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Influence of Childhood Abuse and Neglect Subtypes on Late-life Suicide Risk beyond Depression

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Abstract

Introduction

The association of childhood trauma and suicide has been extensively examined within the population. Depression figures as a main cause for the elevated suicide rate in advanced ages and is often related to childhood adversities. The purpose of the present study was to examine the relationship between childhood trauma subtypes and suicide risk, testing geriatric depression as a moderator.

Method

This is a cross-sectional study looking at a sample of 449 individuals 60 years old or older from the Multidimensional Study of the Elderly of Porto Alegre Family Health Strategy, Brazil (EMI-SUS/POA). Childhood trauma (Childhood Trauma Questionnaire), geriatric depressive symptoms (Geriatric Depression Scale), and suicide risk (Mini International Neuropsychiatric Interview) were assessed.

Results

The subtypes of childhood abuse and neglect were significantly associated with suicide risk. In the multivariate analysis, controlling for age, gender, income, marital status, ethnicity, smoking, and geriatric depression symptoms, all trauma subtypes remained associated with suicide risk with the exception of physical neglect (EA = 3.65; PA = 3.16; SA = 5.1; EN = 2.43; PN = 1.76).

Discussion

The present study showed that childhood maltreatment subtypes predicted suicide risk, and geriatric depression does not directly mediate this relation.

Keywords: childhood maltreatment, suicide risk, geriatric depression, elderly

Introduction

A prior suicide attempt is the most important predictor of death by suicide in the population (WHO, 2014). In 2012, the suicide rate was 11.4 per 100,000 population throughout the world. Suicide rates are highest in those aged 70 or older for both men and women in almost all regions of the world (WHO, 2014). In Brazil, the suicide rate was 5.7 deaths per 100,000 inhabitants in 2006. There is a predominance in the 70 years or older age group (rate of 7.8 deaths per 100,000 people), followed by those aged 50-59 and then by individuals aged 60-69. The southernmost state of Brazil, Rio Grande do Sul, has the highest national suicide mortality rate, reaching 9.3 deaths per 100,000 inhabitants (Marcos et al., 2006).

Early adversities such as childhood trauma are important risk factors for mental disorders, and increasing evidence shows numerous negative consequences of childhood trauma in the life cycle (Taillieu et al., 2016). There is strong evidence that maltreated children have more depression in youth and adulthood but also more anxiety disorders, substance use disorder, and post-traumatic stress disorder (Gilbert et al., 2009). Also, childhood maltreatment was associated with internalizing (e.g. depression, generalized anxiety disorder) and externalizing (e.g. conduct and substance disorder) psychopathological dimensions (Keyes et al., 2012). Population-attributable risk proportions suggest that childhood adversities account for 29.8% across all mental disorders (Kessler et al., 2010).

Childhood maltreatment is a term that encompasses different types of experiences, such as the emotional abuse, emotional neglect, physical abuse, physical neglect, and sexual abuse that are associated in most of the cases. Early adversities such as childhood trauma have been associated with increased suicidality in depressed adult individuals (Dias et al., 2016) and suicidal behavior in individuals with common psychiatric disorders in young and adult individuals (Carlier, Hovens, & Streevelaar, 2016).

Literature examining the negative consequences of childhood adversities in the elderly is still limited, and the majority of the papers evaluate only one form of abuse or neglect. Despite this, they tend to occur together (Dong et al., 2004; Draper et al., 2008). The research has shown a graded relationship between childhood maltreatment and symptoms of depression (Poole, Dobson, & Pusch, 2017) but also suicide risk (Dube et al., 2001).

The consequences of childhood adversities have received increasing attention in the case of depression (Comijs et al., 2013; Ege, Messias, Thapa, & Krain, 2015; Raposo, Mackenzie, Henriksen, & Afifi, 2014). Depression figures in a high prevalence in the elderly Brazilian socioeconomically disadvantage population (Nogueira, Rubin, Giacobbo, Gomes, & Neto, 2014) and is the main cause of the elevated suicide rate in advanced age (Conwell, Duberstein, & Caine, 2002). The contribution of childhood trauma to suicide in the elderly has been examined only in the past few years. Sachs-Ericsson et al. (2016) show an association

between adverse childhood experiences and suicide throughout the life span. However, the influence of childhood maltreatment subtypes of abuse and neglect on late-life suicide risk has not yet been appropriately addressed; nor has the moderator effect of geriatric depression in this relation.

The primary aim of the present study was to examine the role of childhood maltreatment subtypes as predictors for late-life suicide risk (SR), testing geriatric depression as a moderator. Secondarily, we investigated the sum of the number of dimensions of maltreatment for their likelihood of predicting suicide risk.

Method

1. Participants

This is a cross-sectional study with a sample of 449 persons 60 years old or older. The data was retrieved from registries of the Multidimensional Study of Elderly of Porto Alegre Family Health Strategy, Brazil (EMI-SUS/POA), a population-based survey conducted from March 2011 to December 2012 in collaboration with the Family Health Strategy (FHS) program of Porto Alegre, Brazil.

