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Age-differentiated Risk Factors of Suicidal Ideation among Young and Middle-aged Korean Adults

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Objectives: This study aimed to determine the prevalence of suicidal ideation among young and middle-aged adults, and explore the risk factors that affect suicidal ideation.
Methods: A descriptive study design was used for secondary data analysis. A total sample of 5,214 was drawn from two waves (2012–2013) of the 7th Korea Health Panel (KHP) survey. The KHP data were collected by a well-trained interviewer using the face-to-face method during home visits as well as self-report method. Descriptive statistics of frequency, percentage, chi-square test, and logistic regression analysis were performed using SPSS 22.0.
Results: The prevalence of suicidal ideation in young and middle-aged adults was 4.4% and 5.6%, respectively. For young adults, suicidal ideation risk was higher among those with low income or heavy drinking habits. In middle-aged adults, low income, poor perceived health status, negative perception of peer-compared health status, and negative social perspective were the major risk factors.
Conclusion: There is considerable risk of suicidal ideation in adulthood. Opportunities for increased income, avoidance of heavy drinking, and the construction of positive subjective health status and social perspective should be considered in suicide prevention interventions for Korean young and middle-aged adults.

Key Words: young adult, middle aged, suicidal ideation, suicide, risk factors

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INTRODUCTION

Suicidal ideation can directly link to actualizing an attempt. Therefore, it is a key concept for suicide prevention [1]. South Korea has the highest number of suicide attempts among Organization for Economic Co-operation and Development (OECD) countries [2]. Suicide, alongside with cancer and cardiovascular diseases, is a leading cause of death in Korea. It is the first-leading cause of death for teens and people in their 20s, second for adults in their 40s and 50s, and fourth for the elderly [3]. Each year, approximately 5,000 elderly citizens commit suicide in Korea, and about 4% of suicide attempts cause fatality [4]. Furthermore, there is a much higher rate of suicide attempts, and an even higher rate of suicidal ideation [5]. Suicidal impulse leads to ideation, which can trigger an attempt and cause fatal damage. Therefore, intervening when one conceptualizes suicide and/or feels an impulse is critical for prevention [6].

Individuals experience different life events and environments, and triggers for suicidal ideation vary depending on individual experiences. Humans have different developmental tasks that need to be solved through the lifespan, and negative life experiences often manifest differently across age groups. Traumatic experiences during one's childhood and youth can lead

to emotional instability and mental maladjustment, which are correlated with suicide attempts. In adolescence, problems such as poor academic performance, drinking, stress from school or family problems, lack of emotional support, urge to run away, and depression tend to be a problem [7]. In the 20s, lack of impulse control, uncertainty of future, academics, financial, and relationship problems are common problems [8,9]. For elderly citizens, financial instability, illness, chronic pain, health status, and relationship issues may be critical [10,11]. Likewise, young people under 40 and middle-aged people over 40 have different developmental tasks. Accordingly, life stressors and factors influencing suicidal ideation will differ. Young adulthood is a period when one becomes a legal adult and starts to live independently, become involved in an active social life, and must adapt to social demands and physiological changes. Mid- to late-adulthood requires continued career development, caring for one's own family and parents, and preparing for retirement. With aging, elderly individuals need to prepare for changes in physicality and adjust accordingly [12].

Many studies have investigated suicide in recent decades; however, studies on adults examining the factors related to comparative rituals and social perspectives have been lacking. Some studies have reported that education, job, divorce [13], family conflict, financial problems, social relationships, unemployment [14], depression, despair, stress level, family cohesion [15], stress, gender, education, marital status [16] have been associated with suicide in adults. Considering the recent trend of increased adult suicide [3], investigating suicidal thoughts experienced by adults is essential. In reality, suicide is socially, culturally, and ethically prejudiced, so access is limited. Moreover, it is difficult to investigate because individuals are reluctant to expose their own or their family's experiences with suicide. Most previous studies have been cross-sectional, making it difficult to address causal relationships between each factor at a given time [17]. Thus, this study performed secondary data analysis using the Korea Health Panel (KHP) data, which are collected nationwide from the same people annually. Suicide may be impulsive, but in many cases, it is the result of an accumulation of various psychosocial issues. From that perspective, this study investigated the accumulated effects of physical and perceived psychological states of an individual on suicidal ideation 1 year later.

