

# Exposure to Community and Family violence and self-rated health in the Brazilian population

## *Exposição à violência comunitária e familiar e autoavaliação de saúde na população brasileira*

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**ABSTRACT:** *Introduction:* The isolated negative impacts of community violence and family violence on individuals' self-rated health (SRH) are known, but there is little evidence on the combined effect of these two types of interpersonal violence. *Objective:* To analyze the association between exposure to community violence/by strangers and family violence/by acquaintances and negative SRH, distinguishing the type of violence suffered and also considering its cumulative exposure. *Methods:* Epidemiological cross-sectional study developed with data from the National Health Survey (PNS) 2013. Crude multinomial logistic regression models were performed and adjusted to test the association of variables. *Results:* All types of violence analyzed were associated with negative SRH. Isolated community/unknown interpersonal violence was associated with SRH as regular (odds ratio – OR = 1.38) and bad (OR = 1.79). Exposure to family violence/by acquaintances was associated with regular (OR = 1.52) and bad (OR = 2.70) self-assessment. Concomitant exposure to the two types of violence was associated with regular (OR = 4.00) and bad (OR = 7.81) health assessments, with this association being of greater magnitude than those for isolated violence. *Conclusion:* The cumulative effect of exposure to family/known and community/unknown violence enhances the negative assessment of health status. Health professionals must be aware of the multivitaminization and its impact on the health of victims who access health services.

**Keywords:** Exposure to violence. Self-assessment. Health surveys.

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**RESUMO:** *Introdução:* Os impactos negativos isolados da violência comunitária e da violência familiar na autoavaliação de saúde (AAS) dos indivíduos são conhecidos, mas existe pouca evidência sobre o efeito combinado desses dois tipos de violência interpessoal. *Objetivo:* Analisar a associação entre a exposição à violência comunitária/por desconhecidos e à violência familiar/por conhecidos e a AAS negativa, distinguindo o tipo de violência sofrido e também considerando sua exposição cumulativa. *Métodos:* Estudo epidemiológico de corte transversal desenvolvido com os dados da Pesquisa Nacional de Saúde (PNS) 2013. Foram realizados modelos de regressão logística multinominal brutos e ajustados para teste de associação das variáveis. *Resultados:* Todos os tipos de violência analisados se associaram à AAS negativa. A violência interpessoal comunitária/por desconhecidos isolada esteve associada à AAS como regular (*odds ratio* — OR=1,38) e ruim (OR = 1,79). A exposição à violência familiar/por conhecidos mostrou-se associada à autoavaliação regular (OR = 1,52) e ruim (OR = 2,70). A exposição concomitante às duas violências mostrou-se associada à avaliação regular (OR = 4,00) e ruim da saúde (OR = 7,81), sendo essa associação de maior magnitude que aquelas para as violências isoladas. *Conclusão:* O efeito cumulativo da exposição à violência familiar/por conhecido e comunitária/por desconhecido potencializa a avaliação negativa do estado de saúde. Os profissionais de saúde devem estar atentos à polivitimização e ao seu impacto na saúde de vítimas que acessam os serviços de saúde.

*Palavras-chave:* Exposição à violência. Autoavaliação. Inquéritos epidemiológicos.

## INTRODUCTION

According to the World Health Organization (WHO), violence is “the intentional use of physical force or power, real or as a threat, against oneself, against another person, or against a group or a community, which results or is very likely to result in injury, death, psychological damage, developmental disability or deprivation<sup>17</sup>”.

Also according to the WHO, interpersonal violence (IV) can be of a community type (CIV), when the perpetrator is from outside the family circle and the location of the occurrence are generally public spaces, or of a family type (FIV), when committed by known people and mostly indoors<sup>1</sup>.

In Brazil, deaths from IV grew significantly in the late 1980s<sup>2</sup> and since then they have been the number one cause of death in the young population (15 to 24 years old) and among the lost of potential years of life<sup>3-5</sup>. In addition, it is the sixth leading cause of hospital admissions, which represents a large portion of hospital morbidities<sup>4</sup>. In 2016, 62,517 intentional violent deaths and 49,497 rapes were recorded in the country<sup>6</sup>.

