



The Association between Unstable Employment and Suicidal Behavior in Young-Adult Precarious Workers

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Objective Precarious workers have increased over the past two decades in South Korea. Employment instability, especially among young adults, is considered a serious social problem. The unstable employment status of precarious workers has negative impacts on their mental health, such as suicidal behavior. This study aims to identify the effect of the unstable employment conditions on the suicidal behavior of precarious workers.

Methods An online survey was conducted with a panel sample of South Korean adults ($n=797$) who were precarious workers aged between 25–34 years. We applied Model 6 of SPSS PROCESS MACRO 3.5 to examine the multiple mediation effects of depression and anger in the relationship between employment instability and suicide.

Results Unstable employment had no direct effect on suicidal behavior. The path of unstable employment to suicidal behavior via depression and anger had a significant indirect effect. However, employment and anger were negatively related. The indirect effect of depression and anger on the relation between unstable employment and suicidal behavior was statistically significant.

Conclusion This study suggests an association between unstable employment and suicidal behavior, mediated by depression and anger. Specifically, a high level of unstable employment status increased depression. In contrast, a low level of unstable employment status increased anger, which ultimately led to an increase in suicidal behavior. These contrasting findings are likely to reflect the heterogeneity of precarious workers. Further longitudinal studies are necessary to identify the causality between precarious employment and suicidal behavior over time.

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Key Words Precarious employee, Unstable employment, Depression, Anger, Suicide.

INTRODUCTION

In South Korea, the percentage of precarious workers has increased over the past two decades from 32.6% in 2003 to 33.2% in 2010 and 36.4% in 2019.¹ This trend is consistent with the flexibility and diversification of the global labor market, which has developed over the past decades. It is particularly important to note the employment status of adults in the age group of 25–34 years in OECD countries with high university enrolment rates. This is the age range during which individuals first enter the labor market after graduating from university; there-

fore, they are likely to be exposed to varied labor market conditions.² Moreover, as approximately 35% of young people are reported to begin their working life as precarious workers, the employment instability of young adults is considered to be a serious social problem.³

Precarious employment is characterized by unfavorable contract conditions compared to regular workers, such as low wages, employment insecurity, and low socioeconomic support and benefits.⁴ Kreshpaj et al.⁵ mention three components of precarious employment: employment insecurity, income inadequacy, and lack of rights and protection. Precarious employment is likely to be associated with more dangerous working conditions with high stress and dissatisfaction that may lead to poor health.^{6,7} In addition, the unstable employment status of precarious workers has a negative impact on their mental health, causing psychological fatigue, sleep problems, burnout, depression and anxiety, and the risk of suicidal ideation and attempts.⁸⁻¹³ In particular, several studies have reported that suicide risk among those with precarious employment is similar to or higher than that of those with unemployment status.^{2,14,15}

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Employment insecurity felt by precarious workers contributes to negative emotions such as anxiety, anger, and frustration as workers become concerned about their job performance, and consequently respond passively to their jobs.¹⁶ Furthermore, the stress of unstable employment conditions induces powerlessness, frustration, and anger in the individual, which is likely to pose a risk factor for suicidal behavior.¹⁷ A study revealed that anger acts as a potential predictor of the suicidal risk of depression,¹⁸ and another study suggested that anger contributes to increasing the capability of suicide.¹⁹ Therefore, the roles of depressive symptoms and anger are important in the impact of employment instability on suicidal behavior.

In terms of the objective conditions of unstable employment, a study revealed that job insecurity and low job control were prospectively associated with suicidal thoughts.²⁰ Economic difficulties such as insufficient or insecure income can raise the level of depression, and the absolute and relative deprivation resulting from this aggravates depression.²¹ In addition, employment instability increases work tension, which is a known risk factor for depression, and can contribute to suicidal ideation.²² Further, precarious workers have a high risk of being excluded from the social security system, which in turn is related to subjective health and depression.^{8,23}

However, precarious employment does not necessarily have only negative effects. Differences have been reported among precarious workers' job satisfaction in terms of their spontaneity, such that high-income professionals tend to prefer adjusting their daily routines on their own terms, making it difficult to categorize them as typical precarious workers.²⁴ Wilkin²⁵ suggested that the reason why precarious workers' job satisfaction is inconsistent is because the industries and working conditions for precarious workers are diverse. Thus, as job satisfaction is directly related to mental health issues, such as depression and anxiety,²⁵⁻²⁷ owing to the heterogeneity among precarious workers, the impact on mental health may vary depending on the characteristics of the specific job.

To select high-risk workers, especially among precarious workers, and find ways to intervene, we aimed to identify the effect of the unstable employment conditions of precarious workers on suicidal behavior. Young adults are at a stage of life where their goals involve professional achievements and developing social relationships through marriage and occupation;²⁸ however, they are also more likely to be exposed to unstable working conditions than other age groups, increasing the likely risk of mental stress. Therefore, this study focuses on young adults at the first age of entry into the labor market, to identify the risks of their mental health. Based on previous reports on the association between unstable employment and poor mental health, such as depression,^{4,9,29,30} which is associated with suicidal behavior,^{10,30,31} it was hypothesized that 1) employment instability

is related to suicidal behavior and 2) this tentative association is mediated by depression and anger. The hypothetical model is presented in Figure 1.

