

# The Korea National Suicide Survey (KNSS) : Rationale and Design

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Suicide, the fourth leading cause of death in Korea, is a serious national problem. The Korea National Suicide Survey (KNSS) is the result of the first legislation to address this issue, "Article 11 of THE ACT FOR THE PREVENTION OF SUICIDE AND THE CREATION OF A CULTURE OF RESPECT FOR LIFE" (the "Act for the Prevention of Suicide"). To overcome the limitations of previous studies, the KNSS was designed by collaborators from a variety of fields : psychology, epidemiology, social welfare, and psychiatry. The KNSS was composed of four substudies that addressed the multifaceted process involved in suicide-related behavior over time, exploring general attitudes toward suicide and suicidal ideation, suicide planning, suicide attempts, and completed suicides. Study 1 examined the risk factors for suicide based on data regarding completed suicides ; Study 2 adopted the approach of a psychological autopsy ; Study 3 focused on suicide attempters ; and Study 4 explored attitudes toward suicide in the general population. The KNSS was designed to provide a comprehensive understanding of suicide from a longitudinal, multifaceted perspective to serve as a basis for policies aimed at suicide prevention.

**Key Words** Suicide · Nationwide survey · Rationale · Design.

**Received:** December 4, 2014 / **Revised:** December 26, 2014 / **Accepted:** January 7, 2015

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## Introduction and Background

In 2012, a total of 14160 deaths were attributable to suicide in Korea, where the suicide rate is 28.1 per 100000, the highest among members of the Organization for Economic Cooperation and Development. In deed, the suicide rate in Korea has increased every year for the last 10 years, and the current suicide rate is almost twice that of 10 years ago. Therefore, suicide is considered a serious problem in Korea.

Despite implementation of the first and second 5-year suicide-prevention programs in 2004 and 2009, the suicide rate in Korea has continued to increase. In response to this absence of success, the Korean government adopted more systematic strat-

egies for suicide prevention by enacting "Article 11 of THE ACT FOR THE PREVENTION OF SUICIDE AND THE CREATION OF A CULTURE OF RESPECT FOR LIFE" (hereafter, the "Act for the Prevention of Suicide") in 2011. This law led to the establishment of the Korea Suicide Prevention Center in 2012 and to various related activities. These efforts reflected the recognition of the need for a systematic, comprehensive survey regarding suicide in the service of suicide prevention. Indeed, the Act for the Prevention of Suicide stipulates that a national survey regarding suicide be conducted every 5 years. The first national survey, the Korea National Suicide Survey (KNSS), was performed in 2013.

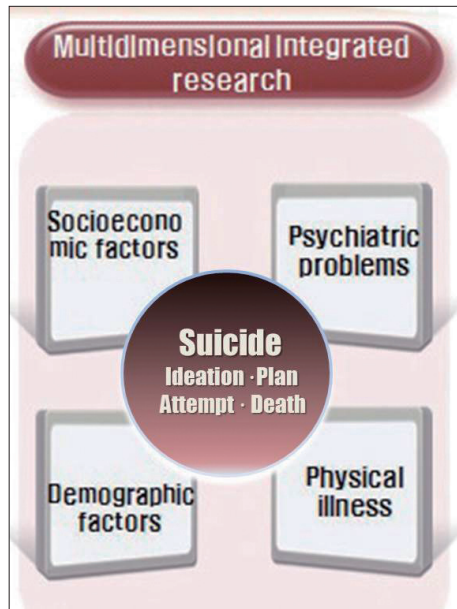


Fig. 1. Aspects of suicide.