The negative health impacts caused by violence are recognized worldwide<sup>1,2</sup>. CIV exposure is associated with depression, aggressive behaviors, post-traumatic stress disorder and chronic pain<sup>7-11</sup>. There is evidence that women exposed to intimate partner violence (IPV) are more likely to experience depression, changes in physical and mental functioning, somatic complaints and chronic pain<sup>12-15</sup>. Likewise, elderly people undergoing FIV have a feeling of frustration, fear, depression and a higher number of morbidities<sup>16</sup>.

Despite efforts in research related to violence, the effects of exposure on health are not always recognized<sup>17</sup>. Thus, self-rated health (SRH) has been considered an important indicator for measuring such effects<sup>18-20</sup>. SRH consists of the perception that individuals have of their own health<sup>18</sup>. Studies show that the tool plays an important role in predicting mortality, morbidity and shorter survival even when clinical measures are taken into account<sup>21-23</sup>, in addition to being an indicator of easy applicability and reproducibility<sup>23</sup>.

Individuals exposed to FIV/by acquaintances or CIV/by strangers have negative SRH and worsening quality of life, with a consequent increase in demands for the health service<sup>24-27</sup>. There is evidence that cumulative exposure to violence is associated with depression<sup>28</sup>, anxiety<sup>28</sup>, greater use of mental health services<sup>29</sup>, symptoms of post-traumatic stress<sup>30,31</sup>, common mental disorders<sup>31</sup>, use of alcohol and drugs<sup>31</sup>, less satisfaction with life<sup>32</sup>, accumulated negative health effects<sup>28</sup>, and worse health status assessment<sup>33</sup>. Although few studies have sought to understand the effect of exposure to both types of violence (community/by strangers and family/by acquaintances) simultaneously in SRH, the results point to a worse perception of health when both types are present in an accumulated manner<sup>28,32,33</sup>.

The effect of concomitant exposure to CIV and FIV on SRH can be understood through the risk accumulation model, according to which the overlap of adverse experiences has a cumulative negative effect on health. This model has been used to explore the effects of adverse experiences in childhood, which trigger physiological responses to acute and chronic stress<sup>33</sup>. Exposure to violence can be considered a social stressor that, when present, triggers humoral and neurophysiological responses that produce negative health outcomes<sup>21</sup>. Most studies consider the effect of a same type of violence (CIV or FIV) with victimization accumulated over time, with few addressing the accumulated exposure to community and family violence<sup>34</sup>.

Our objective was to analyze the association of negative SRH with exposure to FIV/by acquaintances, to CIV/by strangers and both, after adjusting for sociodemographic variables in the Brazilian population over 18 years of age.

## METHODS

This study was developed with secondary data from the National Health Survey (*Pesquisa Nacional de Saúde – PNS*) 2013 — Perception of health status, lifestyles and chronic diseases —, a cross-sectional investigation. Participants of PNS 2013 comprise a subsample of the master sample of the Integrated System of Household Research (*Sistema Integrado de Pesquisas Domiciliares – SIPD*) of the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística – IBGE*). Random sampling by clusters in three stages with stratification was used<sup>35</sup>.

The surveyed population covered 81,167 private households visited across the country. Of these, 69,994 were occupied. For individual interviews, 64,308 residents aged over

18 years were selected, of whom 2,389 were not found and 1,717 refused to answer the investigation, obtaining a final sample of 60,202 individuals<sup>35,36</sup>. All individuals in the final sample were eligible for this study.

Exposure to IV in the 12 months prior to the application of the questionnaire was the independent variable. The elaboration of this variable used the following questions:

- In the past 12 months, did you experience any violence or aggression from an unknown person (such as a thief, police officer, burglar etc.) ?;
- In the past 12 months, did you experience any violence or aggression from a person you know (such as father, mother, child, spouse, partner, boyfriend, friend, neighbor)?

The variable exposure to IV was created with four categories:

- 0: not exposed;
- 1: exposed to CIV (by unknown person);
- 2: exposed to FIV (by known person);
- 3: exposed to CIV and FIV.

