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Examination of the population attributable risk of different risk factor domains for suicidal thoughts and behaviors

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ABSTRACT

Background: Despite the fact that suicide is an important public health problem, the etiology is still not well understood. Especially lacking is a societal-level approach that takes into account the extent to which several risk factor domains are attributable to new onset of suicidal thoughts and behaviors (STB).
Methods: Data stem from a cross-sectional population study of the non-institutionalized adult (18+) population from Belgium ($N=2419$). The third version of the Composite International Diagnostic Interview (CIDI-3.0) was administered to assess lifetime STB and risk factor domains. Multivariate approaches, expressed in population attributable risk proportions, were used to estimate the proportion of new onset cases of STB related to the occurrence of different risk factors.
Results: Approximately 38% of cases of suicidal ideation onset were attributable to mental disorders, 20% to chronic physical conditions, and another 13% to parental psychopathology. Suicide attempts in the general population were attributable to mental disorders (PARP=48%), but attempts among persons with suicidal ideation were unrelated to mental disorders, but rather to trauma (PARP=17%) and childhood adversities (PARP=12%).
Limitations: This is an explorative study using multivariate additive general models that generates specific hypotheses on the development of STB onset rather than testing specific pathways in the process of STB.
Conclusions: New onset STB is mostly attributable to proximal risk factors such as mental disorders. However, distal risk factors like childhood adversities or trauma also play a considerable role in the new onset of STB, especially in the transition from suicide ideation to suicide attempt.

1. Introduction

Suicide is one of the leading causes of death worldwide but the etiology of suicide is still not well understood. Previous studies have examined the extent to which different risk factors are associated with the subsequent onset of suicidality. Among those, mental disorders are perhaps the most studied risk factors for suicidal thoughts and behaviors (STB) (Nock et al., 2010; Hawton and van Heeringen, 2009). Compared to persons without mental disorders, persons with mental disorders are between two and three times more likely to have STB (Nock et al., 2012). However, other risk factors such as negative life experiences and physical health problems also contribute to the onset of STB. For example, there is an association between a broad range of traumatic events during childhood and STB in adulthood (Gureje et al., 2011; Stein et al., 2010; Bruffaerts et al., 2010). The same applies for chronic physical conditions, although to a lesser extent (Scott et al., 2010; Harris and Barraclough, 1994). All-in-all, persons with adversities or traumas, physical conditions, or with parents with mental illness are generally around 50% more likely to subsequently develop STB.

Although these approaches are valuable in identifying risk factors for STB, there are two major limitations in the current literature. First, it is quite unlikely that these risk domains operate in isolation in their relation with the onset of STB (Nock et al., 2012). Indeed, it is relatively unknown to what extent different risk factors or domains of risk factors effectively cluster together and

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influence one another. In addition, most studies in this area tend to focus on proximal risk factors of STB despite the need to integrate proximal and distal risk factors (Drum et al., 2009). A second limitation is that most studies have examined STB on an individual level, i.e. studying the associations of particular risk factors for STB among those who are suicidal (Knox et al., 2004). The few studies that have taken into account the prevalence of different risk factors in determining the potential impact of key risk factors on STBs have focused mostly on depression (Beautrais et al., 1996; Pirkis et al., 2000; Goldney et al., 2000; Goldney, 2005; Cheung et al., 2006; Li et al., 2011). These studies have estimated that the attributable risk proportion of depression on STB in the 47–80% range. The extent to which STB is attributed to a broad domain of distal risk factors (like parental psychopathology or childhood adversities) is not well understood. Nonetheless, in an era where, from a public health perspective, a large emphasis lies in the prevention of suicide, it is important to estimate the impact of different risk domains on the new onset of STB because such data enable policy makers to better targeted interventions.

The current study examines the relative predictive associations of different suicide risk domains with subsequent STB in Belgium, the country with the highest suicide rate within Europe. We use representative population-based data from the World Health Organization (WHO) World Mental Health (WMH) Survey Initiative (www.hcp.med.harvard.edu/WMH). The WMH initiative consists of a series of psychiatric epidemiologic studies conducted worldwide. The present study builds on earlier work that identified risk factors for STB (Nock et al., 2012; Bruffaerts et al., 2010; Van Rijsselberghe et al., 2011; Kovess-Masfety et al., 2011; Nock et al., 2008). In this study, we use population attributable risk proportions (PARPs) to identify the unique population-level effects of each risk factor domain on the new onset of STB. In more detail, our aim is to investigate to what extent parental psychopathology, childhood adversities, traumatic events, chronic physical conditions, and mental disorders attribute to the subsequent new onset of (a) suicidal ideation, (b) suicide attempt, and (c) suicide attempt among suicide ideators.

