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Effects of Stress, Depression, and Problem Drinking on Suicidal Ideation among Korean Workers

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ABSTRACT

The mental health of workers is an important issue that affects not only individuals and their families but also workplaces and communities. Therefore, it is necessary to regularly evaluate and analyze workers' mental health status, including levels of stress, depression, and addictive behaviors to apply these findings in creating mental health promotion programs. This study aims to provide basic data that would facilitate early intervention for workers' mental health problems by analyzing factors such as stress, depression, and problem drinking that can affect suicidal ideation. From April 15 to October 25, 2019, a survey was conducted with 165 workers across six workplaces in a Korean city. Analysis was performed using descriptive statistics, correlation, and simple and multiple regression analyses using the R statistics program 4.0.3. There was no difference in suicidal ideation scores based on the participants' general characteristics, while there was a significant positive correlation among stress, depression, problem drinking, and suicidal ideation. In addition, severe depression, severe stress, and severe problem drinking had significant effects on suicidal ideation, and among the subitems of stress, somatic symptoms had an effect on suicidal ideation. In addition, severe stress, somatic symptoms, depression, and severe problem drinking had a significant effect on suicidal ideation in males but not in females. It is necessary to identify the effects of stress, depression, drinking problems, and suicide on workers' mental health, and evaluate their mental health systematically and regularly to recognize whether active psychiatric treatment and nursing intervention are necessary as well as preventive management. In addition, it is meaningful to pay attention to the suicide ideation of adult workers and provide basic data to promote systematic public health policies on mental health.

KEYWORDS

Alcohol; depression; mental health; stress; suicidal ideation

1 Introduction

Deaths by suicide are more common than those due to malaria, breast cancer, war, and murder. The WHO has included a reduction in suicide mortality in its Mental Health Action Plan indicators, aiming to reduce suicide rates globally by 2030 [1]. In particular, Korea has an alarmingly high suicide rate, with an average suicide rate *per capita* of 26.6%, which is double the rate of 11.5 among OECD countries [2].

Suicide not only causes psychological damage to family members and the people around them, but it also causes material damage such as losses in the most active working age group and increased health expenditures due to emergency room use [3]. Adults, in particular, do not reveal their emotions compared to other age groups, and even if problems arise, they are more likely to blame themselves and try to solve these problems alone rather than trying to get help [4]. In addition, in the event of a suicide death, the remaining family members experience serious mental panic and a double tragedy that aggravates financial difficulties [5].

Suicidal ideation is a predictor of suicide planning and suicide attempts, and the management of suicidal ideation is necessary to prevent suicide [6]. Rather than defining suicide as a momentary act, it can be defined as a continuous concept involving suicidal ideation, suicide attempts, and suicidal acts [7]. According to the Diagnostic and Statistical Manual of Mental Disorders fifth edition (DSM-5), and the 10th Edition of the International Classification of Diseases (ICD-10), among the most common symptoms of depression are recurrent ideation of suicide or having detailed plans to commit or attempt suicide [8]. In other words, suicidal ideation is included in depressive symptoms and is generally included as a component in self-reporting or clinical interview measurements that measure depression [9]. The fact that suicidal ideation is included in the criteria for the diagnosis of depression suggests that depression is a psychological disorder closely correlated with suicidal ideation. In addition, as the social environment surrounding workers changes rapidly, work and family conflicts increase, and the resulting tension and stress negatively affect mental health [10]. Previous studies have also identified chronic and daily life stress as the most influential predictors of suicide [11]. High stress and constant stress situations could also increase the risk of suicide. It has been reported that adults are prone to extreme suicidal ideation under constant stress situations such as work or daily life [12]. Furthermore, adults are strongly aware that drinking is instrumental in relieving these stresses and tensions, and a social atmosphere tolerant of drinking further promotes this [13]. The lifetime prevalence rate of alcohol users accounts for 12.2% [14], and the social atmosphere tolerant of drinking increases the proportion of high-risk drinkers in adults; therefore, health interventions to prevent drinking are urgent [15]. In addition, chronic and repetitive problem drinking may lead to the development of chronic mental illnesses such as alcohol abuse and alcohol dependence, which are major risk factors for suicide [16].

