2-2013

The Relationship Between Childhood Abuse and Psychosis for Women Prisoners: Assessing the Importance of Frequency and Type of Victimization

Stephanie C. Kennedy
Florida State University

Stephen J. Tripodi
Florida State University, stripodi@fsu.edu

Carrie Pettus-Davis
Washington University in St Louis

The relationship between childhood abuse and psychosis for women prisoners: Assessing the importance of frequency and type of victimization

Stephanie Kennedy, MSW
Doctoral Student
Florida State University
College of Social Work
296 Champions Way
University Center C
Tallahassee, Florida 32306
slc03k@my.fsu.edu

Stephen J. Tripodi, PhD
Assistant Professor
Florida State University
College of Social Work
296 Champions Way
University Center C
Tallahassee, Florida 32306
stripodi@fsu.edu

Carrie Pettus-Davis, PhD
Assistant Professor
Washington University in St. Louis
Brown School
Campus Box 1196
One Brookings Drive
St. Louis, Missouri 63130
cpettusdavis@brownschool.wustl.edu

This study was supported by a grant from the National Institute of Mental Health (Grant #P30 MH079920).

Special thanks to David Edwards of the North Carolina Department of Correction and both the administration and staff at the two prisons where data collection took place.

The authors declare that they have no conflict of interest.

Abstract

This study examines the relationship between childhood victimization and self-reported current symptoms of psychosis in an incarcerated female population in the United States. Participants are 159 randomly selected women incarcerated in two North Carolina state prisons. Participants completed a battery of self-report measures to assess childhood victimization and current and lifetime experience of audio/visual hallucinations and delusions. In accordance with the dose-response model, we hypothesized a predictive relationship between severity, frequency, and type of victimization and psychosis for this sample of women prisoners. Results indicate that women who experienced multi-victimization were 2.4 times more likely to report current symptoms of psychosis than other women prisoners who experienced only physical or sexual victimization in childhood. Likewise, a one-unit increase in frequency of childhood victimization was associated with a 3.2% increased likelihood of having reported symptoms of current psychosis. These results provide support for the dose-response model hypothesis that multi-victimization is an important predictor of psychosis for the women prisoner population. Results indicate that adjusting prison-based mental health services to address the relationship of childhood victimization and symptoms of psychosis may be a key factor in improving outcomes among this population.

Keywords: Women prisoners, psychosis, childhood victimization, dose-response model

Introduction

Little is known about the incidence and prevalence of psychosis among a prisoner population in the United States, although reported rates are disproportionate in European, Canadian, and Australian prisoner populations versus community samples. [1-5] Research suggests that the experience of psychosis may be related to childhood victimization. [6,7] Read et al.[6] and Varese et al.[7] posit a dose-response model to interpret the relationship between childhood victimization and the subsequent experience of psychosis. In this model, the relationship conforms to findings that the more severe or more frequent the abuse the stronger the relationship.[6] This study attempts to fill this gap in the literature by exploring the relationship between specific types of childhood victimization and the experience of psychosis among women prisoners.

Literature Review

The dramatic rise in incarceration rates in the latter half of the twentieth century is generally attributed to the War on Drugs, a term coined by President Nixon in 1971, and mandatory minimum sentencing policies.[8] Since that time, women have comprised the fastest growing prisoner population in the United States, with the total female prisoner population rising from 6,329 in 1971 to 112,797 in 2010.[9] Although the prison system is designed to provide equal services to both men and women prisoners, women prisoners have unique needs compared to their male counterparts. Women prisoners report higher rates of victimization, substance use, and mental health problems when compared to both male prisoners and women in the community.[10-12] Many women enter prison with significant untreated mental and physical health impairments but receive few relevant treatment options during, and especially after incarceration.[13,14]

While incidence and prevalence rates vary by sample, the literature suggests that the majority of women prisoners have experienced childhood physical abuse (CPA), childhood sexual abuse (CSA), or both childhood physical and sexual abuse (CPSA).[15-17] In a comparative study of 127 women prisoners and 109 women in the community, Severson et al.[17] found that 68.2% of women prisoners (versus 47.2% of controls) had experienced CPA and 53.9% of women prisoners (versus 41.5% of controls) had experienced CSA. The differential experience of victimization by group was significantly associated with negative

outcomes for women prisoners including interpersonal violence, rape, health and mental health issues, and drug and alcohol use problems. Likewise, Asberg and Renk[15] assessed the relationship between CSA and psychological symptoms (e.g., depression, posttraumatic stress), difficulties coping, and problematic family functioning in a comparative study of 169 women prisoners and 420 female college students. The women prisoners were more likely to have experienced CSA in general (66.0% versus 35.5%) and to report more severe CSA experiences, more mental health issues, fewer coping strategies, and more problematic family functioning relative to female college students. The rates of CSA reported for women prisoners in both studies are more than double the estimated prevalence rate for women in the general population.[16]

The experience of CPA and CSA is associated with mental health problems in adulthood for incarcerated and non-incarcerated populations. Depression, anxiety, and post-traumatic stress are all hypothesized as the sequelae of childhood abuse.[6] Until recently, however, the experience of psychosis was thought to be strictly genetic, rather than environmental or trauma-based origins. In the past 10 years, a wealth of studies suggest that psychosis, marked by the presence of audio/visual hallucinations or delusions, is also causally related to childhood abuse.[6,7,18-24] Read et al.[6] and Varese et al.[7] suggest a dose-response model to interpret the relationship between violent adverse life events and the subsequent experience of psychosis. In this model, the dose-response relationship of CPA, CSA, and CPSA with the development of psychosis can be explained by the severity, duration, and frequency of these adverse experiences.[6,7] That is, the relationship is causal and conforms to the notion that the more severe the abuse, the stronger the relationship.[6] This model is supported by findings that experiencing CPSA increases the probability of psychosis beyond the probability associated with the experience of CPA or CSA alone.[6]

