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Factors associated with family violence by persons with psychiatric disorders

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ABSTRACT

Family violence by persons with psychiatric disorders (PD) is a highly under-researched area. The primary objective of the present analysis was to identify perpetrator, victim, and interaction/relationship factors associated with this phenomenon. The secondary objective was to examine the extent to which the relationship between caregiving and family violence was mediated by limit-setting practices used towards relatives with PD. 573 adults across the U.S. with an adult relative with PD completed an online survey. Multivariate logistic regression was performed examining the association of factors with the occurrence of family violence. Mediation was assessed with Sobel testing. Family violence was significantly associated with the following factors: perpetrator—income, illegal drug use, psychiatric hospitalization, treatment attendance, and use of medications; victim—age, employment status, income, and mental health status; interaction/relationship—parental relationship, co-residence, use of limit-setting practices, representative payeeship, and unofficial money management. Mediation was statistically significant. Increasing access to mental health and/or substance abuse treatment may decrease the risk of family violence. Interventions may benefit from attempting to decrease/modify the use of limit-setting practices. Where family representative payeeship or unofficial money management exists, it is advisable for practitioners to assess and address financial coercion and promote greater collaboration in financial decision-making.

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1. Introduction

Although accounting for only a small portion of all violence committed (Joyal et al., 2007), persons with major psychiatric disorders (PD) such as schizophrenia, bipolar, or major depressive disorder are between 2 and 8 times more likely to commit acts of violence than are members of the general population (Arseneault et al., 2000; Corrigan and Watson, 2005; Fleischman et al., 2014; Hodgins et al., 1996; Stuart and Arboleda-Flórez, 2001). Unlike violence by the general population (Harlow et al., 2005), it is estimated that approximately half of all violence committed by persons with PD is against family members (Binder and McNeil, 1986; Estroff et al., 1998; Monahan et al., 2001). Studies show that family violence by persons with PD is surprisingly common across western (Chan, 2008; Onwumere et al., 2014; Skinner et al., 1992; Vaddadi et al., 2002) and eastern nations (Kageyama et al., 2015), with a recent review of the literature concluding that "among family members with high levels of contact with their relative with psychiatric disorders, the best available estimate is that 20–35% have been the victim of violence by their relative with psychiatric disorders in the past 6–12 months and at least 40% have been the victim of such violence since their relative's onset of illness" (Labrum and Solomon, 2015a, p. 15). In addition to family members being the most common targets of violence by persons with PD, they compose the vast majority of victims of repeated acts of violence (Estroff et al., 1998) and are significantly more likely than strangers to incur severe injuries—including death—when victimized by this population (Nordström and Kullgren, 2003).

Despite the salience of family violence when considering violence by persons with PD, little research has been conducted regarding family violence by this population across developed nations, with only a handful of quantitative studies being performed in this area in the past decade not exclusively examining intimate partner violence (Ahn et al., 2012; Chan, 2008; Kageyama et al., 2015). It is of paramount importance that factors associated with family violence by persons with PD be identified as such knowledge would enable the identification of persons with PD at risk of perpetrating family violence—to whom prevention and intervention services could be provided—and may indicate areas that interventions should aim to modify in attempting to decrease the risk of violence.

A conceptual model has been created by Solomon et al. (2005),

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proposing that perpetrator, victim, and interaction/relationship factors are associated with violence by persons with PD towards caregivers. Upon reviewing the available literature regarding family violence by this population and proximal fields (i.e. community violence and elder abuse by persons with PD) we have updated this model to explain the occurrence of family violence by this population. Perpetrator characteristics proposed to be associated with a greater risk of family violence include younger age (Heru et al., 2006; Vaddadi et al., 2002), male gender (Witt et al., 2013), unemployment (Swanson et al., 2006), lower income (Witt et al., 2013), diagnosis of schizophrenia or bipolar disorder (Corrigan et al., 2005), use of alcohol or illegal drugs (Arseneault et al., 2000; Elbogen and Johnson, 2009), younger age of onset of illness (Swanson et al., 2002), more frequent history of psychiatric hospitalization (Fleischman et al., 2014; Swan and Lavitt, 1988), medication non-adherence (Greenberg et al., 1990; Swanson et al., 2008), mental health treatment non-attendance (Estroff et al., 1998; Monahan et al., 2001), and history of arrest (Monahan et al., 2001). Victim characteristics proposed to be associated with an increased risk of violence include younger age (Vaddadi et al., 2002), unemployment, lower income (Swan and Lavitt, 1988), and presence of a mental illness (Vaddadi et al., 1997). Interaction/relationship factors include parental relationship (Estroff et al., 1998), greater levels of financial assistance (Estroff et al., 1998) and caregiving with activities of daily living (Labrum and Solomon, 2015b) provided to the relative with PD, co-residence (Straznickas et al., 1993; Swanson et al., 2006), more frequent in-person contact (Elbogen et al., 2005), greater levels of limit-setting practices used towards relatives with PD (Straznickas et al., 1993), and the presence of family representative payeeship (Elbogen et al., 2005) and unofficial money management. The primary objective of the present analysis is to examine the extent to which proposed perpetrator, victim, and interaction/relationship factors are associated with the occurrence of family violence by persons with PD (see Fig. 1).