The EMI-SUS/POA sample was composed of socioeconomically disadvantage elderly from all health districts of Porto Alegre. Thirty family health teams in Porto Alegre were selected from a total of 97 through a stratified random sampling. Within each team, 36 individuals aged 60 years or older were randomly selected, for a total sample of 1,080 for home visits by the community health workers. The final sample of 449 is composed of those participants who participated in evaluation in the facility of the Hospital São Lucas. We excluded those who had an inability to understand the questions and could not go to the hospital. Assessment and registry of suicide risk were made by board-certified psychiatrists experienced in late-life neuropsychiatric disorders (Nogueira et al., 2014).

2. Variables

Suicide risk was assessed using the suicidality module of *Mini International Neuropsychiatric Interview 5.0 plus Portuguese version*, or MINI plus (Amorim, 2000). The MINI plus is a gold standard validated diagnostic tool intended for use by general physicians and non-clinical professionals (Lecrubier et al., 1997). Its accuracy is similar to that of more complex psychiatric interviews in different settings. The suicide module encompasses six questions, and the final score is calculated with the sum of each dichotomous variable (yes or no). It was considered positive for current suicide risk if the individual sum was one or more points.

The shorter version of the Childhood Trauma Questionnaire (CTQ) was used (Bernstein et al., 2003). It was translated into Brazilian Portuguese (Grassi-Oliveira, Stein, & Pezzi, 2006) and validated in community and clinical samples with good reliability and validity (Grassi-Oliveira et al., 2014). CTQ is a screening tool that aims to detect five subscales of negative childhood experiences: emotional abuse (EA), physical abuse (PA), sexual abuse (SA), emotional neglect (EN), and physical neglect (PN). It consists of 28 questions that allow the respondent to indicate abuse and its intensity through a five-point Likert scale. For maltreatment types, a positive case was defined by one that surpassed the cut-off "none or minimal" suggested by the CTQ manual as a dichotomous variable.

Emotional abuse is defined as verbal assaults on a child's sense of worth or well-being or any humiliating behavior directed toward a child by an older person. Physical abuse is defined as bodily assaults on a child by an older person that confer a risk of or result in injury. Sexual abuse is defined as sexual conduct between a child and an adult or older person. Emotional neglect is defined as the failure of an adult to meet children's emotional and psychological needs. Physical neglect is defined as the failure of adults to provide for a child's basic physical needs (food, shelter, clothing, safety, and health care).

The 15-item Brazilian Geriatric Depression Scale (GDS15) was utilized to assess depressive symptoms (Almeida & Almeida, 1999). GDS-15 is a valid and reliable instrument used to detect depressive symptoms in the elderly with good accuracy for major depression disorder. The cutoff values of 5/6 showed 81% sensitivity and 71% specificity for geriatric depression (Martins et al., 2005).

Sociodemographic variables included age, gender, education or years of schooling, marital status, ethnicity, smoking, and income. To measure income, the variable "minimum salary" was used, which corresponds to approximately $300 US. "Illiterate" includes those with no formal education and those who are functional illiterates.

3. Statistical Analysis

For descriptive statistics, we used absolute and relative frequencies. The chi-squared test was used to assess uncontrolled associations and examine sample distributions and frequency variations with expected outcomes.

Logistic regression explored each of the five maltreatment types for their likelihood to be associated with suicide risk (dependent variable). The first adjusted model (OR) controlled for sociodemographic variables only. The second adjusted model (OR-D) controlled for sociodemographic variables and depressive geriatric symptoms. Controlling for socioeconomic covariates (age, gender, education or years of schooling, marital status, ethnicity, smoking, and income) was conducted in each step of the analysis because these could be associated to the risk of suicide a priori (Crump, Sundquist, Sundquist, & Winkleby, 2014; Miret, Ayuso-Mateos, Sanchez-Moreno, & Vieta, 2013; World Health Organization, 2014). We also tested the likelihood of

sum of dimensions of maltreatment experienced to predict suicide risk. For all tests, a 95% confidence interval (CI) was used.

Separate logistic regression analysis of the interactions between depression and each maltreatment subtype was used to test the prediction of suicide risk. Table 3 presents the coefficients of depressive symptoms, maltreatment subtypes, and the interaction between maltreatment subtypes and depressive symptoms. All models included age, gender, education or years of schooling, marital status, ethnicity, smoking, and income as covariables.

Calculations were carried out using the software Statistical Package for the Social Sciences 20.0, SPSS®.

4. Ethics

The research protocol was fully approved by both the research ethics committees of PUCRS (Registry: 10/04967) and the Public Health Secretary of the City of Porto Alegre (SMS-POA Registry: 499; Process: 001.021434.10.7). All participants or their legal representatives gave written informed consent.

Results

1. Characteristics of the sample

Sociodemographic characteristics of the sample are shown in Table 1. The population (n = 449) was composed mainly of females, with zero to four years of formal education, low income (less than one minimum salary), and marital status of married or divorced. Most of the people in the study were up to 75 years old.