SRH was the dependent variable, obtained by asking the following question: in general, how do you evaluate your health? The response options were categorized as: very good/good, regular and very bad/bad.

The following covariables were used for adjustment: gender (male or female), age (categorized by quartiles), race/color (white, black, yellow, brown, indigenous), region of residence in the country (North, Northeast, Central-West, South and Southeast), education (selected as a proxy for socioeconomic conditions and categorized as complete/incomplete higher education, complete/incomplete high school, complete/incomplete elementary school and without education) and score of harmful behaviors to health. For this score, the variables used were binge drinking (ingestion of five or more doses of alcoholic beverages in a single day or time in the month, classified as 0, that is, without binge drinking, 1, equivalent to up to four episodes of binge drinking, and 2, corresponding to more than four binge drinking episodes per month), not performing physical activities and using tobacco, both with two categories each. The answers given were added up, resulting in a score with values ranging from 0 to 4.

## STATISTICAL ANALYSIS

The data were analyzed in Stata version 12.0, and all variables, worked in the categorical way. Initially, a descriptive analysis of the data was carried out using proportions calculations. To analyze the raw association (bivariate), the proportions of SRH (very good/good, regular and bad/very bad) by category of independent variables were calculated, and Pearson's  $\chi^2$  test was used.

For the analysis of the association between exposure to violence and SRH, raw and adjusted multinomial logistic regression was conducted for all covariates. To analyze the existence of a linear trend in the odds ratio (OR) between the types of exposure to violence (community, family, and combined community and family), the  $\chi^2$  trend test was applied.

The analyzes considered the sample structure with strata and sample weights. Statistical significance was assumed arbitrarily at 5%.

The project was sent to the Research Ethics Committee of the Faculty of Medicine of the University of São Paulo and approved, with the Presentation Certificate for Ethical Appreciation (*Certificado de Apresentação para Apreciação Ética* – CAAE) 61603516.2.0000.0065 and opinion number 1.818.294.

## RESULTS

Table 1 shows the characteristics of the studied population. Most individuals were female (52.89%), between 18 and 30 years old (28.33%), complete or incomplete primary level (35.16%), white (47.46%), from the Northeast Region of the country (26.62%), and with harmful health behavior (58.04%). Most of them (66.13%) rated their health as good and 5.44% of respondents were victims of some type of violence.

A greater proportion of women rated their health as regular (30.76%) and bad (7.25%) when compared to men. The percentage of negative SRH was increasing between the age categories and decreasing between the education categories. Whites were the ones who had the lowest proportion of health status assessment as bad (5.36%). The lowest proportion of negative SRH was found among respondents who had no harmful health behavior (2.88%). Exposure to FIV and combined exposure to FIV and CIV were associated with higher proportions of negative evaluation (11.19 and 11.52%, respectively).

Exposure to CIV/by unknown person alone in the raw analysis was not associated with regular or bad SRH, however in the adjusted model it was possible to evidence such an association (Table 2). FIV/by acquainted person alone proved to be linked to regular and bad/very bad SRH in both the crude and adjusted models. After the adjustments, the chance of an SRH as bad/very bad among those exposed to FIV was about three times higher than among those not exposed to violence (OR = 2.70; 95% confidence interval — 95%CI 2.06 – 3.53), and regular assessment, 1.52 times higher than among those not exposed (OR = 1.52; 95%CI 1.25 – 1.85).

Polyvictimization, in turn, was the category with the highest magnitude of association, when we considered the point estimate of OR. Individuals who were exposed to polyvictimization were four times more likely to rate their health as regular (95%CI 2.33 – 6.88) and 7.81 times more likely to rate their health as bad (95%CI 3.04 – 20, 06).

In the case of regular assessment, there is no overlapping of the confidence intervals (CI) found for exposure to exclusive CIV or exclusive FIV and combined exposure. In the bad evaluation, there is no overlapping of the CI found for exposure to exclusive CIV and

Table 1. Socioeconomic and demographic characterization and self-rated health of participants in the National Health Survey (PNS) 2013. Brazil.