METHODS

Participants

An online survey was conducted in May 2020 with a panel sample of South Korean adults ($n=797$) who were precarious workers aged between 25–34 years. To recruit the participants, an online research service utilized its own consumer panel site (www.invight.co.kr). Quotas were imposed to reflect the age distribution of the population. The research service sent an email including invitations to ask for participation in this study to a random panel of potential respondents who had completed another survey at least once within a year. From the 62,088 individuals who received the invitation email, 7,333 responded to the screening questions: 'What is your birthday?', 'What is your current job?', 'What is the type of employment in your current job?' Of those 7,333 individuals, 797 participants met the inclusion criteria and were included in this study. A brief introduction and description of the study was given on the first page of the web survey. If participants consented, they clicked a "participate" button and began the survey. No identifying information was obtained. Participants who completed all questionnaires obtained online credits equal to KRW 2,000 for participation. The study was reviewed and approved by the Institutional Review Board of the National Center for Mental Health (No. 116271-2020-21).

Measures

Sociodemographic characteristics

Sociodemographic data regarding age, gender, education level, marital status, and socioeconomic status were collected.

Employment status

The participants were required to answer several questions about their employment status. We used questions from the Fifth Korean Working Condition Survey;³² the questionnaire included job type, daily working hours, and monthly income as objective indicators of employment status. Additionally, the following were assessed as 'yes' or 'no' questions: job continuity

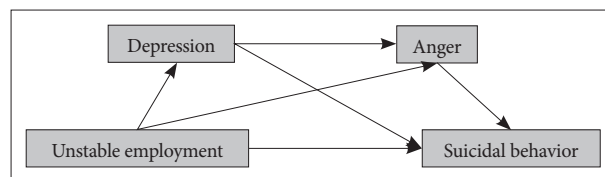


Figure 1. Hypothetical model.

(e.g., ‘If you do not do anything wrong, can you keep working as long as you want?’), and social insurance (‘Do you currently have social insurance?’). In addition, work level (‘Do you think the main work you do in your current workplace is appropriate to your level of education or skills?’), career development (‘How much do you think your current work will help your career path or career development?’), and satisfaction of work (‘Are you satisfied with your current work?’) were assessed as subjective indicators of employment status, and were rated by the respondents on a 5-point Likert scale ranging from 1 (completely disagree) to 5 (completely agree).

Unstable employment

Kreshpaj et al.⁵ suggested three components of precarious employment. Based on this suggestion, we constructed a new variable called ‘unstable employment’ using three variables in this study: monthly income, job continuity, and social insurance. In 2019, the average monthly wages of Korean workers in their 20s and 30s were 2,066,000 and 2,965,000 KRW, respectively.¹ Based on the average wage by age group, 0 points were given for monthly income above the standard and 1 point was given for an income below the standard. Both work continuity and insurance coverage received 1 point each if there was no work continuity and no insurance. The final scores were then added together to calculate the total score for unstable employment. The range of scores was 0–3, with higher scores indicating graver job instability.

Mental health variables

Depressive symptoms were measured using the General Health Questionnaire-12 (GHQ-12), developed for screening non-specific psychiatric symptoms.³³ We used the Korean version of the GHQ-12 (K-GHQ-12), which was translated and validated by Park et al.³⁴ The K-GHQ-12 suggests two factors: depression and anxiety, and social dysfunction. We used the ‘depression and anxiety’ factor, which comprises seven items of the questionnaire. The items are rated on a scale ranging from 0 (not at all) to 3 (always experiencing symptoms); a higher score indicates a more severe level of psychological distress.

Anger was assessed using the Buss-Perry Aggression Questionnaire (BPAQ), which was developed to comprehensively determine the instrumental/motor, emotional, and cognitive elements of aggression, and comprises 29 questions measuring physical, verbal, angry, and hostile anger.³⁵ In this study, out of a total of 27 questions on the Korean scale,³⁶ only 5 questions corresponding to the emotional dimension of aggression were used. The K-BPAQ is rated using a 5-point Likert scale (1=not at all to 5=strongly agree), and the item scores were summed for a total score, with higher scores indicating higher levels of aggression.

The Suicidal Behavior Questionnaire-Revised (SBQ-R) was used to assess suicidal behavior. The Suicide Behavior Scale (SBQ) is a measure developed by Linehan and Nielsen³⁷ to assess past and present suicide behavior, and comprises 34 questions. In this study, we used a modified version of the SBQ, which is a four-question self-reporting questionnaire developed by Osman et al.³⁸ translated and validated with a Korean sample by Lee and Kwon.³⁹ The total score is 18 points, and if the non-clinical adult group has a total score of 7 or higher, the risk of suicide is considered high.³⁸ If the clinical adult group has a total score of 8 or higher, the suicidal risk is also considered high.³⁸

Statistical analysis

Descriptive statistics were used to describe the sociodemographic characteristics of the data. To explore the association between the variables in the study, Pearson’s correlation analysis was performed. We applied Model 6 of SPSS PROCESS MACRO 3.5⁴⁰ to calculate the multiple mediation effect of depression and anger on the relationship between employment instability and suicide. All dependent variables were positively skewed (skewness: depression, 0.371; anger, 0.241, suicidal behavior, 1.065). To exclude the impact of the sociodemographic variables (viz. age, gender, education level, marital status, and socioeconomic status) on the mediation analysis, these variables were controlled as covariates. All statistical analyses were performed using SPSS 26.0 (IBM Corp., Armonk, NY, USA), with the statistical significance level set at $\alpha=0.05$.

