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Adverse childhood experiences and intimate partner aggression in the US: Sex differences and similarities in psychosocial mediation

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Abstract

Six in ten people in the general population have been exposed to adverse childhood experiences (ACEs). Intimate partner violence (IPV) is a major public health problem in the US. The main objective of this study was to assess sex differences in the role of posttraumatic stress disorder (PTSD), substance abuse, and depression as mediators in the association between ACEs and intimate partner aggression. Data were obtained from Wave 2 (2004–2005) of the National Epidemiologic Survey on Alcohol and Related Conditions. Structural equation modeling was used to determine the mediational role of PTSD, substance abuse and depression in the association between ACE constructs (neglect, physical/psychological abuse, sexual abuse, parental violence, and parental incarceration/psychopathology) and intimate partner aggression. Among men, PTSD mediated the relationship between sexual abuse and intimate partner aggression. However, among men and women, substance abuse mediated the relationship between physical and psychological abuse and intimate partner aggression. IPV programs geared towards aggressors should address abuse (sexual, physical and psychological), which occurred during childhood and recent substance abuse and PTSD. These programs should be implemented for men and women. Programs aimed at preventing abuse of children may help to reduce rates of depression and PTSD in adulthood, and subsequent intimate partner aggression.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.socscimed.2015.02.044>

Keywords

Adverse childhood experiences; Intimate partner aggression; Posttraumatic stress disorder; Depression; Substance abuse; Structural equation modeling; Mediation

1. Adverse childhood experiences

Adverse childhood experiences (ACEs) are negative events that a child may experience, including emotional, physical and sexual abuse, witnessing parental violence, or a family member's mental illness, incarceration or substance abuse (Anda et al., 2010; Centers for Disease Control and Prevention (CDC), 2010a). Recent estimates show that six in ten people in the general population have been exposed to at least one ACE (Brown et al., 2013a), and studies have shown an association between exposure to ACEs and adverse health outcomes, including cancer (Brown et al., 2013a, 2010), cardiovascular disease (Felitti et al., 1998; Dong et al., 2004), and diabetes (Felitti et al., 1998). ACEs have also been linked to mental health disorders such as substance abuse (Felitti et al., 1998; Jewkes et al., 2010; Oladeji et al., 2010; Strine et al., 2012; Wu et al., 2010), depression (Felitti et al., 1998; Jewkes et al., 2010; Chapman et al., 2004; Pickles et al., 2010; Sareen et al., 2013), anxiety (Sareen et al., 2013), and posttraumatic stress disorder (PTSD) (Wolfe et al., 1994), and violence in relationships in adulthood (McKinney et al., 2009).

2. Intimate partner violence

Intimate partner violence (IPV) is a major public health problem in the US (The National Intimate Partner and Sexual Violence Survey (NISVS), 2011). IPV is defined as physical, sexual or psychological harm caused by a former or current intimate partner (Injury Center, 2010). Approximately 36% of women and 29% of men in the US have been victims of IPV in their lifetime (The National Intimate Partner and Sexual Violence Survey (NISVS), 2011). The medical and mental health costs, and loss of productivity as a result of IPV costs around \$5.8 billion every year (Centers for Disease Control and Prevention (CDC), 2012). Numerous risk factors such as low academic achievement, unemployment, economic stress, mental disorders, illicit drug use, and child maltreatment are associated with IPV (Centers for Disease Control and Prevention (CDC), 2010b; Guedes and Mikton, 2013; Miller et al., 2011; Sanmani et al., 2013; Ten Have et al., 2013). Child maltreatment and IPV occur within the same household and that exposure to violence as a child, as a victim of physical or sexual abuse, or as a witness to IPV, increases the risk of being a victim or an aggressor of IPV (Guedes and Mikton, 2013).

The Conflict Tactics Scale (CTS) has been used widely to determine intimate partner aggression. However, there are concerns surrounding the use of the CTS to operationalize intimate partner aggression by women. The CTS does not assess the reason why intimate partner aggression has occurred nor the context in which it has happened (DeKeseredy and Schwartz, 1998). Research has shown that intimate partner aggression by men and women tends to happen for different reasons: women tend to use violence in self-defense and men tend to use violence in an attempt to control their partners (De Keseredy et al., 1997; Ellis and Stuckless, 1996). Even though use of the CTS tends to produce findings that women

may be as likely (DeKeseredy and Schwartz, 1998; Morse, 1995), or even more likely to report intimate partner aggression (Magdol et al., 1997), men are more likely to physically abuse their partner during the course of a year and women are more likely to seek medical care due to perpetration of violence from male partners (Morse, 1995). Even though bi-directional violence does occur, uni-directional violence in which men perpetrate violence towards women is usually more severe compared to that which occurs in bi-directional violence or during uni-directional perpetration of violence from women to men (Miller et al., 2014). Nevertheless, in spite of these differences, operationalizing intimate partner aggression using the CTS does not account for these contextual differences by sex.

