Journal of Affective Disorders 136 (2012) 9–16

Contents lists available at SciVerse ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Research report

Preference of lethal methods is not the only cause for higher suicide rates in males

Anna Cibis [a], Roland Mergl [a,*], Anke Bramesfeld [a], David Althaus [b], Günter Niklewski [c], Armin Schmidtke [d], Ulrich Hegerl [a]

[a] Department of Psychiatry and Psychotherapy, University of Leipzig, Leipzig, Germany
[b] Praxis for Psychotherapy, Dachau, Germany
[c] Hospital for Psychiatry and Psychotherapy, Nuremberg, Germany
[d] Department of Psychiatry and Psychotherapy, Julius-Maximilians-University Wuerzburg, Wuerzburg, Germany

ARTICLE INFO

Article history:
Received 23 May 2011
Received in revised form 25 August 2011
Accepted 25 August 2011
Available online 19 September 2011

Keywords:
Suicide
Methods
Lethality
Gender
Suicide prevention

ABSTRACT

Background: In most countries worldwide suicide rates are higher for males whereas attempted suicide rates are higher for females. The aim is to investigate if the choice of more lethal methods by males explains gender differences in suicide rates.
Methods: Data on completed and attempted suicides were collected (n = 3235, Nuremberg and Wuerzburg, years 2000–2004). The research question was analyzed by comparing the method-specific case fatality (= completed suicides / completed + attempted suicides) for males and females.
Results: Among the events captured, men chose high-risk methods like hanging significantly more often than women ($\varphi = -0.27$; $p < 0.001$). However, except for drowning, case fatalities were higher for males than for females within each method. This was most apparent in "hanging" (men 83.5%, women 55.3%; $\varphi = -0.28$; $p < 0.001$) and "poisoning by drugs" (men 7.2%, women 3.4%; $\varphi = -0.09$; $p < 0.001$).
Limitations: The sample size (n = 3235) was not enough for comparing method and gender specific case fatalities with a fine-meshed stratification regarding age.
Conclusions: Higher suicide rates in males not only result from the choice of more lethal methods. Other factors have to be considered.

1. Introduction

Approximately 1 million people worldwide die of suicide every year and the number of attempted suicides is estimated to be 10 to 20 times higher (World Health Organization, 2003). In Europe and most countries rates of completed suicides differ profoundly by gender with a global average male/female ratio of 2.9:1 (Värnik et al., 2008). Opposite to the rate of completed suicides, females outnumber males with respect to the number of attempted suicides. Results from the WHO/EURO Multicentre Study on parasuicide show a male/female ratio for non-fatal suicide acts of 1:1.5 (Schmidtke et al., 1996). Given the high numbers of annual suicides, prevention has been an important issue worldwide. In Western countries, high male suicide rates are of specific concern. Thus, an essential matter for improving suicide prevention is to find out more about the reasons for gender differences in suicide and especially about suicide patterns in males.

Several reasons for gender differences in suicidal behavior have been discussed. Depression as a major cause of suicidality (Bertolote and Fleischmann, 2002; Lönnqvist and Koskenvuo, 1988) has about half the prevalence in males compared to females. This could be a contributing factor to the lower rates of suicidal acts in total (completed + attempted suicides) in

* Corresponding author at: Department of Psychiatry and Psychotherapy, University of Leipzig, Semmelweisstr. 10, D-04103 Leipzig, Germany. Tel.: +49 0 341/9724 556; fax: +49 0 341/9724 539.
E-mail address: Roland.Mergl@medizin.uni-leipzig.de (R. Mergl).

0165-0327/$ – see front matter © 2011 Elsevier B.V. All rights reserved.
doi:10.1016/j.jad.2011.08.032

males, but does not explain why more males have higher completed-suicide rates. Further factors possibly contributing to the high male suicide rate are psychosocial factors: men are more reluctant to seek professional help compared to women when feeling depressed, hopeless or suicidal (Houle et al., 2008; Möller-Leimkühler, 2003), they often have less social support than women (Houle et al., 2005, 2008), unemployment seems to be a major threat especially to males (Andres et al., 2010; Stuckler et al., 2009), and a strong link between alcohol dependence and depression in men increases their suicide risk (Houle et al., 2008; Möller-Leimkühler, 2003). Furthermore, the choice of more or less lethal methods appears to be an important factor. While males in total carry out less suicidal acts, they choose more high-risk methods than women as shown by various studies (Hawton, 2000; Houle et al., 2008; Large and Nielssen, 2010; Schrijvers et al., 2011). High-risk methods have been defined as being more violent and immediately lethal in comparison to low-risk methods (Denning et al., 2000). Methods with the highest case fatality are firearms and hanging. In a recent study analyzing 16 European countries, Värnik et al. (2008) have shown that males are at greater risk of choosing highly lethal suicide methods such as hanging and firearms whereas females are at less risk with mostly choosing self-poisoning.