Therefore, it is important to prevent mental health problems from occurring among workers and to recognize mental health difficulties early, especially since workers spend much of their day at work. Although many studies have been conducted on the suicidal ideations of Korean workers [5,7,11,12], few have comprehensively examined stress, depression, and problem drinking based on gender differences. This study aimed to investigate the relationship among stress, depression, problem drinking, and suicidal ideation in adult workers, who may show different mental health characteristics compared to other population groups. It can be said that suicide has a great social impact because adults have to play the role of producers to support the elderly and young people. In addition, workers' mental health problems are not just personal problems, they can also affect their families and social groups. Specifically, since mental health problems in the economically active population can lead to socioeconomic losses, it is necessary to prepare various policies for early intervention [3]. These results can be used as basic data for developing a static health promotion program to improve the mental health of workers.

The hypothesis of this study is as follows.

1) There will be differences in the idea of suicide according to the general characteristics of workers; and
2) There will be a correlation between workers' suicidal ideation, stress, depression, and drinking problems;
3) Stress, depression, and problem drinking will affect suicidal ideation.

2 Methods

2.1 Research Design

This descriptive research study examined the relationship among stress, depression, problem drinking, and suicidal ideation in adult workers.

2.2 Setting and Samples

This study was conducted with adult workers located in the J region of Korea, employed at six workplaces, who volunteered to participate. Participants included adult employees who were employed at the relevant workplace and wanted to undergo mental health examinations for employees. Data from 165 participants (117 males and 48 females) from six workplaces were collected.

2.3 Data Collection and Procedure

Data were collected from April 15 to October 25, 2019. The J-City Mental Health Welfare Center sent a letter of cooperation to the heads of J-City government offices, welfare institutions, and major industries in the local community to explain the purpose of the mental health study. The workplaces that volunteered for this survey were fire stations, railroad corporations, cement companies, welfare offices, police stations, and food producers. Nurses and social workers at the local mental health center met in person with workplace managers who wanted to investigate mental health and informed them that they could explain the details, guide and consult the test results, and link mental health services if necessary. The person in charge of each place of business informed the staff and notified the J-City Mental Health Welfare Center of the date and time of participation. When the workplace wanted to participate, nurses and social workers at the J-City community mental health institution visited the workplace and individually conducted a survey of the employees they selected. Prior to data collection, the purpose of the study, method, anonymity of participation, voluntary participation in the study, and the choice to discontinue at any point during the study were explained in oral and written form. The survey was completed only by those who expressed their willingness to voluntarily participate in the survey, understanding and explaining the questionnaire individually. The participants filled out the questionnaire themselves, and it was collected from them immediately thereafter. One week after the survey, the local community mental health institutions and nurses visited the workplace to inform participants individually of the test results, counseling, and links to necessary mental health services. These data were collected from community mental health institutions using secondary data that could not be personally identified and encoded.

2.4 Measurement

This study used a structured questionnaire consisting of 50 questions, including five items regarding general characteristics, four on suicidal ideation, 22 on stress, nine on depression, and 10 on problem drinking.

2.4.1 Suicidal Ideation

This study used the Suicidal Behaviors Questionnaire-Revised (SBQ-R) developed by Osman et al. [17], which is a self-report questionnaire measuring past and present suicidal behavior and is used to identify suicide risk. It consists of four questions in total: 1) suicidal ideation or suicide attempt experience, 2) frequency of suicidal ideation over the past year, 3) communication on suicide attempts, and 4) measuring the possibility of future suicide attempts. In this study, the Korean version was used, provided by the Regional Mental Health Promotion Center in North Chungcheong Province. The higher the summed score, the higher the suicide risk of respondents, and participants were classified into groups according to their scores: the normal group scored 4 points or less, the mild risk group scored 5–9 points, and the group at severe risk scored 10 points or more. In a validation study conducted with clinical and

non-clinical subjects, the adolescent group's Cronbach's alpha was 0.87–0.88, and the adult group's Cronbach's alpha was 0.7–0.87 [17], while in this study the Cronbach's alpha was 0.786.

2.4.2 Stress

The Stress Response Inventory developed by Koh et al. [18] was shortened by Choi et al. [19] from 39 questions to 22 (SRI-short form) [18,19]. The SRI-short form consists of nine questions regarding somatic symptoms, eight regarding depression symptoms, and five regarding anger symptoms. A total of 22 questions were answered using a five-point Likert scale, with answers ranging from "not at all" (zero points) to "very strongly" (four points). The total sum ranged from 0 to 88 points, and the higher the score, the higher the level of stress response. A total score of 0–31 corresponded to the normal group, 32–49 corresponded to the mild group, and more than 50 points were classified into the severe group. The reliability at the time of development, as measured through Cronbach's alpha, was 0.71 [18], while in this study, Cronbach's alpha was 0.926.