RESULTS

Descriptive analysis

Table 1 shows the sociodemographic characteristics of the 797 participants (446 women, 56%; mean age=29.67±2.9 years). The number of respondents aged 20–29 years and 30–34 years was 378 (47.4%) and 419 (52.6%), respectively. A large number of the participants had an education level higher than a bachelor’s degree (university=56.5%; graduate school and above=10.9%), and 82.2% had never been married. Regarding socioeconomic status (SES), 45.7% of the participants indicated ‘middle-low’ and 22.5% indicated ‘low-high’ levels. A total of 33.4% of the respondents were office workers, and 18.7% were professionals.

Additionally, sociodemographic characteristics by each item (income, employment continuity, insurance) that constitutes unstable employment were presented as Supplementary Table 1, 2, and 3 (in the online-only Data Supplement). Specifically, in terms of income stability, the difference in educational background between the stable and unstable groups has been shown to be statistically significant ($\chi^2=10.8$, $p<0.05$). Among them, stable group had 18.6% with graduate school or higher

education, while the unstable group had only 9.6% with graduate school or higher education. There was also a difference in job type, with the highest proportion of professionals, at 34.7%, among the stable group, while the unstable group has the highest proportion of office workers, at 35.6%.

Table 1. Sociodemographic characteristics of the participants

Characteristics	N=797
Sex	
Male	351 (44)
Female	446 (56)
Age (years)	29.67 (2.9)
20–29	378 (47.4)
30–34	419 (52.6)
Education	
High school	131 (16.4)
College	129 (16.2)
University	450 (56.5)
Graduate school and above	87 (10.9)
Marital status	
Never married	655 (82.2)
Married	142 (17.8)
Socio-economic status	
High-high	3 (0.4)
High-low	9 (1.1)
Middle-high	140 (17.6)
Middle-low	364 (45.7)
Low-high	179 (22.5)
Low-low	102 (12.8)
Monthly income (KRW)	
≤1,500,000	304 (38.1)
1,550,000–2,500,000	399 (50.1)
>2,500,000	94 (11.8)
Job type	
Manager	19 (2.4)
Professional	149 (18.7)
Engineer and semi-professional	53 (6.6)
Office worker	274 (34.4)
Service worker	127 (15.9)
Sales worker	42 (5.3)
Skilled worker in agriculture and fisheries	2 (0.3)
Functional worker	18 (2.3)
Mechanical worker	19 (2.4)
Manual worker	92 (11.5)
Soldier	2 (0.3)

Data are presented as the mean (SD) N (%). SD: standard deviation

Correlation analysis

Pearson's correlations were conducted to explore the relationship between the variables, and Table 2 shows the results of the analysis. Education level ($r=-0.09$, $p<0.05$), SES ($r=-0.2$, $p<0.001$), and monthly income ($r=-0.47$, $p<0.001$) were negatively related with unstable employment. However, gender and age factors were not associated with unstable employment. Regarding subjective indicators of participants' work, the satisfaction of work ($r=-0.19$, $p<0.001$), perception of work level ($r=-0.14$, $p<0.001$), and association of work with their career development ($r=-0.17$, $p<0.001$) were all negatively related with unstable employment. In addition, depression ($r=0.15$, $p<0.001$) was reported to have a positive relationship with unstable employment. Most subjective indicators were negatively related to the mental health variables. In other words, satisfaction with work and career development had a negative relationship with depression, anger, and suicidal behavior (Table 2). However, we could not find a significant relationship between work level and anger.

Mediation analysis

Although we focused on the association between unstable employment status of precarious workers and suicidal behavior, we did not identify a significant relationship between them in the correlation analysis. However, unstable employment had a positive correlation with depression, and depression had a significant association with anger and suicidal behavior. For a clearer investigation, we assumed that depression and anger were potential risk factors as mediators and constructed a mediation model.

Table 3 shows the results of the mediation analyses to determine the significance of the indirect effect of unstable employment on suicidal behavior through depression and anger. At first, unstable employment had a significant positive association with depression ($B=0.793$, $p<0.01$). When unstable employment and depression were inserted as predictors into the regression model of anger, depression had a positive effect ($B=0.206$, $p<0.001$). On the other hand, unstable employment had a negative impact on anger ($B=-0.515$, $p<0.01$). Finally, the effect of anger, depression, and unstable employment on suicidal behavior was significant. While anger and depression had a positive association with suicidal behavior, unstable employment had no direct effect on suicidal behavior. The model accounted for approximately 32.1% of the variance in suicidal behavior, indicating that the complete mediation model was statistically supported.