2. Materials and methods

This study uses data from a cross-sectional face-to-face household interview survey, based on probability samples representative of the adult population of Belgium. The target population is the non-institutionalized adult population in Belgium (aged 18 years or older), residing in private households. The sample frame was the National register of residents in Belgium. A stratified multistage random sample was drawn by Statistics Belgium, formerly National Institute of Statistics. In total, 2419 respondents were interviewed between April 2001 and June 2002 by lay interviewers that were trained by the Scientific Institute of Public Health, using a computer-assisted personal interview (CAPI). The overall response rate was 50.6%. This study is part of the European Study of the Epidemiology of Mental Disorders (ESEMeD), as a part of the World Mental Health Survey Initiative (WMH – see http://www.hcp.med.harvard.edu/wmh).

The central WMH staff trained bilingual supervisors in Belgium. Consistent interviewer training documents and procedures were used. The WHO translation protocol was used to translate instruments and training materials. The Belgian survey was carried out in bilingual form (Dutch and French). Persons who could not speak these languages were excluded. Standardized descriptions of the goals and procedures of the study, data uses and protection, and the rights of respondents were provided in both written and verbal form to all potentially eligible respondents before obtaining verbal informed consent for participation in the survey. Quality control protocols, described in more detail elsewhere (Pennell et al., 2008; Harkness et al., 2008), were standardized across the WMH countries where this study took place, in order to check on interviewer accuracy and to specify data cleaning and coding procedures. The institutional review board of the organization that coordinated the survey in Belgium approved and monitored compliance with procedures for obtaining informed consent and protecting human subjects (Demarest et al., 2011).

Internal sub-sampling was used to reduce respondent burden by dividing the interview into two parts. Part 1 included the core diagnostic assessment of mental disorders. Part 2 included additional information relevant to a wide range of survey aims, including the assessment of other risk domains than mental disorders. Details of the sub-sampling are described elsewhere (Pennell et al., 2008). All respondents completed part 1. All part-1 respondents ($N=2419$) who met criteria for any mental disorder and a probability sample of other respondents were administered part 2. Part 2 ($N=1043$) respondents were weighted by the inverse of their probability of selection for part 2 of the interview to adjust for differential sampling. Analyses in this article were based on the weighted part 2 sample. Additional weights were used to adjust for differential probabilities of selection within households and for post-stratification (i.e. to match the samples to population sociodemographic distributions).

3. Measures

All measures are part of the third version of the Composite International Diagnostic Interview developed for the World Mental Health initiative (Kessler and Üstün, 2004). The CIDI is a fully structured diagnostic interview that assesses mental disorders, their treatment, and a wide range of possible risk factors. The WHO translation, back-translation, and harmonization protocol was used to translate instruments and training materials. For the present study, we used the following modules from the CIDI-3.0: suicidal ideation and attempts, mental disorders, childhood experiences, trauma, and chronic physical conditions. Only traumatic events that occurred prior to the onset of either suicide ideation or attempt were tested as predictors in the model.

3.1. STB

The CIDI-3.0 module includes an assessment of the lifetime occurrence and age-of-onset of suicide ideation, plan, and attempt. This module includes an assessment of the lifetime occurrence, age-of-onset, and age of most recent episode of suicide ideation ("*Have you ever seriously thought about committing suicide*?"), plans ("*Have you ever made a plan for committing suicide*?"), and attempts ("*Have you ever attempted suicide*?"). For the purpose of this study, we only used lifetime suicide ideation and attempt as dependent variables. We also asked for age-of-onset of the STB because our main research question was to examine the associations between the different risk factor domains and the subsequent onset of STB. We therefore included only those respondents with STB that occurred after the occurrence of the specific risk factor.

3.2. Mental disorders

The disorders included are lifetime DSM-IV mood disorders (MDE and dysthymia), anxiety disorders (generalized anxiety disorder [GAD], panic disorder and/or agoraphobia, posttraumatic stress disorder [PTSD], and social phobia), alcohol abuse and/or dependence, and externalizing disorders (attention deficit disorder and intermittent explosive disorder) (Kessler and Üstün, 2004). Clinical reappraisal studies carried out in four WMH