The objective of this study was to determine the prevalence of suicidal ideation among young (19–39 years) and middle-aged adults (40–64 years), and to explore the risk factors for suicidal ideation.

MATERIALS AND METHODS

1. Research design

A descriptive study design was used for secondary data analysis.

2. Participants

Participants were 19- to 64-year-old adults who underwent the 7th KHP survey (2012–2013). Excluding those (n = 284) who did not respond to suicidal ideation questions among the initial participants (n = 5,498), data from 5,214 participants were analyzed.

3. Data collection

Two waves (2012, 2013) of data from the 7th KHP were obtained from the KHP website. The KHP survey is conducted by the National Health Insurance Service and the Korea Institute for Health and Social Affairs. According to a KHP report, the nationwide surveys are conducted annually to measure demographic and socio-economic characteristics, chronic illness, and medical use including medication, emergency service, admission, and insurance expenditure. Data were collected by a well-trained interviewer using the face-to-face method via household visit, as well as by self-report.

4. Ethical considerations

Prior to using the data, approval was obtained from the KHP. The data were open to the public for research use, and no personal information of participants was identifiable. This study was approved by Eulji University Institutional Review Board (EUIRB2015-52).

5. Research variables

The independent variables were demographic and health-related characteristics as well as social perspectives. Demographic characteristics included gender, education, marital status, economic activity, and household income. Health-related characteristics included smoking status, heavy drinking, perceived health status, peer-compared subjective health status, and weekday and weekend sleep time. For smoking status, subjects were asked, "Do you smoke currently?" For heavy drinking, they were asked the number of times they drank more than 7 glasses of alcohol (Soju) for men (or 5 glasses for women) in the past month. In this study, "more than once a month" was categorized as heavy drinking.

In terms of health-related characteristics, the following questions were used to assess subjective health: "What do you think about your current health status?" and "What do you think about your current health compared to your peers?" These were measured on a 5-point scale (1, very good; 2, good; 3, moderate; 4,

poor; 5, very good). Sleep time was measured by asking, "How many hours a day did you sleep on average in the past week or weekend?" Data were divided into "6 hours or more" or "less than 6 hours," with reference to the recommended sleep time of 6 hours from the Korean Sleep Association [18].

Social characteristics addressed subjective social perspectives. Survey questions included "Our society is given the opportunity to succeed if one makes efforts" and "The gap between the rich and the poor of our society is getting worse." Participants answered either "yes" or "no." Subjective perception of social hierarchy recognition was measured by asking "Where do you think you are located socially?" Hierarchical self-recognition was measured with a ladder picture from 1 to 10 indicating where they think they are. Social hierarchy self-recognition level was categorized as high (7–10), middle (4–6), or lower (1–3). The dependent variable, suicidal ideation, was assessed with the question, "Have you ever thought about wanting to die in the last year?" In order to understand the causal relationship over 1 year, data for independent variables were drawn from 2012 dataset and data for the dependent variable were from the 2013 dataset.

6. Data analysis

Data were analyzed using IBM SPSS Statistics ver. 22.0 (IBM Co., Armonk, NY, USA). The prevalence of suicidal ideation was analyzed with descriptive statistics using frequency and percentages. Differences as a function of risk factors were analyzed with chi-square test and logistic regression analysis at a significance level of 0.05.

RESULTS

1. Participant characteristics

There were 5,214 participants, excluding the 284 who did not respond to the suicidal ideation question among the 5,498 participants between 19 and 64 who initially participated in the 7th KHP 2012–2013. Of the young adults aged 19–39 years, 47.1% and 52.9% were men and women, respectively. The majority attended college (70.0%) or high school (28.9%). About 52% were married, and 66% were engaged in economic activity. Income level was reported as high (54.7%), middle (23.4%), and low (21.9%). In the 40–64 years age group, the proportion of men and women was 53.9% and 46.1%, respectively. The distribution of subjects' education level was high school (43.1%), college (or higher; 31.2%), and middle school (or lower; 25.8%). About 89% reported being married, while about 79% reported economic activity, and more than half (52.5%) reported high economic status.

2. Prevalence of suicidal ideation between groups

The prevalence of suicidal ideation in young and middle-aged adults was 4.4% and 5.6%, respectively.