While several explanations as to why level of caregiving towards relatives with PD may be associated with an increased risk of family violence are feasible (proximity, frustration at denied requests, etc.), a likely explanation is that family members providing higher levels of caregiving more frequently engage in limit-setting practices towards relatives with PD and that the increased use of limit-setting practices results in a greater likelihood of family violence. While empirical studies have yet to examine this potential mediation, such an explanation is highly conceivable as family members providing more caregiving are enabled to engage in greater levels of limit-setting practices via contingently providing valued services to relatives with PD based on behavior modification. Family members providing greater levels of caregiving may also be more motivated to set limits with relatives with PD in an effort to decrease behaviors perceived to exacerbate the need for assistance or due to perceptions that setting limits is a component of caregiving (e.g. assistance contingent on medication adherence or abstinence from drugs). As such, the secondary objective is to examine the extent to which the relationship between degree of caregiving and risk of family violence is mediated by the level of limit-setting practices used towards relatives with PD.

2. Methods

This investigation was conducted in accordance with the latest version of the Declaration of Helsinki. The study design was reviewed and approved by the university Institutional Review Board. Between July 2014 and February 2015, 573 persons residing in the U.S. who report having an adult relative with PD completed an online survey. Each respondent provided information regarding him or herself, their relative with PD, and the interactions they've had with each other in the past 6 months, including if and how often their relative with PD has committed violence against them. It was decided to conduct an online survey as surveys result in less social desirability bias than interviews (Pew Research Center, 2015) and enable recruiting geographically and clinically diverse samples, as opposed to recruiting through persons with PD attending treatment services.

2.1. Sampling

Unfortunately, it is not financially feasible to obtain a truly

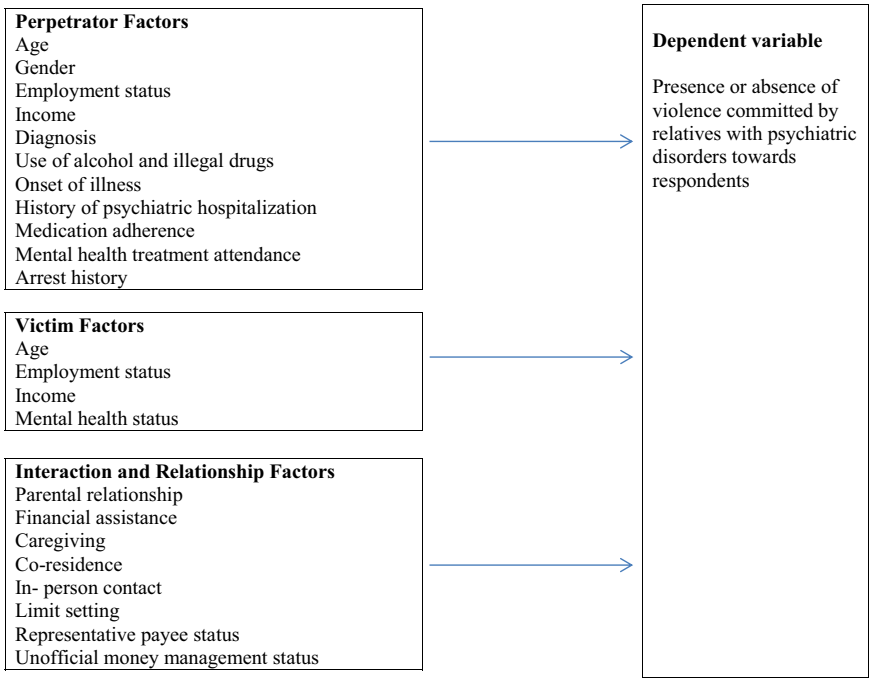

Fig. 1. Factors proposed to be associated with the occurrence of violence by relatives with psychiatric disorders towards respondents.