The relationship between CPA, CSA, and psychosis is evident in both clinical samples and in large-scale general population studies.[7,21,25-27] For example, in a narrative systematic review, Read et al.[6] synthesized 46 studies of female psychiatric patients (39 inpatient; seven outpatient) in which at least half of the women were diagnosed with some form of psychosis. Almost 70% of the women reported either CPA (48%) or CSA (48%). And, in a longitudinal population study of 4045 subjects aged 18-64 years, Janssen et al.[21] found that a reported history of CPA or CSA at baseline predicted the development of psychotic symptoms (e.g., audio/visual hallucinations, paranoia, thought insertion) after controlling for demographic variables, risk factors, and the presence of a psychiatric disorder at baseline. The authors

report that those persons reporting childhood trauma were two and a half times more likely to experience hallucinations.[21]

Building upon these findings, Varese et al.[7] conducted a meta-analysis of the relationship between childhood victimization and the experience of psychosis. Included are 36 total studies: 18 case-control studies (n = 2,048 psychotic patients and 1,856 nonpsychiatric controls), 10 prospective and quasi-prospective studies (n = 41,803) and 8 population-based cross-sectional studies (n = 35,546). The authors report significant associations between childhood victimization and psychosis with an Odds Ratio of 2.78 (95% CI = 2.34–3.31). This relationship endured across population and research design for retrospective and prospective studies. Specific types of victimization (e.g., CPA, CSA, emotional abuse, neglect) were all significantly related to psychosis. The authors suggest a dose-response model with age of exposure and multi-victimization as more powerful predictors of psychosis than any specific type of exposure.

Although many studies suggest that women prisoners have high rates of CPA, CSA, and mental health disorders like depression, anxiety, or post-traumatic stress, the prevalence of psychosis among this population is less clear. A recent Bureau of Justice Statistics report on the prevalence of mental health problems among inmates suggests that 15.4% of state prisoners reported experiencing at least one symptom of psychosis in the previous twelve months.[28] This statistic is compared to 3% self-reported lifetime prevalence of psychotic symptoms among adults in the United States.[28] James and Glaze [28] assert that state prisoners who reported any mental health problem (27%) were almost three times as likely as those with no mental health problems (10%) to also report having experienced CPA or CSA. Although a specific correlation between CPA, CSA, and psychosis is not provided, these descriptive statistics endorse an association between childhood victimization and the subsequent experience of psychosis.

The majority of studies located on the incidence and prevalence of psychosis in prisoner populations are based on samples drawn in England [1,3-5,29-32], Canada [33], and Australia.[2] Rates of psychosis remain disproportionate in prisoner population versus community samples. For example, Singleton et al. [4,5] report the prevalence of psychosis among prisoners (symptoms or formal diagnosis) in England and Wales to be between 6-13% and the prevalence in the adult working population to be less than one half of one percent (0.4%). Additionally, Brugha et al. [1] found a tenfold higher weighted prevalence of psychotic disorders among prisoners in Great Britain when compared to the national household survey. Women

prisoners in England and Wales appear to have slightly higher incidences of psychosis than their male counterparts. O'Brien et al. [32] estimate that 14% of women prisoners in England and Wales are affected by functional psychosis.

In the United States, few studies explore the relationship between CPA, CSA, and psychosis among prisoners. In a review of the literature on violence and dissociation in an offender population, Moskowitz [34] located 12 studies, 10 of which used an adult sample. The findings were mixed, with some studies showing significantly predictive relationships between CPA and dissociation and others between CSA and dissociation. Since the publication of this review, Roe-Sepowitz, Bedard, and Pate [35] conducted a study of women prisoners in Florida. They assessed CPA, CSA, and clinically significant levels of dissociation among 192 women prisoners. Those women in the dissociative group reported higher rates of CPA (60%) versus the non-dissociative group (42%) and reported higher rates of CSA (79%) versus the non-dissociative group (67%). However, a significant predictive relationship was only identified among women who experienced CPA. In this model, women with a history of CPA were more than twice as likely as women without such a history to report clinically significant levels of dissociation. These outcomes add to the mixed findings in the literature about whether CPA or CSA have a stronger predictive relationship with dissociation.[34] Employing the dose-response model, the accumulated risk of multiple types of abuse at higher frequencies is hypothesized to moderate direct relationships between experiences and outcomes. [6,7]

Among prisoners, psychosis is generally conceptualized as an independent or grouping variable, rather than a dependent variable. Variations in rates of incarceration, age at first offence, severity of offence, and presence of substance use or medical disorders among persons diagnosed with schizophrenia or a psychotic disorder are well represented in the literature.[14,36-40] Descriptive facts about the histories and experiences of persons formally diagnosed with a psychotic disorder are informative, and underscore the relationship between incarceration and psychosis. For example, persons diagnosed with schizophrenia or a psychotic disorder are more likely to be incarcerated (and reincarcerated) than persons without such a diagnosis.[14,36,38] And persons experiencing psychosis are more likely than persons with non-psychotic mental health issues and community controls to be homeless and to have substance use issues, both of which are associated with increased rates of criminal activity, incarceration, and recidivism.[37,39,40] However, although the literature suggests a robust relationship between CPA, CSA, and psychosis in both

general and clinical populations and psychosis is acknowledged as a risk factor for incarceration, the relationship between childhood victimization and the experience of psychosis in a female prisoner population in the United States is less clear.[6,7]