3. Prevalence of suicidal ideation by demographics between groups

In young adults, the prevalence of suicidal ideation was higher in men, married individuals, and in those engaged in economic activity, but the differences were non-significant. The prevalence was highest in those who completed middle school or less (15.0%), followed by high school (5.9%) and college (3.6%; χ^2 = 9.199, p = 0.008). According to household income, the prevalence was 6.5%, 6.1%, and 2.8% for low, middle, and high income levels; χ^2 = 13.166, p = 0.001).

In middle-aged adults, the prevalence of suicidal ideation in women (6.1%) was higher than it was in men (5.3%), but the difference was non-significant. The prevalence differed by marital status (χ^2 = 5.563, p = 0.018) and by engagement in economic activity (χ^2 = 5.984, p = 0.014). With respect to educational or marital status, the prevalence was higher for those who attended middle school or lower (7.8%) compared to those who completed high school (6.2%) or college or higher (3.0%; χ^2 = 22.126, p < 0.001). For household income, the prevalence was higher in those at low (10.0%) than at middle (6.7%) or high (3.1%) income levels (χ^2 = 51.511, p < 0.001). Comparisons of suicidal ideation prevalence by demographic characteristics are shown in Table 1.

4. Prevalence of suicidal ideation by health characteristics between groups

In young adults, the prevalence was higher among smokers (6.1%) and heavy drinker (5.9%) as compared to non-smokers (3.8%) and non-heavy drinkers (3.5%), and the differences were statistically significant (χ^2 = 4.432, p = 0.035 and χ^2 = 5.936, p = 0.015, respectively). Suicidal ideation prevalence was highest among those who perceived their own health status as bad or perceived their health status compared to peers as bad as compared to those with moderate or good perceptions. Prevalence differences by perceived health status (χ^2 = 14.198, p = 0.001) and by perceived peer-compared health status (χ^2 = 12.008, p = 0.002) were significantly different. The differences in prevalence according to sleep hours on weekdays and weekends were non-significant.

In middle-aged adults, with regard to perceived health status and perceived peer-compared health status, the prevalence was highest among those who perceived their own health as bad (own, 14.1%; peer-compared, 13.9%), followed by moderate (own, 6.7%;

Table 1. Prevalence of suicidal ideation by demographic characteristics among young and middle-aged adults (n = 5,214)

Category	Young adults (n = 1,825)				Middle-aged adults (n = 3,389)			
	Total	Suicidal ideation, yes	χ^2	*p*	Total	Suicidal ideation, yes	χ^2	*p*
Gender			0.991	0.320			1.084	0.298
Male	859 (47.1)	42 (4.9)			1,827 (53.9)	96 (5.3)		
Female	966 (52.9)	38 (3.9)			1,562 (46.1)	95 (6.1)		
Education			9.199[a]	0.008[a]			22.126	< 0.001
≤ Middle school	20 (1.1)	3 (15.0)			873 (25.8)	68 (7.8)		
High school	527 (28.9)	31 (5.9)			1,459 (43.1)	91 (6.2)		
≥ College	1,278 (70.0)	46 (3.6)			1,057 (31.2)	32 (3.0)		
Marital status			1.046	0.307			5.563	0.018
Married	946 (51.8)	37 (3.9)			3,015 (89.0)	160 (5.3)		
Not married	879 (48.2)	43 (4.9)			374 (11.0)	31 (8.3)		
Economic activity			0.087	0.768			5.984	0.014
Yes	1,204 (66.0)	54 (4.5)			2,685 (79.2)	138 (5.1)		
No	621 (34.0)	26 (4.2)			704 (20.8)	53 (7.5)		
Household income			13.166	0.001			51.511	< 0.001
Low	400 (21.9)	26 (6.5)			822 (24.2)	82 (10.0)		
Middle	427 (23.4)	26 (6.1)			789 (23.3)	53 (6.7)		
High	998 (54.7)	28 (2.8)			1,778 (52.5)	56 (3.1)		

Values are presented as number (%).
[a]Fisher's exact test.

peer-compared 6.2%) and good (own, 2.8%; peer-compared 3.1%). The differences by perceived and peer-compared health status were significant ($\chi^2 = 73.977$, $p < 0.001$ and $\chi^2 = 66.596$, $p < 0.001$, respectively). The differences in prevalence according to sleep hours on weekdays ($\chi^2 = 12.904$, $p < 0.001$) and weekends ($\chi^2 = 12.357$, $p < 0.001$) were also significant. There were no differences in prevalence by smoking status or heavy drinking. The prevalence of suicidal ideation by health variables is summarized in Table 2.