Physical neglect is the most common subtype of reported childhood trauma, followed by physical abuse. The least reported subtype was sexual abuse (Table 2). Most of the sample (67.8%) reported at least one childhood trauma experience. The prevalence of cumulative trauma declined progressively. Missing data was registered in variable income (n = 424), marital status (n = 444), and ethnicity (n = 442).

2. Childhood trauma, sociodemographic variables, and suicide risk

All subtypes of childhood maltreatment were significantly associated with suicide risk (Table 2).

In the multivariate analysis, controlling for age, gender, income, marital status, ethnicity, and smoking, all trauma subtypes remained associated with suicide risk (OR EA = 4.36; PA = 3.61; SA = 3.74; EN = 3.24; PN = 1.91; $p \leq 0.01$). Individuals with three trauma subtypes reported were 5.66 times ($p \leq 0.01$) more likely to present suicide risk than those with no trauma subtypes, and individuals with four trauma subtypes reported

were 6.72 times ($p \leq 0.01$) more likely to present suicide risk. Finally, those with five trauma subtypes were 10.76 ($p \leq 0.01$) times more likely to experience suicide risk.

Female gender, no income was associated with suicide risk. In the multivariate analysis, gender and current smoking remained associated with suicide risk.

3. Geriatric depression

In the multivariate analysis, controlling for age, gender, income, marital status, ethnicity, smoking, and geriatric depression symptoms measured by GDS scale, emotional abuse, physical abuse, and emotional neglect remained associated with suicide risk in similar magnitude (Table 2). Exceptions were sexual abuse, which increased from OR 3.74 (1.71–8.16) to OR 5.1 (2.68–9.69), and physical neglect, which lost its significance. Having experienced three or more trauma subtypes, controlling for the same sociodemographic factors and geriatric depressive symptoms, implies a great magnitude of risk of suicide (OR 3 trauma subtypes = 4.45; OR 4 traumas subtypes = 5.06; OR 5 trauma subtypes = 7.34 $p \leq 0.05$).

To evaluate the moderator effect of depression between maltreatment subtypes and suicide risk, interactions analysis was conducted. Depressive symptoms and each maltreatment subtype dimension individually predicted suicide risk (Depressive Symptoms OR 5.11, CI 2.72–9.58, $p \leq 0.001$). Interactions analysis between maltreatment subtype dimensions and depressive symptoms did not predict suicide risk significantly.

Discussion

In this study we analyzed the childhood maltreatment subtypes and the sum of the number of dimensions of maltreatment as predictors for late-life suicide risk in a socioeconomically disadvantaged elderly population. Geriatric depression was tested as a moderator between childhood maltreatment and suicide risk. We found that childhood maltreatment subtypes predicted suicide risk, and geriatric depression does not directly mediate this relation. Having experienced three or more dimensions of maltreatment significantly predict suicide risk.

The population in study is characteristic of socioeconomically disadvantaged elderly who earn less than one Brazilian minimum salary, have few years of education, and live in poor communities. The sample was retrieved from the data of a representative community study. This environmental context also includes high exposure to violence, dissolution of families, and adversities (Coêlho et al., 2016).

Most of the elderly population live in precarious conditions and in poor or developing countries such as Brazil, where we found our sample population. To our knowledge, only a few studies of childhood maltreatment have been conducted with this population.

1. Childhood maltreatment, suicide risk

The link found between suicide risk and childhood maltreatment is consistent with many previous studies. Suicide risk in the elderly was associated with physical and sexual abuse (Draper et al., 2008; Sachs-Ericsson et al., 2013). Indeed, most studies that focused on this link looked at adult populations (Bruwer et al., 2014; Jeon et al., 2014; Norman et al., 2012; Perales et al., 2012; Rajalin, Hirvikoski, & Jokinen, 2013; Tunnard et al., 2014; Vares et al., 2016). In a nationally representative sample of 55,299 respondents in 21 countries, childhood adversities were associated with an increased risk of lifetime suicide attempts and ideation. Associations remained similar after additional adjustments were made for respondents' lifetime mental disorder status, including mood disorders, and the risk increased with the number of adversities experienced (Bruffaerts et al., 2010).

A relationship between the sum of dimensions of maltreatment and risk of suicide exists in our sample. The odds ratio of suicidality among persons with three or more dimensions of maltreatment increased from four- to sevenfold. Adjustments for sociodemographic variables and depressive symptoms partially reduce the strength of the association. As previous research indicates, the types of maltreatment are interrelated rather than occurring alone, which implies an increased risk of psychopathology (Dong et al., 2004). Another populational cohort study with adults suggests the same graded relationship between suicide and adverse childhood experiences, with partial mediation of the depressed affect (Dube et al., 2001).

2. Geriatric depression

The effects of childhood maltreatment appear to last a lifetime, with poor physical and health outcomes. A history of childhood maltreatment is seen to be strongly associated with older adults' depression (Comijs et al., 2013; Ege et al., 2015; Raposo et al., 2014) and internalizing disorders (Sachs-Ericsson et al., 2010). The association of mood disorders and suicide is also confirmed by many previous studies (Beautrais, 2002; Conwell, Duberstein, & Caine, 2002).