3. Adverse childhood experiences and intimate partner aggression

Research examining the association between ACEs and intimate partner aggression have found that long-term parental separation due to adoption after age two, foster care, juvenile detention, living with relatives for six months or more, parent mental illness, parent substance abuse, parent incarceration, parental violence, physical abuse, sexual abuse, neglect and economic adversity are associated with intimate partner aggression among adolescents (Miller et al., 2011; Duke et al., 2010). Childhood physical abuse and exposure to domestic violence between parents have been shown to be an independent risk factor for intimate partner aggression in adulthood (Ehrensaft et al., 2003). Physical abuse and sexual abuse during childhood have been found to be associated with intimate partner aggression among women and men, respectively (Fang and Corso, 2007).

The association between ACEs and intimate partner aggression may also be mediated by psychosocial factors (Swopes et al., 2013; Wolfe et al., 2004). PTSD has been found to mediate the association between ACEs and intimate partner aggression among male IPV offenders (Swopes et al., 2013). Trauma-related symptoms have been shown to mediate child maltreatment and dating violence in adolescence (Wolfe et al., 2004). However, factors such as dating violence attitudes, empathy, and self-efficacy were not found to significantly mediate the relationship between ACEs and intimate partner aggression in adolescence (Wolfe et al., 2004).

4. The clinical approach to the intrapersonal model

One approach that may help us to understand the association between ACEs and intimate partner aggression is the intrapersonal model approach. Intrapersonal models highlight factors that may be internal to the aggressor that may increase the tendency to inflict violence (Finkel et al., 2013). Four theories that contribute to the intrapersonal model approach include: social learning/family of origin, cognitive-behavioral, personality, and clinical theories (Finkel et al., 2013). The clinical approach explains intimate partner aggression via associated psychological disorders where aggressors are more likely to have greater levels of psychopathology compared to nonaggressors (Finkel et al., 2013). For example, the clinical approach to IPV may be used to explain the role of potential psychosocial mediators: PTSD, substance abuse, and depression. The presence of mental health disorders may predispose individuals to be involved in violent relationships and to be aggressors. For example, individuals with PTSD may be more aggressive due to

hyperarousal symptoms (Taft et al., 2007), while individuals with substance abuse disorders may be more impulsive due to the disinhibition that may occur due to substance use and/or abuse (Leonard and Quigley, 1999). The mechanism between depression and intimate partner aggression is not as clear (Shorey et al., 2012). Nevertheless, research has shown that depression may increase emotion dysregulation (which includes behavioral dyscontrol in the context of intense affect) (Roemer et al., 2009; Tull and Gratz, 2008), and this greater emotion dysregulation may be related to intimate partner aggression (Gratz et al., 2009; Shorey et al., 2011). Therefore, we hypothesize that intimate partner aggressors may be more likely to report PTSD, substance abuse, and depression compared to respondents who do not report to be aggressors of IPV, and these disorders will mediate the association between ACEs and intimate partner aggression in adulthood.

4.1. Rationale

Sex differences have been observed in the correlates of intimate partner aggression (Magdol et al., 1997). For example, severe physical intimate partner aggression was more strongly associated with fewer social support resources and depression symptoms among men compared to women (Magdol et al., 1997). Sex differences have also been found in the association between ACEs and intimate partner aggression (Fang and Corso, 2007; Roberts et al., 2011), and in the relationships between PTSD, substance abuse (Stuart et al., 2008), depression (Graham et al., 2012), and intimate partner aggression. To date, no study has examined the association between ACEs and intimate partner aggression in a nationally representative sample of the US considering multiple mediators by sex. The aim of the current study was to determine the extent to which PTSD, substance abuse, and depression mediate the association between ACEs and intimate partner aggression, among men and women, in a nationally representative sample of adults. By determining the mediators along the pathway between ACEs and intimate partner aggression, clinical providers, and prevention and intervention programs geared towards IPV aggressors may be able to use these findings to determine additional risk factors of intimate partner aggression.

5. Methods

5.1. Ethics statement

The Virginia Commonwealth University Institutional Review Board deemed the current study exempt as de-identified, secondary data were used.

