

## HIGHER RISK OF COMMON MENTAL DISORDERS AFTER EXPERIENCING PHYSICAL VIOLENCE IN RIO DE JANEIRO, BRAZIL: THE *PRÓ-SAÚDE* STUDY

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### ABSTRACT

**Background:** In Brazil, violence is a major public health problem. However, up until now, the extent to which violence acts as a risk factor for mental disorders has not been investigated prospectively.

**Aims:** We determined the risk of common mental disorders (CMD) associated with personal experience with physical violence (PV).

**Methods:** A cohort of 3253 public employees in Rio de Janeiro completed questionnaires that measured CMD (GHQ-12), experience with PV and stressful life events (SLE).

**Results:** After adjusting for age, income and SLE, those who experienced PV in either 1999 or 2001 and those who experienced PV in both years had, respectively, 1.2-fold (95% CI; 1.0–1.4) and 2.1-fold (1.6–2.6) increased risks of CMD.

**Conclusion:** Direct exposure to violence may act cumulatively on the risk of developing CMD. The absence of association for reporting CMD both in 1999 and 2001 suggests that other determinants may be more relevant for chronic mental disorders.

### INTRODUCTION

In recent decades, Brazilian society has undergone significant demographic, economic and social changes, including accelerated urbanization, growing employment instability (and thus greater financial insecurity), and increased violence. These trends have contributed to the high prevalence of common mental disorders (CMD) in the general population (Lima *et al.*, 1996; Ludermit & Lewis, 2005). In large Brazilian cities, violence has attained epidemic levels and has consistently been identified as an important public health problem (Cruz, 1999). Mortality from external causes in Brazil ranks as one of the highest in the world, and in Rio de Janeiro a substantial portion of this mortality is due to homicides (Jorge *et al.*, 1997). Exposure to violence has already been identified as an important stressful life event associated with mental disorders in the developed world (Pastore *et al.*, 1996; Lai, 1999; Bond *et al.*, 2001; Kilpatrick & Acierno, 2003). In Brazil, Lopes *et al.* (2003), using a cross-sectional design, showed an association between exposure to physical aggression and assault or robbery by means of violence and occurrence of common mental disorders. Fleitlich and Goodman (2001) showed that family violence was strongly associated with

higher rates of probable psychiatric disorders among Brazilian 7–14 year olds. However, to our knowledge, the present study is the first using a prospective epidemiological design to investigate the extent to which violence acts as a risk factor for mental disorders in Brazil.

In this study, we examine the effects of personal experience with physical violence (PV) on the onset and persistence of CMD.

## METHODS

### Design and study population

The Pró-Saúde Study is a prospective cohort study of socio-economic and psychosocial influences on health among non-faculty public employees at a university in Rio de Janeiro. Human subjects approval was obtained from the University Ethics Committee. Written informed consent was obtained from all participants.

The study got under way in 1999 (baseline), when all 4459 eligible workers were invited to participate; the overall response rate was 90.4% (4030 participants). The second phase took place in 2001 and the current analyses are based on 3253 subjects (1819 women and 1434 men) who participated in both phases (80.7% of 4030). Employees that had retired or were on a non-medical leave of absence were excluded from the analysis. Compared to the general population, the subject group is characterized by higher levels of education and better income (Chor *et al.*, 2004).

### Measures

Data were gathered using self-administered questionnaires filled out in the workplace. Several methods were used to ensure the validity and reliability of data collection, including a pilot study in phases 1 and 2, test–retest reliability analyses, and double data entry (Faerstein *et al.*, 2005; Lopes & Faerstein, 2001).

Common Mental Disorders (CMD) were assessed in phases 1 (1999–baseline) and 2 (2001), using the validated Brazilian version of the General Health Questionnaire-12 (Mari & Williams, 1985), which showed a sensitivity of 91% and a specificity of 71%. The questionnaire asks about the presence of CMD during the previous two weeks. It is scored by designating each item as absent (0) or present (1); those scoring 3 or more (out of 12) were classified as ‘cases’ (Goldberg & Williams, 1988).

Two questions measured experience with physical violence: ‘In the last twelve months have you been a victim of assault or robbery by means of violence?’ and ‘In the last twelve months have you been a victim of physical aggression?’ The PV variable was coded 1 if the person answered ‘yes’ to at least one of these questions.

Potential confounding variables were age, gender, household income (adjusted for family size) and other stressful life events (SLE). Age and income were continuous variables. SLEs were measured at phase 1 through dichotomous questions which included: hospitalization, severe disease, disruption of a love relationship, forced change of residence, financial strain and death of a close relative. For the current analyses a dichotomous variable was created considering at least one stressful life event in the previous 12 months.

### Statistical analyses

Separate analyses were carried out for onset (proportion of non-cases at phase 1 who became cases at phase 2) and persistence (proportion of cases at phase 1 who were also cases at phase 2)

of CMD. Relative risks (RR) and 95% confidence intervals (95% CI) were estimated through a log-binomial regression model for those who experienced PV in either 1999 or 2001 (PV1) and for those who experienced PV both in 1999 and 2001 (PV2), compared to those unexposed in both periods. Log-binomial regression models are preferred in this situation, in which prevalence of the outcome is greater than 10%, because they provide direct estimates for the relative risks, which would be overestimated if traditional logistic regression models are used (Skov *et al.*, 1998). All the analyses were performed using the STATA 8<sup>TM</sup> software.

