



Contents lists available at ScienceDirect

Preventive Medicine

journal homepage: www.elsevier.com/locate/ypmed

1 Precarious employment and the risk of suicidal ideation and 2 suicide attempts

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8 A R T I C L E I N F O

9 Available online xxxx

11 Keywords:

12 Employment
13 Self-destructive behaviors
14 Socioeconomic disparity
15 Health inequality

A B S T R A C T

Objective. Although the effect of occupation or employment status on suicide risk is notable, there are few studies on the effect of precarious employment on suicide. We compared suicidal ideation and suicide attempts in precarious workers and their non-precarious counterparts using a representative sample from South Korea.

Method. The 2008 Korean Community Health Survey data were used for this study. Information was obtained on 52,161 participants (41,063 employees with non-precarious work and 11,098 employees with precarious work). The outcome of the logistic regression model was the presence of suicidal thoughts and attempts, and the independent variables were the demographics, socioeconomic status, and health status.

Results. Employees with precarious work were more likely to exhibit suicidal ideation (OR = 1.41; 95% CI, 1.28–1.55) and suicide attempts (OR = 1.52; 95% CI, 1.02–2.27) than employees with non-precarious work. After controlling for income and education (Model 2) depressive feelings (Model 6), compared with unadjusted model, remained significant but the odds ratio was largely attenuated, indicating a strong association between suicidal risk and socioeconomic and feelings of depression.

Conclusion. Precarious workers had a higher risk of suicidal ideation and suicide attempts than non-precarious workers. Our study suggests that precarious employment is an important risk for suicide.

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34 Introduction

35 Suicide is a significant public health issue because of associated
36 human, social, and economic losses. The World Health Organization
37 (WHO) has estimated that almost one million people commit suicide
38 annually, which is an average of one suicide death every 40 s (World Health
39 Organization, 2007). Although suicidal thoughts and attempts are
40 frequently influenced by personality characteristics (e.g., impulsivity
41 and aggression), a family history of suicide, social deprivation, alcohol or
42 drug abuse, and psychiatric disorders (Hawton and van Heeringen,
43 2009; Nock et al., 2008), the impact of occupation or employment status
44 on the risk of suicide is notable (Stack, 2001; Voss et al., 2004).

45 Suicide rates vary across occupational groups. Suicide is more
46 frequent among physicians, nurses, pharmacists, veterinarians, police
47 officers, farmers, and military personnel (Mahon et al., 2005; Meltzer
48 et al., 2008; Roberts et al., 2013). Suicide risk is also elevated among in-
49 dividuals who are unemployed or have a lack of full-time employment
50 (Blakely et al., 2003; Kraut and Walld, 2003; Maki and Martikainen,
51 2012).

52 Easy access to lethal measures (e.g., toxic substances and fire-
53 arms) and work-related difficulties (e.g., social isolation, psychiatric
54 problems, and financial constraints) have received attention as
55 common factors associated with an increased risk of self-destructive
56 behavior (Agerbo et al., 2007; Schneider et al., 2011; Skegg et al., 2010).

57 Addressing such work-related difficulties appears to be relevant to
58 labor market changes. Recent decades have seen less uniform and
59 more flexible and complex work arrangements, resulting in the growth
60 of precarious employment situations (Benach et al., 2000; Rodgers,
61 1989). Precarious employment, namely non-standard, part-time, or con-
62 tingency work, is characterized by a temporary nature, powerlessness,
63 limited benefits, and low earnings (Benavides et al., 2006). Such difficul-
64 ties impose serious vulnerabilities to emotional distress, mental and
65 physical illness, and stressful working conditions, which are known risk
66 factors for self-destructive behaviors (Agerbo et al., 2007; Schneider
67 et al., 2011). Given these vulnerabilities, employees with precarious
68 work might be at a higher risk for suicide; however, relatively few
69 studies have focused on the effect of precarious employment on suicide.

