Prevalence and Associated Factors of Suicide Ideation among University Students: Evidence from Large-Scale Surveys

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Although it constitutes a highly reliable predictor of successful suicide attempt, suicide ideation has received scant attention in terms of research and prevention in much of Asia. Given the high levels of burgeoning suicide cases among Asia's youth populations, such as those in Japan and the Philippines, there is a need to seriously focus on the phenomenon of suicide ideation. If those young people who are seriously thinking about committing suicide are identified and given prompt interventions, the numbers of persons dying from suicide can be effectively reduced. This review article seeks to provide a research perspective on suicide ideation among university students in order to help guide the region's research and interventions on youth suicide. Cross-sectional evidence from nine large-scale surveys on the prevalence and associated factors of suicide ideation among university students was reviewed. The surveys, which had sample sizes ranging from 1,181 to 16,000 and were selected either randomly or conveniently, were conducted in various countries. The surveys measured suicide ideation by asking university students a lone question/statement or two or more questions/statements. Some only had one specific time reference for their measure while one study had multiple time references. Suicide ideation only formed part of the range of mental health issues examined by the surveys. Considerable numbers of university student populations were reported to have thought about killing themselves. A variety of factors, ranging from socio-demographic characteristics to psychological/mental health conditions to social conditions, were identified as statistically significantly related with suicide ideation. This report elaborates on the details of the review evidence on prevalence and associated factors vis-à-vis other related research information, and in its final section, underscores major points that future research in Asia may consider.

Keywords: suicide ideation, suicide, university student population, review article, associated factors

Suicide, the act of killing oneself, is a very serious health issue affecting the youth. The highest rates are found among young people in one third of all countries in the world. Moreover, suicide is a major cause of mortality for this demographic sector (American Psychological Association, 2013). In the US where relevant evidence is available, approximately 4,600 suicide-related deaths using firearms, suffocation, and poisoning are reportedly occurring among the 10-24 age group (Center for Disease Control and Prevention, 2012a). In addition to grave personal and social consequences, these deaths have staggering economic costs, which are valued at more than US$6.0 billion a year in medical expenses and work losses alone (Centers for Disease Control and Prevention, 2012b).

Across Asia, youth suicide has not been given adequate attention despite its elevated or increasing levels (Hendin et al., 2008). For example, Japan has one of the highest youth suicide rates in the world while the Philippines has rising cases of suicide among its young people, from 1.0 to 2.34 suicides per 100,000 in 1984-2005 (Redaniel, Dalid, & Gunnell, 2011). The burgeoning numbers of reported suicide cases among young people have compelled various groups of stakeholders to call for concerted and well-informed efforts, both in terms of research and interventions (Hendin et al., 2008). One of their chief recommendations to avert suicide-related deaths and injuries is to identify and provide at-risk persons with prompt, effective interventions (Yip et al., 2008). Individuals with suicide ideation (Kuo, Gallo, & Tien, 2001)—or persons who think, contemplate, and plan to kill themselves—are the ones prone to suicide. Notwithstanding its varied definitions and measures across studies (McAuliffe, 2002), suicide ideation is a stable precursor of self-killing (Miller & Taylor, 2005). According to a study, suicide ideators are about 6.0 times more likely to attempt suicide than their non-ideator counterparts (Kuo et al., 2001).

This report discusses the results of a review of large-scale surveys that we carried out to identify the prevalence of suicide ideation among university students and its associated social, demographic, and mental health factors. To reduce suicide cases among their youths, Asia needs research perspectives on which to base their research, discourse, and action. The rapid growth and expansion of these countries in social, economic, and development terms and their attendant dynamics and complexities are likely to continue and to affect the huge numbers of youth populations in multiple and varied ways. Systematic anti-suicide efforts need to be in place in order to mitigate the adverse mental health impacts of relentless development processes.

