Comprehensive Psychiatry 85 (2018) 61–66

Contents lists available at ScienceDirect

Comprehensive Psychiatry

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

Incidence of suicide among military police officers in South Brazil: An 11-year retrospective cohort study☆,☆☆

Denise Alves Riambau Gomes [a], Rafael Moreno Ferro de Araújo [b,c,*], Maximiliano Schünke Gomes [a,c]

[a] Department of Health of the Military Brigade of Rio Grande do sul, Brazil, Rua Castro de Menezes, 275, CEP 90010-190 Porto Alegre, RS, Brazil
[b] Vale do Taquari University - Univates, Lajeado, Brazil, Rua Avelino Talini, 171, CEP 95914-014 Lajeado, RS, Brazil
[c] Pontifical Catholic University of Rio Grande do Sul, Porto Alegre, Brazil, Av. Ipiranga, 6681, prédio 6, CEP 90619900 Porto Alegre, RS, Brazil

ARTICLE INFO

ABSTRACT

Background: Suicide is known to be the leading cause of death among police officers (PO) worldwide. However, most studies were conducted in developed countries, with no data from Brazil. The present study aimed to evaluate the incidence and the sociodemographic profile of suicide among a military PO subpopulation in South Brazil.

Methods: This retrospective cohort evaluated 31,110 military PO with available data on cause of death from 2006 to 2016. Participants were monitored for an average of 18.8 ± 9.6 years following the date of entry into the military police.

Results: Mean age at the end of the follow up time was 41.4 ± 9.1 years, with 90.7% males. A total of 650 participants died (2.1%), with 43 suicides (6.6% of all deaths) - cumulative incidence of 138/100,000. Bivariate analysis revealed a significant association ($p < 0.05$) between suicide and age (HR = 0.70, 95%CI = 0.66–0.74), females (HR = 1.67, 95%CI = 1.08–2.60) and enlisted military rank (HR = 14.9, 95%CI = 2.05–108.5). Multivariate models showed an independent association between suicide and age (HR = 0.71, 95%CI = 0.67–0.74) and enlisted military rank (HR = 9.96, 95%CI = 1.30–76.3).

Conclusions: The incidence of suicide among military PO in South Brazil was high, compared to the national suicide rate. Younger age and lower military rank were independent predictors of suicide in this subpopulation.

1. Introduction

Suicide is the cause of 1.4% of all annual deaths worldwide [1]. Deaths due to suicide results in several social problems, since it influences the risk of suicide attempt to the relatives and friends [2,3], and impacts on a high disability adjusted life years (DALYs) [4]. This burden of disease can be associated to the age period that most of these deaths occur, between 15 and 35 years, especially in low and middle-income countries [1]. The investigation of suicide is fraught of challenges as a result of the multifactorial nature of suicidality, the complex cultural meaning of suicide and the research practices common to the field over the past decades [5]. Some consistent risk factors for suicide have been described: mental disorders, past suicide attempts, social isolation, family conflict, physical illness, and occupation [6]. Police are among the occupations at most risk for suicide, RR = 1.52 (95% CI 1.28–1.80), along with 'elementary' occupations (laborers, cleaners), machine operators and ship's deck crew, and agricultural, forestry and fishery works [7].

Findings from a systematic review showed that police officers (PO), as well as other first responders (e.g. firefighters, paramedics, emergency medical technicians), may be at elevated risk for suicidal thoughts and behaviors [8]. The police labor activity has major peculiarities related to the daily exposure to both acute and chronic severe stressful situations [9]. In addition, a few studies indicated that combat exposure, a type of severely stressful life event, is a robust risk factor for lethal suicide behavior among war veterans [10–12]. However, there is a scarcity of studies involving military individuals who are not from the Army, such as military PO. Thus, suicide research focusing on this vulnerable population is essential, especially in developing countries at high levels of urban criminality, including the presence of organized crime, such as Brazil [13], which is ranked in the 79th position in the Human Development Index (HDI) [14]. Suicide and homicide rates usually shown an inverse correlation, while suicide rates and HDI shown a positive correlation [15]. In Brazil, 47,135 inhabitants died by homicide (rate = 24.3/100,000) in 2012, although there are laws to regulate and restrict civilian access to firearms [16]. There is a lack of epidemiological studies involving suicide rates among Brazilian PO, who are probably highly exposed to violence in their daily lives.