The results of the indirect effect are illustrated in Table 4. The path from unstable employment to suicidal behavior via depression was significant [$B=0.185$, 95% CI=(0.041, 0.329)]. The path of unstable employment to suicidal behavior via anger was

Table 2. Correlations among variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
Unstable employment	1											
Sex	0.036	1										
Age	0.056	-0.066	1									
Education	-0.09*	0.072*	0.049	1								
Socioeconomic status	-0.195†	0.097†	-0.038	0.247†	1							
Monthly income	-0.474†	-0.127†	0.182†	0.108†	0.213†	1						
Satisfaction-work	-0.185†	0.034	0.029	0.129†	0.19†	0.153†	1					
Work level	-0.14†	0.032	0.032	0.047	0.185†	0.23†	0.375†	1				
Career development	-0.174†	0.018	0.063	0.222†	0.226†	0.248†	0.452†	0.562†	1			
Depression	0.148†	0.012	-0.018	-0.148†	-0.294†	-0.152†	-0.338†	-0.133†	-0.277†	1		
Anger	-0.033	0.121†	0.04	-0.128†	-0.102†	-0.014	-0.096†	-0.063	-0.13†	0.36†	1	
Suicidal behavior	0.06	0.129†	-0.052	-0.135†	-0.181†	-0.067	-0.167†	-0.124†	-0.2†	0.535†	0.309†	1

* $p < 0.05$, † $p < 0.01$, ‡ $p < 0.001$ **Table 3.** Results of serial multiple mediation analysis

Dependent variables	Predictors	B	SE	t	95% CI		F	R ²
					LL	UL		
Depression	Unstable employment	0.793	0.304	2.607*	0.196	1.389	16.678†	0.112
	Depression	0.206	0.019	10.686†	0.168	0.244	22.972†	0.169
Anger	Unstable employment	-0.515	0.166	-3.115*	-0.84	-0.19		
	Anger	0.105	0.029	3.686†	0.049	0.161	46.657†	0.321
Suicide	Depression	0.233	0.017	14.102†	0.201	0.266		
	Unstable employment	-0.086	0.133	-0.645	-0.348	0.176		
Suicide	Unstable employment	0.062	0.154	0.401	-0.24	0.364	10.763†	0.076

* $p < 0.01$, † $p < 0.001$. B: unstandardized regression coefficient, SE: standard error, CI: confidence interval, LL: lower limit, UL: upper limit, R²: coefficient of determination**Table 4.** Indirect effect among variables

Path	B	BootSE	BootLLCI	BootULCL
Unstable employment → depression → suicide	0.185	0.074	0.041	0.329
Unstable employment → anger → suicide	-0.054	0.025	-0.111	-0.015
Unstable employment → depression → anger → suicide	0.017	0.009	0.003	0.037

B: unstandardized coefficient, BootSE: Bootstrap estimates standard error, BootLL(UL)CL: Bootstrap estimates the lower limit (upper limit) of the confidence interval

also valid; in contrast to the previous path, unstable employment and anger were negatively related [B=-0.054, 95% CI=(-0.111, -0.015)]. This means that the lower the level of unstable employment (i.e., a stable employment status), the higher the anger, which increased the risk of suicidal behavior. Lastly, the indirect effect of depression and anger between unstable employment and suicidal behavior was statistically significant (B=0.017, 95% CI=(0.003, 0.037)]. The path coefficient of the study model is presented in Figure 2.

DISCUSSION

The aim of this study was to examine the effect of employment instability on precarious workers' mental health. In particular, we focused on suicidal behavior and tried to reveal the role of depression and anger regarding the relationship between employment instability and suicidal behavior.

The results showed that the link between unstable employment status of precarious workers and suicidal behavior was significant. This finding supports the results of preceding studies that unstable status of precarious employment contributes

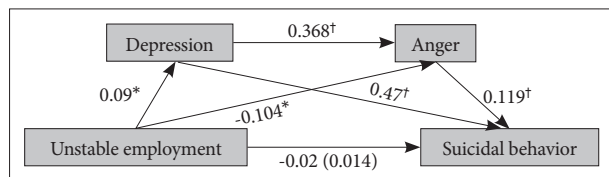


Figure 2. Model of serial multiple mediating effects footnote: the numbers indicate standardized regression coefficients. * $p < 0.01$, † $p < 0.001$.

to the risk of suicide.^{2,10,30,31,41,42} Milner et al.⁴³ suggested that low job control, job insecurity, and poor income were likely to increase suicidal thoughts. Several previous studies have mentioned that low incomes of precarious workers are associated with suicidal risk.^{9,10,30} These results are consistent with our findings. Particularly, our study found that a majority of the participants (85.2%) received lower than average income as compared to the general population of the same age group.¹ This income inequality of precarious workers is a serious problem. In addition, precarious workers are known to be at higher risk of being excluded from social security benefits, and social exclusion is likely to induce mental health problems such as depression and suicide.⁴⁴ Other studies have indicated that employment instability could lead to a loss of belonging or social integration, increasing vulnerability to suicide, especially in women.⁴⁵ In addition, a panel study conducted in South Korea found that the variables most significantly related to precarious workers' suicidal ideation were subjective health conditions and sleeping hours, indicating that the risk of precarious employees' suicide was closely related to irregular living patterns and physical health.⁴²