Current Study Focus

This study attempts to fill this gap in the literature by analyzing the relationship between specific types of childhood victimization and the experience of psychosis among women prisoners. The dose-response model suggests a positive relationship between multi-victimization, the frequency of childhood victimization, and the experience of psychosis. Therefore, the purpose of this study is to investigate the predictive power of CPA and CSA independently as well as the predictive power of having experienced CPSA. Gaining a deeper understanding of the specific victimization histories of women prisoners and the relationship of those experiences to the current (past 30 days) experience of psychosis is integral to the development of targeted and effective mental health and transition interventions offered to women prisoners. Currently, when mental health services are available within the prison system, they are not trauma-focused, and are not designed to address the pervasive experiences of childhood victimization among this population.[41,42] We used a random sample of women prisoners soon to be released from two state prisoners in the North Carolina to investigate the following research questions:

1. Is there a predictive relationship between type of childhood victimization and psychosis for this sample of women prisoners?
2. Are women prisoners in this sample who experienced higher frequencies of childhood victimization more likely to experience symptoms of psychosis?
3. Does frequency of victimization matter when predicting psychosis for women prisoners who experienced CPA versus CSA in this sample?

We hypothesize that there is a positive relationship between childhood victimization and psychosis in this sample of women prisoners. In line with the dose-response model, we expect that the experience of CPSA will increase the probability of current psychosis more than the experience of CPA or CSA alone.[6] Additionally, in accordance with the dose-response model, we hypothesize that increased frequency of childhood victimization will be associated with a higher likelihood of experiencing current psychosis.

Finally, although the literature is unclear whether CPA or CSA have stronger independent predictive ability with psychosis [6,7], we expect the relationship between frequency of victimization and current incidence of psychosis to be positive – conforming to the dose-response model.

Method

Participants and procedures

A random sample of women prisoners soon to be released from prison (n = 159) was obtained from two state prisons in North Carolina. One of the prisons is a maximum, medium, and minimum level facility that houses over 1,300 prisoners and the other is a minimum security prison that houses approximately 200 prisoners. The sample was randomly selected using a census of all eligible women in one of two prisons in North Carolina who had a scheduled release date within 30 to 120 days of the data collection period. There were 630 potential participants from the two prisons. To be eligible, the prisoner had to be at least 18 years old; English-speaking; and cognitively functioning to the degree that they were able to provide informed consent, and indicate that they understood the nature of the study and what being a study participant entailed.

The researchers randomly selected eligible participants from the sampling frame, which contained women randomly selected from an electronic list provided by the North Carolina Department of Correction. Overall, 190 women were asked to participate in the research and 159 agreed to do so, yielding an 80% response rate. There were no significant differences between women from the two prisons in terms of demographics or constructs of interest for this study, including frequency of childhood victimization, type of childhood victimization, whether the participant has ever experienced psychosis, and whether the participant has experienced symptoms of psychosis the 30 days prior to study participation. Data collection occurred at four intervals in the two prisons from December 2010 to May 2011. All participants were interviewed by a research team member who read out loud the measurements and wrote down the participant responses. All procedures were reviewed and approved by the Florida State University and North Carolina Department of Correction Human Subject Review Boards.

Characteristics of the women who volunteered for the study are in Table 1. The mean age is 33.7 (SD = 9.71) with a range of 18-62. Eighty-eight (55.3%) of the participants are Caucasian, 66 (41.5%) are African American, and 5 (3.1%) are Hispanic. Mean length of incarceration is 18.75 months (SD = 19.68).

The majority of women report that they were victimized as children: 53.9% (*n* = 83) report CPA, 48.7% (*n* = 75) report CSA, and 35.1% (*n* = 54) report no history of abuse. More specifically, 16.2% (*n* = 25) of the total sample report CPA only, 11.7% (*n* = 18) of the total sample report CSA only, and 37% (*n* = 57) of the total sample report CPSA. Data was missing for five participants. Over 42% of the sample (*n* = 67) reported having experienced at least one symptom of psychosis in their lifetime. Of these women, roughly half (*n* = 34; 21.8%) self-reported having experienced these symptoms in 30 days prior to study participation. Data was missing for three participants.

Measures

Each participant completed a battery of standardized assessments including measures of childhood and previous adult victimization, current and lifetime histories of mental illnesses and substance use, and social support. The *Childhood Trauma Questionnaire* (CTQ) and the *Mini International Neuropsychiatric Interview* (MINI) are the sole instruments used in the current analysis.

Childhood Victimization

A 20-item version of the CTQ was used to measure childhood victimization (Bernstein, Fink, Handelsman, & Foote, 1994). When completing the CTQ, the participant was asked how frequently certain events happened to them as a child (up to age 18) on a five-point Likert scale ranging from ‘Never’ to ‘Very Frequently’. The participant was considered to have been sexually victimized if they answered affirmatively to any of the following items: 1) I believe I was sexually abused, 2) Someone molested me, or 3) Someone threatened to hurt me or tell lies about me unless I did something sexual to them. The participant was considered to have experienced childhood physical victimization if they responded affirmatively to the following item from the CTQ: When I was growing up, people in my family hit me so hard that it left me with bruises or marks. The following victimization variables are dichotomous in the first model assessing the relationships between childhood victimization and psychosis: Experienced Physical

and Sexual Victimization, Experienced Physical Victimization and not Sexual Victimization, Experienced Sexual Victimization and not Physical Victimization, and No Victimization.

