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Sexual violence, mood disorders and suicide risk: a population-based study

Violência sexual, transtornos de humor e risco de suicídio:
um estudo de base populacional

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Abstract *This article seeks to analyze the association between sexual violence, manic and depressive episodes, and suicide risk among young adults. This is a cross-sectional population-based study carried out with young people between 18 and 24 years of age in a town in southern Brazil. The sample was selected through clusters. The prevalence of sexual violence, manic, depressive and mixed episodes and suicide risk were evaluated, as well as the association between them. The chi-square test and Poisson regression were used for statistical analysis. The study sample comprised 1,560 subjects. Among these, 3.1% had suffered sexual violence at some point in their life. The prevalence of depressive, mixed episodes, and (hypo)manic episodes were 10%, 2.4% and 2.3%, respectively. Suicide risk had a prevalence of 8.6% in the total sample. Young people who have suffered sexual violence are more likely to be subject to mood changes or suicide risk than those who have not ($p < 0.05$), except for the occurrence of (hypo)manic episodes. These results revealed a strong association between sexual violence and depressive and mixed episodes and suicide risk.*

Key words Sexual violence, Sexual abuse, Mood disorders, Depression

Resumo *O artigo tem por objetivo analisar a associação entre abuso sexual, episódios maníacos, depressivos e risco de suicídio em jovens adultos. Este é um estudo transversal de base populacional realizado com jovens entre 18 e 24 anos em Pelotas/RS. A seleção da amostra foi realizada por conglomerados. Foram avaliados a prevalência de violência sexual, o episódio de mania, depressão, misto e o risco de suicídio. Para a análise bruta dos dados foi utilizado o teste Qui-Quadrado, posteriormente, a análise ajustada foi realizada por Regressão de Poisson. A amostra do estudo foi de 1560 jovens, dos quais 3,1% haviam sofrido abuso sexual em algum momento de sua vida. O episódio depressivo esteve presente em 10,0% dos jovens entrevistados, seguido pelo maníaco (hipo) (2,3%) e pelo misto (2,4%). O risco de suicídio apresentou prevalência de 8,6% na amostra total. Nos jovens que sofreram abuso sexual, a probabilidade de apresentar alterações de humor ou risco de suicídio foi maior do que naqueles que não haviam sofrido ($p < 0,05$), exceto para a ocorrência de episódio maníaco (hipo). Os achados deste estudo indicam uma forte associação entre abuso sexual e episódios de depressão, misto e risco de suicídio, ainda, em uma amostra sem nenhum tratamento.*

Palavras-chave Abuso sexual, Depressão, Depressão bipolar, Risco de suicídio

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Introduction

Sexual assault has been recognized as a serious public health and social problem, resulting not only in great physical and psychological impact, but also in behavioral problems to the victims¹⁻⁵. Despite the low percentage of complaints, sexual assault has been increasing. According to the World Health Organization [WHO] 20% of women and from 5% to 10% of men reported suffering sexual violence and the overall prevalence of rape was 2-5%⁶.

Some studies focus on the association between sexual abuse, unipolar depression and bipolar disorder^{7,8}. A current study carried out in Canada, verified that sexual abuse was associated with several mental disorders but not with bipolar disorders⁹. In another study which was analyzed 269 patients who had experienced sexual violence found that 48.7% were diagnosed with some affective disorder and 22.3% had at least one suicide attempt in the past¹⁰. Depression in later life represents the main psychopathological manifestation associated with traumatic events in childhood. Researchers observed that sexual abuse in children was a primary risk factor for the onset of bipolar disorder¹¹.

Individuals who suffered some type of violence, such as sexual abuse, rape, physical violence or harassment, are more likely to suffer from other forms of violence throughout their lives¹². The association between sexual violence and subsequent mental disorders is already well established, however, there are still controversies about the relationship between sexual violence and bipolar disorder.

Especially in Brazil, we know little about the different effects associated with sexual violence. Therefore, population studies are important to examine sexual violence prevalence and thus contribute to political actions, linked to prevention of sexual violence and mood disorders, as well as, strategies of intervention. Yet this type of study is less likely to bias since it is a population that is not seeking treatment.

Considering the probable relationship between sexual assault and mood disorders, this study aimed to analyze the association between self-reported sexual violence and (hypo) mania, depressive and mixed episodes as well as the suicide risk in a sample of young adults aged 18 and 24 years.

