Increase of perceived frequency of neighborhood domestic violence is associated with increase of women's depression symptoms in a nationally representative longitudinal study in South Africa

Susan M. Meffert [a, *], Charles E. McCulloch [b], Thomas C. Neylan [c], Monica Gandhi [d], Crick Lund [e]

[a] University of California, San Francisco, Department of Psychiatry, 401 Parnassus Avenue, San Francisco, CA 94143, USA
[b] University of California, San Francisco, Division of Biostatistics, UCSF Box 0560, 185 Berry Street, Lobby 5, Suite 5700, San Francisco, CA 94107-1762, USA
[c] University of California, San Francisco, Department of Psychiatry, UCSF Box 116P VAMC, 4150 Clement St, San Francisco, CA 94121, USA
[d] University of California, San Francisco, Department of Internal Medicine, 995 Potrero Ave, SFGH 80, San Francisco, CA 94110, USA
[e] Alan J. Flisher Centre for Public Mental Health, Department of Psychiatry and Mental Health, University of Cape Town, 46 Sawkins Road, Rondebosch, 7700 Cape Town, South Africa

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ABSTRACT

Studies that examine the effects of neighborhood characteristics on mental health show that perceptions of general neighborhood violence are associated with depression across diverse populations (Clark et al., 2008; Velez-Gomez et al., 2013; Wilson-Genderson & Pruchno, 2013). However, to our knowledge, none have examined the specific effect of perceived frequency of neighborhood domestic violence (PFNDV) on residents' mental health, despite knowledge that domestic violence is a potent predictor of depression at the level of the individual. This study investigates the impact of PFNDV on mental health using the South African National Income Dynamics Study (SA-NIDS). NIDS Waves 2 and 3 measure the perceived frequency of six neighborhood violence subtypes through the NIDS household respondent questionnaire and depression through a questionnaire administered to all NIDS participants. Linear regression was used to model the relationship between change in depression symptoms and change in violence subtypes between Waves 2 and 3. We found that two-year increase in PFNDV was significantly correlated with increase of depression symptoms over the same time period for women, independently of individual, household and neighborhood level characteristics, including five other types of neighborhood violence. No other type of violence was associated with increased depression in women in the fully adjusted model. Research and policy implications are discussed.

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1. Introduction

Studies that examine the effects of neighborhood characteristics on mental health show that perceptions of general neighborhood violence are associated with depression across diverse populations (Clark et al., 2008; Velez-Gomez et al., 2013; Wilson-Genderson and Pruchno, 2013). However, the specific effect of perceived frequency of neighborhood domestic violence (PFNDV) on residents' mental health has not been examined.

Objective measures of neighborhood violence (e.g., neighborhood violent crime statistics) and residents' perceptions of neighborhood violence are both associated with poor mental health among residents, and the impact of objective measures is thought to be mediated by subjective perceptions of neighborhood violence (Weden et al., 2008). Researchers have examined potential pathways for how residents' perceptions of neighborhood violence might affect their mental health. Although risk of personal victimization is slightly higher if resident's report high perceived neighborhood violence, studies suggest that the dominant mediators of personal mental health impact on residents living in neighborhoods with high perceived violence are not actual victimization, but threat-related feelings of mistrust and powerlessness (Ross and Mirowsky, 2009). The rapidly growing research

* Corresponding author.
  E-mail addresses: Susan.Meffert@ucsf.edu (S.M. Meffert), chuck@biostat.ucsf.edu (C.E. McCulloch), thomas.neylan@ucsf.edu (T.C. Neylan), monica.gandhi@ucsf.edu (M. Gandhi), crick.lund@uct.ac.za (C. Lund).

of social-cognitive neuroscience is consistent with such observations. Investigations of "intersubjectivity" or the psychological relationship between people, have found that neuroscientific processes for producing an understanding of one's self are tightly related to processes governing understandings of others—which may partly explain why perceiving one's neighborhood as threatening to others could translate into feelings of being personally threatened, with related impact on personal mental health (Marchetti and Koster, 2014; Murray et al., 2014; Weden et al., 2008).

At the level of the individual, the relationship between personal domestic violence victimization and depression among survivors is well-established in the field of mental health. Exposure to domestic violence leads to high levels of depression, typically doubling the odds of incident depression among survivors (Devries et al., 2013). The epidemic proportions of domestic violence against women are also well known— the WHO estimates that 35% of women worldwide have experienced violence in their lifetime (WHO|Violence against women, 2013). Despite the knowledge that (1) domestic violence is one of the most potent violence subtypes for individual mental health damage; (2) it is a widespread global problem and; (3) it has the potential to affect the health of whole populations via pathways identified through neighborhood violence research, no studies have examined the impact of perceived neighborhood domestic violence on community mental health.