The total CTQ score is the predictor variable in the second model to assess the relationship between frequency of childhood victimization and psychosis. The total CTQ score is based on the cumulative frequency of childhood victimization. Items on the CTQ asking about familial support were reverse coded so the higher number represented less support. Additionally, the following two items were reverse coded: 1) There was enough food in the house for everything, and 2) I knew that there was someone to take care of me and protect me. The reliability and validity of the CTQ has been established in both clinical and general populations, however psychometric data is not available for use with prison populations. [43,44] For this particular project the CTQ has high internal consistency ($\alpha = .943$). The physical victimization and sexual victimization subscales of the CTQ in the third model to assess the relationship between type of victimization and psychosis. The internal consistency for the physical abuse subscale is $\alpha = .920$ and the internal consistency for the sexual abuse subscale is $\alpha = .977$.

Psychosis

The MINI was used to assess current experiences of psychosis.[45] Psychosis is defined as the presence of audio/visual hallucinations or delusions. Audio/visual hallucinations are operationally defined as having visions while awake, seeing things that other people are not able to see, or hearing things that other people are not able to hear, such as voices. These experiences must be beyond culturally or religiously appropriate boundaries. Delusions are defined as idiosyncratic false beliefs maintained in spite of evidence to the contrary. Specifically, the participant was considered to be experiencing psychosis if they answered affirmatively to any of the items on the psychosis subscale of the MINI. For example, the MINI asks whether the participant currently believes they are being sent special messages through the media, whether some force was putting thoughts in their mind, or whether they hear things other people do not hear, such as voices. Whether or not the participant is currently experiencing symptoms of psychosis or not is a dichotomous variable in this study.

Race is included as a variable in each of the models due to the disproportionate number of African Americans who experience symptoms of psychosis and disparities in incarceration rates nationwide.[46,47] African American women compose approximately 27% of the state and federal female prison population

nationwide.[47] Due to the demographic characteristics of the sample, race is operationalized as a dichotomous variable – the participant is an African American or they are not.

Statistical Analysis

We used binary logistic regression models to assess the relationship between childhood victimization and psychosis for this sample. Binary logistic regression is a nonlinear regression model that allows for the assessment of the relationship between multiple predictor variables and a discrete outcome variable.[48,49] The mean response function is the probability that the observed outcome variable equals the given levels of predictor variables.[48,49] The logistic regression produces an odds ratio. The odds ratios are interpretable in terms of the probabilities of the dependent variable (e.g., currently experiencing symptoms of psychosis) outcome being equal to 1 when all other variables in the model are held equal. The data in this study fit the assumptions of the logistic regression that the outcome variables were binary and the sample was independently and randomly selected.

Predictor variables were included in a forced entry approach without any forward or backward stepwise selection processes. Using a forced entry approach allowed for theoretically informed regression models to be retained.[50] For each model we examined the following: case to predictor variable ratio, multicollinearity by examining the Variance Inflation Factors, model fit, and relationships between predictor variables and the dependent variable. Whether or not the participant is currently experiencing psychosis is the dependent variables in all three models. The predictor variables in the final models are:

Model 1 includes race and the following four victimization variables as the predictor variables: CPA, CSA, CPSA, and no victimization. Model 2, which allows the researchers to assess whether participants with higher frequencies of childhood victimization are more likely to experience psychosis, includes race and total score on the CTQ. Model 3 includes race, CTQ -physical victimization subscale scores, and CTQ-sexual victimization subscale scores. Whether the participant experienced symptoms of psychosis in the past 30 days is the dependent variable in all of the models.

Results

The first research question asks if there is a predictive relationship between the type of childhood victimization experienced (e.g., CPA, CSA, CPSA) and psychosis for this sample of women prisoners. The second research question asks whether women prisoners in this sample who experienced higher frequencies of childhood victimization (as evidenced by the total CTQ score) are more likely to experience symptoms of psychosis than women with lower CTQ scores. Finally, the third research question asks whether frequency of CPA (as evidenced by total score on the physical victimization subscale of the CTQ) has the same statistical power to predict psychosis as frequency of CSA (as evidenced by total score on the sexual victimization subscale of the CTQ) for this sample of women prisoners.

Model One: The Relationship between Severity of Victimization and Psychosis

There were five predictor variables in the first regression model: CPA, CSA, CPSA, no abuse, and race. 154 cases were used for the analysis – five cases had missing data and were excluded from the analysis – which satisfied the minimum case to predictor variable ratio for logistic regression.[48] There were 154 cases and 5 predictor variables, making the ratio 30.8:1. Multicollinearity was assessed by examining the Variance Inflation Factors (VIF).[48] A VIF value of over 10.0 indicates problems of multicollinearity. The VIF values for the variables in this analysis ranged from 1.003-1.265 which suggests that multicollinearity between predictor variables was not evident in this model.

The presence of a relationship between the dependent variable and the combination of predictor variables is based on the statistical significance for the model chi-square for the -2 log likelihood differences between the model with the predictor variables and the model without the predictor variables.[48] The probability of the model chi-square (15.227) was $p = .004$. Therefore, we rejected the null hypothesis that there is no difference between the model with only a constant and the model with the predictor variables, and supported the existence of a relationship between the predictor variables and the dependent variable.

We then examined the relationships between the predictor variables and the dependent variable by analyzing the significance of the Wald test of the beta coefficient and the interpretations of the odds ratios for significant relationships. As indicated in Table 2, the only significant predictor of psychosis was experiencing CPSA (OR = 2.38, $p = .05$). Women in this sample who experienced CPSA were

approximately 2.4 times more likely to report having experienced symptoms of psychosis within the past 30 days.

