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# Effects of the gap between socioeconomic status and perceived social class on suicidal ideation: Unique perspectives using a longitudinal analysis

Jae-Hyun Kim[a,b], Eun-Cheol Park[b,c], Ki-Bong Yoo[d,*]

[a] Department of Public Health, Graduate School, Yonsei University, Seoul, South Korea
[b] Institute of Health Services Research, Yonsei University College of Medicine, Seoul, South Korea
[c] Department of Preventive Medicine, Yonsei University College of Medicine, Seoul, South Korea
[d] Department of healthcare management, Eulji university, Sungnam, South Korea

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ABSTRACT

*Purpose:* We investigate the impact of gaps between socioeconomic status (SES; household income and education) and perceived social class on suicidal ideation.
*Design and methods:* Longitudinal data from the 2009 and 2011 Korean Health Panel Survey were used. Our sample consisted of 12,357 subjects included in the 2009 survey and 11,758 subjects included in the 2011 survey. We analyzed rates of suicidal ideation as a function of the gap between SES and perceived social class, defined as the difference between household income and education—high (H; college or higher), medium (M; high school), low (L; middle school or lower)—and perceived social class (H, M, and L).
*Results:* Among respondents whose actual and perceived levels of household income (HH: odds ratio [OR] = 0.611 [95% CI [confidence interval]: 0.486–0.768], LL: OR = 1.829 [95% CI: 1.489–2.247]) and education (HH: OR = 0.788 [95% CI: 0.622–0.998], LL: OR 1.853 [95% CI: 1.476–2.328]) were the same, suicidal ideation increased as perceived social class decreased. The adjusted effect of the association between SES and perceived social class on suicidal ideation decreased according to the same pattern.
*Conclusions:* This study suggests that the gap between SES and perceptions of one's position in the social hierarchy explains a substantial part of inequalities in suicidal ideation. It is important to consider the impact of the slopes of both gaps on suicidal ideation rather than focus only on perceived social class.
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## 1. Introduction

Suicide, a serious public health problem and an important social issue, is a significant cause of death in many Organization for Economic Co-operation and Development (OECD) countries. In South Korea, suicide was the leading cause of death among those 10–39 years of age and the fourth leading cause of death in the total population in 2012 (Annual Report on the Cause of Death Statistics, 2012). South Korea has the highest suicide rate among OECD countries (OECD Health Statistics, 2014), and it experienced an unprecedented increase in the rate of suicide in the decade after the financial crisis of the late 1990s (Chan et al., 2014). The age-standardized suicide rate in South Korea increased from 10.2 (per 100,000) in 1985 to 21.5 in 2006. In 2012, it increased to 29.1 (per 100,000), which is 10 times higher than the rate in Greece, the country with the lowest suicide rate in 2012 (OECD Health Statistics, 2014).

Suicide is associated with a variety of psychological disorders, such as major depression and alcoholism (Liu, 2004). The relationship between socioeconomic disadvantages and psychiatric outcomes probably involves unequal exposure to adversity and stress as a function of socioeconomic position (Hatch & Dohrenwend, 2007). Furthermore, prospective research has found that socioeconomic status (SES) is causally associated with suicidal behaviors (Fairweather-Schmidt, Anstey, Salim, & Rodgers, 2010). Suicidal ideation is the strongest known predictor of suicidal behavior (Baca-Garcia et al., 2010). Previous studies have identified many of the factors associated with suicide. Indeed, suicide has been related to complex factors, including biological, psychological, environmental, and sociocultural variables (Hawton & van Heeringen, 2009). According to recent multifactorial theoretical

* Corresponding author at: Department of Healthcare Management, Eulji University, 553 Sansung-daero Soojung-gu, Sungnam-si, Kyungki-do 461-815, South Korea.
*E-mail address:* kb53545@gmail.com (K.-B. Yoo).

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frameworks, predisposing risk factors, such as SES, may, both directly and indirectly through precipitating factors, affect suicide risk (Mortensen, Agerbo, Erikson, Qin, & Westergaard-Nielsen, 2000). Indicators of low SES have been reliably identified as risk factors for suicidal behavior in community settings. In general, low income and educational attainment are associated with suicide-related morbidity and mortality (Blakely, Collings, & Atkinson, 2003).

Many studies (Feigon & Hays, 2003) have examined the positive associations between SES (i.e., income and education) and health outcomes, and previous studies have found associations between self-perceptions of social class and quality of life (Hoebel, Kuntz, Muters, & Lampert, 2013) and between quality of life and suicide (Kao, Liu, Cheng, & Chou, 2012). However, no study has investigated the impact of gaps between SES and perceived social class on suicidal ideation.