In our study, the risk of suicide seems to be partially moderated by geriatric depression; probably other important factors interfere with this risk. Sachs-Ericsson et al. (2016) propose one model that considers interrelated domains (biological, psychiatric, physical health, and psychosocial functioning) to explain the mechanisms between adverse childhood experience and late-life suicide. Among these, life events seem to be an important factor that generates geriatric depression (Donoghue et al., 2016). In addition, there may be a specific association between childhood trauma and the cognitive dimension of depression in adult life (associated with hopelessness, thoughts of death, suicidal thoughts, guilt, and self-punishment), which may explain the increased prevalence of late-life suicide risk (Vares et al., 2015, 2016).

Possibly childhood maltreatment is a stressor that alters brain-development trajectories and, together with genetic susceptibility, predisposes the subject to develop psychiatric symptoms (Teicher et al., 2016).

The multiple possible psychiatric outcomes of exposure to childhood maltreatment depend on the timing, type, and severity of exposure (Page, 2014). One study proposes that depressed adult patients with a history of childhood sexual or physical abuse have greater scores of suicidality, but separation of parents during childhood did not influence the severity of psychopathology in adulthood (Kim et al., 2013).

Finally, it is crucial to expand our knowledge about the most important factors in those individuals exposed to childhood maltreatment that could contribute to attempting suicide in later life.

3. Strengths and limitations

There are few studies about childhood maltreatment and suicide in late life. To our knowledge, there is no study about this subject with socioeconomically disadvantaged populations, even though they represent the majority. The partial moderator effect of geriatric depressive symptoms has been so far explored only in adults and adolescent populations.

Some limitations are to be acknowledged. The cross-sectional design of this study does not allow us to draw any conclusions about cause-to-effect relationships. The sample of socioeconomically disadvantage elderly did not allow generalizing these results directly to other populations. Data were collected in the hospital, and many participants may not have been able to reach the facility mainly because of socioeconomic difficulties (violence, family support disruption, poverty). This is expressed in limitations in the recruitment process and important sample losses.

We do not evaluate neurological health, physical health, medication use, and other psychiatric diagnoses as possible confounders that could interfere in the data collection and the suicide risk prevalence. The age that the maltreatment was experienced was not evaluated in this study.

Retrospective evaluations can lead to bias, as the long period of time between the event and the assessment of the event may affect the reliability of the reports. Retrospective reports have been found to underestimate suicidal ideation and adverse childhood experience as well as declining propensity among the elderly to give an affirmative response to questions with emotionally aversive content (Hardt & Rutter, 2004; Klimes-Dougan et al., 2007; MacDonald et al., 2016). These studies indicate a possible tendency of the elderly to respond in the negative, leading researchers to underestimate the results in CTQ subscales, which means that the associations found in this study might be stronger than in others (Schulz, 2013).

Advancing age has been found to be associated with more adaptive shifts in affect and personality traits. Social desirability may also play a role, indicating a bias in the way an elderly person responds to a questionnaire. This phenomenon can alternatively be interpreted as a tendency of aging to increase maturity and emotional regulation. Both can possibly affect the measurements of items loaded with aversive content (Soubelet & Salthouse, 2011).

Conclusion

In this study, we found that childhood maltreatment subtypes are predictors for late-life suicide risk, even controlling for geriatric depression in socioeconomically disadvantaged elderly populations. It is crucial to understand other factors besides depression associated with the rise of the suicide risk that could advance the development of strategies and specific treatment groups that may improve treatment.

Bibliography

Beautrais, A. L. (2002). A case control study of suicide and attempted suicide in older adults. *Suicide & Life-Threatening Behavior*, *32*(1), 1–9. https://doi.org/10.1521/suli.32.1.1.22184

Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., … Zule, W. (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse and Neglect*, *27*(2), 169–190. https://doi.org/10.1016/S0145-2134(02)00541-0

Bruffaerts, R., Demyttenaere, K., Borges, G., Haro, J. M., Chiu, W. T., Hwang, I., … Nock, M. K. (2010). Childhood adversities as risk factors for onset and persistence of suicidal behaviour. *British Journal of Psychiatry*, *197*(1), 20–27. https://doi.org/10.1192/bjp.bp.109.074716

Bruwer, B., Govender, R., Bishop, M., Williams, D. R., Stein, D. J., & Seedat, S. (2014). Association between childhood adversities and long-term suicidality among South Africans from the results of the South African Stress and Health study: A cross-sectional study. *BMJ Open*, *4*(6), e004644–e004644. https://doi.org/10.1136/bmjopen-2013-004644

Carlier, I. V. E., Hovens, J. G. F. M., & Streevelaar, M. F. (2016). Characteristics of suicidal outpatients with mood , anxiety and somatoform disorders: The role of childhood abuse and neglect. *International Journal of Social Psychiatry*, *62*(4). https://doi.org/10.1177/0020764016629701