To our knowledge, no systematic review of evidence from large-scale surveys on suicide ideation among university students has been accomplished, albeit reviews of related surveys that likewise involved research with smaller sample sizes are not rare (e.g., Ibrahim, Kelly, Adams, & Glazebrook, 2012). This report focuses on cross-sectional evidence related to the general and non-clinical university student population. Relative to their high school or non-school-going counterparts, university students are a more distinct sector and with a more complex life, since they deal not only with the pressing demands of higher education, but also with the expectations associated with their developmental transition towards adulthood.

METHODS

Searches

We conducted a search of manuscripts published recently (1995-2013) through seven subscribed health and social sciences databases in our universities (i.e., EBSCO, Gale, JSTOR, Proquest, PsycArticles, ScienceDirect, and Scopus). The words used, independently and in combination, to search and identify materials were "suicide", "suicide ideation", "suicidal thoughts", "college students" and "university students". Based on these words and phrases,

each database search generated many or several thousands of records; however, we reduced the number of accessed records to just some hundreds by applying essential refinement criteria to our search (e.g., in terms of time range, topic, and type of publication). For instance, the first search round, based on ScienceDirect database, had yielded a total of 2,872 records, but with refinements, this was pared down to 162 records. Virtually similar results were obtained for our searches in other online databases (e.g., EBSCO, Proquest).

Inclusion Criteria

Cross-sectional studies involving the general university student population and published in 1995 onwards were considered. Studies were regarded as cross-sectional if their data were drawn from a single point in time. Furthermore, published research was selected if it was large scale, that is, with a sample size of at least 1,000 university students; and had an explicit aim to identify a set of associated factors, among others. Manuscripts reporting only on prevalence rates, unique university student sub-populations (e.g., medical and nursing students, and sexual minorities), and on studies with smaller sample sizes were not included. Thesis and other non-published materials were excluded.

Screening and Data Extraction

We, the authors, performed all the tasks associated with the screening of accessed records and abstracts, and extracting the data. The abstracts of records were reviewed and identified as either eligible or non-eligible. Given an eligible abstract, we obtained a pdf copy of its full-length paper and assessed the paper's suitability vis-à-vis our research purpose (those not suitable were excluded). Thereafter, information about the prevalence and associated factors of suicide ideation were extracted from the paper.

Quality Assessment

The published studies whose evidence is utilized in this review were assessed for their overall quality. Our assessments indicate that the definitions and measures used by studies to identify prevalence of suicide ideation and characteristics of suicide ideators are robust. Also, the quality level of the included studies is attested by the fact that they had been published in reputable international journals.

Data Presentation and Synthesis

The prevalence rates and the associated factors are summarized and presented descriptively in a tabular form. Where available, the descriptive statistics, as reported in the original reports, are likewise given.

Ethics Statement

We did not seek ethical approval for this review, since we cited findings that are already widely publicized.

RESULTS

Study Characteristics

Table 1 shows the descriptive information of the reviewed studies on suicide ideation. Nine studies satisfied the inclusion criteria. Four studies were conducted in the US (Eisenberg, Gollust, Golberstein, & Hefner, 2007; Drum, Brownson, Denmark, & Smith, 2009; Kisch, Leino, & Silverman, 2005; Brener, Hassan, & Barrios, 1999); two in China (Meng, Li, Loerbroks, Wu, & Chen, 2013; Chen et al., 2010); one study each in Austria (Skala et al., 2012) and Turkey (Engin, Gurkan, Dulgerler, & Arabaci, 2009), and one was conceived as a multi-country research and was carried out in 22 countries in Asia, Middle East, Europe, North America, Australia, and New Zealand (Chan, Straus, Brownridge, Tiwari, & Leung, 2008). The studies were published in

1999-2013 and had sample sizes between 1,181 and 16,000 university students. The samples were selected based on probability (i.e., five studies employed simple, stratified or cluster random sampling) and non-probability schemes (i.e., four studies used convenience sampling). Studies were all framed within an aim of developing or strengthening suicide prevention programs for university students.