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representative sample of adults with an adult relative with PD. We attempted to achieve a geographically and demographically diverse sample by using a combination of web-based and in-person methods. Regarding web-based methods, we solicited hundreds of non-profit organizations across the U.S. to distribute an advertisement for the study via online methods, including social media and website posts and inclusion in e-newsletters. Organizations solicited to circulate a web-based announcement primarily included low cost medical care providers, department of aging agencies, food banks, housing assistance organizations, disability advocacy agencies, and various mental illness advocacy and education organizations (e.g. National Alliance on Mental Illness [NAMI], Depression and Bipolar Support Alliance). Advertisement also occurred at two in-person events held by NAMI. Web-based advertisements included a web address where prospective participants could obtain more information regarding the study and participate if willing. In-person advertisements provided the same web address or asked prospective participants to provide their email address, to which this web address was later emailed. Advertisements described the study as intending to explore the interactions family members have with adult relatives with mental illness. From observing the inflow of participation in relation to recruitment efforts it is believed that most respondents were recruited through NAMI.

2.2. Procedure and instrument

Before completing the survey, respondents were informed of the nature and purpose of the study, including the potential benefits and risks of participation. Prior to participating, respondents were required to indicate that they met eligibility criteria (being at least 18 years of age and having an adult relative who has been diagnosed with a mental illness) and that they consented to participate. The survey was estimated to require approximately 15 min to complete. If desired, respondents were entered to win one of eight $50 electronic gift cards. The vast majority (84%) of persons who began the survey completed. No significant differences existed regarding the gender, age, or race of those who completed the survey vs. those who began but failed to complete. It is not possible to calculate the rate of participation of all eligible persons who viewed a study advertisement.

Common survey practices and guidelines (Fowler, 1995) were adhered to in creating the survey. Feedback was received from three administrators of mental health consumer and advocacy organizations, which resulted in minor changes. The survey was pretested with two persons eligible for participation who reported having no difficulty or confusion in completing the survey. Data obtained from pretest participants were excluded from analyses.

2.3. Measures

2.3.1. Dependent variable

Violence committed against respondents by relatives with PD in the past 6 months was measured with questions closely adapted from the MacArthur Community Violence Instrument ([MCVI] Monahan et al., 2001), the standard measure for assessing violence by persons with PD (Desmarais et al., 2014; Elbogen et al., 2006; Swanson et al., 2008). Based on severity, the MCVI categorizes acts of violence as “other aggressive acts” or “acts of violence”. Consistent with other studies regarding family violence by this population (Kageyama et al., 2015; Vaddadi et al., 2002), the present analysis does not differentiate between the severity of violence. Instead, victimization of violence is defined as respondents having indicated that their relative with PD had committed any assaultive act against them or had threatened them with a knife, gun, or any other lethal object, in the past 6 months. Unlike the MCVI, sexual assault was not assessed, as the focus of this analysis is physical violence. Additionally, the current definition of victimization is slightly different from that of the MCVI as, among respondents who reported being threatened with a lethal object, it is not known for certain whether the relative with PD had a weapon in hand at the time of the threat. While the accuracy of self-report is not infallible, it is a more valid means of measuring victimization than official records as 40% of all family violence goes unreported to authorities (Harlow et al., 2005).

2.3.2. Independent variables

Level of caregiving with completion of activities of daily living by respondents to their relative with PD was assessed with seven questions adapted from the Objective Activities of Daily Living Caregiving Scale (Tessler and Gamache, 1993), yielding a Cronbach's alpha of .83 in the present analysis. Total scores can range from 0 to 21, with higher scores indicating a greater level of caregiving. Frequency of financial assistance by respondents towards relatives with PD was measured with the sum of two questions with a Cronbach's alpha of .78 (In the past 6 months about how often did you personally pay for or give your FMMI [family member with a mental illness] money for 1) basic living necessities such as food, transportation, or rent? 2) non-necessities such as spending money, personal items, or cigarettes?). Total scores can range from 0 to 8 with higher scores indicating more frequent financial assistance. Termed limit-setting practices, family members often attempt to modify behaviors they consider problematic that their relative with PD engages in, using a variety of strategies including verbal encouragement and pressure, admission to inpatient treatment, and creation of behavioral, housing, and monetary-based contingency contracts (Labrum et al., 2016). Using the Family Limit-Setting Scale (FLSS), the level of limit-setting practices used by respondents towards relatives with PD was measured. The FLSS is a 10-item scale found to have a number of indicators of construct validity including an acceptable two factor structure (Routine Limit-Setting and Crisis Prevention Limit-Setting correlated at.69) that is highly generalizable to men, women, Caucasian, and Non-Caucasian respondents (Labrum et al., 2016). Total scores on the FLSS range from 0 to 40 and higher scores indicate greater level of limit-setting practices. In the present analysis, the FLSS yielded a Cronbach's alpha of .87.

