

Effects of Experienced Socioeconomic Deprivation on Suicidal Ideation in South Korea: Analysis of the Mediating Effect of Depression

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Purpose of this study

- This study is designed to verify the relationship between socioeconomic deprivation and depression. Along with the direct effect of socioeconomic deprivation on suicidal ideation, this study ascertains the role of depression mediating the main relationship between deprivation and suicidal ideation.

Method

Data: the 9th Korea Welfare Panel Study in 2014 (Korea Institute for Health and Social Affairs and Seoul National University)

- First generated in 2006, the KoWePS survey population represents 90% of the census conducted in 2005, and to determine final panel households, the stratified double sampling model was.
- Although this data represents the whole population, it is highly needed to alleviate the bias from the oversampled poor households (50% of the whole sample). Thus, cross-sectional weights for individuals were applied to the research target.
- Also, cases which had missing values on any variables were removed. The target is 12,678 adults who are over 20.

Variables

- 1) **Dependent variable:** Measuring of socioeconomic deprivation is formulated as the sum of 22 items of 7 areas (food, housing, education, social security, occupation/economy, social deprivation, health) scoring the case of deprivation is 1 and otherwise is 0, so that the variation of score varies from 0 to 22. (Salmond et al., 2006; Heo et al., 2010). Items are shown in Table 1.
- 2) **Independent variable:** Suicidal ideation is measured by a binary variable asking “have you thought about suicide seriously within the last 1 year?”
- 3) **Mediator variable:** For depression, CESD-11 (Center for Epidemiologic Studies Depression Scale) is used. Each item of this scale is graded from 0 to 3 so that the sum of total 11 items varies from 0 to 33. The score is proportional to the severity of depression. Cronbach’s α demonstrating reliability is 0.857 in this study.
- 4) **Control variables:** age, gender, education, marital status, and monthly average household income

Table 1. Full items and areas for measurement of socioeconomic deprivation (* counter coded)

Area of Deprivation		Item (deprived if Experienced within last 1 year)
Food		One couldn't afford to buy food due to lack of money.
Housing	Rent fee	One couldn't pay the rent more than two months or had to move due to lack of money.
	Heating bills	One couldn't heat the house due to lack of money
	Facilities*	One didn't have any of following; a detached stand-up kitchen, a detached flush toilet, and a detached hot water-supply bathroom.
	Number of rooms	Less than; 1 room for 1~2 people/ 2 rooms for 3~4 people/ 3 rooms for 5~6 people
	Living space	Smaller than; 12m ² for 1 person/ 20m ² for 2 people/ 29m ² for 3 people / 37m ² for 4 people/ 41m ² for 5 people/ 49m ² for 6 people
	House structure*	One's house was not; Permanent building, solid, equipped with material favorable enough for heatproof, fireproof, radiating, and dampproof.
	Light & Heating*	One's house was not; soundproof, ventilation, well-lighted, equipped with heater.
	Pollution	One's house was exposed to; noise, vibration, smell, and air pollution.
	Natural disaster*	One's house was not safe from; tsunami, flood, landslide and collapse.
Education	Public	One couldn't afford to pay a child's public educational costs.
	Private	One couldn't afford to send a child to private educational institutes.
Social Security	National pension	One couldn't join the National pension or afford to pay
	Health insurance	One couldn't join the Public health insurance or afford to pay
Occupation/ Economy	Total living costs*	Total living costs was less than the minimum cost of living.
	Type of employment*	One's job was not regular job.
	Unemployment	One was unemployed.
Social deprivation	Work environment	One had to work at harmful working environment.
	Credit status	One had a delinquent borrower in the family.
	Utility bill	One or more of the following was cut off; electricity, telephone, tap water.
	Family relationship	One was not satisfied with the family relationship.
Health		One or his/her family member couldn't afford to go to hospital.