The studies measured suicide ideation by asking university students either one question/statement or two or more questions/statements. However, the most common was the single-question measure—have you seriously considered attempting suicide? While some studies only had one specific time reference for their measure (e.g., during the past 12 months or past week or lifetime), one study had multiple time references for its measure; that is, it had four response options—'never', 'at some earlier point in life', 'last month', and 'last week' to the question "Have you ever considered committing suicide?" It should be noted that suicide ideation only formed part of the variety of mental health issues investigated in the reviewed studies. For example, Eisenberg et al. (2007) in their US study had likewise examined depression, anxiety, and suicidality.

Prevalence and Associated Factors

The reported rates for suicide ideation vary across studies, but most rates are about 10% or higher. The prevalence figures aggregated for the 22-country study of Chan et al. (2008) constitute the highest (a fourth to nearly 40%). The two studies, that in Turkey (Engin et al., 2009) and the US (Eisenberg et al., 2007), had the lowest reported prevalence rates, at 2.4% and 2.5%, respectively.

The studies analyzed the relationships of a set of independent variables with suicide ideation (dependent variable). The multiple or multivariate logistic regression was the most predominant mode of statistical analysis used. Table 1 lists the factors as originally mentioned in the study reports that are statistically significantly associated with suicide ideation. Findings suggest that these factors are wide ranging. Factors can be categorized into those that represent a trait or characteristic and those that represent a state or condition (Kapur, 2000).

In terms of the socio-demographic characteristics of university students, suicide ideation was tested as significantly related with one's gender, age, civil status, educational status, year level, sexual orientation, geographic area of residence, race, and weight. Additional information culled from the reviewed published reports suggests that, in particular, women (Engin et al., 2009; Chen et al., 2010), younger and lower-year level students; and those of Asian, Pacific Islander, American Indian, and Alaskan parentage are more likely to consider killing themselves (Brener et al., 1999). In addition, students with the lowest educational status (i.e., without a high school diploma) (Skala et al., 2012); being single and in a sexual minority (i.e., gay, lesbian, transgender or bisexual); with a rural background; and being obese had increased loading for the probability of seriously considering attempting suicide (Kisch et al., 2005).

In terms of the psychological/mental health conditions of university students, suicide ideation was observed as being robustly associated with, among others, an individual's psychological problems, anger expression, somatization, hostility, psychotic symptoms, phobic anxiety, anxiety disorder, interpersonal sensitivity, and temperament. Further research information drawn from the reviewed published reports suggest that, those who felt sad, lonely and hopeless, and with an articulated desire to terminate one's life (Drum et al., 2009); and those with suppressed feelings, such as anger, guilt, and shame; psychotic symptoms, such as depression (Engin et al., 2009); and were not satisfied with their financial status (Eisenberg et al., 2007) were more inclined to think of self-killing.

In terms of the social conditions of university students, suicide ideation was examined as strongly related to one's smoking, substance

Table 1

Summary of Findings Derived from Large-Scale Cross-Sectional Studies of Suicide Ideation