Variables	Total sample	Self-rated health			global P
		Good	Regular	Bad	
	%	%	%	%	
<b>Gender</b>					
Male	47.10	69.02	25.66	5.32	< 0.0001
Female	52.89	61.99	30.76	7.25	
<b>Age range (years)</b>					
18 to 30	28.33	80.00	17.91	2.09	< 0.0001
31 to 40	21.22	73.62	22.88	3.50	
41 to 55	26.21	60.51	32.00	7.49	
56 or more	24.21	45.29	41.92	12.79	
<b>Education</b>					
Complete and incomplete high education	17.50	83.01	15.15	1.84	< 0.0001
Complete and incomplete high school	33.64	74.66	22.48	2.86	
Complete and incomplete elementary school	35.16	56.24	35.60	8.16	
Without instruction	13.68	43.66	41.14	15.20	
<b>Race/color</b>					
White	47.46	69.23	25.41	5.36	< 0.0001
Black	9.20	60.86	31.01	8.13	
Yellow	0.94	66.04	27.02	6.94	
Brown	41.98	62.44	30.68	6.88	
Indigenous	0.42	58.27	30.22	11.51	
<b>Region</b>					
Southeast	43.79	71.28	23.90	4.82	< 0.0001
South	14.78	70.61	24.05	5.34	
Midwest	7.36	68.92	25.89	5.19	
North	7.44	62.03	31.25	6.72	
Northeast	26.62	58.26	33.33	8.41	

Continua...

Tabela 1. Continuação.

Variables	Total sample	Self-rated health				global P
		Good	Regular	Bad		
	%	%	%	%		
Score of harmful behaviors to health						
No harmful behavior	23.69	75.58	21.55	2.87	< 0.0001	
1 harmful behavior	58.04	61.70	30.89	7.41		
2 harmful behaviors	13.78	61.69	30.12	8.19		
3 harmful behaviors	3.47	66.43	28.75	4.82		
4 harmful behaviors	0.99	65.41	26.34	8.25		
Self-rated health	100	66.13	28.05	5.82	< 0.0001	
Exposure to violence						
Not exposed	94.56	65.46	28.26	6.28	< 0.0001	
Community only	2.91	63.37	30.43	6.20		
Family only	2.30	52.59	36.22	11.19		
Concomitant exposure	0.23	49.09	39.39	11.52		

concomitant exposure, but there is an overlap between the CI found for exposure to exclusive and concomitant FIV. The trend analysis in the OR shows that there is a significant trend that points to the linear growth of the magnitude of the association between the exposure categories.

## DISCUSSION

Our results confirm the existence of negative health effects associated with exposure to FIV/by acquainted person. Women exposed to IPV most often have negative perceptions about their health status<sup>37-39</sup>, in addition to other negative outcomes for physical and mental health<sup>38-40</sup>. Similar results were found among men victims of IPV<sup>39</sup>, among the elderly<sup>41,42</sup>, children, adolescents, and young people<sup>28,43</sup>.

The health implications of CIV are increasingly studied. As with our findings, existing research makes it clear that victims of CIV assess their health more negatively, use health services more regularly, report more physical health problems, and exhibit health risk behaviors more frequently<sup>1,2,7,10,21,32,44-47</sup>.

Accumulated exposure to violence has also been the subject of studies. It is assumed that the overlap of exposures to negative events, which produce stress, leads to a cumulative

increase in health risk<sup>32-34</sup>. Kadra et al.<sup>31</sup> investigated the effect of overlapping violent experiences in life (victimization, perpetration, and testimony) on the mental health of adults (over 16 years old) in a population-based cross-sectional study in South London and found that prevalence of common mental disorders, drug use and alcohol abuse increases significantly with the increase in the number of experiences.

Polyvictimization in IPV victims, in turn, is associated to a higher frequency of use of mental health services, according to a study conducted with a sample of adult women (over 18 years old) in the United States<sup>29</sup>. The results are consistent when considering the effects of accumulated exposure to different types of violence.