70 In this study, we hypothesized that employees with precarious work
71 would be more susceptible to suicidal thoughts and actions. We com-
72 pared suicidal ideation and suicide attempts between precarious
73 workers and their non-precarious counterparts using a representative
74 sample from South Korea.
75

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76 Methods

77 Study population

78 We used data from the Korean Community Health Survey (KCHS), which
79 was conducted by the Korea Centers for Disease Control and Prevention. The
80 KCHS is a cross-sectional study that began in 2008 with the goals of gathering
81 reliable health-related data at the community level in different geographical
82 regions and providing evidence-based public health programs and services.
83 The study participants were recruited from public health centers in sub-
84 communities using probability proportional to size systematic sampling and
85 root proportional allocation. The survey is conducted from September to
86 November each year and gathers information through face-to-face, paper-
87 assisted personal interviews between trained interviewers and respondents.
88 The collected data includes socio-demographic information, health behaviors
89 (e.g., smoking and alcohol consumption), self-reported health status, health
90 system utilization, and quality of life. A total of 220,258 participants were
91 included in this study in 2008 (Korea Centers for Disease Control and
92 Prevention, 2014).

93 Of the 220,258 participants, we initially sampled the 148,330 participants
94 who were between the ages of 20–59 and were therefore considered working-
95 age adults. We excluded 84,774 of these participants because they were not
96 engaged in economic activity or were not waged workers. Additionally,
97 11,395 subjects were excluded because of a lack of information regarding
98 suicide ($n = 175$) or other variables of interest ($n = 11,220$). In total,
99 52,161 participants in this study.

100 Employment status: non-precarious and precarious employment

101 Employment status was assessed by questions regarding (1) job
102 attendance, (2) job title, (3) employment status (e.g., waged worker, self-
103 employed, or unpaid family employee), and (4) work status (i.e., full-time,
104 part-time, or contingency jobs). Employees with precarious work were defined
105 as participants with part-time or contingency jobs, and full-time workers were
106 regarded as non-precarious workers.

107 Suicidal ideation and suicide attempts

108 Information regarding the participants' suicidal ideation and suicide attempts
109 was obtained through self-reports. Suicidal ideation was based on a question of
110 whether the respondent had contemplated dying in the past 12 months. Suicide
111 attempts were based on a question regarding whether the respondent had
112 attempted suicide in the past 12 months. The responses were coded as dichoto-
113 mous variables ("yes" or "no").

114 Variables

115 The variables of interest in the association between precarious employment
116 and the risk of suicide were determined based on evidence presented in the
117 previous literature. As part of the KCHS, the respondents provided information
118 regarding their age (20–29, 30–39, 40–49, or 50–59 years), gender, marital status
119 (married, divorced or widowed, or never married), monthly income
120 ($\leq \$2000$, $\$2001$ – $\$3000$, or $\geq \$3001$), and education (less than high school,
121 high school, or college or higher). Working classes included white-collar (man-
122 agerial, professional, or clerical), pink-collar (services or sales), blue-collar
123 (manual labor), or the military. Health behaviors included smoking status
124 (current, former, or never) and alcohol consumption (drinker or non-drinker).
125 Feelings of depression were identified by a yes–no question regarding whether
126 the respondent had experienced feelings of depression during the past 12 months.
127 Physical health status was identified based on previous physician-diagnosed
128 diseases (e.g., hypertension, diabetes mellitus, dyslipidemia, stroke, myocardial
129 infarction, or angina).

130 Statistical analysis

131 We used Chi-square tests to determine if the differences between the demo-
132 graphic, socioeconomic, and health status of the precarious and non-precarious
133 workers who did or did not contemplate suicide, were statistically significant.
134 We performed logistic regression using a series of ordered logistic regression
135 models and produced crude and adjusted odds ratios (ORs) with 95% confi-
136 dence intervals (95% CIs). To investigate the effect of the individual employee
137 variables on suicide risk, we used estimating models adjusting for covariates:
138 Q5 Model I adjusted for demographic characteristics (i.e., age, gender, and marital