Study, sample size, country	Measures of suicide ideation	Prevalence of suicide ideation	Associated factors
Meng et al. (2013), n=1,145, convenience sampling, China	Two Likert scale questions: In the previous week, how much were you distressed by thoughts of ending your life? In the previous week, how much were you distressed by thoughts of death or dying?	Urban background: 9.21% Rural background: 15.24%	Multiple logistic regression: rural background (OR=2.15, 95% CI=1.36-3.41), depression (4.36, 3.45-5.50)
Engin et al. (2009), n=1992, simple random sampling, Turkey	Likert scale statements in Brief Symptom Inventory	2.4%	Multiple logistic regression: gender (p=0.003), school problems (p=0.024), family relationship/support (p=0.000), anger expression (p=0.006), somatization (p=0.009), hostility (p=0.022), psychotic symptoms (p=0.000), phobic anxiety (p=0.034), anxiety disorder (p=0.000), interpersonal sensitivity (p=0.014)
Skala et al. (2012), n=1,381, convenience sampling, Austria	One question: Have you ever considered committing suicide?	12.6%	Multivariate logistic regression: educational status (p=0.005), smoking (p=0.001), frequency of alcohol consumption (p=0.039), illicit drug use (p=0.01), alcohol dependence (p=0.01)
Eisenberg et al. (2007), n=1,181, convenience sampling, US	One question: In the past four weeks, have you ever seriously thought about committing suicide?	2.5%	Multivariate logistic regression: living with parents (p<0.000), financial condition (p<0.000)
Chen et al. (2010), n=9,808, simple random sampling, China	One question: Have you ever thought of suicide or hurting yourself anytime in the past?	13.0%	Multiple logistic regression: gender (OR=1.66 95% CI=1.45-1.90), feeling of hopelessness (5.07, 4.27-6.02), psychological problems (2.07, 1.79-2.38), relatives' suicide behavior (1.77, 1.52-2.08), friends' suicide attempts (1.46, 1.28-1.67), sexual experience (1.95, 1.65-2.30), sickness (1.29, 1.08-1.52)
Drum et al. (2009), n=15,010, stratified random sampling, US	One question: Have you seriously considered attempting suicide in the past 12 months?	6.0%	Percentages: Emotional/physical pain (65%), romantic relationship problems (59%), desire to end one's life (49%)
Kisch et al. (2005), n=15,977, random sampling, US	One question: Have you seriously considered attempting suicide in the past 12 months?	9.5%	Multiple logistic regression: race (p=0.000), civil status (p=0.000), sexual orientation (p=0.000), sexually harassed (p=0.03), forced into sex (p=0.018), having an emotionally abusive relationship (p=0.000), smoking frequency (p=0.003), drinking frequency (p=0.005), amphetamine use frequency (p=0.006), body weight (p=0.000)
Chan et al. (2008), n=16,000, convenience sampling, multi-country (22 countries)	One Likert scale item: I have thought about killing myself	Asia/Middle East: 31.4%, Australia/New Zealand: 38.4%, Europe: 25.9%, Latin America: 37.5%, North America: 32.3%	Correlation: severe and total levels of perpetrating physical assault (p<0.05), total level of experiencing physical assault (p<0.05), self-harm (p<0.05), depression (p<0.05)
Brener et al. (1999), n=4,609, two-stage cluster nationally representative sampling, US	One question: During the past 12 months, did you ever seriously consider attempting suicide?	10%	Percentage and 95% confidence interval: age, year level, race/ethnicity, living arrangement, fraternity/sorority membership, substance use

OR=odds ratio, CI=confidence interval

consumption, sickness, sexual experience, and physical assault experience; and to an array of variables pertaining to one's schooling, family, peers, love relationships, and organizational memberships. Additional details on these variables obtained from the appraised studies underscore that the university students with a greater likelihood of considering suicide were smokers, alcohol drinkers for at least once a week, and using illicit drugs (Skala et al., 2012); and had sexual experience, diseases in the past month (Chen et al., 2010), and severe and/or total levels of physical assault experience, either as a perpetrator or as a victim (Chan et al., 2008).

Additionally, students with a proclivity to commit suicide involved individuals who: poorly performed in academics, failed to receive social support from their families, or whose families are experiencing problems (Engin et al., 2009); lived with parents or alone (Eisenberg et al., 2007; Brener et al., 1999); had relationship breakups (Drum et al., 2009); and were non-members of a fraternity/sorority (Brener et al., 1999). Moreover, these university students were involved in relationships that were characterized by abuse and violence (e.g., sexual harassment and forced sex) (Kisch et al., 2005); and had relatives and friends who exhibited suicidal behaviors themselves (Chen et al., 2010).