Margolin et al.<sup>28</sup> examined the cumulative effect of exposure to IPV and CIV in young people and noted an increased risk of somatic symptoms (relative risk — RR = 1.12; p <0.05), depressive symptoms (RR = 1.77 ; p <0.001), and anxiety (RR = 1.58; p <0.001) associated with an increase in the number of victimization experiences. Dubow et al.<sup>30</sup> reported a higher risk of depression in young Palestinians exposed to different types of violence (ethnic-political, community, family, and at school). In Brazil<sup>32</sup>, a study sought to investigate the effects of exposure to family and extra-family violence on the subjective well-being of adolescents and found a negative and significant association, indicating that the accumulation of experiences is related to lower subjective well-being. These surveys use different methodologies, which makes comparison difficult, however all point to an accumulated

Table 2. Raw and adjusted association between exposure to violence and self-rated health. National Health Survey (PNS) 2013. Brazil.

Exposure to violence	Raw model				global P
	Regular		Bad		
	OR	95%CI	OR	95%CI	
Not exposed	1	-	1	-	< 0.0001
Community only	1.00	0.84 – 1.20	0.99	0.72 – 1.36	
Family only	1.41	1.17 – 1.69	2.28	1.75 – 2.96	
Community and family	2.38	1.45 – 3.92	3.30	1.46 – 7.44	
Exposure to violence	Adjusted model*				global P
	Regular		Bad		
	OR	95%CI	OR	95%CI	
Not exposed	1	-	1	-	< 0.0001
Community only	1.38	1.13 – 1.69	1.79	1.26 – 2.46	
Family only	1.52	1.25 – 1.85	2.70	2.06 – 3.53	
Community and family	4.00	2.33 – 6.88	7.81	3.04 – 20.06	

\*adjusted for: sex, age, race/color, region of residence in the country, education, and score of harmful behaviors to health; OR: *odds ratio*; 95%CI: 95% confidence interval.



risk effect. Our results confirm these findings and signal an increased risk of negative SRH when accumulated exposure to FIV and CIV.

Efforts have been made to understand the pathophysiological mechanisms of health effects associated with exposure to violence. The studies carried out by Wright<sup>48</sup> are a landmark on the effects of exposure to violence in childhood asthma. According to the author, community violence works as a psychosocial stressor, activating neurophysiological mechanisms of acute and/or chronic response to stress and influencing allostasis. Changes in the levels of cytokines, catecholamines and cortisol explain, for the author, the health effects of exposure to violence. The permanent experience in situations of violence, resulting, for example, from an abusive relationship with an intimate partner, or from living in a neighborhood with high levels of violence, leads to chronic hyperactivity of these mediators, with effects on health and well-being<sup>21,49-51</sup>.

Wright<sup>48</sup> also points out that exposure to violence leads to behavioral changes due to the feeling of insecurity and fear, loss of control over the external environment and life itself, which is related to the greater adoption of health risk behaviors, such as smoking, alcohol abuse, physical inactivity, and changes in eating habits, factors that in turn are associated with negative health effects and negative SRH<sup>21</sup>.

Our results show that the association between FIV/by acquainted person and negative SRH was greater than that of CIV/by acquainted person and SRH, and that of polyvictimization with SRH was superior to that of FIV/by acquainted person with SRH. By understanding violence as a psychosocial stressor, it is possible to understand such findings, as the characteristics between the types of violence differ, making it possible to consider each type of violence as a new stressor. FIV occurs among acquaintances, often in a chronic form, and usually within the home, which should be a safe environment.

In this way, it is possible to understand the increased strength of association between the categories analyzed and, therefore, to emphasize that polyvictimization further enhances the stressor effect of exposure to violence. This cumulative effect was also demonstrated in a longitudinal study carried out with adolescents in 2008, in which a strong gradual association was observed between cumulative exposure to violence and negative SRH, this association being 38% greater for each additional exposure to violence and 4.6 times greater in comparison to those who have not suffered any violence<sup>33</sup>.