The association between unstable employment status of precarious workers and suicidal behavior was found to be fully mediated by depression and anger. Similar to previous studies, this study confirms that depression is a powerful factor affecting precarious workers' suicidal risk.^{10,30} Socioeconomic deprivation due to employment instability was associated with depression in precarious workers.²¹ In addition, a longitudinal study showed that precarious employment was related to the development of depressive symptoms.⁴⁶ As is well known, depression is considered the most influential risk factor for suicide in many studies;⁴⁷⁻⁵⁰ therefore, the depression of non-regular workers is a contributing factor in increasing the risk of suicide. To our knowledge, research addressing anger in the context of the mental health of precarious workers has not been conducted so far. A qualitative study using interviews with 15 precarious workers suggested that job stress regarding unstable employment could be related to powerlessness, frustration, and anger;¹⁷ therefore, our finding makes this assumption clearer. Moreover, this study considered the role of anger as a kind of 'accelerator'¹⁹ and found that job insecurity increases depression, and depression increases anger levels, leading to suicidal

behavior. Further, as has been established by previous studies, we demonstrated that depression and anger have a strong effect on suicidal behavior.^{18,51-55}

It is particularly notable that the unstable employment status of precarious workers and anger had a negative association, which was an unexpected result, and may have been caused by the heterogeneity of samples. Based on our findings, one possible explanation is that lower instability of employment was related to higher education levels. Highly educated workers have high expectations of wages,⁵⁶ and for them, opportunities regarding personal career are more important than other terms of a contract when choosing a job.⁵⁷

Moreover, lower-than-expected wage and opportunities for personal growth are associated with job attitude and satisfaction.^{58,59} Further, a study by Yang et al.⁶⁰ with a sample comparable to ours in terms of educational levels and job types showed that the job satisfaction or organizational commitment of precarious workers was higher than that of permanent workers due to expectations for the future, but was lower than that of permanent workers in terms of demands for compensation and pointing out problems within the company. In other words, these results seem to reflect the reality of precarious workers who are unable to actively express their opinions to improve work-related dissatisfaction. Therefore, despite the stable employment status, it is possible that the gap between expectations and reality increases anger in precarious workers.⁶¹ On the other hand, another possible explanation for the unexpected outcome is that highly unstable precarious employees might suppress their anger. As mentioned in the results section and in the Supplement Table 1 (in the online-only Data Supplement), more than 50% of people experiencing income inequality were office workers and service workers who were likely to experience the atmosphere within hierarchical organizations. Fitness⁶² revealed that there were differences in anger expression depending on the occupational position, and low-powered workers used passive methods such as calming emotions or avoiding situations. Considering that all of the participants of this study are young adults and usually have a short period of employment, it is highly likely that they will hold low-level positions and suppress their anger. However, further research is needed to determine whether consistent results can be confirmed.

Some limitations of the current study are as follows. First, we created a new continuous variable by combining different factors that constitute the instability of employment to reflect the heterogeneity of precarious workers. In addition, to facilitate the quantification of unstable employment in statistical terms, each component was arbitrarily categorized as 0 and 1 according to certain criteria; however, it was limited in fully considering the heterogeneous characteristics of precarious

workers. A previous study showed that job satisfaction varied depending on the spontaneity of precarious workers or their educational level.²⁴ Therefore, in future research, a comparative study subdividing the groups of precarious workers regarding their spontaneity and other such distinct variables would help to clarify the effect of unstable employment on mental health. Second, all dependent variables were positively skewed. Statistically, skewness below 2 is considered normal,⁶³ and all dependent variables are represented below 2. However, positive skewness can result in biased results, so careful interpretation and application of results are needed. Third, the participants of this study may not be a truly representative sample of precarious workers among Korean young adults because more than 50% of them were office workers or professionals and highly educated “white-collar workers.” It is possible that the sample was biased due to the use of an online survey format. Finally, owing to the cross-sectional design of the study, we were unable to reveal temporal relationships between the variables. Some researchers have suggested the possibility that people with poorer mental health are likely to select jobs with inferior conditions.^{64,65} Therefore, further longitudinal studies are necessary to identify the causality between precarious employment and suicidal behavior over time.

Despite the limitations, we found some meaningful results. This study suggested an association between unstable employment and suicidal behavior, mediated by depression and anger. More specifically, a high level of unstable employment status increased depression. In contrast, a low level of unstable employment status increased anger, which ultimately led to an increase in suicidal behavior. These contrasting findings are likely to reflect the heterogeneity of precarious workers. Therefore, when establishing suicide prevention strategies for these workers, individual-focused approaches would be needed depending on their status of unstable employment. In other words, we suggest that it would be effective to establish a strategy focused on each unstable employment status, such as focusing more on preventing depression or alleviating stress for groups with higher employment instability and establishing policies such as increasing the wage level to address conditions that cause anger among those with lower employment instability.

Supplementary Materials

The online-only Data Supplement is available with this article at <https://doi.org/10.30773/pi.2020.0447>.

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Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

Author Contributions

Conceptualization: Subin Park, Eun-Sun Lee. Data curation: all authors. Formal analysis: Yoanna Seong, Eun-Sun Lee. Methodology: Subin Park. Writing—original draft: Yoanna Seong. Writing—review & editing: Yoanna Seong, Subin Park. Approval of final manuscript: all authors.