5.2. Data source and sample population

Data were obtained from Wave 2 (2004–2005) of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). The NESARC was designed to study psychiatric and substance use disorders (Introduction to the Natio, 2013). Adults age 18 years and older living in the US were surveyed (Grant et al., 2004). Additionally, the “Group Quarters Inventory” from the US Bureau of Census 2000 was used to obtain information from military personnel living off base, boarding houses, rooming houses, nontransient hotels and motels, shelters, facilities for housing workers, college quarters, and group homes (Grant et al., 2004). The NESARC also included Spanish speakers (SAMSHA’s Co-

Occurring Center for Excellence, 2007), and oversampled Black and Hispanic households (Grant et al., 2004). Sample weights were available for each observation.

5.3. Operational definition of adverse childhood experiences

ACEs were operationalized by questions asking about experiences during childhood: if a respondent was left alone or unsupervised before age 10, went without things needed (clothes, school supplies), went hungry or failed to get medical treatment; if a parent or caregiver insulted or said hurtful things to the respondent, threatened to hit or throw something at the respondent, made respondent fear that they would be physically hurt or push, grabbed, shoved, slapped or hit the respondent, or hit the respondent causing marks, bruises or injury; if an adult or other person had touched the respondent sexually, had the respondent touched him/her sexually, attempted to have sexual intercourse with the respondent, or had sexual intercourse with the respondent; if the respondent witnessed his/her father or another adult male push, grab, slap, or throw something at the mother, hit mother with a fist or something hard, repeatedly hit mother for at least a few minutes, threaten mother with a knife/gun or use it to hurt her. These ACEs were analyzed in a Likert Scale format: “Very often”, “Fairly often”, “Sometimes”, “Almost never” and “Never”. However, some ACEs, which had relatively few respondents in some categories were recoded to Very often/Fairly often/Sometimes/Almost never vs. Never (sexual abuse categories) or Very often/Fairly often vs. Sometimes/Almost never vs. Never (witnessing parental violence categories) (Roberts et al., 2011). Other ACEs were determined from questions asking if, before 18 years old, the respondent had lived with a parent or other adult who was a problem drinker, abused drugs, had been incarcerated, or had a mental illness, or had attempted and/or committed suicide. These questions elicited a binary response (Yes vs. No) (Supplemental Table 1).

5.4. Operational definition of intimate partner aggression

Intimate partner aggression was operationalized by questions asking about being the aggressor of physical violence to one’s partner in the past year: pushing, grabbing or shoving, slapping, kicking, biting or hitting; threatening partner with a weapon like a knife or gun; cutting or bruising partner; forcing partner to have sex; and injuring partner enough so that he/she needed medical care. These questions asked about intimate partner aggression in the past 12 months. Six questions from the Conflict Tactic Scales (Straus and Gelles, 2009), which have been validated in a population-based sample (Moffitt and Caspi, 1997), were used to ask respondents about use of force with partners in the past year (Roberts et al., 2011). Many previous studies have categorized IPV in the past year into a dichotomous variable (Moffitt and Caspi, 1997; Finneran and Stephenson, 2014; Ramirez et al., 2012; Reed et al., 2013). All intimate partner aggression variables were categorized into a binary construct: Once/2 to 3 times/Once a month/More than once a month vs. Never.

5.5. Operational definition of mediators

PTSD, substance use disorder, and depression were operationalized by questions asking about symptoms of PTSD, alcohol or drug abuse and/or dependence, and major depressive episode since Wave 1 interview (2001–2002) but before the past year. PTSD, substance use disorder, and major depression were diagnosed using the Diagnostic and Statistical Manual

of Mental Disorders, Fourth Edition (DSM-IV) criteria (American Psychiatric Association, 2000) and the Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV Version (AUDADIS-IV) (Grant et al., 2001; Ruan et al., 2008), which is a fully-structured interview appropriate to be used by clinicians as well as trained lay interviewers (Afifi et al., 2011). Substance use disorders considered were abuse of and/or dependence on alcohol, nicotine, sedatives, tranquilizers, opioids, amphetamines, cannabis, hallucinogens, cocaine, and heroin (Afifi et al., 2012).