## Aims

Suicide is a very complex phenomenon (Fig. 1) that can be understood only through in-depth knowledge of related phenomena, including psychiatric problems such as depression and substance abuse ; excessive stress ; interpersonal relationships ; and occupational, economic, and physical problems. However, extant research has tended to rely on cross-sectional designs and focus on only one dimension. Thus, these studies have been limited in their ability to explain the etiological mechanisms of suicide from an integrated perspective. Moreover, suicide should be understood in terms of various phases in a longitudinal process that includes suicidal ideation, suicide attempts, and completed suicides. For instance, each of these phases may differ according to the characteristics of the suicide victim or attempter and the severity of the suicide ideation. Therefore, an integrated understanding of suicide requires large-scale research conducted with the full support of the government.

In this context, the KNSS was designed to produce a comprehensive understanding of suicide from a longitudinal, multifaceted perspective. The KNSS developed from collaboration among experts in the psychological, epidemiological, socio-cultural, and psychiatric dimensions of suicide. The suicide research team at Seoul National University Hospital organized and supervised all four substudies. The project manager for the overall study and one of the principal research officers of Study 3 was the President of the Korean Association for Suicide Prevention and was thus endowed with authority at the national

level. The principal researcher for each of the four studies was a leading expert in the relevant research field. The KNSS was supported by funds raised by the task service of the Ministry of Health and Welfare, which also acted as a collaborator throughout this research.

The KNSS may be the first study to arise from the collaborative efforts of experts in various fields related to suicide (psychology, epidemiology, social welfare, and psychiatry) and to use a large, nationally representative sample. We aimed to comprehensively understand suicide and provide an empirical foundation for preventative strategies.

## Study Rationale, Design, and Data Collection

### Overall study rationale and design

In terms of the process of suicide, suicide attempts precede completed suicides, the development of specific suicide plans precedes suicide attempts, and suicidal ideation precedes the development of specific plans. In addition to this stepwise process, we hypothesized that overall prejudicial and negative attitudes toward suicide may influence suicidal ideation. That is, completed suicides are the culmination of a series of steps that occur in the following order : the harboring of certain general attitudes toward suicide, suicidal ideation, the development of a specific suicide plan, the enactment of a suicide attempt and a completed suicide (Fig. 2). We divided our survey into steps and selected our subjects (i.e., suicide victims, suicide survivors, suicide attempters, and members of the general public) based on this longitudinal model. We initially analyzed statistics related to suicide and suicide survivors obtained from the Korea National Statistical Office to indirectly explore the risk factors for, and variables related to, suicide (Study 1). Working from another perspective, we investigated the causes of suicide by interviewing suicide survivors and performing psychological autopsies (Study 2). We next explored the characteristics of suicide attempters and the risk factors associated with suicide attempts using both the optimal methodology, having psychiatrists interview suicide attempters in the emergency department, and analyzing statistical data regarding mortality (Study 3). Finally, we conducted a survey of attitudes toward, and prejudices against, suicide among the general public (Study 4). Our use of these approaches produced multidimensional data that integrated socioeconomic, demographic, physical/medical, and psychiatric issues.

In summary, the KNSS consisted of four substudies : Study 1 relied on statistical data to explore the risk factors for deaths attributable to suicide ; Study 2 involved psychological autopsies

