



Research paper

First onset of suicidal thoughts and behaviours in college



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ABSTRACT

Background: College students are a worldwide increasing group of young people at risk for suicidal thoughts and behaviours (STB). However, no previous studies have prospectively investigated the first onset of STB during the college period.

Methods: Using longitudinal data from the Leuven College Surveys, 2337 (response rate [RR]=66.6%) incoming freshmen provided baseline data on STB, parental psychopathology, childhood-adolescent traumatic experiences, 12-month risk for mental disorders, and 12-month stressful experiences. A total of 1253 baseline respondents provided data on 12-month STB in a two-year annual follow-up survey (conditional RR=53.6%; college dropout adjusted conditional RR=70.2%).

Results: One-year incidence of first-onset STB was 4.8–6.4%. Effect sizes of the included risk factors varied considerably whether viewed from individual-level (ORs=1.91–17.58) or population-level perspective (PARPs=3.4–34.3%). Dating violence prior to the age of 17, physical abuse prior to the age of 17, and 12-month betrayal by someone else than the partner were most strong predictors for first-onset suicidal ideation (ORs=4.23–12.25; PARPs=8.7–27.1%) and plans (ORs=6.57–17.58; PARPs=15.2–34.3%). Multivariate prediction (AUC=0.84–0.91) revealed that 50.7–65.7% of first-onset STB cases were concentrated in the 10% at highest predicted risk.

Limitations: As this is a first investigation of STB onset in college, future studies should use validation samples to test the accuracy of our multivariate prediction model.

Conclusions: The first onset of STB in college appears to be higher than in the general population. Screening at college entrance is a promising strategy to identify those students at highest prospective risk, enabling the cost-efficient clinical assessment of young adults in college.

1. Introduction

Suicide is the second leading worldwide cause of death for individuals between 15 and 29 years old (WHO, 2016). A growing subpopulation of these young people consists of college students (OECD, 2012). Suicidal thoughts and behaviours (STB) are common among college students, with 12-month suicidal ideation estimates (either defined as broad ideation or as seriously considering suicide) in the 5–35% range (Robins and Fiske, 2009; Wong et al., 2011), and 12-month suicide attempts ranging between 0.6–11% (Chou et al., 2013; Eisenberg et al., 2013). In response to these alarming statistics, a broad

array of prevention interventions have been developed and implemented in colleges worldwide. However, a recent Cochrane review (Harrod et al., 2014) found little evidence that these programs lead to reductions in suicidality.

One explanation for this finding may be that STB risk factors are generally derived from cross-sectional studies that do not distinguish between those students with an onset of STB *prior to* or *after* matriculation. College entrance marks the transition from adolescence to “emerging adulthood”, a distinct developmental period characterized by increased autonomy, new social and academic challenges, and continued exploration of possible life directions (Arnett, 2015; Cleary

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et al., 2011). Interestingly, previous research has found different trajectories of STB in early life (Boeninger et al., 2010; Musci et al., 2015; Rueter et al., 2008), suggesting that risk for STB not only differs by age (Nock et al., 2012) but also as a function of developmental stage (Nkansah-Amankra, 2013). Therefore, an important but unexplored issue in college STB research may be the identification of true risk factors (as opposed to correlates) for a first onset of STB during the college period. As defined by Kraemer et al. (1997) risk factors should effectively split non-suicidal students at college entrance into high and low risk groups, and should be significantly associated with a subsequent first lifetime occurrence of STB during the college years. Identifying such reliable prospective predictors of first-onset STB would facilitate the implementation of targeted evidence-based interventions.

Two additional shortcomings relate to the way risk for STB has been studied. First, previous studies have exclusively provided individual-level effect sizes for risk factors. This does not account for a *population-level* perspective (Christensen et al., 2016; Drum and Denmark, 2012), which finds that high-prevalence risk factors carrying low individual risk for STB may be equally or even more important to consider as low-prevalence risk factors carrying high risk for the affected individuals (Bruffaerts et al., 2015). This can be evaluated by calculating population attributable risk proportions (PARP; Krysinaka and Martin, 2009), thus allowing the risk factors that potentially contribute most to the onset of STB in student populations to be identified. This is important, as it is the combination of both individual- and population-level interventions (Rose, 2008) that has shown to be successful in reducing adverse outcomes with complex multicausal aetiologies such as cardiovascular disease (Taylor et al., 2006), and even STB among the active duty US Air force population (Knox, 2014). Second, most previous studies have failed to evaluate *multivariate prediction models* based on longitudinal approaches. As has recently been shown for post-traumatic stress disorder (Kessler et al., 2014) and suicide among US Army Soldiers (Kessler et al., 2016), accurate prediction models for the onset of STB could enable the successful targeting of students at highest risk for STB, improving the cost-effectiveness of current interventions. As STB are determined by a large number of distal and proximal risk factors (Knox, 2014) – a number that increases with more severe suicidal outcomes (Van Orden et al., 2010) – it is important to take into account a broad array of risk factors when developing prospective prediction models (Nock, 2016).