5. Prevalence of suicidal ideation by social perspectives between groups

In young adults, the prevalence was higher among those who responded "no" (4.7%) to the question, "In our society one has opportunity to succeed if one were try" as compared to those who responded "yes" (4.1%), but the difference was non-significant. The prevalence by subjective perspective of 'the gap between the rich and the poor' was also non-significant. Prevalence of suicidal ideation differed by social hierarchy recognition was as follows; low (7.7%), middle (3.6%), and high (0.9%; $\chi^2 = 14.847$, $p < 0.001$).

In middle-aged adults, the prevalence was higher among those with a negative view toward social opportunity to succeed ($\chi^2 = 13.008$, $p < 0.001$) and social hierarchy recognition ($\chi^2 = 41.064$, $p < 0.001$) as compared to those with than those with positive views. Comparisons of the prevalence of suicidal ideation by social perspectives are shown in Table 2.

6. Risk factors of suicidal ideation among young and middle-aged adults

A logistic regression model was used to analyze factors affecting suicidal ideation in young and middle-aged adults. Models I-1 and II-1 considered demographic factors, and then, health-related and social perspective factors were added in Models I-2 and II-2 and Models I-3 and II-3, respectively. Only significant variables in the chi-square analysis were included. Tables 3 and 4 show the risk factors of suicidal ideation among young and middle-aged adults.

1) Model I

In Model I-1, demographic risk factors were analyzed for young adults. Suicidal ideation risk was 2.10 times greater (95%

Table 2. Prevalence of suicidal ideation by health characteristics and social perspectives among young and middle-aged adults (n = 5,214)

Category	Young adults (n = 1,825)				Middle-aged adults (n = 3,389)			
	Total	Suicidal ideation, yes	χ^2	*p*	Total	Suicidal ideation, yes	χ^2	*p*
Health-related characteristics								
Smoking			4.432	0.035			2.062	0.151
Yes	477 (26.1)	29 (6.1)			896 (26.4)	59 (6.6)		
No	1,348 (73.9)	51 (3.8)			2,493 (73.6)	132 (5.3)		
Heavy drinking (time)			5.936	0.015			0.321	0.571
< 1/mo	1,126 (61.7)	39 (3.5)			2,153 (63.5)	125 (5.8)		
≥ 1/mo	699 (38.3)	41 (5.9)			1236 (36.5)	66 (5.3)		
Perceived health status			14.198	0.001			73.977	< 0.001
Poor	103 (5.6)	9 (8.7)			348 (10.3)	49 (14.1)		
Moderate	710 (38.9)	42 (5.9)			1,482 (43.7)	99 (6.7)		
Good	1,012 (55.5)	29 (2.9)			1,559 (46.0)	43 (2.8)		
Subjective peer-compared health status			12.008	0.002			66.596	< 0.001
Poor	135 (7.4)	11 (8.1)			367 (10.8)	51 (13.9)		
Moderate	828 (45.4)	45 (5.4)			1,521 (44.9)	94 (6.2)		
Good	862 (47.2)	24 (2.8)			1,501 (44.3)	46 (3.1)		
Sleep time (h): weekdays			0.009	0.926			12.904	< 0.001
< 6	177 (9.7)	8 (4.5)			496 (14.6)	45 (9.1)		
≥ 6	1,648 (90.3)	72 (4.4)			2,893 (85.4)	146 (5.0)		
Sleep time (h): weekend			0.772[a]	0.333[a]			12.357	< 0.001
< 6	77 (4.2)	2 (2.6)			309 (9.1)	31 (10.0)		
≥ 6	1,748 (95.8)	78 (4.5)			3,080 (90.9)	160 (5.2)		
Social perspectives								
Opportunity to succeed when one makes an effort			0.373	0.541			13.008	< 0.001
No	920 (50.4)	43 (4.7)			1,629 (48.1)	116 (7.1)		
Yes	905 (49.6)	37 (4.1)			1,760 (51.9)	75 (4.3)		
Gap between rich and poor is getting worse			1.000[a]	0.611[a]			3.285	0.092[a]
No	72 (3.9)	3 (4.2)			113 (3.3)	2 (1.8)		
Yes	1,753 (96.1)	77 (4.4)			3,276 (96.7)	189 (5.8)		
Perceived social class			14.847[a]	< 0.001[a]			41.064[a]	< 0.001[a]
Low	414 (22.7)	32 (7.7)			931 (27.5)	92 (9.9)		
Middle	1,297 (71.1)	47 (3.6)			2,265 (66.8)	95 (4.2)		
High	114 (6.2)	1 (0.9)			193 (5.7)	4 (2.1)		

