physical activity, chronic medical disease, subjective health conditions, BMI, and sleep. Stress recognition and depression were assessed for mental health factors, and physical activity was defined as “medium-intensity physical activity for 2.5 hours or more per week, or a mixture of medium-intensity and high-intensity physical activity.” In the case of chronic diseases, the number of diagnoses for hypertension, diabetes mellitus, dyslipidemia, stroke, and angina pectoris was classified into “none”, “one”, or “two or more.”

Statistical analysis

SAS software (version 9.4; SAS Institute, Cary, North Carolina, USA) was used for analysis. General characteristics of the participants were assessed using the Chi-square test. Multivariable logistic regression was applied to investigate the association between employment status and suicidal ideation. Subgroup analyses were also performed to examine the combined effects of employment status and covariates on suicidal ideation. ORs and 95% CIs were calculated to assess the association between employment status and suicidal ideation. Statistical significance was set at p-value < 0.05.

Declarations

Ethical consideration

The Institutional Review Board (IRB) of Yongin Severance Hospital waived the requirements for approval and consent because the analyses of the present study were based on de-identified, publicly available secondary data (IRB No. 9-2021-0161). All methods of the study were carried out in accordance with the guidelines and regulations of the Declaration of Helsinki.

Author contributions

S.K. and S.L. led the study conceptualization and design. S.K. and N.S. performed statistical analyses and interpretation. S.K. wrote the first draft of the manuscript, and J.O. and S.L. reviewed and edited the drafts. All authors have full access to all data in the study, and take responsibility for the integrity of the data and the accuracy of the data analysis.

Data availability

This study analyzed data from the 2015, 2017, and 2019 KNHANES. All the KNHANES data are available to the public, and can be downloaded from the KNHANES official website (http://knhanes.kdca.go.kr).

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Competing interests

The authors declare no competing interests.

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Figures

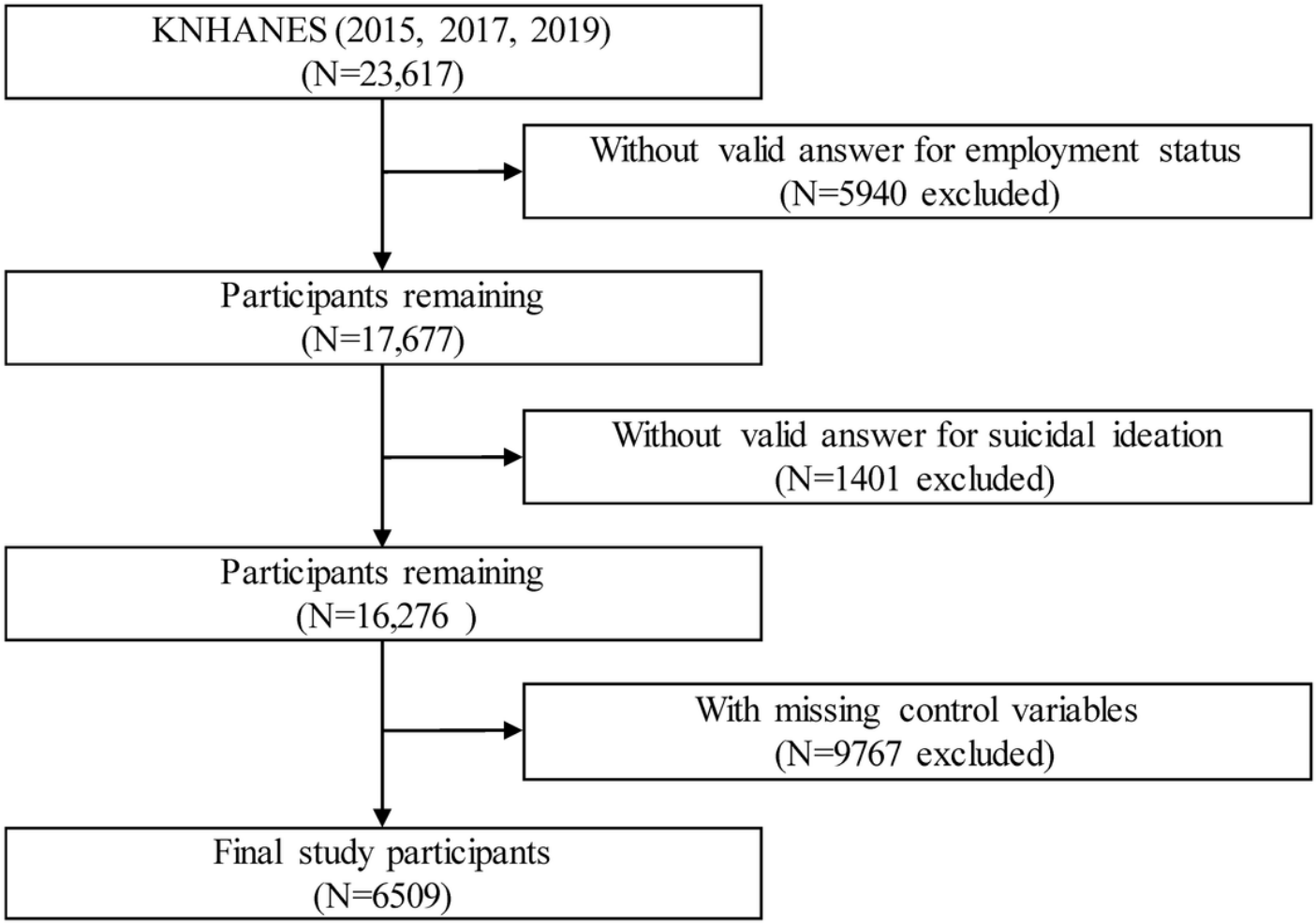

Figure 1

Flow diagram of the study participants.

KNHANES, Korean National Health and Nutritional Examination Survey.