In the present study, we address each of these limitations by investigating a broad range of risk factors at college entrance as predictors for subsequent first-onset STB (i.e., a first lifetime occurrence of STB) during the first two college years. Longitudinal data were obtained from the Leuven College Surveys (LCS, 2015), which is part of the WHO World Mental Health Surveys International College Student project (WMH-ICS, 2015). Predictors included in this study are well-established risk factors for STB (Nock et al., 2012) that have also shown to be related to college STB: parental psychopathology (Abramson et al., 1998; Wilcox et al., 2010), early traumatic experiences (Gibb et al., 2001; Zhang and Tao, 2013), mental disorders (Paul et al., 2015; Whitlock et al., 2013), and recent stressful experiences (Chou et al., 2013; You et al., 2014). We build on earlier LCS studies that found self-injurious behaviours to be widespread among incoming freshmen (Kiekens et al., 2016; Mortier et al., 2015). The current study's objectives are to: (1) estimate one-year incidence proportions of first-onset STB during college, (2) evaluate individual-level and population-level risk for first-onset STB, and (3) test a multivariate model for first-onset STB in terms of prediction accuracy.

2. Methods

2.1. Procedures

The LCS consists of a series of ongoing web-based self-report

surveys of KU Leuven students. Representing Belgium's largest university, the KU Leuven has an enrolment of over 40,000 students. In the academic year 2012, a total of 3510 Dutch-speaking incoming freshmen aged 18 years or older were eligible for the baseline survey. The sample was recruited in three stages. In the first stage, the baseline survey was included in a routine psychomedical check-up organized by the university. All incoming freshmen (i.e., census sampling) were sent a standard invitation letter for the check-up. Participants completed the survey on a desktop computer in the waiting room of the student health centre. In a second stage, non-respondents to the first stage were personally contacted using customized emails containing unique electronic links to the survey. The third stage was identical to the second stage, but additionally, included an incentive to complete the survey (i.e., a raffle for 20 euro store credit coupons). Each stage used reminder emails, setting the maximum amount of contacts at eight. The study's protocol was approved by the University Hospital Leuven Biomedical Ethical Board (B322201215611). Informed consent was obtained from all subjects who participated in the study. Students who reported any past year STB or non-suicidal self-injury were presented with links to local mental health resources.

A total of 2337 students completed the baseline survey, equivalent to a baseline response rate (RR) of 66.6% (76.7% when adjusting for non-participation due to college dropout). Students were contacted for the follow-up survey 12 and 24 months after the baseline assessment, using a similar sampling design to the one used at baseline. Personalized emails with unique electronic links to the survey were sent, including up to seven reminder emails. Beginning with the fifth reminder email, emphasis was put on a 20 euro store credit coupon raffle. A total of 1253 of the original baseline respondents responded to at least one follow-up survey, equivalent to a conditional follow-up rate of 53.6% (70.2% when adjusting for non-participation due to college dropout). Reporting STB in a previous wave was not predictive for nonresponse in a subsequent wave (follow-up 1 vs. baseline: $\chi^2_1=0.59$, $p=0.44$; follow-up 2 vs. follow-up 1: $\chi^2_1=2.41$, $p=0.12$), suggesting attrition rates of the STB cases were equivalent to the full sample.

2.2. Measures

The WMH-ICS survey instrument was developed by the World Mental Health Survey Consortium to include multiple screening instruments measuring a wide range of mental health outcomes. Each of the included areas of assessment for this study is briefly reviewed in the remainder of this section.

2.2.1. Socio-demographic variables

Information about freshman socio-demographic characteristics was obtained from the KU Leuven students' administration office and included gender, age, nationality, parents' financial situation, parental education, parental familial composition, university group membership, and secondary school educational type. Survey items assessed sexual orientation and living situation at college.

2.2.2. Suicidal thoughts and behaviours (STB)

STB items were taken from the Self-Injurious Thoughts and Behaviours Interview (SITBI; Nock et al., 2007). STB was conceptualized as a continuum (Nock et al., 2012), starting with suicidal ideation ("Did you ever in your life have thoughts of killing yourself?"), possibly accompanied by a suicide plan ("Did you ever think about how you might kill yourself [e.g., taking pills, shooting yourself] or work out a plan of how to kill yourself?"), and then leading in some cases to a suicide attempt ("Have you ever made a suicide attempt [i.e., purposefully hurt yourself with at least some intent to die]?"). Suicidal ideation was clearly differentiated from a mere death wish ("Did you ever wish you were dead or would go to sleep and never wake up?"). Past year occurrence of the separate STB outcomes was derived from additional items that assessed age of onset and offset.

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