Remaining independent variables were measured with the use of single straight forward questions. The following variables were measured dichotomously (Yes/No): Perpetrator—use of illegal drugs, regular use of alcohol, psychiatric hospitalization, regular use of mental health medications, regular attendance of mental health treatment, and history of arrest; Interaction—co-residence, representative payee, and unofficial money management. In-person contact was measured with the following response options: not at all =0, less than once a month =1, once a month =2, once a week =3, more than once a week =4. Response options used in measuring gender, race, marital status, employment status, annual income, and primary mental health disorder are listed in Table 1. With the exception of parental relationship, all interaction/relationship factors were measured regarding the past 6 months.

2.4. Analysis

To enable easier interpretation of results, odds ratios were computed as opposed to logit coefficients, requiring that independent variables be dichotomies. As is common (MacCallum et al., 2002), continuous and ordinal independent variables were dichotomized at the median. Non-binary categorical independent variables were dichotomized where we believed would be the most meaningful (e.g. employed full time vs. not employed full-time). With regard to the primary objective of identifying factors

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Table 1
Characteristics of respondents and relatives with psychiatric disorders.

	Characteristics of respondents ($N=573$) % (n)	Characteristics of relatives with psychiatric disorders ($N=573$) % (n)
Gender		
Female	87 (496)	39 (225)
Male	13 (77)	61 (348)
Race		
Caucasian Non-Hispanic	88 (507)	85 (487)
Hispanic	4 (25)	6 (34)
African American	4 (25)	5 (27)
Asian	1 (7)	2 (10)
American Indian	0.7 (4)	0.9 (5)
Other (mixed race)	0.9 (5)	2 (10)
Marital status		
Married or in a civil union	62 (354)	29 (164)
Widowed, separated, or divorced	21 (122)	17 (99)
Never been married	17 (97)	54 (310)
Employment status		
Employed full time	47 (267)	21 (120)
Employed part time	20 (116)	16 (94)
Retired	16 (91)	3 (20)
Unable to work/disabled	7 (39)	38 (215)
Unemployed	10 (60)	22 (124)
Annual income		
Less than $10,000	8 (45)	54 (311)
$10,000–$19,999	8 (43)	15 (80)
$20,000–$39,999	18 (103)	12 (70)
$40,000–$59,999	19 (111)	8 (44)
$60,000–$79,999	15 (85)	4 (22)
$80,000 or more	32 (186)	7 (38)
Primary mental health disorder		
None	58 (330)	NA
Schizophrenia or schizoaffective	2 (12)	31 (177)
Bipolar	12 (67)	40 (230)
Major depressive disorder	11 (65)	13 (76)
Anxiety related disorder	12 (71)	10 (57)
Other (non-major depression, PTSD, ADD)	5 (28)	5 (26)
Unknown	NA	1 (7)
Relation to relative with psychiatric disorders		
Parent	47 (268)	NA
Spouse/romantic partner	20 (113)	NA
Child	12 (69)	NA
Sibling	15 (85)	NA
Other	7 (38)	NA
Psychiatric hospitalization past 12 mo.	NA	34 (195)
Regularly taking MH medications past 6 mo.	NA	77 (443)
Regularly attending MH treatment past 6 mo.	NA	64 (368)

Abbreviations: mo., months; MH, mental health.

associated with the occurrence of family violence, models were estimated by using logistic regression with the presence or absence of violence committed by the relative with PD towards the respondent serving as the dependent variable. Unadjusted odds ratios for independent variables were first estimated. Adjusted odds ratios were then estimated by conducting a forward stepwise logistic regression model specific to each independent variable. The independent variable examined was forced into the model and the remaining independent variables (including limit-setting) were permitted to enter and leave the model based on alpha levels of .05 and .06, respectively. As there are 24 independent variables, 24 multivariate regression models were estimated. The number of retained control variables varied between 8 and 10 across models. This process resulted in an adjusted odds ratio being computed for all independent variables while controlling for all other variables in the model remaining significantly associated with the dependent variable. This process also protected against the risk of near extreme multicollinearity.

The secondary objective of examining the extent to which limit-setting practices mediates the relationship of caregiving with family violence was assessed using Sobel testing to evaluate the statistical significance of the indirect effects of limit-setting practices (Baron and Kenny, 1986; Sobel, 1982). As the independent variable, mediator, and dependent variable are all dichotomous, established adjustments in Sobel testing were performed (Herr, n. d.; MacKinnon and Dwyer, 1993).