Model Two: Frequency of Childhood Victimization

The second regression model investigated whether frequency of childhood victimization matters when analyzing the relationship between childhood victimization and psychosis. Total score on the CTQ and race were the predictor variables. The 151 cases for the analysis satisfied the minimum case to predictor variable ratio. Eight cases were missing data and excluded from the analysis. There were 151 cases and two predictor variables, for a ratio of 75.5:1. There was no evidence of multicollinearity; the VIF value for both predictor variables was 1.002.

The logistic regression model indicated a relationship between the dependent variable and the combination of predictor variables. The probability of the model chi-square (11.205) was $p = .004$. Therefore, we rejected the null hypothesis that there is no difference between the model with only a constant and the model with the predictor variables. As indicated in Table 3, total score on the CTQ was a significant predictor of psychosis (OR = 1.032, $p = .003$). A one-unit increase in frequency of childhood victimization was associated with a 3.2% increased likelihood of having reported symptoms of psychosis within the past 30 days, all else being equal.

Model Three: Frequency of CPA versus Frequency of CSA

The third regression model analyzed whether frequency of victimization predicts symptoms of psychosis for women who experienced CPA and women who experienced CSA. The predictor variables were total scores on the childhood physical victimization subscale and sexual victimization subscale along with race. The 153 cases for the analysis satisfied the minimum case to predictor ratio. There are 153 cases and three predictor variables, for a ratio of 51:1. There were no problems of multicollinearity. The VIF values for the predictor variables ranged from 1.06-1.397.

The logistic regression model indicated a relationship between the dependent variable and the combination of predictor variables. The probability of the model chi-square (13.476) was $p = .004$. Therefore, we rejected the null hypothesis that there is no difference between the model with only a constant and the model with the predictor variables. None of the predictor variables were significant with an alpha of .05. However, if the alpha was .10, the total score on the childhood sexual victimization

subscale would be a significant predictor. A one-unit increase in frequency of childhood sexual victimization was associated with being 5.3 times more likely to have reported symptoms of psychosis within the past 30 days, all else being equal.

Discussion

Study findings indicate that type of victimization and frequency of victimization are important predictors of current psychosis among women prisoners. In the current study, two-thirds of the participants self-reported having experienced some form of childhood victimization. This figure, roughly double the estimated prevalence rate of childhood victimization for women living in the community, is consistent with comparable studies using samples of women prisoners.[15,17,51] Additionally, over 42% of the total sample reported having experienced at least one symptom of psychosis in their lifetime. Of these women, roughly half self-reported having experienced these symptoms in 30 days prior to study participation. The rates of psychosis reported here are elevated compared to similar estimates among prisoners in both the United States and Great Britain. For example, studies of general prisoner populations in the United States suggest that 15% of state prisoners have experienced symptoms of psychosis in the previous twelve months.[28] The rates of psychosis reported in the current study may be elevated due to our use of a sample of women prisoners. Women, whether in prison or in the community, consistently self-report higher rates of CPA, CSA, and CPSA than their male counterparts.[6]

In the current study, women prisoners with a history of CPSA were more likely to report current symptoms of psychosis than women prisoners with a history of CPA or CSA alone. Women who experienced CPSA were 2.4 times more likely to report current symptoms of psychosis than women prisoners who did not experience CPSA. These results provide support for the dose-response model of the relationship between childhood abuse and the experience of psychosis. Likewise, results also provide support for the hypothesis that multi-victimization, measured as CPSA in this study, is an important predictor of psychosis.[7] Varese et al.[7] suggest that exposure to one type of childhood abuse increases the risk for exposure to other types of abuse. In their meta-analysis, the authors note that although the majority of studies did not test for a dose-response relationship between childhood abuse and the development of psychosis, 9 of the 10 studies that did investigate this relationship were positive for a dose-response

reaction. The significant relationship between psychosis and CPSA identified in the current study may speak to severity of abuse as an important predictor variable for psychosis. Although severity was not measured in the current study, the experience of CPSA versus CPA or CSA alone may serve as a proxy measure for severity of abuse. Using the dose-response model, the experience of multiple types of victimization would be associated with higher rates of current psychosis.

Study results also indicate that frequency of childhood victimization is a significant predictor of psychosis for women prisoners. In the current study, a one-unit increase in frequency of childhood victimization was associated with a 3.2% increased likelihood of having reported symptoms of current psychosis. Taken together, these findings suggest that victimization and psychosis are related in a dose-response relationship. That is, the accumulated risk of multiple types of abuse and abuse sustained at higher frequencies moderates the relationship between experiences and outcomes.[6,7]

Our finding of non-significant relationships between CPA, CSA, and psychosis with an alpha of .05 mirrors mixed findings in the literature about the predictive power of CPA versus CSA.[7,34,35] The meta-analysis conducted by Varese et al.[7] reported significant relationships between all specific types of victimization (CPA, CSA, emotional abuse, neglect) and psychosis. However, the significance of the relationships may be influenced by the sample size of 81, 253. The current study also differs from the narrative review conducted by Moskowitz [34] and the study of women prisoners in Florida conducted by Roe-Sepowitz et al.[35] in several important ways. First, our study explores audio/visual hallucinations and delusions (the positive symptoms of psychosis) as opposed to dissociation (the negative symptoms of psychosis). Although reported findings about the power of CPA and CSA to predict dissociation in offender populations is mixed, the use of dissociation versus hallucinations and delusions limits the ability to make direct comparisons. Second, both Moskowitz[34] and Roe-Sepowitz et al.[35] use clinically significant levels of dissociation as an outcome variable. The current study considers the presence of symptoms of psychosis regardless of whether or not these symptoms warrant formal diagnosis or cause the respondent psychological distress.