☆ Conflict of interest: None.
☆☆ Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

* Corresponding author.
E-mail addresses: rafael.araujo2@univates.br, (R.M.F. de Araújo), maximiliano.gomes@pucrs.br (M.S. Gomes).

https://doi.org/10.1016/j.comppsych.2018.06.006
0010-440X/

Suicide was found to be an important cause of mortality among PO in some studies [17,18]. A meta-analysis found a median suicide rate of 18.2/100,000 [19] in this susceptible population. However, most studies included in that review were conducted in developed countries, with no data from Brazil [19]. Accordingly, there is scarce scientific reports on the suicide rates among Brazilian PO [20]. Although Brazil's suicide mortality rate increased by 29.5% in 26 years (1980–2006), the national rate (4.9 per 100,000 inhabitants on average) is still considered low compared to worldwide suicide rates. With an average of 9.3 deaths per 100,000 inhabitants, South Brazil presented the highest rates of suicide in the country [21]. Nevertheless, it should be noted that underreporting may occur in poorer countries, which may underestimate the informed suicide rates [1]. Considering the social, economic and cultural peculiarities of Brazil, it may be supposed that suicide rates may differ among PO in Brazil, compared to other areas of the world.

Thus, the aim of this study was to evaluate the 11-year incidence of suicide among military PO based on deaths registered in the state of Rio Grande do Sul, Brazil. In addition, the present study analyzed the mortality by other causes than suicide (e.g. deaths related to police work activity, cancer, cardiovascular disease, etc.) to compare their frequencies in the target population, and to analyze associations between some risk factors (sociodemographic and occupational characteristics of participants) and each specific cause of death.

2. Material and methods

The study protocol was reviewed and approved by the Committee of Ethical Affairs of the Vale do Taquari University - Univates (#1676090 - CAAE#56999616.7.0000.5310) and by the Research Institute of the Military Police of Rio Grande do Sul, Brazil. The privacy and confidentiality of the personal information of the research participants were protected. All data were de-identified before the analysis. Present observational study conforms to the STROBE guidelines.

The target population of this retrospective cohort study comprised military PO from the state of Rio Grande do Sul, in South Brazil. All active military PO of any age and sex were eligible and included in the study, whereas military retirees were excluded from the study sample. Collected data was retrieved from the military police files, provided by the Department of Intelligence and by the Administrative Department of the Military Police of Rio Grande do Sul (State population in 2016 = 11,286,500 inhabitants), Brazil, from January 2006 to June 2016.

As sociodemographic data we included age, sex, military rank and time of military police work (years). Mortality was ascertained by annual searches in the military files. Cause of death was determined by ICD10 codes, according to the death certificate of each individual. Deaths caused by intentional self-harm (codes X60-X84) were considered as "suicide". "Deaths related to police work activity" included homicide (assault, codes X85-Y09) or traffic accidents (codes V02-V04, V09.0, V09.2, V12-V14, V19.0-V19.2, V19.4-V19.6, V20-V79, V80.3-V80.5, V81.0-V81.1, V82.0-V82.1, V83-V86, V87.0-V87.8, V88.0-V88.8, V89.0, V89.2). All other deaths were considered natural causes or other external cause of morbidity, categorized as "other deaths". Information on the workplace of the participants was available, but this data was not included since the database considered only the baseline workplace. There was no information on the changes throughout working time, which are common in the PO career. The institutional database had no additional data on other potential confounders for suicide.