Values are presented as number (%).
[a]Fisher's exact test.

confidence interval [CI], 1.21–3.66) for the middle and 2.09 times greater (95% CI, 1.19–3.70) for low income as compared to the risk of the high income group. Model I-2 examined the influences of smoking, heavy drinking, subjective health status, and peer-compared subjective health status, which were significant in the chi-square analysis. In addition to income, suicidal ideation

Table 3. Risk factors of suicidal ideation among young adults

Characteristic	Category	Model I-1		Model I-2		Model I-3	
		OR (95% CI)	*p*	OR (95% CI)	*p*	OR (95% CI)	*p*
Demographic							
Education	≤ Middle school	3.47 (0.96–12.54)	0.058	3.40 (0.91–12.72)	0.069	3.07 (0.81–1.62)	0.098
	High school	1.42 (0.87–2.29)	0.158	1.32 (0.81–2.15)	0.273	1.24 (0.75–2.02)	0.402
	≥ College	1.00		1.00		1.00	
Household income	Low	2.09 (1.19–3.70)	0.011	1.87 (1.05–3.33)	0.033	1.57 (0.87–2.83)	0.139
	Middle	2.10 (1.21–3.66)	0.008	2.05 (1.17–3.59)	0.012	1.87 (1.07–3.29)	0.029
	High	1.00		1.00		1.00	
Health related							
Smoking	Yes			1.35 (0.82–2.21)	0.236	1.29 (0.79–2.11)	0.315
	No			1.00		1.00	
Heavy drinking (time)	≥ 1/mo			1.62 (1.01–2.60)	0.044	1.60 (1.00–2.57)	0.050
	< 1/mo			1.00		1.00	
Perceived health status	Poor			1.85 (0.63-5.46)	0.263	1.77 (0.60–5.18)	0.299
	Moderate			1.50 (0.78–2.90)	0.224	1.49 (0.77–2.87)	0.238
	Good			1.00		1.00	
Subjective peer-compared health status	Poor			1.91 (0.67–5.43)	0.223	1.88 (0.67–5.31)	0.233
	Moderate			1.46 (0.74–2.87)	0.271	1.41 (0.72–2.77)	0.319
	Good			1.00		1.00	
Social perspective							
Perceived social class	Low					5.61 (0.74–42.43)	0.095
	Middle					3.28 (0.44–24.17)	0.244
	High					1.00	

OR, odds ratio; CI, confidence interval.

risk was 1.62 times greater (95% CI, 1.01–2.60) in heavy drinkers than in non-heavy drinkers. As a result of adding social characteristics in Model I-3, the suicidal ideation risk was 1.87 times greater (95% CI, 1.07–3.29) for those with middle level income as compared to high income. The prevalence was 1.60 times greater (95% CI, 1.00–2.57) in heavy drinkers than in non-heavy drinkers. In all cases, the difference was statistically significant.

2) Model II

Model II examined the prevalence of suicidal ideation among middle-aged adults. In Model II-1, among demographic variables, education and income level were found to be the major risk factors. In Model II-2, perceived health status and peer-compared subjective health status were identified as major risks. Finally, in Model II-3, all statistically significant variables were entered into the regression analysis.

In the middle-aged group, suicidal ideation risk was 1.80 (95% CI, 1.20–2.69) and 2.11 times greater (95% CI, 1.41–3.15) in the middle and low-income groups, respectively, than in the high-income group. The risk of suicidal ideation was 1.90 (95% CI, 1.17–3.09) and 2.66 times greater (95% CI, 1.40–5.05) among those who rated their own health as moderate or poor as compared to those who rated it as good. Regarding social perspective, suicidal ideation risk was 1.59 times greater (95% CI, 1.17–2.17) among those with positive views on social opportunity to succeed as compared to those with negative views. In all cases, the difference was statistically significant.