In the current study, although neither CPA nor CSA were significant at an alpha of .05, if the alpha was .10, CSA would be a significant predictor. In this model, a one-unit increase in frequency of childhood sexual victimization was associated with being 5.3 times more likely to have reported symptoms

of psychosis within the past 30 days, all else being equal. Varese et al.[7] suggest a dose-response model with age of exposure and multi-victimization as more powerful predictors of psychosis than any specific type of exposure. The results presented in the current study endorse multi-victimization as a significant predictor of psychosis in the population of women prisoners.

Implications for Policy and Practice

The current study provides a deeper understanding of the specific victimization histories of women prisoners and the relationship of those experiences to the current (past 30 days) experience of psychosis. These findings support the development of targeted mental health and transition services offered to women prisoners. Although mental health services are sometimes available within the prison system, they are generally not designed to address the pervasive experiences of childhood victimization among this population.[41,42] Additionally, persons experiencing psychosis are generally not offered trauma-focused services when they do make contact with either prison-based or community mental health systems.[6]

The provision of effective mental health services to women in prison is of particular importance as some authors suggest that women offenders have better access to mental health counseling while incarcerated than in the community.[13] To contextualize this finding, James and Glaze [28] report than only 33% of state prisoners with a documented mental health disorder received any mental health treatment or counseling while in custody. The majority of women in the current study (66%) report that they were victimized as children. Although just over one-fifth of the sample reported having experienced symptoms of psychosis within the past 30 days (n = 34), over 42% of the sample reported having experienced at least one symptom of psychosis in their lifetime.

Adjusting prison-based mental health services to address experiences of childhood victimization and the symptoms of psychosis may be a key factor in reducing recidivism among this population.[39] Although studies suggest that recidivism rates are equivalent among inmates with and without mental health diagnoses, these results obscure key variables associated with the experience of psychosis. Persons experiencing psychosis are more likely than persons with non-psychotic mental health issues to be

homeless and to have co-occurring substance use problems.[37,40] Homelessness and substance use have been identified as significant predictors of recidivism for this population.[37]

Limitations

The current study is part of a larger project assessing the relationship between childhood victimization and recidivism with mental health and substance use as mediating variables. Therefore, women prisoners were only eligible for randomization into the study if they were between 30 and 120 days of release at time of interview. This sampling methodology may impact the results presented in unforeseen ways. Additionally, the retrospective, cross-sectional self-report methodology of the current study limits the interpretations that can be made from its results. Participants' recollection of their childhood experience of physical and sexual abuse may have been affected by memory distortion and social desirability factors may translate into under- or over-reporting of their childhood histories or current levels of distress. However, although childhood victimization data was gathered from a retrospective self-report measure, there is evidence that retrospective accounts of trauma exposure tend to underestimate, rather than overestimate incidence rates.[52] Likewise, Fisher, Craig, and Fearon [53] have validated the use of retrospective measures of childhood abuse among patients diagnosed with psychosis. Further, although an 80% response rate is quite good, potential participants who declined to join the study may differ in key ways from the final sample. Finally, the current sample is limited by an underrepresentation of Hispanic women when compared to both incarcerated and non-incarcerated populations in the United States.

Limitations of the analyses include a lack of data on when childhood abuse first occurred and how that abuse relates to the onset of psychotic symptoms. The current data only provides information on lifetime prevalence (dichotomous yes or no) and past 30 days incidence of psychosis. The current analysis uses only current incidence of psychosis as an outcome variable to ensure that the victimization occurred prior to psychotic symptoms. Nuanced information about the relationship between abuse and psychosis is absent and limits the ability to draw meaningful conclusions about the experience of psychosis among this population.

A primary strength of the study design, however, is the use of self-reported symptoms of psychosis, rather than a formal diagnosis of schizophrenia or another psychotic disorder. Although some

studies suggest that persons diagnosed with psychotic disorders are more often minority and poor, it is unclear whether these groups have higher incidence and prevalence of psychosis or whether these groups are more often referred for diagnosis through the criminal justice system.[46,54] The research design focused on symptoms of psychosis versus formal diagnosis to mitigate this concern. However, in the current analysis, results from all three models indicate that race is not a significant predictor variable for psychosis within the population of women prisoners.

Additional research is needed among this population to aid in the provision of mental health services within prisons and to inform both transition and re-entry planning. Results from the current study endorse the presence of a dose-response relationship between childhood victimization and the experience of psychosis in adulthood. Participants who sustained multi-victimization and more frequent victimization were more likely than other victimized women to report symptoms of psychosis within the past 30 days. Future research is needed to explore the impact of the dose-response relationship between childhood victimization and psychosis for this population.

References

1. Brugha T, Singleton N, Meltzer H, et al. Psychosis in the Community and in Prisons: A Report From the British National Survey of Psychiatric Morbidity. *Am J Psychiatry.* 2005;162(4):774-780.

2. Nielssen O, Misrachi S. Prevalence of psychoses on reception to male prisons in New South Wales. *Aust N Z J Psychiatry.* 2005;39(6):453-459.