Coêlho, B. M., Andrade, L. H., Borges, G., Santana, G. L., Viana, M. C., & Wang, Y. P. (2016). Do childhood adversities predict suicidality? Findings from the general population of the metropolitan area of Sao Paulo, Brazil. *PLoS ONE*, *11*(5), 1–18. https://doi.org/10.1371/journal.pone.0155639

Comijs, H. C., Van Exel, E., Van Der Mast, R. C., Paauw, A., Oude Voshaar, R., & Stek, M. L. (2013). Childhood abuse in late-life depression. *Journal of Affective Disorders*, *147*(1–3), 241–246. https://doi.org/10.1016/j.jad.2012.11.010

Conwell, Y., Duberstein, P. R., & Caine, E. D. (2002). Risk factors for suicide in later life. *Biological Psychiatry*, *52*(3), 193–204. https://doi.org/10.1016/S0006-3223(02)01347-1

Crump, C., Sundquist, K., Sundquist, J., & Winkleby, M. A. (2014). Sociodemographic, psychiatric and somatic risk factors for suicide: A Swedish national cohort study. *Psychological Medicine*, *44*(2), 279–289. https://doi.org/10.1017/S0033291713000810

Dias, L., Souza, D. M., Jansen, K., Molina, M. L., & Azevedo, R. (2016). History of childhood trauma as risk factors to suicide risk in major depression. *Psychiatry Research*, (October), 0–1. https://doi.org/10.1016/j.psychres.2016.11.002

Dong, M., Anda, R. F., Felitti, V. J., Dube, S. R., Williamson, D. F., Thompson, T. J., … Giles, W. H. (2004). The interrelatedness of multiple forms of childhood abuse, neglect, and household dysfunction. *Child Abuse and Neglect*, *28*(7), 771–784. https://doi.org/10.1016/j.chiabu.2004.01.008

Donoghue, H. M., Traviss-Turner, G. D., House, A. O., Lewis, H., & Gilbody, S. (2016). Life adversity in depressed and non-depressed older adults: A cross-sectional comparison of the brief LTE-Q questionnaire and life events and difficulties interview as part of the CASPER study. *Journal of Affective Disorders*, *193*, 31–38. https://doi.org/10.1016/j.jad.2015.12.070

Draper, B., Pfaff, J. J., Pirkis, J., Snowdon, J., Lautenschlager, N. T., Wilson, I., & Almeida, O. P. (2008). Long-term effects of childhood abuse on the quality of life and health of older people: Results from the depression and early prevention of suicide in general practice project. *Journal of the American Geriatrics Society*, *56*(2), 262–271. https://doi.org/10.1111/j.1532-5415.2007.01537.x

Dube, S. R., Anda, R. F., Felitti, V. J., Chapman, D. P., Williamson, D. F., & Giles, W. H. (2001). Childhood abuse, household dysfunction, and the risk of attempted suicide throughout the life span: Findings from the Adverse Childhood Experiences Study. *JAMA: The Journal of the American Medical*

Association, *286*(24), 3089–3096. https://doi.org/10.1001/jama.286.24.3089

Ege, M. A., Messias, E., Thapa, P. B., & Krain, L. P. (2015). Adverse childhood experiences and geriatric depression: Results from the 2010 BRFSS. *The American Journal of Geriatric Psychiatry*, *23*(1), 110–114. https://doi.org/10.1016/j.jagp.2014.08.014

Almeida, O. P, & Almeida, S. A. (1999). Confiabilidade da versão brasileira da escala de depressão em geriatria (gds) versão reduzida, *Arquivos de Neuro-Psiquiatria, 57*, 421–426.

Gilbert, R., Widom, C. S., Browne, K., Fergusson, D., Webb, E., & Janson, S. (2009). Burden and consequences of child maltreatment in high-income countries. *The Lancet*, *373*(9657), 68–81. https://doi.org/10.1016/S0140-6736(08)61706-7

Grassi-Oliveira, R., Cogo-Moreira, H., Salum, G. A., Brietzke, E., Viola, T. W., Manfro, G. G., … Arteche, A. X. (2014). Childhood Trauma Questionnaire (CTQ) in Brazilian samples of different age groups: Findings from confirmatory factor analysis. *PLoS ONE*, *9*(1). https://doi.org/10.1371/journal.pone.0087118

Grassi-Oliveira, R., Stein, L. M., & Pezzi, J. C. (2006). Tradução e validação de conteúdo da versão em português do Childhood Trauma Questionnaire. *Revista de Saude Publica*, *40*(2), 249–255. https://doi.org/10.1590/S0034-89102006000200010

Jeon, H. J., Lee, C., Fava, M., Mischoulon, D., Shim, E.-J., Heo, J.-Y., … Park, J.-H. (2014). Childhood trauma, parental death, and their co-occurrence in relation to current suicidality risk in adults: A nationwide community sample of Korea. *The Journal of Nervous and Mental Disease*, *202*(12), 870–6. https://doi.org/10.1097/NMD.0000000000000217