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REFERENCES

1. KOSIS. Wage and Working Hours by Age Group. Daejeon: Statistics Korea; 2019.
2. Kim C, Cho Y. Does unstable employment have an association with suicide rates among the young? *Int J Environ Res Public Health* 2017; 14:470.
3. KOSIS. Korean Survey of Careers and Mobility of Doctorate Holders. Daejeon: Statistics of Korea; 2017.
4. Rönblad T, Grönholm E, Jonsson J, Koranyi I, Orellana C, Kreshpaj B, et al. Precarious employment and mental health: a systematic review and meta-analysis of longitudinal studies. *Scand J Work Environ Health* 2019;45:429-443.
5. Kreshpaj B, Orellana C, Burström B, Davis L, Hemmingsson T, Johansson G, et al. What is precarious employment? A systematic review of definitions and operationalizations from quantitative and qualitative studies. *Scand J Work Environ Health* 2020;46:235-247.
6. Chung HJ, Muntaner C. Employment conditions and inequalities in health: pathways and mechanisms. *Korean Assoc Soc Policy* 2011;18: 245-287.
7. Clarke M, Lewchuk W, de Wolff A, King A. ‘This just isn’t sustainable’: precarious employment, stress and workers’ health. *Int J Law Psychiatry* 2007;30:311-326.
8. Benach J, Vives A, Amable M, Vanroelen C, Tarafa G, Muntaner C. Precarious employment: understanding an emerging social determinant of health. *Annu Rev Public Health* 2014;35:229-253.
9. Jang SY, Jang SI, Bae HC, Shin J, Park EC. Precarious employment and new-onset severe depressive symptoms: a population-based prospective study in South Korea. *Scand J Work Environ Health* 2015;41:329-337.
10. Min KB, Park SG, Hwang SH, Min JY. Precarious employment and the risk of suicidal ideation and suicide attempts. *Prev Med* 2015;71:72-76.
11. Park S, Lee D. Influence of job satisfaction, job stress, anger expression, depression, and hopelessness of junior officers of armed forces on their suicidal ideation. *J Korean J Couns Psychother* 2014;26:545-571.
12. Virtanen M, Kivimäki M, Joensuu M, Virtanen P, Elovainio M, Vahtera J. Temporary employment and health: a review. *Int J Epidemiol* 2005; 34:610-622.
13. Yoo KB, Park EC, Jang SY, Kwon JA, Kim SJ, Cho KH, et al. Association between employment status change and depression in Korean adults. *BMJ Open* 2016;6:e008570.
14. Kim W, Ki M, Choi M, Song A. Comparable risk of suicidal ideation between workers at precarious employment and unemployment: data from the Korean Welfare Panel Study, 2012–2017. *Int J Environ Res Public Health* 2019;16:2811.
15. Mäki N, Martikainen P. A register-based study on excess suicide mortality among unemployed men and women during different levels of unemployment in Finland. *J Epidemiol Community Health* 2012;66: 302-307.
16. Kiefer T. Feeling bad: antecedents and consequences of negative emotions in ongoing change. *J Organ Behav* 2005;26:875-897.
17. Toivanen S, Tarantino AO, Emmelin M, Östergren PO. Diverting blame to stay sane—young people’s strategies for dealing with the men-