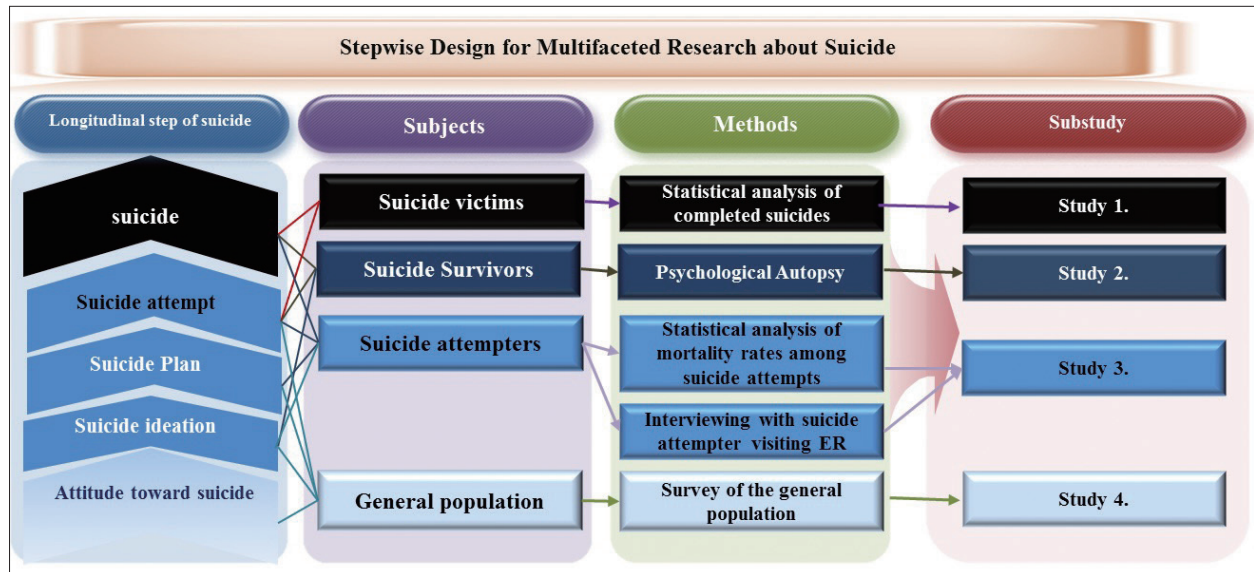


Fig. 2. Stepwise, integrated plan for research of the multidimensional factors of suicide.

sies of suicide survivors ; Study 3 focused on the characteristics of suicide attempters ; and Study 4 explored attitudes toward suicide in the general population.

### Study 1. Risk factors for suicide based on statistical data

#### Study rationale

Suicide is a relatively rare event. Therefore, it is necessary to examine a large population to include the types of people who commit suicide and to identify statistically significant risk factors. Data were obtained from a large cohort study of subjects who underwent medical examinations and from death records compiled by the Korea National Statistical Office. In this way, we were able to perform an in-depth analysis of the association between suicide and independent risk factors, such as past medical examinations, lifestyle, and healthcare utilization.

#### Study design : Cohort study of completed suicides

Study 1 relied on an analysis of two large-scale cohort studies. The National Health Insurance System (NHIS) provides health insurance to government employees, teachers, and their dependents. The Korean Cancer Prospective Study (KCPS), the first cohort, included 2384045 subjects aged  $\geq 20$  years who underwent biennial medical evaluations (1992–1999) funded by the NHIS. These data, obtained from the Korea National Statistical Office, include information about demographic characteristics, healthcare utilization, prescription drug use, and mortality.

Data regarding the second cohort, which consisted of 817124 individuals with intractable metabolic syndrome who underwent the comprehensive medical examination centers since

2005, were obtained from the Korean Metabolic Syndrome Research Initiatives (KMSRI-Seoul) Study. This study comprised prospective and retrospective cohorts. The prospective cohort study involved subjects aged  $\geq 20$  years who had visited seven comprehensive medical examination centers or 12 university hospitals within Seoul or Gyeonggi province since April 2006. The retrospective study utilized data previously obtained from 18 health examination centers in South Korea between 1996 and 2004. These data consisted of the results of screening tests, information from the NHIS about healthcare utilization and prescription drug use, and mortality records from the Korea National Statistical Office.

#### Data collection

The KCPS study and KMSRI-Seoul were conducted in collaboration with the NHIS. Data regarding the general characteristics of the sample, including age, marital status, educational level, and income were analyzed according to the suicide rate, which was calculated by dividing the number of those who committed suicide by the sum of person years or the number of subjects. Of the 3201169 participants in the KCPS and KMSRI, 245349 of those who were followed to December 2012 died ; 8305 of these deaths were due to suicide.