5.6. Potential confounders

Potential confounders that were considered were based on the literature review done a priori and were found to be associated with ACEs and intimate partner aggression. Confounders were also considered based on analyses shown in Table 2. Previous studies have shown differences by age (Brown et al., 2013a; Schussler-Fiorenza Rose et al., 2014; Centers for Disease Control and Prevention (CDC) and 2009), gender (Kelly-Irving et al., 2013; Liu et al., 2013; Roxburgh and Macarthur, 2014), race/ethnicity (Brown et al., 2013a; Schussler-Fiorenza Rose et al., 2014; Centers for Disease Control and Prevention (CDC) and 2009; Roxburgh and Macarthur, 2014), income (Brown et al., 2013a; Schussler-Fiorenza Rose et al., 2014), education (Schussler-Fiorenza Rose et al., 2014; Centers for Disease Control and Prevention (CDC) and 2009), marital status (Brown et al., 2013a; Schussler-Fiorenza Rose et al., 2014), and insurance status (Brown et al., 2013a), associated with ACEs. Statistically significant differences by age (Brown et al., 2013b; Palmetto et al., 2013), sex (Clark et al., 2014; Cui et al., 2013; Lovestad and Krantz, 2012; Menard et al., 2014), race/ethnicity (Palmetto et al., 2013; Clark et al., 2014; Lipsky et al., 2012; Stephenson et al., 2011), income (Brown et al., 2013b; Edwards et al., 2014), education (Brown et al., 2013b; Stephenson et al., 2011), marital status (Brown et al., 2013b; Cui et al., 2013), and insurance status (Brown et al., 2013b) were associated with IPV. Therefore, the proposed study controlled for the following sociodemographic characteristics as confounders namely: age, race/ethnicity, income, education, marital status and insurance status.

5.7. Analytic approach

Respondents were excluded (8999) if answers to questions on all ACEs or all intimate partner aggression variables were unknown or missing. The resultant sample size was 25,654. Majority of respondents excluded reported not being in an intimate relationship in the past year (8732/8999). Weighting variables were used to account for weighting procedures. The distribution of sociodemographic characteristics across populations exposed and unexposed to ACEs, and aggressors and nonaggressors of IPV were examined. This stage of the analysis was conducted in SAS version 9.4 (SAS Institute, Cary, NC).

Structural equation modeling (SEM) was used to determine appropriate latent factor(s) for ACEs and intimate partner aggression. Exploratory factor analysis (EFA) was used to determine the appropriate structure. Confirmatory factor analysis (CFA) was then used to determine if the model from the EFA fit the data. Structural/path models were then developed to determine associations among ACE factors (modeled as separate latent factors), mediators (PTSD, substance abuse, and depression modeled as separate observed variables) and intimate partner aggression. The temporal sequence was clear for ACEs,

mediators, and intimate partner aggression. ACEs were reported to have occurred before age 18. Respondents were asked to report on PTSD, depression and substance abuse after Wave 1 interview, which took place in 2001–2002 but before the prior year of the Wave 2 interview, which took place in 2004–2005. Respondents were asked to report on intimate partner aggression in the prior year before the Wave 2 interview. Therefore, this timing of events helped to establish the temporal sequence of ACEs, PTSD, substance abuse, depression, and intimate partner aggression. Direct and indirect associations were examined. Full information maximum likelihood estimation was used to handle missing data, which accounts for missing-at-random data.

Sex differences have been observed in the association between ACEs and intimate partner aggression (Roberts et al., 2011). Therefore, multiple group analysis was performed to obtain separate estimates for men and women. See Fig. 1 for the mediational model showing indirect associations. Survey weights were used for final models. SEM and mediational analyses were performed in Mplus (Muthén & Muthén, Los Angeles, CA).

Measurement invariance by sex was tested. Configural invariance indicates that parameters (factor loadings and thresholds) are freely estimated (Schroeders and Wilhelm, 2011). Strong invariance would indicate that the factor loadings and thresholds are fixed across sex groups (Schroeders and Wilhelm, 2011). A limitation of the chi-square difference test is that the test is highly influenced by sample size (Brannick, 1995; Kelloway, 1995; Meade and Lautenschlager, 2004), which may lead to overidentifying a lack of measurement invariance (Meade and Bauer, 2007). As the chi-square difference test is highly influenced by sample size, the CFI ($CFI_{\text{constrained}} - CFI_{\text{unconstrained}}$) was considered, which has been proposed as an alternative goodness-of-fit index to be used in measurement invariance analyses (Cheung and Rensvold, 2002). A general criterion was proposed: a value of CFI > 0.01 indicates that the null hypothesis of measurement invariance (configural invariance) should not be rejected (Cheung and Rensvold, 2002).

6. Results

6.1. Weighted descriptive statistics

Overall, among the eligible population, 62.6% were exposed to at least one ACE and 5.6% of the population reported perpetrating IPV in the past year (Table 1). Approximately 6.3% had a PTSD diagnosis, 15.7% had a substance use disorder, and 6.6% had a major depressive episode after the Wave 1 interviews but prior to the past year.