Therefore, this study investigated the impact of such gaps by measuring the effect of differences between perceived social class and actual household income and educational level on suicidal ideation.

## 2. Methods

### 2.1. Sample

The Korea Health Panel Survey (KHPS) collected data for a total of about 8000 households, with a response rate of 94.1%. The KHPS is a nationwide, multi-stage stratified survey of a representative sample of the entire South Korean population that is conducted by the Korea Institute for Health and Social Affairs (KIHASA). To give an equal probability of being sampled, weights were assigned to each respondent, enabling the results to represent the entire Korean population. This weighting method guarantees unbiased point estimates of population parameters for the entire population and its subsets.

As a type of study that possesses both the strengths of cross-sectional data and time series data, the KHPS was constructed by repeatedly surveying the identical content for the same respondents every year. Thus, all variables surveyed by the KHPS were repeatedly measured to collect observation cases at multiple points in time and it is formed by selecting 8000 households and all household members residing in the relevant households form the panel samples and then carrying out repeated observations on the selected samples once a year every year.

Our analysis relied on data obtained between October 2009 and December 2011 from a nationally representative sample of families and individuals by the Korean Health Panel Survey. The initial 2008 baseline data consisted of information from 21,283 individuals in 7009 households (2009: 19,154 individuals in 6314 households, 2010: 17,878 individuals in 5956 households, 2011: 17,037 individuals in 5741 households). This study analyzed the data from 2009 and 2011, from and 2011 which included information obtained from adults older than 18 years of age about their actual and perceived social class.

We excluded 93 individuals with missing data regarding household income, 6516 individuals with missing data regarding perceived social class, and 188 individuals with missing data regarding smoking status in 2009. Thus, a total of 12,357 individuals were included in the analyses of data collected in 2009. We also excluded 5 individuals with missing data regarding household income and 5274 with missing data regarding perceived social class in 2011. Thus, a total number of enrolled subjects in this study were 11,758. We did not make any submission that has data collected from human subjects and do not require ethics approval because of using the open data source (Korea Health Panel Survey),

## 3. Study variables

### 3.1. Dependent variables

Self-reported data regarding suicidal ideation were obtained by asking the following question: “Have you wanted to die during the last year?” Suicidal ideation was categorized as either “yes” or “no”.

### 3.2. Independent variables

#### 3.2.1. Socioeconomic status

Equivalized household income can be viewed as an indicator of the economic resources available to each individual in a household. Mean equivalized household income is usually calculated by adding the equivalized household income of all persons and then dividing by the number of persons in the household. Thus, people in large households have the same contribution to the mean as do people living alone (Australian Bureau of Statistics, 2006).

Therefore, equivalized household income is the total household income adjusted by the application of an equivalence scale to facilitate the comparison of income levels between households of different sizes and compositions, reflecting the need for a larger household to have a higher level of income to achieve the same standard of living as a smaller household. Household income was calculated by dividing the annual household income by the square root of the number of persons in the household (Sung Jin, 2006).

Household income was ranked from lowest (1) to highest (3) and grouped into three tertiles using the SAS Rank function.

Education was categorized into three groups: middle school or lower, high school, and college or higher.

Perceived social class was measured by asking respondents to assess their social status within their country in terms of a ladder. Pictures of ladders with 10 rungs were used to answer the following question: “Think of this ladder as representing where people stand in South Korea. At the top of the ladder are the people who are the best off—those who have the most money, the most education, and the most respected jobs. At the bottom are the people who are the worst off—who have the least money, the least education, and the least respected jobs or no jobs”. Respondents were then asked to consider their current situation and rank themselves. The items were coded so that a higher score indicated a higher perceived social class.

We categorized perceived social class from lowest (1) to highest (3) using the SAS Rank function. Thus, we analyzed the impact of relative social class using the gap between SES, defined as equivalized household income and education, and perceived social class as independent variables.

This gap was defined as the difference between household income (high [H], medium [M], low [L]) and education (college or higher, high school, middle school or lower) on the one hand and perceived social class (H, M, and L), on the other. Therefore, it was categorized into nine groups: HL (H [college or higher]–L), HM (H [college or higher]–M), HH (H [college or higher]–H), ML (M [high school]–L), MM (M [high school]–middle), MH (M [high school]–H), LL (L [middle school or lower]–low), LM (L [middle school or lower]–M), and LH (L [middle school or lower]–high).

### 3.3. Control variables

Residence was categorized as urban (Seoul, Daejeon, Daegu, Busan, Incheon, Kwangju, or Ulsan) or rural (not classified as a city). Economic activity was divided into two categories: employed and unemployed (including housewives and students). Individuals were classified as currently or never married, with the latter group including those who had previously been married or were widowed or divorced. Depressive symptoms

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