2.4.3 Depression

This study used the Korean translation of the Patient Health Questionnaire (PHQ) developed by Spitzer [9,20]. The PHQ is a self-report questionnaire developed for the recognition and diagnosis of mental disorders common in primary care, and it is used as a tool to evaluate depression. It consists of a total of nine questions and is organized in accordance with the diagnostic criteria for depressive episodes of the DSM-5. This includes feelings of malaise, depression, changes in sleep, fatigue, changes in appetite, feelings of guilt or worthlessness, decreased concentration, restlessness or feeling of being struck, and suicidal ideation experienced over the past two weeks. A total of nine questions were answered on a 4-point Likert scale ranging from "not at all" (0 points) to "very strongly" (3 points). In this study, participants with a total score of 0–3 were classified into the normal group, 4–9 points were classified as the mild group, and those with 10 points or more were classified as the severe group. The Cronbach's alpha in the study conducted by Park et al. [20] was 0.81 and for this study it was 0.834.

2.4.4 Problem Drinking

This study used a 10-question self-reporting questionnaire called the Alcohol Use Disorder Identification Test (AUDIT), developed by the World Health Organization (WHO) in 1989 for the early screening of problem drinking [21]. AUDIT is designed to assess the amount and frequency of alcohol consumption over the past year, symptoms of alcohol dependence, and alcohol-related problems resulting from harmful alcohol consumption. This was translated into Korean by Lee [22], and its reliability and validity were tested [22]. AUDIT is applied in drinking counseling for secondary health examinations, which is currently conducted as part of a national health management project, or in national health promotion projects conducted by each health center. The higher the summed score, the higher the respondent's problem drinking. Furthermore, the classification criteria for males and females were different. Males who scored nine points or less were classified under the normal group, those who scored 10–19 points were classified under the mild group, and those who scored 20 points or more were classified under the severe group; whereas, for females, those with five points or less were classified under the normal group, 6–9 points under the mild group, and 10 or more points under the severe group [23]. The Cronbach's alpha in the study conducted by Lee [22] was 0.92, and the Cronbach's alpha in this study was 0.840 [22].

2.5 Data Analysis

The collected data were analyzed using the R 4.0.3. version statistical program, and the statistical significance was set to $p < 0.05$. The suicidal ideation scores were analyzed based on the general characteristics of the subjects using descriptive statistics, standard deviation, t-test, and one-way ANOVA.

Pearson correlation analysis was performed to determine if there were correlations among stress, depression, problem drinking, and suicidal ideation. A simple regression analysis was used to analyze the effect on suicidal ideation according to the degree of stress, depression, and problem drinking by gender. In addition, through multiple regression analysis, the effects of the stress subitem group on suicidal ideation were analyzed.

2.6 Ethical Consideration

The contents and methods of this study were approved by the University Biothics Committee (IRB NO: DUC-2020-09-001-01). The principle of informed and voluntary consent was maintained, and all participants signed a consent form that informed them of their right to withdraw from the research at any time. The confidentiality of the participants was protected as best as possible by not including information that could identify them.

3 Results

This study provides basic data for the development of a static health promotion program to improve mental health by understanding the effects of workers' stress, depression, and problem drinking on suicidal ideation.

3.1 General Characteristics

The general characteristics of the participants are listed in Tab. 1. Among the participants 117 (70.9%) were male and 48 (29.1%) were female. The most common age distribution was 30–39 years old, with 46 (26.0%) participants falling under this age group. Regarding civil status, 82 participants (49.7%) had a spouse, while 83 participants (50.3%) had no spouse. In terms of education, the majority (127% or 76%) were university graduates. Regarding religion, 97 participants (58.8%) had a religion, and 68 (41.2%) had no religion. There were no significant differences in suicidal ideation based on these general characteristics.