Among men, 63.8% reported at least one ACE, 3.8% had a PTSD diagnosis, 19.6% had a substance use disorder and 4.1% had a major depressive episode. Approximately 4.2% reported being aggressors of IPV in the past year. Among women, 61.1% reported at least one ACE, 8.8% had a PTSD diagnosis, 11.7% had a substance use disorder and 9.2% had a major depressive episode. Seven percent reported being aggressors of IPV in the past year.

Table 2 shows the distribution of sociodemographic characteristics across respondents exposed and unexposed to ACEs, and aggressors and nonaggressors of IPV. About eight in ten (80.9%) respondents reporting intimate partner aggression were exposed to at least one

ACE while approximately six in ten (61.4%) respondents who reported no intimate partner aggression reported exposure to ACEs.

6.2. Measurement invariance

There was strong invariance as the difference in CFI values in comparing configural invariance and strong invariance models was 0.01. For ACEs, the CFI was 0 and for intimate partner aggression, the CFI was 0.01. Therefore, the null hypothesis of invariance was not rejected, and strong invariance model was preferred over the configural invariance. Therefore, the results for men and women could have been compared directly because they were corrected for measurement error.

6.3. Evaluation of measurement models

Latent constructs, their factor compositions, and standardized loading coefficients for ACEs and intimate partner aggression are shown in Supplemental Table 2. Fit statistics for the CFA for the ACE measurement model with strong invariance were: χ^2 (df = 484) = 5127.96, $p < 0.0001$; χ^2 for men = 2307.038; χ^2 for women = 2820.888; CFI = 0.991; TLI = 0.991; RMSEA = 0.027; 90% CI (0.027–0.028), WRMR = 4.467. Fit statistics for the CFA for the IPV measurement model with strong invariance were: χ^2 (df = 22) = 152.862, $p < 0.0001$; χ^2 for men = 52.716; χ^2 for women = 100.146; CFI = 0.990; TLI = 0.986; RMSEA = 0.022; 90% CI (0.018–0.025), WRMR = 2.421. These statistics indicate that the measurement models were a good fit for the data.

6.4. Evaluation of structural model

After controlling for age, race/ethnicity, income, education, marital and insurance status, there were direct effects of sexual abuse ($\beta = 0.196$, $p < 0.001$) and parental violence ($\beta = 0.168$, $p = 0.007$) on intimate partner aggression among men. See Table 3 for unstandardized estimates, standard errors and p-values for direct paths.

Among men, PTSD partially mediated sexual abuse and intimate partner aggression ($z = 0.004$, $p = 0.018$) and substance abuse fully mediated physical/psychological abuse and intimate partner aggression ($z = 0.011$, $p = 0.036$) (Table 4). Among women, substance abuse also fully mediated physical/psychological abuse and intimate partner aggression ($z = 0.008$, $p = 0.049$). Fit statistics for this model were: χ^2 (df = 1476) = 6411.409, $p < 0.0001$; χ^2 for men = 3100.400; χ^2 for women = 3311.009; CFI = 0.990; TLI = 0.989; RMSEA = 0.016; 90% CI (0.016–0.017), WRMR = 3.684, which showed that the model was a good fit for the data.

7. Discussion

The current findings suggest that psychosocial mediators between ACE factors and intimate partner aggression vary by sex. However, there is a lack of studies examining the role of mediators between ACEs and intimate partner aggression. SEM was the best approach for determining the sex differences in the role of mediators in the association between ACEs and intimate partner aggression so as to determine measurement invariance in ACEs and intimate partner aggression for men and women.

Our findings should be contextualized with the existing, although limited, research on the relationship between ACEs, psychopathology, and intimate partner aggression in adulthood. Wolfe et al. (2004) found that trauma-related symptoms mediated the relationship between child maltreatment and dating violence in adolescence. Swopes et al. (2013), one of the few studies to study mediation between ACEs and violent outcomes in adulthood showed that PTSD mediated the association between ACEs and partner aggression among male IPV offenders (Swopes et al., 2013). Although the operationalization of intimate partner aggression differed between the Swopes et al. (2013) study (i.e., physical aggression, verbal aggression, anger and hostility toward one's partner) and the present report (i.e., latent variable as described above), the current study extends these findings to show that PTSD significantly mediated the relationship between sexual abuse, specifically, and intimate partner aggression among men.