DISCUSSION

Suicide is a reflection of individual's internal psychological

Table 4. Risk factors of suicidal ideation among middle-aged adults

Characteristic	Category	Model II-1		Model II-2		Model II-3	
		OR (95% CI)	*p*	OR (95% CI)	*p*	OR (95% CI)	*p*
Demographic							
Education	≤ Middle school	1.86 (1.19–2.92)	0.006	1.40 (0.88–2.21)	0.158	1.38 (0.87–2.21)	0.176
	High school	1.73 (1.14–2.63)	0.010	1.56 (1.02–2.38)	0.041	1.48 (0.97–2.27)	0.072
	≥ College	1.00		1.00		1.00	
Marital status	Not married	1.11 (0.73–1.69)	0.618	1.01 (0.66–1.54)	0.978	1.05 (0.68–1.63)	0.814
	Married	1.00		1.00		1.00	
Economic activity	No	1.34 (0.96–1.87)	0.083	1.12 (0.79–1.58)	0.518	1.14 (0.81–1.62)	0.457
	Yes	1.00		1.00		1.00	
Household income	Low	2.81 (1.94–4.09)	< 0.001	2.60 (1.78–3.80)	< 0.001	2.11 (1.41–3.15)	< 0.001
	Middle	2.00 (1.36–2.96)	< 0.001	2.03 (1.37–3.01)	< 0.001	1.80 (1.20–2.69)	0.004
	High	1.00		1.00		1.00	
Health related							
Perceived health status	Poor			2.83 (1.49–5.36)	0.001	2.66 (1.40–5.05)	0.003
	Moderate			1.94 (1.19–3.15)	0.007	1.90 (1.17–3.09)	0.010
	Good			1.00		1.00	
Subjective peer-compared health status	Poor			1.89 (1.01–3.50)	0.045	1.82 (0.98–3.37)	0.060
	Moderate			1.26 (0.78–2.03)	0.341	1.23 (0.77–1.99)	0.390
	Good			1.00		1.00	
Sleep time (h): weekdays	< 6			1.17 (0.61–2.24)	0.646	1.14 (0.59–2.21)	0.688
	≥ 6			1.00		1.00	
Sleep time (h): weekend	< 6			1.36 (0.78–2.38)	0.275	1.37 (0.79–2.40)	0.265
	≥ 6			1.00		1.00	
Social perspective							
Opportunity to success with effort	No					1.59 (1.17–2.17)	0.003
	Yes					1.00	
Perceived social class	Lower					2.00 (0.70–5.75)	0.198
	Middle					1.35 (0.48–3.79)	0.565
	High					1.00	

OR, odds ratio; CI, confidence interval.

state, and so it should be understood in relation to one's personal and social context [19]. In particular, different from existing research, this study used data from 2012 for its independent variables and 2013 data for the dependent variable, making it a 1-year longitudinal study. The results suggest that somatic and social psychological states as well as situational factors influenced suicidal ideation after 1 year. The results suggest that these factors act in the longer term rather than only in the urgent moment of suicidal ideation. This may magnify the importance of the potential risk factors identified here.

In analyzing the prevalence of suicidal ideation, 5.0% of all subjects—4.4% of young adults under 39 years and 5.6% of middle-aged adults between 40 and 64 years—reported experiencing suicidal ideation. A study using national survey data reported a 4.1% rate of suicidal ideation among adults aged 19 to 65 years [20]. In another study analyzing the National Health and Nutrition Survey, suicidal thoughts among adults over 20 years were reported in 15.3% of the sample [21]. This difference may be attributable to differences in the time of data collection and sampling method.

In the multivariate logistic regression analysis, Model I for young adults showed higher suicidal ideation among those who had less education and lower income. Less education likely leads to fewer employment opportunities, low economic power, and low health status [22], thereby leading to increased suicidal ideation. For young adults, people who have lower income experience suicidal ideation at least twice as much as those with a higher income. In Japan, where the distribution of suicides has increased sharply in men aged 35–64 years, 32% cite economic reasons, 16% of whom are reported to have a large amount of debt [23].

In Model II for young adults, heavy drinkers were 1.62 times more likely to experience suicidal ideation than non-heavy drinkers. In the case of heavy drinking, suicide can be attempted impulsively due to a decrease in the capacity for rational judgment [24]. Frequent heavy drinking can act as a mediator of negative emotions such as depression, which can further strengthen suicidal ideation [25]. Frequent heavy drinking can develop into problem drinking, such as alcoholism, which can affect suicidal thoughts [26]. Accordingly, health professionals should pay close attention to these young adults.