## RESULTS

The prevalence of exposure to physical violence in 1999 was 12.4% and in 2001 it was 11.1%. The prevalence of exposure to PV in either 1999 or 2001 was 18.3% and in both 1999 and 2001, it was 4.6%. Overall, the prevalence of CMD was 30% at baseline. In 2001, the proportion of onset of CMD was 21% and the proportion of persistence was 59%. The risk of being a case in phase 2 was 5.4 times (95% CI; 4.6–6.4) greater for those who had been identified as a case at baseline as compared with non-cases.

CMD at phase 2 was associated with being a woman ( $p < 0.0001$ ), having a low per capita income ( $p = 0.002$ ) and being exposed to at least one other stressful life event ( $p < 0.0001$ ). Age, education and ethnic group were not statistically associated with presence of CMD at phase 2. Having experienced physical violence either in 1999 or 2001 was associated with being a woman ( $p < 0.05$ ) and being exposed to at least one other SLE ( $p < 0.0001$ ). Additionally, having experienced PV in both phases was associated only with exposure to at least one other SLE ( $p < 0.0001$ ).

The frequency of onset of CMD at phase 2 among those who experienced PV either in 1999 or 2001 (PV1) and both 1999 and 2001 (PV2) was 26.5% and 44.9%, respectively. Frequency of persistence of CMD was 63.5% for PV1 and 58.8% for PV2. After adjustment for age, gender, income and SLE, the risk of CMD onset for those who experienced PV in either 1999 or 2001 (PV1) was 1.19 (95% CI; 1.0–1.4) and 2.06 (95% CI; 1.6–2.7) for those who experienced PV in both 1999 and 2001 (PV2), when compared to the reference group. Regarding the persistence of CMD, the association with PV was weak and statistically significant only for those who experienced PV in either 1999 or 2001 (RR = 1.15; 95% CI; 1.00–1.3) (Table 1).

## DISCUSSION

Experiencing physical violence in two different periods about two years apart was associated with a greater risk of CMD onset, suggesting a cumulative effect. This result is consistent with the association between victimization and self-reported symptoms of anxiety or depression previously reported (Hawker & Boulton, 2000; Rigby, 2000), and the observed effect sizes for the onset of CMD replicated cross-sectional associations between exposure to physical aggression and assault or robbery by means of violence and CMD found in an earlier analysis of our data (Lopes *et al.*, 2003).

As regards to exposure to PV in 1999, there were no statistically significant differences between participants in both phases of the study (1999 and 2001) and those who participated only at baseline, which indicates the lack of bias due to losses in the follow-up.

**Table 1**  
**Frequencies of onset and persistence of common mental disorders (CMD) according to experience of physical violence in either 1999 or 2001, or at both times, relative risks (RR) and 95 % confidence intervals (95 % CI). Pró-Saúde Study 1999-2001**

Physical violence	Non-cases		Cases		Onset of CMD		Non-cases		Cases		Persistence of CMD	
	n (%)	n (%)	n (%)	n (%)	Crude RR (95% CI)	Adjusted RR* (95% CI)	n (%)	n (%)	Crude RR (95% CI)	Adjusted RR* (95% CI)	Crude RR (95% CI)	Adjusted RR* (95% CI)
Not exposed	1359 (79.1)	359 (20.9)	1.00	1.00	1.00	1.00	331 (46.4)	383 (53.6)	1.00	1.00	1.00	1.00
1999 or 2001	264 (73.5)	95 (26.5)	1.27 (1.0-1.5)	1.19 (1.0-1.4)	1.18 (1.1-1.3)	1.15 (1.0-1.3)	80 (36.5)	139 (63.5)	1.18 (1.1-1.3)	1.15 (1.0-1.3)	1.18 (1.1-1.3)	1.15 (1.0-1.3)
1999 and 2001	43 (55.1)	35 (44.9)	2.15 (1.7-2.8)	2.06 (1.6-2.7)	1.10 (0.9-1.4)	1.05 (0.9-1.3)	28 (41.2)	40 (58.8)	1.10 (0.9-1.4)	1.05 (0.9-1.3)	1.10 (0.9-1.4)	1.05 (0.9-1.3)

\* Adjusted for age (years), gender, household per capita income (continuous), stressful life events in previous 12 months as reported in 1999.

Some limitations of this study should be considered. The use of the GHQ, a self-administered screening instrument, may have detected fewer CMDs relative to what a standardized clinical interview would generate in terms of formal diagnoses. Associations between SLE and victimization with CMD are generally stronger in studies using standardized clinical interviews (Kendler *et al.*, 1998). Since GHQ is sensitive to mild or transient psychological disturbances, non-differential misclassification would be a possibility that might have biased associations toward the null.

Finally, this is a specific occupational cohort, public employees in Rio de Janeiro, and it is uncertain to what extent the findings of this study can be generalized to other occupational groups and countries.

Our results indicate that physical violence may act cumulatively on the risk of developing CMD. The absence of association between PV and persistence of CMD suggests that other determinants may be more relevant for chronic mental disorders.

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