Our results need to be analyzed considering the limitations of the present study. The first is that exposure to violence was measured by means of a single general question, and not by different questions about specific acts or situations of violence suffered, such as having been beaten with a slap, having been the victim of humiliation, cursing or have been forced into sex. This way of approaching victimization is recommended as a strategy to minimize information bias and consequent underestimation and incorrect classification, since the perception of violence varies between people, time and different cultures<sup>52</sup>. As a result, prevalences found may be underestimated. In addition, indirect victimization and perceived violence in the community and its effects were not assessed. Another aspect to be taken into account is that the questions refer to violence by unknown or known people. The latter

group includes family members, friends and close acquaintances. It should be noted, however, that most cases (60.6%) are related to victimization by family members.

Although there are instruments translated and validated for Brazil that are more sensitive for detecting cases of violence, their use in a nationwide population-based survey is difficult to apply, as they increase time and complex data collection. In addition, these validated instruments are, in most cases, used in a specific exposure group<sup>53-56</sup>. Thus, it is possible that non-differential classification errors have occurred and that there is an underestimation in the estimates of violence.

Chronic diseases and/or depression were not included as an adjustment variable in our model. Both can have great influence on SRH and be associated with violence. This condition would imply including them in our model as variables with confounding potential, therefore requiring their inclusion as an adjustment variable in the model. It was done so because violence in the PNS was measured in the last 12 months and chronic diseases have no time limit. Therefore, it is not possible to know whether a chronic disease is pre-existing to violence or not.

Furthermore, from a theoretical-conceptual point of view, chronic diseases would be, when and if triggered by the stress mechanisms related to exposure to violence (as one of the factors, not the only one), better conceived as a mediating variable (exposure increases the risk of developing chronic diseases, which, in turn, increases the risk of poor health status assessment), and not as confusing. In this case, the inclusion of the variable to adjust the model would be incorrect. This made us choose not to include chronic diseases in our model as an adjustment variable. The same can be said about depression. PNS uses the Patient Health Questionnaire-9 (PHQ-9) to measure the presence of depression, with a 15-day time reference. However, we consider that depression is better conceived as a mediating variable, and not a confusion variable, which would make the adjustment incorrect.

It should also be noted that our objective in this article was not to explore mechanisms or means of mediation, but only to verify the association between exposure to violence and assessment of health status, taking into account combined exposure to family and community violence.

Furthermore, the literature points out that there are other factors associated with exposure to violence that can contribute to negative SRH, such as anxiety and post-traumatic stress, which were not measured by the PNS and, therefore, could not be adjusted in our final model<sup>6,8,20</sup>.

The transversal nature of the study does not allow us to make longitudinal inferences about the direction of the studied association, however there is a considerable amount of studies that reinforce the hypothesis of association in the sense that violence causes worse SRH, and not the other way around<sup>8,27,31,57,58</sup>.

It is important to remember that, in order to estimate the socioeconomic status of individuals and their families, we chose to use education as a proxy for socioeconomic status, thus avoiding the problem of multicollinearity in our model. It is known that there is a strong association between income and education, but it is possible that there is residual confusion in income, which is associated with both violence and worse SRH.

Among the strong points, it is highlighted that this is a study with a representative sample of the Brazilian population of home base, with high response rate (91.9%), which reduces the possibility of selection bias. The large sample size can also be considered an advantage, allowing the study of events of low prevalence. It should be noted, however, that this same sample size is able to explain the finding of statistically significant differences for associations of small magnitude.

## CONCLUSION

The present study allowed us to observe the association between exposure to violence and negative SRH. Furthermore, it pointed out that exposure to both types of violence greatly increases the chance of a negative assessment of health status.

Although specialized services for caring for victims of community violence are still rare in Brazil, specialized services for caring for victims of family violence are common. The potentiation of the stressor effect of violence through polyvictimization in negative SRH, evidenced by our study, signals the need for these services to be aware of joint exposure to family and community violence. This is more relevant when we consider that in Brazil urban violence is assessed as endemic, there is an increase in State violence and the structural collapse of public policies, which reinforces the possibility of polyvictimization<sup>6</sup>.

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