DISCUSSION

In this review, we identified broad survey findings on the prevalence of and factors associated with suicide ideation among university students. Our aim is to offer a research-based perspective so that suicide ideation, a stable risk factor for suicide attempts, will attract greater research attention, and will be better understood and addressed. Even though we cited here studies designed with ≥1,000 sample sizes (generally, a large sample size is more representative of the population (FAO, 2002)), some caution should be observed when appreciating the findings. Some reviewed studies are not necessarily representative

of their target populations, since they recruited and interviewed respondents utilizing convenience rather than probability sampling procedures. The operational measures of suicide ideation and its related factors tend to also markedly differ across studies (e.g., time reference, number of indicators), thus the reported prevalence figures and statistically significant variables are not strictly comparable.

Notwithstanding the foregoing methodological constraints, it is evident that, in almost all countries where the studies were completed, the numbers of university students with thoughts, or serious thoughts, about killing themselves were considerable. A closer examination would reveal that the normative figures were around 6-15%, with positive and negative outlying figures at least 25.9% and 2.5%, respectively. It is difficult to ascertain the explanations for these cited numbers, but wide-ranging and disparate figures tend to be common in suicide ideation studies (Blum, Sudhinaraset, & Emerson, 2012) due to methodological, situational, and cultural factors. For example, in Turkey (2.4% suicide ideation prevalence), the youth do not internalize the fact of suicide because it is considered culturally embarrassing and sinful (Engin et al., 2009), but in Japan, the internalization appears marked and strong.

Certain socio-demographic traits (e.g., gender), psychological/mental health conditions (e.g., depression), and social conditions (e.g., smoking, lack of family support, relationship break-ups) were the related factors of suicide ideation as revealed. The mechanisms in which these variables influence suicidal thoughts are well explained in the extant literature. For example, the association of gender with suicidal thoughts, where women are more prone to exhibit the condition compared to men, are being attributed to cognitive, attitudinal, and behavioral differences between these groups. For instance, women are more likely to think of suicide as a result of their expressiveness and sensitivity to the support provided by their social networks (Avison & McAlpine, 1992). Conflicts in one's family, which

is the basic and important social group in most societies, and their dysfunctional effects tend to discourage an open discussion of important adolescent issues (Ary, James, & Biglan, 1999), thus the individuals concerned are vulnerable to suicidal thoughts for feeling that they lack social support and are neglected. As widely known, romantic relationship break-ups tend to induce suicidal thoughts, because individuals grieve their loss of a treasured loved one, union, or memories.

Based on the foregoing, several insights are highlighted here to benefit future studies on suicide ideation among university student populations in Asia. To be definitive and representative, prospective research has to be based on a large randomly selected sample size, the exact number of which will depend on sampling considerations (e.g., required precision of the prevalence estimate). The measures to be used for suicide ideation should be clear about the intent for self-killing; for example, the statement "I wonder whether life is worth living" only implies rather than explicitly pertains to one's consideration of suicide. The most apt, therefore, are those measures querying individuals if they are seriously considering committing suicide.

Further on suicide ideation measures, though the most common time reference adopted for suicide ideation is 12 months (Drum et al., 2009), future research has to decide whether to consider other time periods (e.g., lifetime or the ever-question, the past one month, the past week), each of which has its pros and cons. In terms of response options for these measures, there is a distinct advantage to using Likert-scale (e.g., 'never', 'at some earlier point in life', 'last month', 'last week') rather than dichotomous answers (e.g., yes or no).

The factors to be tested in future investigations need to also cover a spectrum of socio-demographic characteristics and psychological/ mental, and social conditions of university students. However, several of the variables reported here, for methodological and cultural reasons, have to be re-defined and validated. For instance, the variable "frequency of alcohol consumption" should be broadened to encompass a follow-up question on the estimated quantities of alcohol consumed (these two are not equivalent). Moreover, the variable "sexually harassed", which may be an alien concept to many Asians who receive jokes with sexual undertones and physical touching as normative practices, may need to be re-conceptualized. Similarly, the variable "membership in a fraternity or a sorority" may have to be validated accordingly, since several universities (e.g., in the Philippines) have banned these groups in their campuses, even considering their operations illegal.

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