Materials and methods

A cross-sectional population-based study was carried out with young adults between the ages of 18 and 24 years, living in the urban area of the city of Pelotas, Brazil. The sample collection was performed by clusters from August 2007 to December 2008 considering the population of 39667 young adults and according to the current census of 448 sectors in the city of Pelotas. In order to guarantee the necessary sample size, 89 census-based sectors were randomly selected. A systematic sampling technique was employed for recruitment. Out of the 1762 recruited subjects, 11.6% refused to participate. Thus, 1560 subjects were interviewed¹³.

The study included seven interviewers, psychology and physiotherapy undergraduate students from the *Universidade Católica de Pelotas*. To implement the instruments interviewers were trained by psychologists with extensive application experience and weekly meetings were conducted during all data collection period.

We documented information regarding demographic, education of young and head of household and parent's marital status by self-reported. Socioeconomic status was assessed using a classification proposed by the Brazilian Association of Research Companies (*Associação Brasileira de Empresas de Pesquisa, ABEP*)¹⁴. This classification is based on the accumulation of material goods and also on the schooling of the head of the household and it places the subjects into economic classes (A, B, C, D, or E according to the scores obtained; "A" refers to the highest socio-economic class and "E" the lowest.

In the present paper, sexual violence was considered as the sexual assault. The sexual violence was assessed by a self-administered question: *Have you ever been physically forced to have sexual intercourse?*. Current mood disorders and suicide risk were assessed using the Mini International Neuropsychiatric Interview 5.0 (MINI), which is a short structured diagnostic interview widely used by clinicians and in research based on DSM-IV and CID-10 criteria. The MINI is divided into modules identified by letters corresponding to diagnostic categories. Among these categories, it includes the evaluation of depressive, manic and hypomanic episodes as well as the suicide risk. There is a psychometric validation for each module compared to the Structured Clinical Interview for DSM [SCID]¹⁵. According to the MINI, an episode of depression is characterized by the presence of a persistent depressed

mood, a loss of interest, or a decreased pleasure in usual activities, with a minimum duration of two weeks. On the other hand, BD is characterized by the presence of at least one manic episode, an alternating depressive episode or at least one overlapped manic/ hypomanic episode. The manic and hypomanic episodes are characterized by abnormal, persistently high, expansive or irritable moods and increased activity or energy, lasting at least one week. A Mixed episode is considered when the respondent rates both manic and depression episodes simultaneously. Lifetime suicide risk was considered when the individual reports ideation, planning, current or past suicide attempts¹⁶.

After instruments coding, all data was *double-entered* into the Epi-Info 6.04d program¹⁷. STATA 9 software was used for data analysis, in which a univariate analysis was performed to describe the sample distribution and obtain the relative frequency of depression, manic/hypomanic and suicide risk. The chi-square statistic test was applied in the cross data analysis. Finally, in the adjusted analysis prevalence ratio (PR) was obtained by Poisson regression with a robust adjustment of variance and control for the design effect in STATA software. For all hypothesis tests, the level of statistical significance was set at $p < 0.05$.

All the subjects of the study signed an informed consent form. The study was approved by the Research Ethics Committee of the *Universidade Católica de Pelotas (UCPel)*.

Results

In the present study, 1,762 subjects were identified. Among these, 202 (11,5%) individuals refused to participate or could not be located at the time of the interview, resulting in a final sample of 1560. The average age was 20.5 (\pm 2.1) years; female sex was prevalent (56.4%), with elementary school completed or incomplete high school (47.9%). Most household heads had an incomplete elementary school (42.1%), came from class C (48.1%). Most parents were living together (64.1%) (Table 1).

Concerning mood disorders, the depressive episode was more prevalent in 10% of the individuals interviewed, followed by mixed episode (2.4%) and by the manic/hypomanic episode (2.3%). Suicide risk (8.6%) was detected in 134 individuals (Table 1). Of the total sample, 3.1% ($n = 48$) participants experienced sexual vio-

lence (rape) at some point in their lives. Sexual violence was more prevalent in young women than in young men, 4.1% and 1.8%, respectively (RP 2.31; $p = 0.013$); and in those with lower schooling level ($p = 0.004$). It also showed higher prevalence in household heads who had incomplete elementary school ($p = 0.062$) and lower socio-economic status (D or E) ($p = 0.053$). Young individuals whose parents were divorced or separated had a higher prevalence of sexual violence 4.4% (RP 1.81; $p = 0.049$) (Table 2).