3. Singleton N, Bumpstead R, O'Brien M, Lee A, Meltzer H. Psychiatric morbidity among adults living in private households, 2000. *Int Review Psychiatry*. 2003;15(1-2):65-73

4. Singleton N, Meltzer H, Gatward R. Psychiatric morbidity among prisoners in England and Wales. In: Statistics OfN, ed. London: Office for National Statistics; 1998.

5. Singleton N, Pendry E, Taylor C, Farrell M. Drug-related mortality among newly released offenders. In: Archives BN, ed. London: British National Archives; 2003.

6. Read J, van Os J, Morrison AP, Ross CA. Childhood trauma, psychosis and schizophrenia: A literature review with theoretical and clinical implications. *Acta Psychiatr Scand.* 2005;112(5):330-350.

7. Varese F, Smeets F, Drukker M, et al. Childhood adversities increase the risk of psychosis: A meta-analysis of patient-control, prospective- and cross-sectional cohort studies. *Schizophr Bull.* 2012;38(4):661-671.

8. Moore LD, Elkavich A. Who's using, and who's doing time: Incarceration, the war on drugs, and public health. *Am J Public Health.* 2008;98(Suppl 1):S176-S180.

9. Guerino P, Harrison PM, Sabol WJ. Prisoners in 2010. In: Statistics BoJ, ed: Bureau of Justice Statistics; 2011.

10. Greenfield L, Snell TL. Women offenders. In: Statistics BoJ, ed. Washington D.C.: Bureau of Justice Statistics; 1999.

11. Hicks BM, Vaidyanathan U, Patrick CJ. Validating female psychopathy subtypes: Differences in personality, antisocial and violent behavior, substance abuse, trauma, and mental health. *Pers Disord.* 2010;1(1):38-57.

12. Houser KA, Belenko S, Brennan PK. The effects of mental health and substance abuse disorders on institutional misconduct among female inmates. *Justice Q.* 2012;29(6):799-828.

13. Blitz CL, Wolff N, Shi J. Physical victimization in prison: The role of mental illness. *Int J Law Psychiatry.* 2008;31(5):385-393.

14. Cuddeback GS, Scheyett A, Pettus-Davis C, Morrissey JP. General medical problems of incarcerated persons with severe and persistent mental illness: A population-based study. *Psychiatr Serv.* 2010;61(1):45-49.

15. Asberg KK, Renk K. Comparing incarcerated and college student women with histories of childhood sexual abuse: The roles of abuse severity, support, and substance use. *Psychol Traum.* 2012.

16. Briere J, Elliott DM. Prevalence and psychological sequelae of self-reported childhood physical and sexual abuse in a general population sample of men and women. *Child Abuse Negl.* 2003;27(10):1205-1222.

17. Severson M, Postmus JL, Berry M. Incarcerated women: Consequences and contributions of victimization and intervention. *Int J Prisoner Health.* 2005;1(2-4):223-240.

18. Bendall S, Jackson HJ, Hulbert CA. Childhood trauma and psychosis: Review of the evidence and directions for psychological interventions. *Aust Psychol.* 2010;45(4):299-306.

19. Cloitre M, Tardiff K, Marzuk PM, Leon AC, Portera L. Consequences of childhood abuse among male psychiatric inpatients: Dual roles as victims and perpetrators. *J Trauma Stress.* 2001;14(1):47-61.

20. Conus P, Berk M, Schafer I. Trauma and psychosis: Some aspects of a complex relationship. *Acta Neuropsychiatrica.* 2009;21(3):148-150.

21. Janssen I, Krabbendam L, Bak M, et al. Childhood abuse as a risk factor for psychotic experiences. *Acta Psychiatr Scand.* 2004;109(1):38-45.

22. Larkin W, Read J. *Childhood trauma and psychosis: Revisiting the evidence.* New York, NY, US: Routledge/Taylor & Francis Group, New York, NY; 2008.

23. Morrison AP, Frame L, Larkin W. Relationships between trauma and psychosis: A review and integration. *Brit J Clin Psychol.* 2003;42(4):331-353.

24. Read J, Ross CA. Psychological trauma and psychosis: Another reason why people diagnosed schizophrenic must be offered psychological therapies. *J Am Acad Psychoanal.* 2003;31(1):247-268.

25. Davidson G, Devaney J, Spratt T. The impact of adversity in childhood on outcomes in adulthood: Research lessons and limitations. *J Soc Work.* 2010;10(4):369-390.

26. Freeman D, Fowler D. Routes to psychotic symptoms: Trauma, anxiety and psychosis-like experiences. *Psychiatry Res.* 2009;169(2):107-112.

27. Shevlin M, Dorahy MJ, Adamson G. Trauma and psychosis: An analysis of the National Comorbidity Survey. *Am J Psychiatry.* 2007;164(1):166-169.

28. James DJ, Glaze LE. Mental health problems of prison and jail inmates. In: Statistics BoJ, ed. Washington D.C.: Bureau of Justice Statistics; 2006.

29. Carlin P, Gudjonsson G, Rutter S. Persecutory delusions and attributions for real negative events: A study in a forensic sample. *J Forensic Psychiatr.* 2005;16(1):139-148.

30. Farrell M, Boys A, Pebbington P, et al. Psychosis and drug dependence: Results from a national survey of prisoners. *Brit J Psychiat.* 2002;181(5):383-398.

31. Melzer D, Tom BDM, Brugha T, et al. Prisoners with psychosis in england and wales: A one-year national follow-up study. *Howard J Crim Justice.* 2002;41(1):1-13.

32. O'Brien M, Mortimer L, Singleton N, Meltzer H, Goodman R. Psychiatric morbidity among women prisoners in England and Wales. *Int Rev Psychiatr.* 2003;15(1-2):153-157.