3. Results

3.1. Sample characteristics

The mean $\pm$ *SD* age of respondents was 48.94 $\pm$ 14.63 (range 18–88). The vast majority of respondents were female (87%, $n=496$) and Non-Hispanic Caucasian (88%, $n=507$). Two-thirds were either the parent (46%, $n=268$) or spouse/romantic partner (20%, $n=113$) of their relative with PD. Two-thirds were married or in a civil union (62%, $n=354$) and either employed full (47%, $n=267$) or part time (20%, $n=116$). The median annual income of respondents and their spouse/romantic partner if applicable was between $40,000 and $59,999. Sixty percent ($n=346$) of respondents had resided with their relative with PD in the past 6 months. Of the 83% ($n=474$) of respondents who provided their zip code, they resided in 42 states in the U.S.

The mean $\pm$ *SD* age of the relative with PD was 39.34 $\pm$ 15.15 (range 18–87). Sixty one percent ($n=348$) were male and 85% ($n=487$) were Non-Hispanic Caucasian. Over half of the relatives with PD had never been married (54%, $n=310$), were either disabled (38%, $n=215$) or unemployed (22%, $n=124$), and had an annual income less than $10,000 (54%, $n=311$). Primary diagnoses were reported to be bipolar (40%, $n=230$), schizophrenia/schizoaffective (31%, $n=177$), major depression (13%, $n=76$), anxiety related (10%, $n=57$), other (5%, $n=26$), and unknown (1%, $n=7$). More detailed information regarding the characteristics of respondents and relatives with PD is provided in Table 1.

3.2. Rates of violence

Twenty one percent ($n=124$) of respondents reported that their relative with PD committed an act of violence against them in the past 6 months. Forty two (7%) respondents reported that one type of violent act was committed against them once in the past 6 months, with 82 (14%) respondents reporting that either multiple types of violent acts (hitting, slapping, acts of threats etc.) were committed against them or that a specific act was committed multiple times.

3.3. Correlates of violence

Unadjusted and adjusted odds ratios (OR) for the occurrence of violence are presented in Table 2. Adjusted OR indicate that violence was significantly more likely when the relative with PD was reported to have an annual income less than $10,000, to have used illegal drugs in the past 6 months, or to have been psychiatrically hospitalized in the past year. Inversely, violence was significantly less likely when the relative with PD was reported to have regularly taken prescribed mental health medications or to have regularly attended mental health treatment in the past 6 months. Adjusted OR reveal that violence was significantly more likely when the respondent was younger than 53 years old, was not

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Table 2
Factors associated with violent victimization of respondents by relatives with psychiatric disorders in the past 6 months ($N=573$).

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Perpetrator factors		
Younger age (< 37)	1.57 (1.07, 2.35)*	1.34 (0.77, 2.32)
Male gender	1.07 (0.71, 1.62)	0.83 (0.51, 1.35)
Not employed full time	0.94 (0.58, 1.52)	0.84 (0.46, 1.53)
Lower annual income (< $10,000)	1.10 (0.74, 1.64)	1.67 (1.02, 2.70)*
Diagnosis of schizophrenia related or bipolar disorder	1.05 (0.67, 1.63)	1.27 (0.74, 2.18)
Use of illegal drugs past 6 mo.	3.39 (2.22, 5.17)***	2.04 (1.23, 3.68)**
Regular use of alcohol past 6 mo.	1.49 (0.98, 2.25)	0.81 (0.48, 1.37)
Earlier onset of illness (< 20 years of age)	0.95 (0.64, 1.43)	0.67 (0.42, 1.08)
Psychiatric hospitalization past year	2.59 (1.72, 3.89)***	1.93 (1.16, 3.21)*
Regular use of MH medications past 6 mo.	0.65 (0.41, 1.01)	0.53 (0.31, 0.92)*
Regular attendance of MH treatment past 6 mo.	0.55 (0.37, 0.83)**	0.48 (0.29, 0.78)**
Arrested as an adult	1.96 (1.31, 2.94)***	1.38 (0.82, 2.32)
Victim factors		
Younger age (< 53)	1.96 (1.30, 2.96)***	1.75 (1.09, 2.82)*
Not employed full time	1.27 (0.85, 1.90)	1.75 (1.09, 2.82)*
Lower annual income (< $60,000)	1.50 (1.00, 2.24)	1.78 (1.10, 2.88)*
Diagnosed with a mental health condition	1.82 (1.22, 2.72)**	1.72 (1.06, 2.79)*
Interaction/relationship factors		
Being a parent of relative with PD	0.72 (0.48, 1.07)	0.56 (0.34, 0.92)*
More frequent financial assistance (> 2)	2.37 (1.57, 3.58)***	1.25 (0.72, 2.16)
Greater caregiving (> 10)	3.97 (2.58, 6.12)***	1.44 (0.83, 2.53)
Co-residence	2.73 (1.72, 4.32)***	2.38 (1.42, 4.00)**
In-person contact more than once a week	1.97 (1.27, 3.06)***	1.29 (0.70, 2.38)
Greater limit-setting (> 7)	6.14 (3.81, 9.91)***	3.54 (2.07, 6.06)***
Representative payee	2.56 (1.60, 4.08)***	2.93 (1.57, 5.46)***
Unofficial money management	1.67 (1.09, 2.56)*	2.23 (1.31, 3.79)**

Abbreviations: OR, odds ratio; CI, confidence interval; mo., months; MH, mental health; PD, psychiatric disorders.