- tal health effects of precarious employment: a grounded theory study. *BMC Public Health* 2020;20:571.
18. Jandl M, Steyer J, Kaschka WP. Suicide risk markers in major depressive disorder: a study of electrodermal activity and event-related potentials. *J Affect Disord* 2010;123:138-149.
 19. Hawkins KA, Hames JL, Ribeiro JD, Silva C, Joiner TE, Cogle JR. An examination of the relationship between anger and suicide risk through the lens of the interpersonal theory of suicide. *J Psychiatr Res* 2014;50:59-65.
 20. Milner A, LaMontagne AD, Spittal MJ, Pirkis J, Currier D. Job stressors and employment precarity as risks for thoughts about suicide: an Australian study using the Ten to Men Cohort. *Ann Work Expo Health* 2018;62:583-590.
 21. De Witte H, Pienaar J, De Cuyper NJAP. Review of 30 years of longitudinal studies on the association between job insecurity and health and well-being: is there causal evidence? *Aust Psychol* 2016;51:18-31.
 22. Byun G, Lee H. The impact of employment instability on mental health: the case of South Korea. *Health Soc Welfare Rev* 2018;38:129-160.
 23. Kim J. The impact of multidimensional social exclusions on atypical worker's self-rated health and depression: comparative analysis with typical worker. *Health Soc Welfare Rev* 2017;37:398-432.
 24. Kim DH, Sung SH. The impact of the contingent worker's perception on job fit to job attitudes and interaction effect of voluntary choices. *K J Industr Relat* 2016;26:51-73.
 25. Wilkin CL. I can't get no job satisfaction: meta-analysis comparing permanent and contingent workers. *J Organ Behav* 2013;34:47-64.
 26. Faragher EB, Cass M, Cooper CL. The Relationship between Job Satisfaction and Health: A Meta-Analysis. In *From Stress to Wellbeing Volume 1*. London: Palgrave Macmillan UK; 2013, p.254-271.
 27. Nadinloyi KB, Sadeghi H, Hajloo N. Relationship between job satisfaction and employees mental health. *Procedia Soc Behav Sci* 2013;84:293-297.
 28. Roisman GI, Masten AS, Coatsworth JD, Tellegen A. Salient and emerging developmental tasks in the transition to adulthood. *Child Dev* 2004;75:123-133.
 29. Canivet C, Bodin T, Emmelin M, Toivanen S, Moghaddassi M, Östergren PO. Precarious employment is a risk factor for poor mental health in young individuals in Sweden: a cohort study with multiple follow-ups. *BMC Pub Health* 2016;16:687.
 30. Han KM, Chang J, Won E, Lee MS, Ham BJ. Precarious employment associated with depressive symptoms and suicidal ideation in adult wage workers. *J Affect Disord* 2017;218:201-209.
 31. Kraut A, Walld R. Influence of lack of full-time employment on attempted suicide in Manitoba, Canada. *Scand J Work Environ Health* 2003;29:15-21.
 32. Occupational Safety and Health Research Institute. The Fifth Korean Working Conditions Survey. Ulsan: Occupational Safety and Health Research Institute; 2017.
 33. Goldberg DB, Gater R, Sartorius N, Ustun TB, Piccinelli M, Gureje O, et al. The validity of two versions of the GHQ in the WHO study of mental illness in general health care. *Psychol Med* 1997;27:191-197.
 34. Park JI, Kim YJ, Cho MJ. Factor structure of the 12-Item General Health Questionnaire in the Korean general adult population. *J Korean Neuropsychiatr Assoc* 2012;51:178-184.
 35. Buss AH, Perry M. The aggression questionnaire. *J Pers Soc Psychol* 1992;63:452-459.
 36. Kwon SM, Seo SG. Validation study of the Korean version of the Aggression Questionnaire. *Korean J Clin Psychol* 2002;21:487-501.
 37. Linehan MM. *Suicidal Behaviors Questionnaire*. Seattle, WA: University of Washington; 1981.
 38. Osman A, Bagge CL, Gutierrez PM, Konick LC, Kopper BA, Barrios FX. The Suicidal Behaviors Questionnaire-Revised (SBQ-R): validation with clinical and nonclinical samples. *Assessment* 2001;8:443-454.
 39. Lee HS, Kwon JH. Validation for the Beck Scale for suicide ideation with Korean university students. *Korean J Clin Psychol* 2009;28:1155-1172.
 40. Hayes AF. *PROCESS: A Versatile Computational Tool for Observed Variable Mediation, Moderation, and Conditional Process Modeling*. Kansas: University of Kansas; 2012.
 41. Yoon S, Kim JY, Park J, Kim SS. Loss of permanent employment and its association with suicidal ideation: a cohort study in South Korea. *Scand J Work Environ Health* 2017;457-464.
 42. Lee W, Ha J. The association between nonstandard employment and suicidal ideation: data from the first- fourth Korea National Health and Nutrition Examination Surveys. *Korean J Occup Environ Med* 2011;23:89-97.
 43. Milner A, Witt K, LaMontagne AD, Niedhammer I. Psychosocial job stressors and suicidality: a meta-analysis and systematic review. *Occup Environ Med* 2018;75:245-253.
 44. Rho BI, Son JH. The effect of social exclusion of marginal workers on mental health. *Korean J Soc Welfare* 2011;63:113-135.
 45. Kposowa AJ, Ezzat DA, Breault K. New findings on gender: the effects of employment status on suicide. *Int J Womens Health* 2019;11:569-575.
 46. Quesnel-Vallée A, DeHaney S, Ciampi A. Temporary work and depressive symptoms: a propensity score analysis. *Soc Sci Med* 2010;70:1982-1987.
 47. Angst J, Angst F, Stassen H. Suicide risk in patients with major depressive disorder. *J Clin Psychiatry* 1999;60(Suppl 2):57-62.
 48. Sokero TP, Melartin TK, Rytälä HJ, Leskelä US, Lestelä-Mielonen PS, Isometsä ET. Prospective study of risk factors for attempted suicide among patients with DSM-IV major depressive disorder. *Br J Psychiatry* 2005;186:314-318.
 49. Coryell W, Young EA. Clinical predictors of suicide in primary major depressive disorder. *J Clin Psychiatry* 2005;66:412-417.
 50. Oquendo MA, Galfalvy H, Russo S, Ellis SP, Grunebaum MF, Burke A, et al. Prospective study of clinical predictors of suicidal acts after a major depressive episode in patients with major depressive disorder or bipolar disorder. *Am J Psychiatry* 2004;161:1433-1441.
 51. Goldberg EL. Depression and suicide ideation in the young adult. *Am J Psychiatry* 1981;138:35-40.
 52. Goldney R, Winefield A, Saebel J, Winefield H, Tiggeman M. Anger, suicidal ideation, and attempted suicide: a prospective study. *Compr Psychiatry* 1997;38:264-268.
 53. Lehnert KL, Overholser JC, Spirito A. Internalized and externalized anger in adolescent suicide attempters. *J Adolesc Res* 1994;9:105-119.
 54. Mann JJ, Bortinger J, Oquendo MA, Currier D, Li S, Brent DA. Family history of suicidal behavior and mood disorders in probands with mood disorders. *American Journal of Psychiatry* 2005;162:1672-1679.
 55. Westefeld JS, Furr SR. Suicide and depression among college students. *Prof Psychol Res Pr* 1987;18:119-123.
 56. Park C. The reservation wage of college graduates and employment. *Quart J Labor Policy* 2015;15:83-110.
 57. Chae HS, Park JS. The exploratory study on the impact of the professional contingent workers on team members' acceptance and creative team performance. *Asia-Pacific Journal of Business* 2020;11:145-158.
 58. Barnett BR, Bradley L. The impact of organisational support for career development on career satisfaction. *Career Dev Int* 2007;12:617-636.
 59. Grund C, Sliwka D. The impact of wage increases on job satisfaction-Empirical evidence and theoretical implications. Institute for the Study of Labor (IZA), IZA Discussion Papers; 2001.
 60. Yang BH, Hwang HY, Oah SZ, Lee JI. Differences of permanent and temporal employee in organizational commitment and job attitude. *Korean J Indust Organ Psychol* 2001;14:73-93.
 61. Persson E. Testing the impact of frustration and anger when responsibility is low. *J Econ Behav Organ* 2018;145:435-448.
 62. Fitness J. Anger in the workplace: an emotion script approach to anger episodes between workers and their superiors, co-workers and subordinates. *J Organ Behav* 2000;21:147-162.
 63. Curran PJ, West SG, Finch JF. The robustness of test statistics to non-