We also observed that substance abuse mediated the relationship between physical and psychological abuse and intimate partner aggression among men and women. The current findings partially supports previous research, which showed that exposure to physical abuse (Lansford et al., 2010) and emotional abuse (Taplin et al., 2014) has been shown to be associated with subsequent substance abuse in adulthood among women, but not among men. The full mediation of physical and psychological abuse, and intimate partner aggression seen could be due to physical and psychological abuse during childhood being associated with substance abuse in adulthood among men and women, which has been shown to be a risk factor for intimate partner aggression (Reingle et al., 2014). The mediation of the association between physical and psychological abuse and intimate partner aggression could also be due to emotional distress. Psychological distress, which may lead to more substance abuse, has been found to mediate ACEs and alcohol problems in women (Strine et al., 2012), and alcohol use has been shown to be common during IPV episodes (Reingle et al., 2014).

Depression was not found to be associated with intimate partner aggression, and did not play a mediational role between ACEs and intimate partner aggression for men or women. Previous findings on the association between depression and intimate partner aggression has been mixed. Depression has been linked to lifetime intimate partner aggression (Johnson et al., 2014), and being a victim and being an aggressor of IPV (Johnson KL et al., 2015), but a statistical association was not seen with past-year intimate partner aggression (Reingle et al., 2014). Johnson et al. (2014), suggests that individuals with psychiatric disorders are not likely to report interpersonal violence. This interpretation goes against the intrapersonal model approach (Finkel et al., 2013), which was used to hypothesize the mediational role for PTSD, substance abuse, and depression. This approach did not hold for depression in the current study as was previously hypothesized as depression, even though statistically significantly associated with physical and psychological abuse for men and women, and sexual abuse for men, was not associated with intimate partner aggression among men or women. Male aggressors of IPV may have been more likely to suffer from prior PTSD and substance abuse compared to male respondents who were not aggressors of IPV. However, women aggressors of IPV may have been more likely to suffer from substance abuse only compared to women who were not aggressors of IPV. The disparities by sex in the role of mediators in the association between ACEs and intimate partner aggression may be due to

differences in emotional, behavioral, and psychobiological responses to stress (Olff et al., 2007).

In contrast to much prior research, in this study there was no statistically significant association between witnessing parental violence and intimate partner aggression neither among men nor women. Although studies have shown an association between witnessing domestic violence, and internalizing problems (Evans et al., 2008; Kitzmann et al., 2003) and externalizing problems (Evans et al., 2008; Kitzmann et al., 2003) in children, it is possible that the association between witnessing domestic violence and externalizing behaviors (such as perpetration of violence) does not continue into adulthood. Questions obtaining information on witnessing female-to-male perpetrated violence and violence between same-sex partners in the household were not included in the survey. This exclusion of questions may have also contributed to the non-statistically significant findings. The study must be considered with limitations in mind. First, the data were self-reported. Therefore, it is possible that ACEs, psychopathology (PTSD, substance abuse, and depression), and intimate partner aggression may have been underreported. However, prior research has shown adequate stability in the report of ACEs including abuse, physical neglect and family adversity (da Silva and da Costa Maia, 2013). This bias towards underreporting, if non-differential with respect to exposure and outcome groups, may suggest that effect estimates may be conservative (Eaton et al., 2000). Second, the use of the CTS to determine intimate partner aggression has some limitations. The CTS does not tell us the reason intimate partner aggression has happened and does not consider the differences contributing to intimate partner aggression by women and men (DeKeseredy and Schwartz, 1998). Therefore, the analysis of intimate partner aggression in the current study is limited by the determination of intimate partner aggression occurrences in the past year and not the related contextual differences by gender. However, using measurement invariance in structural equation modeling for the mediation analyses helped to account for measurement differences in intimate partner aggression. Third, the use of structural equation modeling (exploratory and confirmatory factor analyses) resulted in a one-factor measurement model for intimate partner aggression. However, by using this one factor model, we were not able to examine the differences in intimate partner aggression (physical, sexual, psychological).

Fourth, even though there was no association observed between witnessing parental violence and intimate partner aggression, parental violence questions only consisted of male-to-female perpetrated violence. The exclusion of witnessing female-to-male perpetrated violence and witnessing violence in the wider community could have influenced the results observed. Future studies should consider obtaining information on witnessing female-to-male violence in the household as well as witnessing violence perpetrated between same-sex parents.