In a previous study on the relationship between drinking and suicide in adults, problem drinking and alcohol addiction increased depression and affected suicide attempts [27]. As more than 90% of suicides involve psychological problems such as alcohol dependence [14], counseling and intervention should be provided to help solve drinking problems. In Model III for young adults, social class perceptions did not reach significance, despite showing statistically significant differences in the chi-square analysis. Income level and heavy drinking were identified as the main risk factors for suicidal ideation in young adults.

In Model I for middle-aged adults, the prevalence of suicidal ideation showed significant differences by education and income level, just as in young adulthood. In Model II, there was a significant difference by subjective health status. In previous studies, subjective health status has been reported as a major risk factor for suicidal ideation across all adult age groups [28,29]. Subjective health status influences various domains such as physical and mental function, activities of daily living, and quality of life [30,31]. Therefore, if subjective health status is negative, it affects an individual negatively, and consequently, can trigger suicidal ideation. Subjective health status may be a judgment of one's actual health status or may differ from one's actual health status. Dissatisfaction with one's physical condition can sometimes lead to problems in social interaction and affect suicidal ideation [32].

In Model II for middle-aged adults, subjective peer-compared health status was a major risk factor, contrary to the finding in young adults. Perceived peer-compared health status again may be subjective or reflect one's actual health status. However, people who feel that their health is worse than that of their peers can become depressed and show decreases in activities of daily living and social activities [33]. Accordingly, negative perception of one's own health may relate to suicidal ideation. This result supports the findings of previous studies showing a close relationship between subjective health status and suicidal ideation [34,35].

When looking at Model III for middle-aged adults, educational status, income status, and subjective health status showed statistical significance. Additionally, the query "Our society is given the opportunity to succeed if one makes efforts" was a factor, as those who responded negative to this query were 1.59 times more likely to experience suicidal ideation. Only 49.6% and 51.9% of young and middle-aged adults, respectively, responded "yes" to this query. There are many implications for suicidal ideations related to negative feelings about a chance to succeed. Such negative perspectives have profound ties to suicidal ideation, especially for middle-aged adults. In responding "no" to the query, middle-aged adults endorse the idea that no matter how hard one tries, one may not be granted opportunities, and that the future may not hold anything different from the present. Thus, one may conclude that life cannot with any certainty be changed for the better [36]. Deprivation of opportunities in this age group can lead to despair, and such negative thoughts can trigger suicidal ideation.

A common factor triggering suicidal ideation in both young and middle-aged adults is income. In another study, suicidal ideation was high in low-income families [28] and those with high family support burden. Debt holdings have also been found as a risk factor [37]. In particular, low total household income and debt are indicators of suicide risk among those who struggle to clear long-term debt or adults with urgent financial predicaments [37,38]. Korean middle-aged adults went through financial turmoil during the national financial crisis era, experiencing unemployment and seeing suicide rates spike [38]. The aftermath of the era, which included reduced employment opportunities and low incomes, may remain. In addition, middle-aged and low-income men who have traditionally been responsible for the household may feel the urge to commit suicide because of financial burdens [5].

Suicidal ideation is caused by a combination of factors. Thus, it is necessary to identify risk factors in each generation and adopt a multifaceted approach to prevent suicide. The conclusions based on the present results are as follows. First, a considerable number of young and middle-aged adults experience suicidal ideation, which should increase awareness of the risk of suicide in adulthood as well as other risk groups, such as the

elderly. Second, education and employment opportunities should be expanded for less educated and low-income adults. Third, for heavy-drinking adults, close attention needs to be paid to avoid negative emotions such as self-pessimism or depression. Fourth, positive perceptions of health status must be reinforced to avoid a sense of inferiority compared to one's peers. Fifth, negative perceptions of 'not being given the opportunity to succeed even with much effort' are likely to lead to frustration and suicidal ideation among middle-aged adults, and so it is necessary to improve the employment system by stimulating job creation or reemployment for the unemployed or early retirees.

One limitation of this study is that the analyzed data were secondary. However, the data are managed in a reliable manner by the KHP. Further, data were collected by face-to-face interviews, thereby limiting the effects of exposure on disclosing suicidal ideation. In addition, because the answer to the question about the suicidal ideation was either "yes" or "no," the seriousness of suicidal ideation is not known. Accordingly, it is necessary to study suicidal ideation through in-depth interviews.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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