- normality and specification error in confirmatory factor analysis. *Psychol Methods* 1996;1:16-29.
64. Heponiemi T, Elovainio M, Manderbacka K, Aalto AM, Kivimäki M, Keskimäki I. Relationship between unemployment and health among health care professionals: health selection or health effect? *J Psychosom Res* 2007;63:425-431.
65. Milner A, Krnjacki L, LaMontagne A. Psychosocial job quality and mental health among young workers: a fixed-effects regression analysis using 13 waves of annual data. *Scand J Work Environ Health* 2017; 43:50-58.

Supplementary Table 1. Sociodemographic characteristics by unstable employment condition-income

Characteristics	Stable condition (1)	Unstable condition (0)
Sex		
Male	62 (52.5)	289 (42.6)
Female	56 (47.5)	390 (57.4)
Age (years)	29.09 (2.56)	29.77 (2.94)
Education		
High school	18 (15.3)	113 (16.6)
College	12 (10.2)	117 (17.2)
University	66 (55.9)	384 (56.6)
Graduate school and above	22 (18.6)	65 (9.6)
Job type		
Manager	1 (0.8)	18 (2.7)
Professional	41 (34.7)	108 (15.9)
Engineer and semi-professional	13 (11)	40 (5.9)
Office worker	32 (27.1)	242 (35.6)
Service worker	15 (12.7)	112 (16.5)
Sales worker	4 (3.4)	38 (5.6)
Skilled worker in agriculture and fisheries	0	2 (0.3)
Functional worker	3 (2.5)	15 (2.2)
Mechanical worker	3 (2.5)	16 (2.4)
Manual worker	6 (5.1)	86 (12.7)
Soldier	0	1 (0.3)

Data are presented as the mean (SD) N (%). SD: standard deviation

Supplementary Table 2. Sociodemographic characteristics by unstable employment condition-insurance

Characteristics	Stable condition (1)	Unstable condition (0)
Sex		
Male	202 (43.7)	149 (44.5)
Female	260 (56.3)	186 (55.5)
Age (years)	29.7 (2.82)	29.63 (3.00)
Education		
High school	59 (12.8)	72 (21.5)
College	77 (16.7)	52 (15.5)
University	266 (57.6)	184 (54.9)
Graduate school and above	60 (13.0)	27 (8.1)
Job type		
Manager	10 (2.2)	9 (2.7)
Professional	95 (20.6)	54 (16.1)
Engineer and semi-professional	31 (6.7)	22 (6.6)
Office worker	208 (45)	66 (19.7)
Service worker	42 (9.1)	85 (25.4)
Sales worker	14 (3)	28 (8.4)
Skilled worker in agriculture and fisheries	2 (0.4)	0
Functional worker	11 (2.4)	7 (2.1)
Mechanical worker	11 (2.4)	8 (2.4)
Manual worker	37 (8)	55 (16.4)
Soldier	1 (0.2)	1 (0.3)

Data are presented as the mean (SD) N (%). SD: standard deviation

Supplementary Table 3. Sociodemographic characteristics by unstable employment condition-continuity

Characteristics	Stable condition (1)	Unstable condition (0)
Sex		
Male	197 (44.7)	154 (43.3)
Female	244 (55.3)	202 (56.7)
Age (years)	29.56 (2.93)	29.81 (2.85)
Education		
High school	75 (17)	56 (15.7)
College	76 (17.2)	53 (14.9)
University	242 (54.9)	208 (58.4)
Graduate school and above	48 (10.9)	39 (11)
Job type		
Manager	5 (1.1)	14 (3.9)
Professional	82 (18.6)	67 (18.8)
Engineer and semi-professional	34 (7.7)	19 (5.3)
Office worker	126 (28.6)	148 (41.6)
Service worker	83 (18.8)	44 (12.4)
Sales worker	36 (8.2)	6 (1.7)
Skilled worker in agriculture and fisheries	1 (0.2)	1 (0.3)
Functional worker	9 (2.0)	9 (2.5)
Mechanical worker	13 (2.9)	6 (1.7)
Manual worker	51 (11.6)	41 (11.5)
Soldier	1 (0.2)	1 (0.3)

Data are presented as the mean (SD) N (%). SD: standard deviation