Additionally, age patterns seem to play an important role in suicidal behavior. In Germany, suicide rates follow the so-called Hungarian pattern, with higher numbers of completed suicides within the elderly, specifically males (Schmidtke et al., 2008). However, in other parts of Europe, e.g. in Scandinavian countries and Poland, suicide rates are highest between the ages of 45–55 years (Lester, 1982). Importantly, the age at which a suicidal act is carried out influences case fatality. For instance, self-poisoning with psychotropic drugs might be survived by a young person, but can be lethal at an older age. Thus, age needs to be taken into account when disentangling the factors explaining gender differences in suicidality.

If the preference for certain methods is the dominant factor explaining gender differences in suicide rates, then within the same method case fatalities should be similar in males and females, even after accounting for age effects (highest rates of attempted suicides in young females, highest rates of completed suicides in old males). If case fatalities differ by gender, other factors beyond the choice of method must be considered to explain higher male suicide rates.

We wanted to investigate why completed suicides occur more frequently in males although the number of suicidal acts in total is higher in females. Thus, we analyzed whether the choice of methods fully explains higher rates of completed suicide in males answering the following questions: 1. Are there gender differences in case fatality within the same suicide method? 2. Can possible gender differences in case fatality be explained by the influence of age?

2. Methods

Data used in the present study were assessed during a suicide prevention project, the “Nuremberg Alliance Against Depression”, “a 2-year, four-level, multifaceted, community-based intervention with evaluation with respect to both a baseline year and a control region” (Hegerl et al., 2006; p. 1230). The data on completed and attempted suicides from 2000 to 2004 were collected in the city of Nuremberg (480,000 inhabitants) and the region of Wuerzburg (260,000 inhabitants) in Bavaria, Germany. This study aimed at a stable data assessment over the time in order to discover changes in rates of attempted suicides. It was not the aim of the project to achieve a complete coverage of suicide data (Hegerl et al., 2006).

In the course of this project, Nuremberg was selected as the intervention region since size and infrastructure of this city appeared adequate and large central hospitals as well as active and cooperative practice networks could help facilitate the assessment of suicidal acts. Wuerzburg was selected as a control region because this region is characterized by a good infrastructure for the assessment of suicide attempts and participated in the WHO/EURO Multicentre Study on Suicidal Behaviour (Schmidtke et al., 1996). Furthermore, the baseline suicide rate in Wuerzburg (20.22 per 100,000) in 2000 was comparable to the baseline suicide rate in Nuremberg (20.48 per 100,000).

For the present study, the corresponding data from these two areas have been aggregated in order to obtain a sufficiently high number of analyzable suicidal acts. Regarding attempted and completed suicides, this study represents a prospective longitudinal cohort study of routine data collected from two urban regions. Due to anonymization of data concerning attempted and completed suicides, the study addresses selected cases and not individuals.

2.1. Case definition: completed suicides

Data on completed suicides including suicide method as coded by ICD-10 (International statistical classification of diseases; tenth revision), gender and age-group were received from the Bavarian State Office for Statistics and Data Processing. Completed suicide cases with minimum age 18 years (age limit for adulthood in Germany) were selected for the study. For reasons of data protection no personal identifiers were included. Suicide reporting is subject to federal authorities in Germany. Post mortem examinations in Germany have to be performed by a physician. The physician determines the cause of death and lists it according to the X-codes in ICD-10 on the death certificate. In case of evidence for unnatural deaths due to external impact or unexplained causes of death the police have to be informed. All death certificates are administered by the local health authorities. The corresponding data are forwarded to the State Offices for Statistics and Data Processing for further analysis, assigning ICD-10 X codes (see section ‘Method classification’) and the place of residence of the dead person. Thus, only cases with a residential address in the State are registered, excluding e.g. illegal migrants. In the end, the data are transmitted to the German Office for Statistics and Data Processing.

How many suicides in Bavaria were actually recorded as ‘undetermined’ by mistake has not been investigated so far by other studies. However, in order to control this possible confounding factor, we examined whether suicide mortality in Bavaria (between 2000 and 2004) was influenced by the number of undetermined deaths in this time interval (see Table 1).

Time trends in the observation period from 2000 and 2004 for suicides and undetermined deaths (ICD-10 codes: Y10–Y34) were analyzed using Poisson regression models