The proposed study has several strengths. First, we were able to examine the association between ACEs and intimate partner aggression among a nationally representative sample in the US. Second, we were able to consider the role of multiple mediators in this relationship, which is often a forgotten concept in violent outcomes research. To date, this is the first study to examine the relationship between ACEs and intimate partner aggression testing the role of multiple psychosocial mediators. Third, we were able to examine this association by

sex. These findings help to determine what psychosocial constructs may play an important role for male and female aggressors of IPV. Fourth, the temporal sequence between ACEs, PTSD, substance abuse disorders and depression, and intimate partner aggression was evident. ACEs used in the analysis encapsulated adverse events reported by the respondent as occurring before the age of 18, and intimate partner aggression reported would have occurred within the past year. PTSD, substance abuse and depression occurred before the past year.

8. Conclusions

The current findings suggest that there are similarities and differences by sex in psychosocial mediation between ACE factors and intimate partner aggression. Therefore, healthcare providers should be aware of these differences and address intimate partner aggression accordingly. Also, IPV programs that are geared towards aggressors should be implemented for men and women. These programs should address physical/psychological, sexual abuse, and recent substance abuse and depression. “Fathers for Change”, is an example of an intervention that addresses substance abuse, domestic violence and poor parenting in fathers of young children (Stover, 2013). The current study also suggests that interventions geared to female aggressors of IPV are also warranted. However, men may benefit more greatly from intimate partner aggression prevention programs focused on sexual abuse occurring in childhood and subsequent PTSD. Also, abuse prevention programs may reduce PTSD among men and substance abuse rates among men and women, which may reduce IPV rates. Programs geared towards reducing physical and psychological abuse in childhood may also result in lower substance abuse rates, which may consequently lower the rates of IPV. Research has shown that the attributable risk for intimate partner aggression due to prior mental health disorders is relatively low (Miller et al., 2011). However, the findings suggest that addressing PTSD and substance abuse may be beneficial for IPV intervention and prevention programs geared towards aggressors. More studies examining the longitudinal effects of ACEs and mediational pathways between ACEs and violent outcomes are needed.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Fig. 1.

Mediation model showing indirect associations between adverse childhood experiences and intimate partner aggression. Abbreviations (from top to bottom, and left to right): Adverse Childhood Experiences: Unsupervised, Respondent was left alone or unsupervised before age 10; Things, Respondent went without things needed (clothes, supplies); Hungry, Respondent went hungry; Medical, Respondent failed to get medical treatment; Hurtful, Parent/Caregiver said insulted or said hurtful things to the respondent; Hit, Parent/Caregiver threatened to hit or throw something at the respondent; Hurt, Parent/Caregiver made respondent fear they would be physically hurt; Pushed, Parent/Caregiver pushed/grabbed/shoved/slapped or hit respondent; Injured, Parent/Caregiver hit respondent that caused marks/bruises/injury; Touched, Adult/Other person touched respondent sexually; Touch, Adult/Other person had respondent touched them sexually; Attempted, Adult/Other person attempted to have sex with respondent; Had Sex, Adult/Other person had sex with respondent; P_Pushed, Father/Other adult male push, grab, slap or throw something at mother; P_Hit, Father/Other adult male repeatedly hit mother for at least a few minutes; P_Fist, Father/Other adult male hit mother with a fist or something hard; P_Threat, Father/Other adult male threaten mother with a knife/gun or use it to hurt her; P_Drinker, Parent/Other adult living in the home was a problem drinker; P_Drugs, Parent/Other adult had problems with drugs; P_Incarc, respondent lived with a parent/other adult who was

incarcerated; P_Mental, Parent/Other adult was treated/hospitalized for mental illness; P_AttSuic, Respondent lived with a parent/other adult who attempted suicide; P_CommSuic, respondent lived with a parent/other adult who committed suicide. Touch, Adult/Other person had respondent touched them sexually; Mediators: PTSD, post-traumatic stress disorder; Intimate Partner Aggression: Push, Respondent pushed/grabbed/shoved spouse/partner; Slap, Respondent slapped/Kicked/Bit/Hit spouse/partner; Threat, Respondent threatened spouse/partner with a weapon like a knife or gun; Cut, Respondent cut/bruise spouse or partner; Sex, Respondent force spouse/partner to have sex; Injury, Respondent injured spouse/partner enough that they needed medical care.

Table 1

Distribution of characteristics in eligible sample (25,654), National Epidemiologic Survey on Alcohol and Related Conditions, 2004–2005.