* $p \leq 0.05$.
** $p \leq 0.01$.
*** $p \leq 0.001$.

employed fulltime, had an annual income (including that of their spouse/romantic partner if applicable) less than $60,000, and had been diagnosed with a mental illness. Adjusted OR indicate that interaction/relationship factors associated with an increased risk of violence were co-residence, engaging in greater levels of limit-setting practices towards relatives with PD (> 7), representative payeeship, and unofficial money management. The only interaction/relationship factor found to be negatively associated with violence after controlling for other significant covariates was being the parent of the relative with PD.

3.4. Mediation

The OR for greater level of caregiving (> 10) with greater level of limit-setting practices (> 7) was 7.42, 95% CI [5.12, 10.75], $p < 0.001$. The adjusted OR for greater level of caregiving after controlling for all variables in the model remaining significantly associated (alpha 0.05) with violence except limit-setting practices was 2.13, 95% CI [1.26, 3.59], $p=0.005$. After additionally controlling for the use of limit-setting practices, the adjusted OR for greater level of caregiving decreased to 1.44, 95% [0.83, 2.53], $p=0.197$. Results of the Sobel Test indicate that the relationship between caregiving and violence is significantly mediated by the use of greater limit-setting practices, ($Z=3.52$, $SE=0.04$, $p < 0.001$).

4. Discussion

Similar to the sample used in the present analysis, previous samples recruited from advocacy/education organizations for persons with family members with PD (i.e. NAMI) disproportionately consist of female and Non-Hispanic Caucasian participants with Non-Hispanic Caucasian relatives (Katz et al., 2015; National Alliance for Caregiving, 2016; Skinner et al., 1992). In pursuit of a more diverse sample, we recruited respondents not only from NAMI but also from an array of other non-profit organizations. Despite these efforts, the present sample is overwhelmingly female and Non-Hispanic Caucasian, with relatives with PD also being disproportionately Non-Hispanic Caucasian. As described previously, we believe that the majority of respondents were recruited from NAMI, with the gender and racial characteristics of the present sample closely approximating those of other samples recruited predominantly or exclusively from NAMI (Katz et al., 2015; National Alliance for Caregiving, 2016; Skinner et al., 1992). Due to the use of convenience sampling and the high likelihood of selection bias, the sample cannot be argued to be representative of any particular group; however, among persons with a relative with PD, the sample likely better represents Non-Hispanic Caucasian women involved in NAMI than the population in general.

The rate of violence perpetrated by relatives with PD towards respondents in the past 6 months found with the current sample (22%) is similar to rates found with other community-recruited samples across developed nations in the past three decades (Labrum and Solomon, 2015a), suggesting that this social problem continues to occur with little change. The consequences of family violence by this population include injury (Vaddadi et al., 1997) and death (Ahn et al., 2012) of family members, greater family burden (Vaddadi et al., 2002), criminal justice involvement of persons with PD (Winick et al., 2010), and surely increased stigmatization of persons with PD (Torrey, 2011). As such, it is of paramount importance that this phenomenon receive attention from mental health practitioners and researchers.

The perpetrator factors found to be associated with family violence in the present analysis—income, illegal drug use, psychiatric hospitalization, medication use, and mental health treatment attendance—have been linked to acts of community violence in the past (Elbogen and Johnson, 2009; Fleischman et al., 2014; Swanson et al., 2008; Witt et al., 2013). However, to our knowledge, some of these factors have either seldom or never been found to be associated specifically with acts of family violence (e.g. medication use or attendance of treatment). As such, the results of the present study have extended much of the knowledge regarding perpetrator factors associated with community violence to the occurrence of family violence. This contribution is valuable in indicating that many strategies espoused to prevent violence in general by persons with PD (e.g. increased access to, and palatability of, mental health and substance abuse treatment) may also help prevent violence committed against family members.

Few studies have examined factors associated with victimization of family violence by this population, with most such studies quickly becoming dated (Estroff et al., 1998; Swan and Lavitt, 1988; Vaddadi et al., 1997, 2002). However, the studies conducted in this area largely corroborate the findings of the present analysis that risk of victimization is positively associated with younger age (Vaddadi et al., 2002), not being employed full-time, lower income (Swan and Lavitt, 1988), and being diagnosed with a mental health condition (Vaddadi et al., 1997). In identifying victim factors associated with family violence, the present analysis provides recent evidence on which family members are most likely to be victims of violence by this population, to whom the risk of victimization should be assessed most, with prevention and intervention

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services being provided to those deemed liable to be a victim of violence. It is especially imperative that the victimization of relatives found to be most at risk (e.g. those with lower incomes and/or mental health conditions) be prevented as such persons are already vulnerable populations.