### Study 2. Psychological autopsy

#### Study rationale

Countries with sophisticated approaches to suicide prevention, such as Finland and the United States, have benefitted from nationwide suicide prevention plans that include psycho-

logical autopsies. Finland conducted psychological autopsies on 1379 cases of suicide occurring from about April 1987 to April 1988, and based a national suicide prevention exercise strategy on those results. As a result, the suicide rate in 1996 decreased by more than 20% compared to that in 1990, which was the highest rate in that country's history. The United States has relied on psychological autopsies of suicides to advise local police, prosecutors, courts, military personnel, and prison staff, leading to a dramatic reduction in the suicide rate from 19 per 100000 in 1990 to 14 per 100000 in 2000.<sup>1)</sup> Indeed, psychological autopsies are essential contributors to the development of policies aimed at suicide prevention as they enable understanding of the etiology of suicide.

### Study design

Interviews were conducted with the help of experts in the performance of psychological autopsies who specialized in postvention and counseling (Suwon Centre for Suicide Prevention and the Korean National Police Agency). Both 20-min unstructured interviews and ~90-min semi-structured interviews were conducted. In the latter, interviewers read prepared questions and recorded informants' responses.

The semi-structured interviews inquired about the immediately pre-suicide situation of individuals who committed suicide, as well as their general life history, specific life events, general quality of life, physical illnesses and treatment, mental health problems and related treatment, and family structure and family situations. The format of the psychological autopsy report was designed by the Department of Psychology of Ajou University and the Ministry of Health and Welfare (2013). Specifically, data regarding 77 categories of life events, including those involving work, school, finances, interpersonal relationships, home situations, domestic life, illnesses and accidents, and business management, were collected. Informants were asked to create written records of the life events experienced by the victims of suicide during the year prior to their suicide, to classify whether the events were experienced as good or bad by the victims, and to estimate to what extent and for how long the events affected the victims.

### Data collection

The sample consisted of cases of suicide that occurred at least 15 months after data from the informants and information obtained during the investigation of deaths due to unnatural causes, recorded at police stations. Information on the contacts of informants, such as friends, family members, cohabitants, and ex-husbands, was identified by reviewing data related to the cases of suicide. The Psychological Autopsy Team sent a letter as-

suring confidentiality and anonymity and explaining the purpose and background of the research and contacted informants by phone 3 days later. The process yielded a total of 72 cases of suicide for analysis.

## Study 3. Research regarding suicide attempters

### Study rationale

Because suicide is the final act of one's life, it is impossible to interview suicide victims about why they chose to end their life. Instead, the survivors of suicide attempts are the closest we can come to suicide victims. Moreover, previous studies have shown that a history of suicide attempts is the most powerful predictor of future suicidal behaviors.<sup>2-4)</sup> According to the 2010 Korean Epidemiological Catchment Area study, 3.2% of the general population 18–74 years of age had attempted suicide, and it was estimated that 108000 individuals attempted suicide in 2010.<sup>5)</sup> It is essential to understand the characteristics of suicide attempters and the risk factors for completed suicides to develop programs for suicide prevention.