Table 1: Differences in Suicidal Ideation according to the General Characteristics of the Participants (N = 165)

Variables	Categories	N(%)	Suicidal Ideation M ± SD	t or F (p)
Gender	Male	117 (70.9)	3.71 ± 1.67	2.28 (0.131)
	Female	48 (29.1)	3.83 ± 1.40	
Age	20–29	42 (25.5)	3.61 ± 1.18	2.94 (0.566)
	30–39	46 (27.9)	3.80 ± 1.68	
	40–49	43 (26.0)	4.09 ± 2.09	
	50–59	26 (15.8)	3.50 ± 1.24	
	60-	8 (4.8)	3.12 ± 0.35	
Spouse	Yes	82 (49.7)	3.66 ± 0.81	1.07 (0.585)
	No	83 (50.3)	3.62 ± 1.58	
Education	≤Middle school	6 (3.6)	3.78 ± 1.63	
	High school	32 (19.8)	3.85 ± 1.90	0.01 (0.943)
	≥University	127 (76.0)	3.61 ± 1.10	
Religion	Yes	97 (58.8)	3.74 ± 1.48	0.04 (0.827)
	No	68 (41.2)	3.76 ± 1.76	

3.2 Correlation among Stress, Depression, Problem Drinking and Suicidal Ideation

The results of analyzing the relationships among participants' stress, depression, problem drinking, and suicidal ideation are as follows (Tab. 2). Suicidal ideation was positively correlated with stress ($r = 0.28$, $p < 0.001$), depression ($r = 0.29$, $p < 0.001$), and problem drinking ($r = 0.16$, $p = 0.047$). Stress was positively correlated with depression ($r = 0.59$, $p < 0.001$) and problem drinking ($r = 0.17$, $p = 0.021$), while depression was also positively correlated with problem drinking ($r = 0.21$, $p = 0.005$). As the correlation coefficient between the main variables was 0.6 or less, it was determined that there was no multicollinearity problem between the main variables. In addition, further analysis of multicollinearity using the tolerance and variance inflation factor (VIF) during regression analysis found no level of suspicion of multicollinearity.

Table 2: Correlation among Suicidal Ideation, Stress, Depression, and Problem Drinking

	Suicidal ideation	Stress	Depression	Problem drinking
Suicidal ideation	1			
Stress	0.28 (<0.001)	1		
Depression	0.29 (<0.001)	0.59 (<0.001)	1	
Problem drinking	0.16 (0.047)	0.17 (0.021)	0.21 (0.005)	1

3.3 Effects of Stress, Depression, and Problem Drinking on Suicidal Ideation

The results of analyzing the effects of stress, depression, and alcohol problems on suicidal ideation for 'mild' or 'severe' suicidal ideation with reference to 'normal' are as follows (Tab. 3). First, in the total group, analyzing the effect of stress on suicidal ideation based on score, it was found that stress significantly affected suicidal ideation in the severe group compared to the normal group ($\beta = 0.258$, $p < 0.001$). An analysis of the effect of stress on suicidal ideation based on subitems showed that somatic symptoms ($\beta = 0.233$, $p = 0.009$) had a significant effect on suicidal ideation. No problem was found as a result of the multicollinearity analysis (VIF) for the stress sub-item. Depression had a significant effect on suicidal ideation in the severe group ($\beta = 0.226$, $p = 0.021$) compared to the normal group. Furthermore, it was found that problem drinking had a significant effect on suicidal ideation in the severe group ($\beta = 0.223$, $p = 0.004$) compared to the normal group.

On the other hand, the results analyzed by gender are as follows. Among the factors analyzed in relation to suicidal ideation, stress, depression, problem drinking, severe stress ($\beta = 0.294$, $p < 0.001$), somatic symptoms ($\beta = 0.224$, $p = 0.034$), severe depression ($\beta = 0.263$, $p = 0.004$), and severe problem drinking ($\beta = 0.252$, $p = 0.007$) in males had a significant effect on suicidal ideation. There were no statistically significant results found in females.

4 Discussion

This study aimed to identify the relationship between stress, depression, problem drinking, and suicidal ideation of workers to prevent mental health problems and provide basic data on mental health promotion policies through early recognition of suicide risks. The results of this study are as follows:

First, upon analyzing the differences in suicidal ideation, there were no significant differences based on general characteristics such as gender, age, marital status, education, and religion. Through this, we can see that suicidal ideation is not limited to a specific person and can occur to anyone. In previous studies, age, gender, and education did not significantly affect suicidal ideation, and this study supports these results [24]. Prior studies using logistic regression have shown that gender and age were not analyzed alone but had no significant relationship with suicide risk [25].