status); Model II adjusted for Model I + income and education; Model III adjust- 139
ed for Model I + job categories (white-collar, pink-collar, blue-collar, and mili- 140
tary); Model IV adjusted for Model I + smoking and alcohol consumption; 141
Model V adjusted for Model I + physical health status (based on a history of dis- 142
ease, including hypertension, diabetes mellitus, dyslipidemia, stroke, myocardial 143
infarction, or angina); and Model VI adjusted for Model I + depressive feelings 144
(based on the experience of feelings of depression during the past 12 months). 145
The final model was adjusted for all potential variables, including age, gender, 146
marital status, income, education, job classification, smoking and alcohol con- 147
sumption, physical health status, and depressive feelings. All of the analyses 148
were performed using SAS 9.2 software (SAS Institute, Cary, NC, USA), and the 149
statistical significance level was set at $\alpha = .05$. 150

151 Results

152 Table 1 shows the characteristics of non-precarious and precarious 152
workers according to the presence of suicidal ideation and suicide 153
attempts. Of the 52,161 participants, 41,063 employees were 154
non-precarious, and 11,098 employees were precarious workers. The 155
non-precarious and precarious workers with suicidal ideation/attempts 156
were more likely to be female and divorced/widowed, to have low in- 157
come and less education, to be pink-collar workers, to drink, to have 158
depressive feelings, and to have poor self-estimates of health status. 159
The patterns of the ages, smoking, and history of disease were different 160
between non-precarious and precarious workers. The proportion of sui- 161
cidal ideation/attempts among the non-precarious workers was high in 162
the participants aged 50–59 years, those who never smoked, and those 163
with a history of stroke, whereas the highest proportion of suicidal ideation 164
/attempts among precarious workers was found in participants 165
aged 40–49 years, those who were current smokers, and those with a 166
history of angina. 167

168 Fig. 1 shows the prevalence (%) of suicidal ideation and suicide at- 168
tempt between the non-precarious and precarious workers. The major- 169
ity of employees had contemplated suicide ('suicidal ideation'), 170
whereas a small proportion (4.5%) of the employees actually attempted 171
suicide ('suicide attempts'). Employees with precarious work had rela- 172
tively higher rates of suicidal ideation (4.4% among non-precarious 173
workers vs. 10.0% among precarious workers) and suicide attempts 174
(0.2% among non-precarious workers vs. 0.7% among precarious 175
workers). Table 2 shows the odds ratio (95% CI) of suicidal ideation 176
and suicide attempts in employees with precarious work. To show the 177
effects of precarious employment on suicide, we conducted a series of 178
ordered logistic regression analyses, and the odds ratios indicated that 179
the risk increases among precarious workers compared with non- 180
precarious workers. Compared with the unadjusted OR, each adjusted 181
OR for suicidal ideation and suicide attempts decreased but remained 182
significant after controlling for the demographic variables (Model 183
1) and further adjustment for income and education (Model 2), job clas- 184
sification (Model 3), smoking and alcohol consumption (Model 4), 185
physical health status (Model 5), or depressive feelings (Model 6). The 186
effects of income and education (OR = 1.62; 95% CI, 1.48–1.76 for sui- 187
cidal ideation and OR = 1.98; 95% CI, 1.38–2.85 for suicide attempt), 188
and depressive feelings (OR = 1.66; 95% CI, 1.52–1.82 for suicidal 189
ideation and OR = 2.16; 95% CI, 1.49–3.13 for suicide attempt) on 190
suicide risk appear to be particularly influential among employees 191
with precarious work. 192

193 Discussion

194 This study investigated the association between precarious employ- 194
ment and suicidal ideation and suicide attempts, using a nationally rep- 195
resentative sample from South Korea. We found that the employees 196
with precarious work were at an increased risk for suicidal thoughts 197
(OR = 1.41; 95% CI, 1.28–1.55) and actions (OR = 1.52; 95% CI, 1.02– 198
2.27), after adjusting for potential variables. The obvious decrease in 199
the odds ratios in terms of socioeconomic indicators (e.g., income and 200
education) and depressive feelings, compared with the unadjusted 201

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