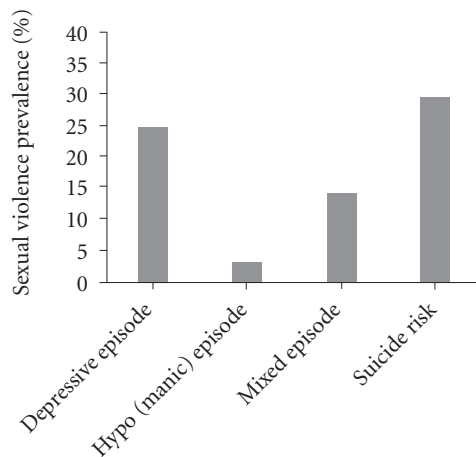
Among the individuals who suffered sexual violence, the prevalence of depressive episode was 24.4%, (hypo)manic episode was 3.1%, while mixed episode was 13.9%, and the lifetime suicide risk was present in 29.2% (Figure 1). There

Table 1. Socio-demographic and clinical characteristics among young people of 18 to 24 years old in the city of Pelotas, Brazil.

Sample Characteristics	N (%)
Sex	
Female	880 (56.4)
Male	680 (43.6)
Age (Mean \pm SD)	20.50 \pm 2.09
Education of young	
Incomplete elementary school	342 (27.9)
Complete elementary school/	748 (47.9)
Incomplete high school	
Complete high school / higher	470 (30.1)
Education of the head of the household	
Incomplete elementary school	656 (42.1)
Complete elementary school/	314 (20.1)
Incomplete high school	
Complete high school/ higher	590 (37.8)
Socioeconomic status	
High (A+B)	583 (37.4)
Medium (C)	751 (48.1)
Low (D+E)	226 (14.5)
Parents' marital status	
Living together	1000 (64.1)
Not living together	560 (35.9)
Sexual abuse	
No	1512 (96.9)
Yes	48 (3.1)
Current mood disorder	
Without	1319 (85.3)
Depressive episode	155 (10.0)
Manic (hypo) episode	36 (2.3)
Mixed episode	37 (2.4)
Lifetime suicide risk	
No	1426 (91.4)
Yes	134 (8.6)
Total	1560 (100.0)

Table 2. Socio-demographic factors associated with the occurrence of lifetime sexual violence.

Characteristic	Prevalence of sexual violence n (%)	Prevalence ratio CI (95%)	p-value
Sex			0.013
Female	36 (4.1)	2.31 (1.21 – 4.42)	
Male	12 (1.8)	1.00	
Education of young			0.004
Incomplete elementary school	17 (5.1)	3.41 (1.43 – 8.14)	
Complete elementary school/ Incomplete high school	24 (3.2)	2.15 (0.93 – 4.95)	
Complete high school / higher	7 (1.5)	1.00	
Education of the head of the household			0.062
Incomplete elementary school	28 (4.3)	2.09 (1.07 – 4.08)	
Complete elementary school/ Incomplete high school	8 (2.6)	1.25 (0.52 – 3.02)	
Complete high school / higher	12 (2.1)	1.00	
Socioeconomic status			0.053
High (A+B)	15 (2.6)	1.00	
Medium (C)	20 (2.7)	1.04 (0.54 – 2.02)	
Low (D+E)	13 (5.8)	2.23 (1.08 – 4.62)	
Parents' marital status			0.049
Living together	24 (2.4)	1.00	
Not living together	24 (4.4)	1.81 (1.04 – 3.16)	
Total	48 (3.1)	-	-

**Figure 1.** Prevalence of sexual violence among young adults with mood episodes and suicide risk (%).

were statistically significant differences for all mood episodes and suicide risk ($p < 0.05$), except for manic episode ($p > 0.05$) when compared to subjects who had not suffered sexual violence.

In the adjusted analysis, when adjusted for sex, educational level of the individuals and of

the head of the household, the socioeconomic status, the families whose parents were separated, the mood episode and the lifetime suicide risk, except (hypo) manic episode, showed higher prevalence among young people who had suffered sexual violence. For those individuals who suffered sexual violence, the probability of having depressive episodes was approximately two times higher when compared to those who did not suffer sexual violence (RP 1.94; CI 95% 1.10 – 3.41); for mixed episodes, the probability was 4 times higher (RP 3.92; CI 95% 1.48 – 10.32), while the probability of lifetime suicide risk was 2.8 times higher among individuals who suffered sexual violence (RP 2.83; CI 95% 1.76 – 4.54). Sexual violence in this sample has not been associated with the higher prevalence of (hypo) mania episode (RP 1.08; CI 95% 0.15 – 7.84) (Table 3).

Discussion

The present study has pointed out a strong association between the history of sexual violence and the presence of mood disorders, especially regarding mixed episodes. In addition, the reports of sexual violence were highly associated with the lifetime suicide risk and with some socio-demographic factors. It was observed that 3.1% of the

Table 3. Prevalence Ratio of young people who have suffered sexual violence presenting mood disorders and suicide risk.