The present analysis, importantly, sheds light on specific interactions associated with family violence by persons with PD. The finding that co-residence is significantly correlated with violence —which has been identified with acts of community violence by this population (Swanson et al., 2006)—could be interpreted to indicate that sheer proximity and availability play roles in the victimization of family members by this population. Notably, however, this phenomenon appears to also be related to the largely unique interactions relatives have with persons with PD. This is the first study we are aware of that has found, using a psychometrically sound measure, that limit-setting practices are significantly associated with family violence and, indeed, limit-setting practices was the variable most strongly associated with violence. As the study employed a cross-sectional design, it is uncertain whether acts of limit-setting preceded or followed acts of violence. It is conceivable that family members increase the use of limit-setting practices as a result of their relative with PD acting violently towards them, perhaps in an effort to prevent future violence or additional crises. Alternatively, it is also likely that limit-setting practices regardless of the intentions of the family member, may be perceived as unnecessary, coercive, and/or ill intended by relatives with PD, resulting in protest by persons with PD and conflictual relationships prone to the escalation of violence. Providing mild support for this argument, the use of limit-setting practices by mental health professionals is associated with perceptions of decreased therapeutic alliance (Neale and Rosenheck, 2000). Additionally, persons with schizophrenia who felt "listened to" by their families have been found to be significantly less likely to commit violence (Swanson et al., 2006)—a remarkable finding given that the study was concerned with violence perpetrated against both family and non-family members. It is also known that many persons with PD who commit violence against a member of their social network perceive their victim as hostile towards them (Estroff et al., 1994, 1998). Similarly, in a more recent study it was found that the use of incendiary communication by family members towards persons with PD was positively associated with the perception that persons with PD were at risk of harming others (Katz et al., 2015). Further suggesting that limit-setting practices may precede and contribute to acts of violence, two studies able to establish temporal ordering by reviewing official records, have identified that limit-setting practices commonly precede acts of family violence by this population (Ahn et al., 2012; Straznickas et al., 1993).

Given the evidence presented above, it is plausible that family conflict and risk of violence could be ameliorated by modifying the type of limit-setting practices family members use or by decreasing the frequency of such practices. More research is certainly needed; however, it could be beneficial for mental illness education and support organizations to begin addressing with family members how they can set limits with persons with PD in ways that are less likely to be perceived as coercive or ill intended. The FLSS is a brief measure and could be administered to attendees of such organizations to identify persons engaging in high levels of limit-setting practices who may benefit from additional support and guidance in setting limits with their relative with PD in ways less likely to result in undesired outcomes. It may also be helpful for mental health practitioners to explore the perceptions of persons with PD regarding the use of limit-setting practices by family members with remedial action being taken when such perceptions appear to increase conflict or otherwise damage familial relationships. While family members are often not involved in the mental health treatment of persons with PD (Molinaro et al., 2012), available evidence suggests that most persons with PD want such involvement (Cohen et al., 2013), with specific types of family involvement clearly resulting in favorable outcomes for persons with PD (Pharoah et al., 2010). As a result, mental health practitioners have recently been recommended to offer family involvement options to persons with PD (Cohen et al., 2013). When family members are involved in services with persons with PD, it may be beneficial for practitioners to similarly address with family members how to set limits in ways less likely to escalate conflict and the risk of violence.

Previous research has failed to specifically examine the association between caregiving and the risk of family violence; although, it has been found that family members providing greater levels of caregiving or with more negative appraisals of caregiving are more likely to perceive that their relative with PD is at risk of harming others (Katz et al., 2015). The finding that limit-setting practices significantly mediates the relationship between caregiving and family violence not only provides tentative evidence of the role limit-setting practices likely play in family violence but also that caregiving and limit-setting practices are likely intricately linked, perhaps as a consequence of increased motivation and means to set limits. As such, when family members are known by mental health practitioners to be providing high levels of caregiving, it may be beneficial for professionals to assess the level of limit-setting practices used and the risk of family conflict and violence. Caregivers assessed to be at a high risk of violence may benefit from services mentioned above aiming to modify the use of limit-setting practices. Given the indicated connection between caregiving and the use of limit-setting practices, it is also possible that by decreasing levels of family caregiving through providing richer supportive services to persons with PD (e.g. intensive case management), the risk of victimization of violence among family caregivers could be decreased.