Our goal is to advance knowledge in this area using the South African National Income Dynamics Study (SA-NIDS). The NIDS measures neighborhood domestic violence by asking household respondents to report their perception of the frequency of domestic violence in their neighborhood. NIDS is the first national household longitudinal study in South Africa and is implemented by the Southern Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town's School of Economics (NIDS|SALDRU Research|South African Income Surveys, 2014). The NIDS includes a household questionnaire that is administered to the oldest woman in the family or another family member who is knowledgeable about the living arrangements, and a separate, adult questionnaire that is administered to everyone living in the household who is over the age of 15 years. The household respondent is asked to report the PFNDV. Depression is measured through the individual questionnaire, using the Center for Epidemiologic Studies-Depression (CES-D) scale, which is administered to all NIDS participants, including household respondents. The NIDS provides a rare opportunity to examine the effects of PFNDV on depression symptoms among household residents. This design allows for assessment of the impact of domestic violence at a population-level, which may be distinct from that related to individual exposure, and may have the potential to inform public health efforts, prevention strategies, and policies regarding law enforcement and safety in low resource settings.

We conducted an analysis of NIDS data to examine relationships between PFNDV and depression symptoms in the 2008, 2010 and 2012 data Waves, controlling for individual, household and neighborhood level variables. We hypothesized that a higher reported PFNDV by household respondents would correlate with higher depression symptoms amongst individual residents and that increase of PFNDV would be associated with increase of depression over the same time period.

2. Materials and methods

2.1. Study population

NIDS began in 2008 with a nationally representative sample which included approximately 16,800 adults in 7296 households (7296 household respondents). Four hundred Primary Sampling Units (PSUs) were selected for NIDS Wave 1 to represent independent households in South Africa's nine provinces. Using a multistage sampling design, PSUs were drawn randomly from the 3000 PSUs of the 2003 South African Labour Force and General Household surveys, District Council strata. NIDS has been repeated with the same households every two years. Currently, data from Waves 1, 2 and 3 are publically available (2008, 2010, and 2012). NIDS is a multi-dimensional study that uses matched household and individual measures to collect data on demographics, depression, social capital, household income, household events and sub-types of perceived neighborhood violence, including PFNDV, gangs, theft/burglary, murder, drugs/alcohol and violence between different households. In 2008, the individual questionnaire non-response rate was 6.7% and household non-response rate was 31% (Woolard et al., 2010). Non-response, differences from national population and attrition were taken into account in the weighting process (design, calibrated and panel weights) and in survey methodology for 2010 and 2012 Waves. See Leibbrandt and colleagues for details of weighting methods (Leibbrandt et al., 2009). Data from all available Waves of the NIDS were used to examine the relationship between depression and perceived frequency of neighborhood violence (all types) for this study.

2.2. Measures

2.2.1. Primary outcome and exposure measures

2.2.1.1. *Depression.* The primary outcome measure was depression on the 10-item version of the CES-D. The original 20 item version of the CES-D was shortened to 10 items to improve clinical utility (Andresen et al., 1994). The CES-D-10 is widely used to screen for depression (Cheng and Chan, 2005; Irwin et al., 1999). The Cronbach's alpha value of the 2008 CES-D-10 in this study is 0.85, similar to the internal consistency observed in prior studies (Björgvinsson et al., 2013). However, the suggested cutoff score on the CES-D 10-item version has been shown to be sensitive but not specific for psychiatric populations—recommended cutoff scores of 8 and 10 resulted in sensitivity of 0.91 and 0.89 and specificity of 0.35 and 0.47 (Björgvinsson et al., 2013). The diagnostic specificity of the CES-D for HIV + populations across Sub-Saharan Africa is also low (Tsai, 2014). Given that the prevalence of depression symptoms among South African women is as high as 20% and HIV infection among adults in South Africa is 18—19%, we elected to model the CES-D-10 continuously as a measure of severity of depression symptoms, rather than limiting our assessment to non-specific diagnostic cutoffs. The CES-D-10 assesses depression symptoms in the past week (e.g., "I felt depressed") which are scored on a 4 point Likert scale: (1) Rarely/none of the time; (2) Some/little of the time; (3) Occasionally/moderate amount of time; (4) all of the time; and summed for a total score ranging from 0 to 30, with higher scores indicating more severe depression. Two of the items are positively worded (e.g., "I was happy") with reverse scoring. Every NIDS participant was asked to complete the CES-D-10.

2.2.1.2. *Perceived Frequency of Neighborhood Domestic Violence (PFNDV).* In 2010 and 2012, the NIDS asked household respondents to report the neighborhood frequency of "violence between members of the same household" using the following question: "How common is violence between members of the same household in your neighborhood?" Response options were: (1) never happens; (2) very rare; (3) not common; (4) fairly common; or (5) very common, scored accordingly with higher number indicating higher frequency. In keeping with other studies in the field of research investigating the health impact of perceived neighborhood characteristics (Kim et al., 2014; Sampson, 2003), the NIDS