### Study design

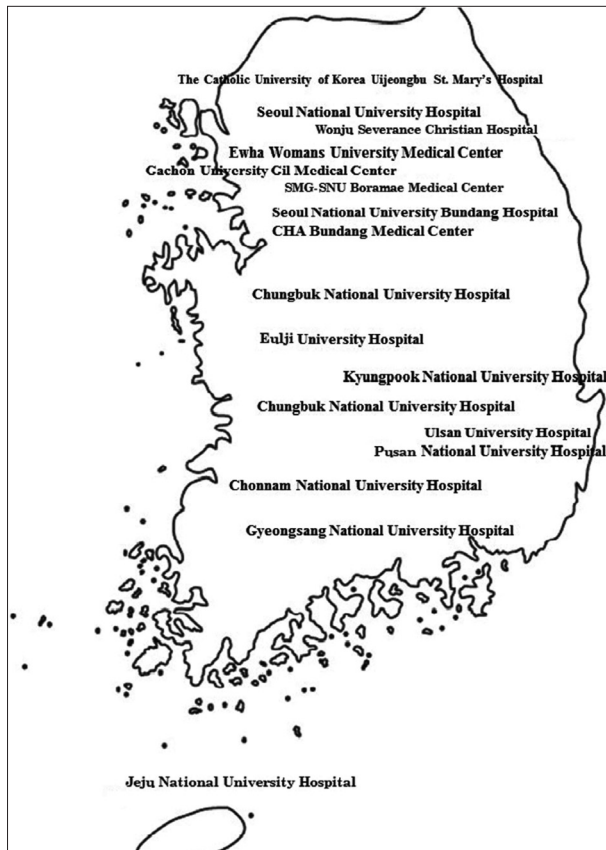
We used two approaches to collect data regarding suicide attempters. First, the characteristics of those who were admitted to emergency departments following an attempted suicide were identified. Second, the mortality rates following suicide attempts were explored to identify the risk factors for completed suicides.

### Study design 1 : Characteristics of suicide attempters admitted to emergency rooms

We collected data from 17 medical centers located throughout Korea (Fig. 3). We selected eight primary districts based on the distribution of the national population and then included those with the relevant research and performance-monitoring capabilities. Data from 17 medical centers with the appropriate study environment, such as emergency centers and psychiatrists on duty for 24 hours, located in all metropolitan/urban and rural regions were included.

A suicide attempt was defined as "a self-destructive behavior with intent to end one's life independent of resulting damage" ; we excluded cases in which death was the result of the index suicide attempt.

After receiving emergency care, all suicide attempters were interviewed by psychiatrists about the factors associated with their suicide attempt. A semi-structured interview form was developed by the current research group based on the results of a previous pilot study conducted in 2012.<sup>6)</sup> In-depth interviews collected data regarding demographic characteristics, emergen-



**Fig. 3.** Medical centers that participated in Study 3.

cy room admissions, medical history, and the current precipitating situation.

#### Study design 2 : Mortality after attempted suicide

Sixteen of the seventeen medical centers that participated in the aforementioned study were included in this study. We reviewed the charts of all suicide attempters admitted to the emergency departments of 16 medical centers from January 2007 to December 2011. We analyzed information collected at the time of the suicide attempt, including demographic characteristics and methods and causes of suicide. We then determined whether suicide attempters had died using data compiled by the Korea National Statistical Office as of December 31, 2012. We analyzed the factors that contributed to mortality after suicide attempts.

#### Data collection

A total of 1359 suicide attempters who received a face-to-face patient care from a psychiatrist during the 6 months from May to November 2013 were admitted to 17 medical centers throughout Korea, including Jeju Island. More than half (59.2%) of the sample of suicide attempters were female, and 40.8% were male ;

the mean ages of females, males, and the total sample were 46.8, 40.3, and 43 years, respectively.

We reviewed the charts at 16 medical centers to obtain data regarding the mortality rates of suicide attempters. The charts of 8848 suicide attempters who visited emergency departments during the 5 years from January 2007 to December 2011 were reviewed. Based on data compiled by the Korea National Statistics Office as of December 31, 2012, a total of 557 people among 6648 suicide attempters were dead, and 230 of these died by suicide.

### Study 4. Attitudes toward suicide in the general population

#### Study rationale

According to one report about the process of suicidal ideation, 34% of Americans aged 15–54 years who experience suicidal ideation develop a suicide plan, and 72% of people with a plan attempt suicide.<sup>7)</sup> That is, the number of people with suicidal ideation are quite large and it needs to understand nonspecific general idea for suicide. Therefore, it may be meaningful to understand attitudes toward suicidal ideation and toward suicide itself among members of the general public before we examine suicide attempters or victims. These data will also contribute to a national educational plan designed to prevent suicide.