When a beneficiary is deemed incapable of managing his or her finances, the Social Security Administration assigns a legal representative payee, who directly receives the beneficiary's benefits and is tasked with ensuring that the beneficiary's basic needs are met (Social Security Administration. A guide for representative payees, 2015a). This is the first study we know of that has specifically found that family members serving as representative payees are significantly more likely to be the victim of violence by relatives with PD. Evidence has been mounting, however, that representative payeeship is associated with conflict (Angell et al., 2007; Dixon et al., 1999). Most notably, in one study, 50% and 36% of family representative payees and recipients, respectively, reported perceiving that family payeeship frequently results in arguments and conflict (Elbogen et al., 2007). In addition, among persons with PD, recipients of family payeeship were found to be twice as likely to commit an act of family violence (Elbogen et al., 2005). Given that the majority of representative payees in the U.S. are family members (SSA, 2015b, 2015c), it is essential that the risk of victimization of this population be ameliorated. It has been suggested that family representative payeeship may result in conflict and violence because payeeship is often misunderstood by payees and recipients and/or because the loss of financial autonomy for relatives with PD ensuing from family representative payeeship may lead to resentments and increased conflict (Elbogen et al., 2005). As such, it has been proposed that conflict may be decreased in families where representative payeeship is present by mental health practitioners providing education to providers and recipients of family payeeship regarding how SSA funds and representative payeeship operate (Elbogen et al., 2008). In addition, it has been suggested that family conflict may be decreased by practitioners facilitating collaboration between persons with PD and their family representative payees in financial decision-making

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and in assisting persons with PD in further developing and practicing their money management skills (Elbogen et al., 2008). Many recipients of family representative payeeship report being financially coerced by their payee (Elbogen et al., 2007), with it being known that financial coercion in the relationships of consumers with PD and professional representative payees leads to increased conflict (Angell et al., 2007). Therefore, it may be especially helpful for mental health practitioners and family support facilitators to assess the use of financial coercion and to encourage family payees to consider alternatives to such coercion.

Similar but distinct from representative payeeship, family members often manage the money of their relative with PD unofficially, with this arrangement not being sanctioned by the SSA or any legal entity (Elbogen et al., 2003). Scarce research has been conducted regarding family members who unofficially manage the money of persons with PD (Elbogen et al., 2003). However, in the U.S., it has been found that the combination of a diagnosis of schizophrenia and being financially dependent on social network members—which may include representative payeeship and unofficial money management—significantly increases the risk of violence (Estroff et al., 1998). Similarly, in Japan, it was very recently found that parents who managed the money of their offspring with schizophrenia—with most believed to be doing so unofficially—were more likely in bivariate analyses to have been a victim of violence (Kageyama et al., 2016). This is the first study to find in multivariate analyses that family members unofficially managing the money of relatives with PD are at a significantly increased risk of violence. While research in this area is desperately needed, it is probable that like family representative payeeship, unofficial money management leads to family conflict and violence by producing resentments in persons with PD as a result of lost autonomy and the use of financial coercion. Consequently, the risk of family conflict and violence among unofficial money managers and persons with PD may possibly also be decreased by practitioners and family support facilitators assessing and addressing acts of financial coercion and promoting greater collaboration between persons with PD and unofficial family money managers.

The finding that after controlling for other significant covariates, parents were significantly less likely to be the victim of violence by persons with PD is inconsistent with previous evidence that mothers are at a much greater risk of violence by persons with PD than are other social network members (Estroff et al., 1998). In interpreting this finding it is important to recognize that parents were only found to be less likely to be the victims of violence upon controlling for other factors significantly associated with violence, including limit-setting practices, family representative payeeship, and unofficial money management—all of which were not specifically examined in the study cited above (Estroff et al., 1998). Available evidence suggests that parents are the relatives most likely to set limits with relatives with PD (Cook, 1988) and to manage their money (Elbogen et al., 2003). It is possible that mothers have previously been found to be at an increased risk of victimization because they engage in greater limit-setting practices and are more likely to be money managers. Future research seeking to understand the risk of violence towards mothers and other relatives by this population should include the use of limit-setting practices and money management in analyses.

Finally, a limitation of the present analysis is the reliance on the self-report of family members, with no information obtained from persons with PD. The accuracy of the present findings depend on the validity of the information provided by respondents, and are thereby tempered. Future research should seek to explore the perceptions of both family members and persons with PD, especially regarding the interactions they have with one another. Similarly, the present analysis is limited in that violence committed by family members towards relatives with PD was not assessed. As such it is unknown what portion of persons with PD reported to have been violent towards respondents were victims of violence by respondents. Future research examining family violence by persons with PD should examine the role mutual violence plays in this phenomenon.

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