Table 3: Effects of Stress, Depression, and Problem Drinking on Suicidal Ideation (N = 165)

		Total		VIF	Male		VIF	Female		VIF
		β	t (p)		β	t (p)		β	t (p)	
Stress (ref. normal)	Mild	0.047	0.621 (0.535)	–	0.032	0.368 (0.713)	–	0.092	0.633 (0.53)	–
	Severe	0.258	3.404 (<0.001)	–	0.294	3.294 (0.001)	–	–	–	–
		$R^2 = 0.068$, adj R^2. = 0.056, F = 5.946, p = 0.003		–	$R^2 = .087$, adj $R^2 = 0.071$, F = 5.465, p = 0.005		–	$R^2 = .008$, Adj R^2 = 0.012, F = 0.400, p = 0.529		–
Stress (subitems)	Somatic	0.233	2.623 (0.009)	1.394	0.224	2.143 (0.034)	1.339	0.241	1.375 (0.176)	1.604
	Depression	0.063	0.574 (0.566)	2.170	0.035	0.272 (0.786)	2.130	0.140	0.657 (0.515)	2.369
	Anger	0.042	0.390 (0.696)	2.134	0.048	0.371 (0.711)	2.105	0.066	0.315 (0.754)	2.303
		$R^2 = 0.088$, adj $R^2 = 0.071$, F = 5.216, p = 0.001		–	$R^2 = 0.074$, adj R^2 = 0.049, F = 3.018, p = 0.003		–	$R^2 = 0.153$, adj R^2 = 0.095, F = 2.6578, p = 0.006		–
Depression (ref. normal)	Mild	0.069	0.901 (0.368)	–	0.057	0.620 (0.513)	–	0.149	1.041 (0.304)	–
	Severe	0.226	2.919 (0.004)	–	0.263	2.866 (0.004)	–	0.237	1.650 (0.106)	–
		R2 = 0.051, adj R^2 = 0.039, F = 4.353, p = .014		–	$R^2 = 0.060$, adj R^2 = 0.050, F = 4.111, p = 0.018		–	$R^2 = 0.074$, adj R^2 = 0.032, F = 1.799, p = 0.177		–
Problem drinking (ref. normal)	Mild	−0.036	-0.473 (0.063)	–	−0.068	-0.743 (0.466)	–	0.162	1.078 (0.466)	–
	Severe	0.223	2.876 (0.004)	–	0.252	2.705 (0.007)	–	2.94	1.96 (0.056)	–
		$R^2 = 0.054$, adj $R^2 = 0.042$, F = 4.681, p = 0.010		–	$R^2 = 0.078$, adj R^2 = 0.061, F = 4.826, p = 0.009		–	$R^2 = 0.083$, adj R^2 = 0.042, F = 2.039, p = 0.142		–

Second, the results of the study showed that suicidal ideation, stress, depression, and problem drinking were positively correlated. The higher the stress, the higher the depression, the higher the problem drinking, and the higher the suicidal ideation. These results support a prior study that noted the relevance of stress, depression, and problem drinking in suicidal ideation [24,26–28].

Third, the results of analyzing the effects of stress, depression, and problem drinking on suicidal ideation for each variable are as follows. As a result of analyzing total participants, variables influencing suicidal ideation had a significant effect on suicidal ideation in the case of severe stress, somatic symptoms, severe depression, and severe problems drinking. As a result of analyzing by gender, severe stress, somatic symptoms, severe depression, and severe problem drinking had a significant effect on suicidal ideation in males, but not females.

Therefore, suicidal ideation is a complex mental health issue that requires dealing with factors such as stress, depression, and problem drinking. Furthermore, our findings are consistent with others which found that high degrees of stress are related to suicidal ideation [12]. In particular, among the subitems of stress, only somatic symptoms were found to have an important influence on suicidal ideation. This is supported by the results of a meta-analysis study that verified the significant association between body sensation and suicidal ideations [29], and a study showing that somatic symptoms are closely related to suicidal ideation in the same context [30]. In addition, participants in the high suicide risk group had significantly higher degrees of depression than those in the non-suicide risk group [25], and previous studies have also reported that depression is a factor that increases the risk of suicide [27,28,31]. Increased stress negatively affects mental aspects and heightens the risk of depression and anxiety, and suicidal ideation

can occur after stressful events [32]. Furthermore, problem drinking had a large influence on suicidal ideation in the severe group, and previous studies reported that suicidal ideation and suicide attempts occurred 2–3 times more frequently in alcohol abusers than in the general population. A recent meta-analysis study found evidence that problem drinking is an important predictor of suicidal ideation [33]. Therefore, severe stress, somatic symptoms, severe depression, and severe problem drinking can affect suicidal ideation. Thus, in-depth intervention through early screening is necessary, and mental health programs need to be enforced in the workplace.