Kessler, R. C., McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., … Williams, D. R. (2010). Childhood adversities and adult psychopathology in the WHO world mental health surveys. *British Journal of Psychiatry*, *197*(5), 378–385. https://doi.org/10.1192/bjp.bp.110.080499

Keyes, K. M., Eaton, N. R., Krueger, R. F., McLaughlin, K. A., Wall, M. M., Grant, B. F., & Hasin, D. S. (2012). Childhood maltreatment and the structure of common psychiatric disorders. *British Journal of Psychiatry*, *200*(2), 107–115. https://doi.org/10.1192/bjp.bp.111.093062

Kim, S. W., Kang, H. J., Kim, S. Y., Kim, J. M., Yoon, J. S., Jung, S. W., … Jun, T. Y. (2013). Impact of childhood adversity on the course and suicidality of depressive disorders: The crescend study. *Depression and Anxiety*, *30*(10), 965–974. https://doi.org/10.1002/da.22088

Klimes-Dougan, B., Safer, M. A., Ronsaville, D., Tinsley, R., & Harris, S. J. (2007). The value of forgetting suicidal thoughts and behavior. *Suicide & Life-Threatening Behavior*, *37*(4), 431–438. https://doi.org/10.1521/suli.2007.37.4.431

Lecrubier, Y., Sheehan, D. V, Weiller, E., Amorim, P., Bonora, I., Sheehan, K. H., & Dunbar, G. C. (1997). The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: Reliability and validity according to the CIDI. *European Psychiatry*, *12*(5), 224–231. https://doi.org/10.1016/S0924-9338(97)83296-8

MacDonald, K., Thomas, M. L., Sciolla, A. F., Schneider, B., Pappas, K., Bleijenberg, G., … Wingenfeld, K. (2016). Minimization of childhood maltreatment is common and consequential: Results from a large, multinational sample using the Childhood Trauma Questionnaire. *PLoS ONE*, *11*(1), 1–16. https://doi.org/10.1371/journal.pone.0146058

Marcos, G., Simone, L., Santos, A., Legays, L., Abelhas, L., Valencia, E., & Lovisi, G. M. (2006). Epidemioiogical analysis of suicide in Brazil from 1980 to 2006, *31*(Supi ii), 86–94. https://doi.org/http://dx.doi.org/10.1590/S1516-44462009000600007.

Paradela, E. M., Lourenço, R. A., & Veras, R. P. (2005). Validation of geriatric depression scale in a general outpatient clinic, *Revista de Saude Publica, 39*(6).

Miret, M., Ayuso-Mateos, J. L., Sanchez-Moreno, J., & Vieta, E. (2013). Depressive disorders and suicide: Epidemiology, risk factors, and burden. *Neuroscience and Biobehavioral Reviews*, *37*(10), 2372–2374. https://doi.org/10.1016/j.neubiorev.2013.01.008

Nogueira, E. L., Rubin, L. L., Giacobbo, S. de S., Gomes, I., & Neto, A. C. (2014). Screening for depressive symptoms in older adults in the Family Health Strategy, Porto Alegre, Brazil. *Revista de Saude Publica*, *48*(3), 368–377. https://doi.org/10.1590/S0034-8910.2014048004660

Nogueira, E. L., Moretti, P. F., Junior, F. P. R., Diefenthaeler, E. C., Neto, A. C., Engroff, P., … Gomes, I. (2014). The Mental Health Research Protocol of the Multidimensional Study of the Elderly in the Family Health Strategy in Porto Alegre, Brazil (EMI-SUS). *Pan American Journal of Aging Research*, *2*(1), 29–34

Norman, R. E., Byambaa, M., De, R., Butchart, A., Scott, J., & Vos, T. (2012). The long-term health consequences of child physical abuse, emotional abuse, and neglect: A systematic review and meta-analysis. *PLoS Medicine*, *9*(11). https://doi.org/10.1371/journal.pmed.1001349

Perales, R., Gallaway, M. S., Forys-Donahue, K. L., Spiess, A., & Millikan, A. M. (2012). Prevalence of childhood trauma among U. S. Army soldiers with suicidal behavior. *Military Medicine*, *177*(9), 1034–1040.

Poole, J. C., Dobson, K. S., & Pusch, D. (2017). Childhood adversity and adult depression: The protective role of psychological resilience. *Child Abuse & Neglect*, *64*, 89–100. https://doi.org/10.1016/j.chiabu.2016.12.012

Rajalin, M., Hirvikoski, T., & Jokinen, J. (2013). Family history of suicide and exposure to interpersonal violence in childhood predict suicide in male suicide attempters. *Journal of Affective Disorders*, *148*(1), 92–97. https://doi.org/10.1016/j.jad.2012.11.055

Raposo, S. M., Mackenzie, C. S., Henriksen, C. A., & Afifi, T. O. (2014). Time does not heal all wounds: Older adults who experienced childhood adversities have higher odds of mood, anxiety, and personality disorders. *American Journal of Geriatric Psychiatry*, *22*(11), 1241–1250. https://doi.org/10.1016/j.jagp.2013.04.009