Survival analysis was carried out by bivariate and multivariate Cox regression models, estimating the relationship (hazard ratios [HR] and 95% confidence intervals [CI]) between sex, age, military rank (dichotomized as enlisted and officers), time of military police work (dichotomized as <10 and ≥10 years) and risk of incident suicide, death related to police work or other causes of death. All variables associated with incident suicide in the bivariate analysis with a p-value < 0.25 were considered potential confounders and were included in the subsequent multivariate models, where the value for the rejection of the null hypothesis was set at $p \leq 0.05$. The statistical approach was carried out with bivariate and multivariate regression models, allowing the analysis of the interaction between exposures, co-variables and the outcome (suicide). The multivariate model evaluated the association between military rank (enlisted) and suicide, adjusting for age, sex and time of police work or time to death.

In addition, the Kaplan–Meier method was used to estimate survival function for each exposure variable (age, sex and military rank) in relation to suicide and the time of military police work. The outcome was death (suicide versus all other deaths or alive). Log-rank testing was used to compare the survival curves at the 5% significance level. These analyses were conducted with the IBM SPSS statistical package (version 20; SPSS Inc).

3. Results

Table 1 shows the characteristics of the study sample (N = 31,110 individuals) according to suicide and death outcomes. The mean age at the end of the follow up time was 41.4 ± 9.2 years (min 20 y, max 85 y), with 90.7% men. Most participants were enlisted (81.5%), and the mean working time in the military corporation was 18.8 ± 9.6 years. A total of 650 participants died in the study period, with 43 suicides (6.6% of total deaths), 16 deaths related to police work (2.4% of total deaths) and 591 deaths due to other reasons (90.9% of total deaths). The median age of participants who died by suicide was 36.0 years (min 20 y, max 51 y), with an interquartile range of 15 years. The mean annual rate of mortality by suicide was 12.5/100,000, with a cumulative incidence of 138 suicides/100,000 PO during the studied period. The age-standardized suicide rates were different for the individuals with <40 years old (mean annual rate of 18.5/100,000 and cumulative incidence of 222 suicides/100,000 PO) than for those with 40 years or more (mean annual rate of 7.3/100,000 and cumulative incidence of 87 suicides/100,000 PO). The mean annual incidence of suicide was higher for females (18.8/100,000) than for males (11.9/100,000), with a female-to-male ratio of 1.58.

Table 2 expresses the bivariate and multivariate models for the association between the characteristics of participants and incident suicide. In the bivariate analysis, age (HR = 0.70; 95%CI = 0.66–0.74), females (HR = 1.67; 95%CI = 1.08–2.60) and enlisted military rank (HR = 14.9; 95%CI = 2.05–108.5) were significantly associated with incident suicide. Multivariate model revealed that age (HR = 0.71; 95%CI = 0.67–0.74) and lower military rank (enlisted) (HR = 9.96; 95%CI = 1.30–76.3) were independent predictors of suicide in this population. Sex was not associated with suicide in the adjusted model (HR = 1.04; 95%CI = 0.67–1.62).

Fig. 1 shows the Kaplan–Meier survival curves for suicide in relation to age (A), sex (B) and military rank (C). Log-rank tests (Mantel-Cox) revealed a significant association ($p < 0.001$) between suicide and age, sex (females) and lower military rank (soldier).

4. Discussion

Similarly to the observed in other countries [19], present results suggest that South Brazilian military PO are at high risk for suicide, especially among women (mean annual rate of 18.8/100,000 in females vs. 11.9/100,000 in males). To the best of the authors' knowledge, this study is novel on describing the incidence and profile of suicide among this subpopulation. Despite the inherent methodological limitations, present results provide the opportunity to alert about the vulnerability of this profession in Brazil, indicating the need for specific prevention programs.

The mean annual incidence of suicide among Brazilian PO in Rio Grande do Sul was 12.5/100,000, which is 3-fold higher than the mean annual rate of the Brazilian general population (5.1/100,000, average from 2006 to 2015 based on 190,755,799 inhabitants, data from the