33. Bland RC, Newman SC, Dyck RJ, Orn H. Prevalence of psychiatric disorders and suicide attempts in a prison population. *Can J Psychiat.* 1990;35(5):407-413.

34. Moskowitz A. Dissociation and Violence: A Review of the Literature. *Trauma Violence Abuse.* 2004;5(1):21-46.

35. Roe-Sepowitz D, Bedard LE, Pate K. The impact of child abuse on dissociative symptoms: A study of incarcerated women. *J Trauma Diss.* 2007;8(3):7-26.

36. Baillargeon J, Binswanger IA, Penn JV, Williams BA, Murray OJ. Psychiatric disorders and repeat incarcerations: The revolving prison door. *Am J Psychiatry.* 2009;166(1):103-109.

37. Draine J, Salzer MS, Culhane DP, Hadley TR. Role of social disadvantage in crime, joblessness, and homelessness among persons with serious mental illness. *Psychiatr Serv.* 2002;53(5):565-573.

38. Hawthorne WB, Folsom DP, Sommerfeld DH, et al. Incarceration among adults who are in the public mental health system: Rates, risk factors, and short-term outcomes. *Psychiatr Serv.* 2012;63(1):26-32.

39. Lamberti JS. Understanding and preventing criminal recidivism among adults with psychotic disorders. *Psychiatr Serv.* 2007;58(6):773-781.

40. McGuire JF, Rosenheck RA. Criminal history as a prognostic indicator in the treatment of homeless people with severe mental illness. *Psychiatr Serv.* 2004;55(1):42-48.

41. Fournier AK, Hughes ME, Hurford DP, Sainio C. Investigating Trauma History and Related Psychosocial Deficits of Women in Prison: Implications for Treatment and Rehabilitation. *Women Crim Justice.* 2011;21(2):83-99.

42. Sorbello L, Eccleston L, Ward T, Jones R. Treatment needs of female offenders: A review. *Aust Psychol.* 2002;37(3):198-205.

43. Bernstein DP, Fink L. *Childhood Trauma Questionnaire: A retrospective self-report manual.* San Antonio, TX: The Psychological Corporation.;1998.

44. Bernstein DP, Fink L, Handelsman L, Foote J. Initial reliability and validity of a new retrospective measure of child abuse and neglect. *Am J Psychiatry.* 1994;151:1132-1136.

45. Sheehan DV, Lecrubier Y, Sheehan H, et al. The Validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability. *Eur Psychiat.* 1997;12(5):232-241.

46. Gelber EI, Kohler CG, Bilker WB, et al. Symptom and demographic profiles in first-episode schizophrenia. *Schizophr Res.* 2004;67(2-3):185-194.

47. West HC, Sabol WJ. Prisoners in 2009. In: Statistics BoJ, ed. Washington D.C.: Bureau of Justice Statistics; 2010.

48. Hosmer DW, Lemeshow S, Klar J. Goodness-of-fit testing for multiple logistic regression analysis when the estimated probabilities are small. *Biometrical J.* 1988;30(7):1-14.

49. Kutner MH, Nachtsheim CJ, Neter J, Li W. *Applied linear statistical models.* 5th ed. New York: McGraw-Hill Irwin; 2005.

50. Field A. *Discovering statistics using SPSS.* 3rd ed. Thousand Oaks, CA: Sage; 2009.

51. Briere J. *Trauma Symptom Inventory: Professional Manual.* Psychological Assessment Resources, Inc.;1995.

52. Hardt J, Rutter M. Validity of adult retrospective reports of adverse childhood experiences: review of the evidence. *J Child Psychol Psyc.* 2004;45(2):260-273.

53. Fisher HL, Craig TK, Fearon P, et al. Reliability and comparability of psychosis patients' retrospective reports of childhood abuse. *Schizophr Bull.* 2011;37(3):546-553.

54. Scheff TJ. The labeling theory of mental illness. *Am Sociol Rev.* 1974;39(3):444-452.

Table 1: *Characteristics of the Sample*

	Mean	SD
Age at incarceration (*n* = 159)	33.7	9.71
	Frequency	**Percent**
Race (*n* = 159)		
African American	66	41.5
Caucasian	88	55.3
Hispanic	5	3.1
Victimization (*n* = 154)		
CPA only	25	16.2
CSA only	18	11.3
CPSA	57	37.0
Not victimized	54	35.1
Psychosis		
Psychosis in lifetime (*n* = 156)	67	42.9
Psychosis last 30 days (*n* = 156)	34	21.8

Table 2: *Severity of Victimization and Psychosis*

Predictors	*B (SE)*	OR	*p*	Wald
Race	.648(.41)	1.91	.12	2.448
CPA only	-.942(.820)	039	.25	1.321
CSA only	-1.365(1.09)	.255	.21	1.567
CPSA	.865(.45)	2.37	.05	3.671

Table 3: *Frequency of childhood victimization and psychosis*

	Models 2 and 3							
	Model 2				Model 3			
Predictors	*B (SE)*	OR	*p*	Wald	*B (SE)*	OR	*p*	Wald
Race	.757(.42)	2.13	.07	3.248	.654(.42)	1.923	.12	2.483
CTQ-Total Score	.031(.01)	1.032	.003	8.564	N/A	N/A	N/A	N/A
CTQ-Physical Abuse Subscale	N/A	N/A	N/A	N/A	.049(.04)	1.050	.192	1.704
CTQ-Sexual Abuse Subscale	N/A	N/A	N/A	N/A	.051.(.03)	1.053	.06	30334