Riou, J., Guyon, H., & Falissard, B. (2015). An introduction to the partial least squares approach to structural equation modelling: A method for exploratory psychiatric research. *International Journal of Methods in Psychiatric Research*, *18*(2), 69–83. https://doi.org/10.1002/mpr

Sachs-Ericsson, N., Corsentino, E., Rushing, N. C., & Sheffler, J. (2013). Early childhood abuse and late-life suicidal ideation. *Aging & Mental Health*, *17*(4), 489–94. https://doi.org/10.1080/13607863.2012.758236

Sachs-Ericsson, N., Gayman, M. D., Kendall-Tackett, K., Lloyd, D. A., Medley, A., Collins, N., … Sawyer, K. (2010). The long-term impact of childhood abuse on internalizing disorders among older adults: the moderating role of self-esteem. *Aging & Mental Health*, *14*(4), 489–501. https://doi.org/10.1080/13607860903191382

Sachs-Ericsson, N. J., Rushing, N. C., Stanley, I. H., & Sheffler, J. (2016). In my end is my beginning: Developmental trajectories of adverse childhood experiences to late-life suicide. *Aging & Mental Health*, *20*(2), 139–65. https://doi.org/10.1080/13607863.2015.1063107

Sheehan, D. V., Lecrubier, Y., Sheehan. K. H., Amorim, P., Janavs, J., Weiller, E., … Dunbar, G. C. (2000). Mini International Neuropsychiatric Interview (MINI): The development and validation of a short structured diagnostic psychiatric interview for DSM IV and ICD 10. *The Journal of Clinical Psychiatry*, *22*(3).Taillieu, T. L., Brownridge, D. A., Sareen, J., & Afifi, T. O. (2016). Childhood emotional maltreatment and mental disorders: Results from a nationally representative adult sample

from the United States. *Child Abuse & Neglect, 59*, 1–12. https://doi.org/10.1016/j.chiabu.2016.07.005

Teicher, M. H., Samson, J. A., Anderson, C. M., & Ohashi, K. (2016). The effects of childhood maltreatment on brain structure, function and connectivity. *Nature Reviews Neuroscience, 17*(10), 652–666. https://doi.org/10.1038/nrn.2016.111

Teicher, M. H., & Samson, J. A. (2014). Childhood maltreatment and psychopathology: A case for ecophenotypic variants as clinically and neurobiologically distinct subtypes. *The American Journal of Psychiatry, 170*(105), 108–113. https://doi.org/10.1176/appi.ajp.2013.12070957.

Tunnard, C., Rane, L. J., Wooderson, S. C., Markopoulou, K., Poon, L., Fekadu, A., … Cleare, A. J. (2014). The impact of childhood adversity on suicidality and clinical course in treatment-resistant depression. *Journal of Affective Disorders, 152–154*(1), 122–130. https://doi.org/10.1016/j.jad.2013.06.037

Vares, E. A., Salum, G. A., Spanemberg, L., Caldieraro, M. A., De Souza, L. H., Borges, R. de P., & Fleck, M. P. (2016). Childhood trauma and dimensions of depression: A specific association with the cognitive domain. *Revista Brasileira de Psiquiatria, 38*(2), 127–134. https://doi.org/10.1590/1516-4446-2015-1764

Vares, E. A., Salum, G. A., Spanemberg, L., Caldieraro, M. A., & Fleck, M. P. (2015). Depression dimensions: Integrating clinical signs and symptoms from the perspectives of clinicians and patients. *PLoS ONE, 10*(8). https://doi.org/10.1371/journal.pone.0136037

World Health Organization. (2014). Preventing suicide., *143*(7), 609–610. https://doi.org/ISBN: 978 92 4 156477 9

Annexes

Table 1. Sociodemographic Characteristics and Associations with Suicide Risk

		Suicide risk		
		X^2 test		Logistic Regression
	N(%)	NO	YES	OR (95% CI)
Gender				
male	161(35.9)	150(93.2)	11(6.8)	1
female	288(64.1)	234(81.2)	54(18.8)**	3.49 (1.62-7.53)**
Age				
60-64.9	166(37)	135(81.3)	31(18.7)	1
65-74.9	207(46.1)	187(90.3)	20(30.8)	0.46 (0.23-0.92)
75 +	76(16.9)	62(81.6)	14(18.4)	0.89 (0.39-1.99)
Education				
Illiterate*	116(25.8)	95(81.9)	21(18.1)	1
1-4 years	159(35.4)	136(85.5)	23(14.5)	1.09 (0.39-2.99)
5-7 years	101(22.5)	88(87.1)	13(12.9)	0.85 (0.33-2.22)
8 + years	73(16.3)	65(89.0)	8(11.0)	0.83 (0.29-2.33)
Marital Status				
Married	176(39.6)	152(86.4)	24(13.6)	1
Single	73(16.4)	66(90.4)	7(9.6)	0.48 (0.18-1.27)
Widowed	74(16.7)	64(86.5)	10(13.5)	0.94 (0.40-2.22)
Sep/Divor	121(27.3)	98(81.0)	23(19.0)	1.17 (0.56-2.45)
Ethnicity				
White	297(67.2)	255(85.9)	42(14.1)	1
Black	62(14.0)	50(80.6)	12(19.4)	1.72 (0.79-3.72)
Mixed-Race	74(16.7)	66(89.2)	8(10.8)	0.83 (0.34-1.97)
Other	9(2.0)	7(77.8)	2(22.2)	2.93 (0.53-16.21)
Income				
None	34(8.0)	24(70.6)	10(29.4)*	7.16 (0.75-67.74)
<1 M.S.	244(57.5)	205(84.0)	39(16.0)	4.28 (0.51-35.92)
1to <2 M.S.	119(28.1)	105(88.2)	14(11.8)	3.57 (0.41-30.96)
2+ M.S.	27(6.4)	26(96.3)	1(3.7)	1
Tobacco use				
Current	99(22.0)	82(82.8)	17(17.2)	2.03 (1.08-3.8)*
Never/former	350(78.0)	302(86.3)	48(13.7)	1