On the other hand, the effects of stress, depression, and problem drinking on suicidal ideation were found to differ according to gender. The study found that severe stress, severe depression, and severe problem drinking had a significant impact on suicidal ideation in males, but none of the variables had a significant effect on females. According to the WHO report, "Suicide in the world: Global Health Estimates," regardless of age or region, there were higher suicide rates among males than among females [1]. South Korea also had a suicide rate of 26.9 per 100,000 people in 2019, with the rate of suicide in males (38.8 persons) being more than double that of females (15.8) [2]. In addition, while depression is more prevalent in females, the findings that these factors lead to suicide more often in males support the results of this study [34]. Not only that in a study on psychiatric patients, depression mediated the relationship between hopelessness and suicide risk in males [31]. In addition, a 2010 Health Barometer sample survey of relationships between problem drinking and suicidal ideation and suicide attempts found that daily alcohol intake affected suicidal ideation in males but not in females, which is consistent with the findings of this study [35]. However, the results of our study contradict those of a previous study in which there was no significant difference between males and females with regard to suicide probability according to the degree of stress [36]. Therefore, more research is needed on the factors that influence suicidal ideation in females.

The occurrence of mental health problems among male workers and the consequent increase in suicidal ideation appear to be due to severe social stress and pressure in relation to being socially and economically responsible for their families [10]. Furthermore, since males are less willing to receive treatment despite encountering psychological difficulties, it is necessary to incorporate this when planning mental health services and public health policies [4]. Based on these results, studies on mental health variables that affect suicidal ideation should also focus on gender differences. In addition, other methods should be put in place, such as those that allow better identification and treatment of mental health problems in workers and improve assistance in the application of interventions.

5 Conclusions

Workers spend a lot of time in the workplace during the day. The workplace is an important environment for the early recognition and identification of mental health difficulties, and the promotion of good mental health practices can be a part of human resource management policies. This descriptive study was conducted to identify the influence of factors such as stress, depression, and problem drinking in workers on suicidal ideation. The results of this study were as follows:

There was no difference in the suicidal ideation score according to the general characteristics of the participants, and there were significant positive correlations among stress, depression, problem drinking, and suicidal ideation. Severe depression, severe stress, and severe problem drinking had significant effects on suicidal ideation, and among the subitems of stress, somatic symptoms had an effect on suicidal ideation. In addition, as a result of gender analysis, severe stress, somatic symptoms, severe depression, and severe problem drinking were found to have significant effects on suicidal ideation in males, but not females.

Developing programs related to improving workers' mental health requires active efforts, such as identifying levels of depression and alcohol problems, identifying stress levels and physical symptoms,

and risk of suicide. In particular, it would be necessary to apply an intensive suicide prevention management program for male workers as well as a program to manage stress, depression, and problem drinking. This study is meaningful in verifying the relationships among stress, depression, problem drinking, and suicidal ideation among adult workers, and identifying the specific state of variables that influence suicidal ideation. When constructing a mental health promotion strategy and suicide prevention program for workers, intensive intervention is required, including identifying high-risk groups with regard to depression, stress, and problem drinking. Furthermore, attention should be paid to the mental health problems of adult workers, and public health policies regarding mental health should be enforced.

6 Limitations

The limitations of this study are as follows. First, further research must take into consideration various variables related to workers' suicidal ideation. In this study, differences in suicidal ideation were also analyzed through a comparison of general characteristics, but more in-depth research is needed to supplement these general characteristics taking into consideration workplace-related variables. Second, it is difficult to generalize these findings to the general population because the research was conducted only on adult workers in one region. It is necessary to conduct more studies involving more participants from various regions. Third, including participants with a wide range of ages at different stages of adulthood imposes limitations on the interpretation of the findings, due to there being several details to consider between the different developmental stages. In follow-up studies, efforts should be made to develop differentiated suicide prevention strategies that reflect the characteristics of different developmental stages, such as early adulthood, middle adulthood, and late adulthood.

Conflicts of Interest: The authors declare that they have no conflicts of interest to report regarding this study.

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