#### Study design

Data were collected during in-person questionnaire-based interviews regarding the following issues : 1) attitudes toward suicide, 2) awareness of suicide-related media reports, and 3) the experiences of individuals who thought about suicide. Attitudes toward suicide were measured with the Attitude Toward Suicide (ATTS) scale, which was originally developed in 1986 based on the Suicide Opinion Questionnaire.<sup>8)</sup> A systematic review of the psychometric properties of 18 instruments that measure attitudes toward suicide identified the ATTS as the appropriate scale for measuring these attitudes in large samples of the general population.<sup>9)</sup>

All interviewers were trained regarding how to administer the structured questionnaire. This in-person approach increased the reliability of responses by allowing respondents to ask questions in real time during the interview itself.

Approximately 1500 adults aged 19–75 years of age were surveyed. The sample was drawn from 150 sample districts distributed throughout the nation ; 10 households were selected from each sample district, and one individual from each sample household was interviewed.

### Data collection

Approximately 1500 adults aged 19–75 years of age were interviewed from February to December 2013. The version of the ATTS used in the current study included 37 items regarding attitudes toward suicide rated on a five-point Likert-type scale (1 = strongly disagree to 5 = strongly agree). The average of age of participants was 45.9 years (standard deviation = 1.4) ; the sample consisted of 747 (49.8%) males and 753 (50.2%) females.

## Implications and Future Research

The KNSS, a well-designed national study regarding suicide, carries several implications and suggestions for future research.

First, because the KNSS was supported by national legislation, the Act for the Prevention of Suicide, it was possible to explore issues related to suicide on a national level. This legislation stipulates that the KNSS will be performed every 5 years to monitor changes in the Korean suicide rate over time. There are also plans to establish a cohort of suicide attempters to determine the most important contributors to the outcomes of attempted suicide. Moreover, it is expected that larger-scale psychological autopsies that include more factors will be performed in the future.

Second, this is the first study to apply this type of integrated approach to the issue of suicide. Indeed, the developers of the KNSS attempted to create an integrated model of suicide through meetings among multidisciplinary collaborators. Our aim was to identify the characteristics of suicide attempters and determine the risk factors for death so that these data could be used in efforts to prevent suicide. Statistical data regarding death from suicide were obtained from a large prospective cohort study of Koreans, and were used to identify high-risk groups in the general population. The results of our survey of attitudes toward suicide will be used in efforts to increase the awareness of the general population and to monitor the effects of national programs that intend to promote a life-affirming culture. The psychological autopsies performed as part of the KNSS were the largest performed in Korea to date and provide an in-depth understanding of the reasons for suicide.

Third, all tools and methods associated with the KNSS were standardized and can be used in future studies. The semi-structured interview used in Study 1, the interview tool used for the psychological autopsies performed in Study 4, and the questionnaire employed to examine attitudes toward suicide in Study 2 were developed for the KNSS. Because each research tool and

method is unique and validated with a large-scale sample, each can be used in future research related to suicide.

Finally, the KNSS can be used for academic purposes as well as to develop national policies to prevent suicide. As members of the KNSS research team are joining the body charged with developing policies for suicide prevention, the results of this research will form the basis of Korean national policies on suicide prevention.

### Acknowledgments

This project has been funded by the Ministry of Health. The following hospitals are joining study 3 for suicide attempters : Seoul National University Hospital, SMG-SNU Boramae Medical Center, Ewha Womans University Medical Center, Seoul National University Bundang Hospital, CHA Bundang Medical Center, The Catholic University of Korea Uijeongbu St. Mary's Hospital, Wonju Severance Christian Hospital, Eulji University Hospital, Chungbuk National University Hospital, Chonnam National University Hospital, Chonbuk National University Hospital, Pusan National University Hospital, Ulsan University Hospital, Gyeongsang National University Hospital, Jeju National University Hospital.

The content of this publication does not necessarily reflect the views of policies of the Ministry of Health of Korea.

### Conflicts of interest

The authors have no financial conflicts of interest.

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