Notes: odds ratios adjusted for gender, age, ethnicity, education, income, tobacco use, and marital status.
M.S. Minimum Salary
*$p \leq 0.05$.
**$p \leq 0.001$.

Table 2. Association between Suicide Risk, Childhood Maltreatment, and Geriatric Depressive Symptoms

		Suicide risk			
		X2 test		OR (95% CI)	
Childhood Maltreatment	**N (%)**	**NO**	**YES**	**OR**	**OR-D**
Maltreatment subtypes					
Emotional Abuse	131(29.2)	95(72.5)	36(27.5)**	4.36 (2.34-8.1)**	3.65 (1.93-6.92)**
	318(70.8)	289(90.9)	29(9.1)		
Physical Abuse	153(34.1)	116(75.8)	37(24.2)**	3.61 (1.92-6.76)**	3.16 (1.64-6.07)**
	296(65.9)	268(90.5)	28(9.5)		
Sexual Abuse	44(9.8)	30(68.2)	14(31.8)**	3.74 (1.71-8.16)**	5.1 (2.68-9.69)**
	405(90.2)	354(87.4)	51(12.6)		
Emotional Neglect	129(28.7)	97(75.2)	32(24.8)**	3.24 (1.73-6.07)**	2.43 (1.27-4.66)**
	320(71.3)	287(89.7)	33(10.3)		
Physical Neglect	225(50.1)	184(81.8)	41(18.2)*	1.91(1.04-3.5)*	1.76 (0.92-3.37)
	224(49.9)	200(89.3)	24(10.7)		
Number of dimensions of maltreatments					
0	144(32.1)	132(91.7)	12(8.3)	1	1
1	112(24.9)	106(94.6)	6(5.4)	0.47 (0.15-1.47)	0.4 (0.12-1.28)
2	83(18.5)	71(85.5)	12(14.5)**	1.97 (0.75-5.15)	1.39 (0.51 - 3.81)
3	53(11.6)	37(71.2)	15(28.8)**	5.66 (2.15-14.9)**	4.45 (1.6-12.39)*
4	42(9.4)	28(66.7)	14(33.3)**	6.72 (2.41-18.77)**	5.06 (1.72-14.81)*
5	16(3.6)	10(62.5)	6(37.5)**	10.769 (2.64-43.78)**	7.34 (1.66-32.33)*

Notes: All odds ratios adjusted for gender, age, education, income, marital status, race/ethnicity, and smoking; OR-D adjusted also for geriatric depressive symptoms.

*$p \leq 0.05$.

**$p \leq 0.001$.

Table 3. Logistic Regression Coefficients for Predictors of Suicide Risk

	B	S.E	Wald	OR	95% CI	p
Depressive symptoms	1.63	0.32	25.86	5.11	2.72-9.58	$p \leq 0.001$.
Emotional Abuse	1.47	0.31	21.7	4.36	2.34-8.1	$p \leq 0.001$.
Physical Abuse	1.28	0.32	16.09	3.61	1.92-6.76	$p \leq 0.001$.
Sexual Abuse	1.31	0.39	10.97	3.74	1.71-8.16	$p \leq 0.001$.
Emotional Neglect	1.17	0.31	13.63	3.24	1.73-6.07	$p \leq 0.001$.
Physical Neglect	0.65	0.3	4.46	1.91	1.04-3.50	$p \leq 0.05$.
Emotional Abuse x depressive symptoms	0.34	0.65	0.28	1.41	0.39-1.53	0.595
Physical Abuse x depressive symptoms	-0.11	0.63	0.03	0.89	0.25-3.08	0.860
Sexual abuse x depressive symptoms	-0.29	0.84	0.13	0.74	0.14-3.85	0.722
Emotional neglect x depressive symptoms	-0.52	0.63	0.69	0.59	0.16-2.05	0.407
Physical neglect x depressive symptoms	-0.52	0.65	0.66	0.59	0.16-2.11	0.418

Notes: Each logistic regression analysis adjusted for gender, age, education, income, marital status, race/ethnicity, and smoking.