Statistics

- 1) Multiple linear regression analysis is utilized to inspect the effect of socioeconomic deprivation on depression.
- 2) Binominal logistic regression analysis is utilized to inspect the effects of socioeconomic deprivation and depression on suicidal ideation.
- 3) Last, to inspect the mediating effect, Z-mediation equation was calculated.

$$Z\text{-mediation} = \frac{\frac{a}{s_a} \times \frac{b}{s_b}}{\sqrt{\left(\frac{a}{s_a}\right)^2 + \left(\frac{b}{s_b}\right)^2 + 1}} = \frac{z_a z_b}{\sqrt{z_a^2 + z_b^2 + 1}}$$

a: unstandardized regression coefficient: independent variable → mediating variable

b: unstandardized regression coefficient: independent variable, mediating variable → dependent variable

s_a: Standard error of a, s_b: Standard error of b

Results & Findings

- 1) All tolerance limits for all variables were higher than 0.3 and the Variance Inflation Factor for all were smaller than 4, which means there is no multicollinearity.
- 2) The effect of socioeconomic deprivation on depression (Step 1) was discovered significant (R square=22.7%, F=543.253, p<.001).
- 3) The effect of socioeconomic deprivation on suicidal ideation (Step 2) was discovered significant (Cox & Schnell R square=3.7%, Chi-square=4374.137, p<.001). Thus, when socioeconomic deprivation increases by 1 unit, the odd ratio for suicidal ideation increases by 38.5%.
- 4) The combined effect of socioeconomic deprivation and depression on suicidal ideation was tested (Step 3), and it also showed a significant result (Cox & Schnell R square=8.3%, Chi-square=3735.453, p<.001). After controlling all the other variables, increasing of socioeconomic deprivation by 1 unit leads the odd ratio of suicidal ideation to increase by 18.7%. Additionally, when depression increases by 1 unit, the odd ratio of suicidal ideation increases by 20.0%. This results says that depression partially mediates the relationship between socioeconomic deprivation and suicidal ideation.
- 5) Following the equation, the Z mediation value produced 19.020; that is significant within 95% confidence interval.

Table 2. The effect of socioeconomic deprivation on depression and mediating effect of depressive mood

		Step 1 (Model 1) socioeconomic deprivation → depressive mood				Step 2 (Model 2) socioeconomic deprivation → suicidal ideation			Step 3 (Model 3) socioeconomic deprivation & depressive mood → suicidal ideation				
		B	S.E	B	t	B	OR	95% CI	B	OR	95% CI		
Coefficient		-1.359	.209		-6.504	-4.562	0.010		-4.598	.010			
Demographic Variables (Reference Group)	Sex-Female (male)	.565	.079	.057	7.126***	.019	1.019	.850~1.222	-.129	.879	.724~1.067		
	Age	.054	.003	.198	17.277***	.001	1.001	.994~1.008	-.010**	.990	.983~.997		
	Education: Middle school or lower (college or more)	.529	.135	.054	3.925***	.537**	1.711	1.215~2.409	.350	1.418	.990~2.032		
	Education: High school (college or more)	.011	.107	.001	.103	.549***	1.731	1.283~2.335	.508**	1.661	1.215~2.272		
	Marital status: With spouse (no spouse)	-1.234	.084	-.121	-14.692***	-.319**	.727	.607~.870	-.065	.937	.773~1.136		
	Monthly average household income	-.001	.000	-.078	-8.629***	-.002***	.998	.998~.999	-.001**	.999	.998~1.000		
socioeconomic deprivation		.763	.024	.255	30.190***	.325***	1.385	1.326~1.446	.172***	1.187	1.130~1.248		
depression									.190***	1.210	1.191~1.228		
		R2		.228		-2 Log Likelihood		4374.137		-2 Log Likelihood		3735.453	
		Adjusted R2		.227		Model x2		487.122*** (df=7)		Model x2		1125.806*** (df=8)	
		F		543.253		Cox & Snell R2		.037		Cox & Snell R2		.083	

*p<.05, **p<.01, ***p<.001