Current disorder	Young people who suffered sexual violence Prevalence Ratio (CI 95%)	p-value
Depressive episode	1.94 (1.10 – 3.41)	0.021
Manic episode (hypo)	1.08 (0.15 – 7.84)	0.938
Mixed episode	3.92 (1.48 – 10.32)	0.006
Suicide risk	2.83 (1.76 – 4.54)	<0.001

sample reported that they were forced to have sexual intercourse.

In this study and in the literature, some socio-demographic variables, such as the female sex, low level of schooling, low family income and families whose young's parents are separated are associated with sexual violence¹⁸⁻²⁰. Likewise, a series of psychiatric disorders, including mood disorders and suicide risk, are associated with sexual assault^{7-9,21-24}.

In the present study, the prevalence of depression among people who suffered sexual violence was nearly three times higher than among those of the population group. Kilpatrick et al.²⁵, 1985, found that 30% of victims who suffered sexual abuse experienced at least one episode of depression, and yet, 21% were depressed at the time of evaluation. Data that are assimilated to the present study found that the prevalence of current depression in 24.4%. In a study focused on child sexual abuse and subsequent diseases conducted in the United States, the percentage of women with depression during life was 39.3% among those women who reported child sexual abuse when compared to a general population with 21.3%. In this study, the sexual abuse had a high prevalence in those young people with the mixed episode (14.3%). Meade et al., (2009) suggests that women were not only more likely to report sexual abuse, but they also reported significantly more weeks of mixed episodes having an immense impact therefore worsening quality of life in young adults⁸. Neria et al.²⁶ evaluated 109 patients with bipolar disorder and found that 40.4% experienced sexual or physical trauma and it is more prevalent in women than in men.

On the other hand, there were no association between hypo (manic) episode and sexual violence in our study. It is not clear in the literature the mechanism involved between sexual violence and bipolar disorder. Afifi et al., in a population study did not find an association between bipo-

lar disorder and sexual abuse, which is similar with our results⁹. However, our study shows that people who suffered sexual violence demonstrated 3.9 chances of presenting a mixed episode. This finding can be explained by the severity of the pathology. It is known in the literature that subjects who present mixed episodes have greater damage in quality of life and global functioning^{13,27}. Therefore, the trauma in childhood could aggravate the pathology prognostic or even how the pathology appears.

According to a meta-analysis carried out by Norman et al. (2012), individuals who have suffered sexual assault are three times more likely to present suicidal ideation, when compared to those who did not suffer such abuse²⁸. Afifi et al.⁹ observed individuals with the presence of past sexual abuse and the likelihood ratio for suicide ideation was 2.3. This finding is similar to that found in the present study, in which the lifetime suicide was 2.8 times more prevalent. Alvarez et al.²⁹ evaluated 102 patients with a diagnosis of schizophrenia, bipolar and schizoaffective disorder and found that the suicide risk was two times more prevalent in those patients who had suffered sexual abuse. In another study, researchers found that adolescents female who suffered sexual assault presented an odds ratios of 3 to develop bipolar disorder².

Sexual assault in childhood or adolescence can be a major stressor event to predict mood disorders and suicide ideation in adult life. It is worth mentioning that factors that characterize the social vulnerability are also involved in this association, which justifies the studies focused on the impact of sexual violence in mood disorders and suicide risk, taking into account the socio-demographic factors associated with the abuse.

One of the limitations of this study is the impossibility to infer causal relationships between sexual violence, the mood episodes and the sui-

cide risk. It is not possible to say that sexual violence is the cause and clinical conditions are the consequences. However, these findings were obtained from a population-based cross-sectional design with young adults who, in their great majority, were not receiving any psychological or psychiatric support for mood disorders. Moreover, the study demonstrated that the relation-

ship between sexual violence and mood disorders may result in damage and suffering already in a sample of young adults. Further *population-based longitudinal studies* are necessary not only to identify the actual effects of sexual violence on the lives of young adults, but also to better understand the neurobiological consequences that those traumatic experiences may bring.

Collaborations

TC Mondin, TA Cardoso, K Jansen, CE Konradt, RF Zaltron, MO Behenck, LD Mattos and RA Silva contributed intellectually to the article; TC Mondin, TA Cardoso, K Jansen and CE Konradt analyzed the data; TC Mondin, TA Cardoso, K Jansen, CE Konradt, RF Zaltron and MO Behenck wrote the article; TC Mondin, TA Cardoso, K Jansen, LD Mattos and RA Silva were responsible for the final content of the article. All authors read and approved the final version of the article.

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