	N	Weighted % ^a
Sex		
Men	11,796	50.8
Women	13,858	49.2
Age		
18–34	6726	26.6
35–49	9169	33.8
50+	9759	39.7
Race/Ethnicity		
White, non-Hispanic	15,211	72.0
Black, non-Hispanic	4278	9.7
American Indian/Alaska Native, non-Hispanic	430	2.1
Asian/Native Hawaiian/Other	764	4.4
Pacific Islander, non-Hispanic		
Hispanic, any race	4971	11.8
Income		
<\$25,000	5770	17.0
\$25,000 – <\$50,000	7513	16.2
\$50,000 – <\$80,000	6201	15.9
\$80,000 – <\$100,000	2198	8.8
\$100,000	3792	8.8
Education		
<High School	3404	12.2
High School	6779	26.9
>High School	15,471	60.9
Insurance		
Yes	22,489	88.5
No	3144	11.5
Marital Status		
Married/Cohabiting	18,744	78.9
Widowed/Divorced/Separated	3219	8.6
Never Married	3691	12.4
ACE Exposure		
Yes	16,383	62.6
No	9203	37.4
Intimate Partner Aggression		
Yes	1679	5.57
No	23,948	94.4

Abbreviation: ACE, Adverse Childhood Experience.

^a All Chi square p-values were <0.0001.

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Table 2

Distribution of characteristics across respondents exposed and unexposed to adverse childhood experiences ACEs, reporting intimate partner aggression and no intimate partner aggression among eligible population, National Epidemiologic Survey on Alcohol and Related Conditions, 2004–2005.

	ACEs N(%) ^a N = 16,383	No ACEs N(%) ^a N = 9,271	P-value	Intimate Partner Aggression N(%) ^a N = 1,679	No Intimate Partner Aggression N(%) ^a N = 23,948	P-value
Sex						
Men	7664 (51.9)	4132 (49.0)	<0.0001	513 (38.1)	11,271 (51.6)	<0.0001
Women	8719 (48.1)	5139 (51.0)		1166 (61.9)	12,677 (48.4)	
Age						
18–34	4210 (26.0)	2516 (27.5)	<0.0001	739 (43.4)	5985 (25.6)	<0.0001
35–49	6099 (35.4)	3070 (31.0)		627 (35.8)	8533 (33.6)	
50+	6074 (38.6)	3685 (41.5)		313 (20.8)	9430 (40.7)	
Race/Ethnicity						
White, nH	9702 (72.2)	5509 (71.6)	<0.0001	721 (57.7)	14,476 (72.8)	<0.0001
Black, nH	2886 (10.3)	1392 (8.77)		491 (18.6)	3782 (9.2)	
AI/AN, nH	315 (2.42)	115 (1.68)		46 (3.8)	383 (2.0)	
Asian/NH/PI, nH	404 (3.56)	360 (5.68)		39 (3.6)	724 (4.4)	
Hispanic, any race	3076 (11.5)	1895 (12.3)		382 (16.3)	4583 (11.6)	
Income						
<\$25,000	3647 (19.8)	2123 (20.3)	<0.0001	610 (30.7)	5150 (19.3)	<0.0001
\$25,000 – <\$50,000	4709 (27.4)	2804 (29.1)		521 (31.6)	6986 (27.8)	
\$50,000 – <\$80,000	4017 (25.7)	2184 (24.8)		319 (21.7)	5874 (25.5)	
\$80,000 – <\$100,000	1409 (9.17)	789 (9.27)		91 (6.1)	2106 (9.4)	
\$100,000	2601 (18.0)	1371 (16.5)		138 (9.9)	3832 (17.9)	
Education						
<High School	2047 (11.5)	1357 (13.3)	<0.0001	301 (16.7)	3098 (11.9)	<0.0001
High School	4239 (26.5)	2540 (27.6)		530 (32.0)	6243 (26.6)	
>High School	10,097 (62.0)	5374 (59.1)		848 (51.3)	14,607 (61.5)	
Insurance						
Yes	14,406 (88.6)	8083 (88.2)	0.0979	328 (19.7)	2815 (11.1)	<0.0001
No	1964 (11.4)	1180 (11.8)		1349 (80.3)	21,115 (88.9)	

	ACEs N(%) ^a N = 16,383	No ACEs N(%) ^a N = 9271	P-value	Intimate Partner Aggression N(%) ^a N = 1679	No Intimate Partner Aggression N(%) ^a N = 23,948	P-value
Marital Status						
Married/Cohabiting	11,628 (77.6)	7116 (81.2)	<0.0001	1075 (71.6)	17,647 (79.3)	<0.0001
Widowed/Div/Sep	2348 (9.9)	871 (6.5)		228 (10.0)	2986 (8.6)	
Never Married	2407 (12.5)	1284 (12.3)		376 (18.4)	3315 (12.1)	
ACE Exposure						
Yes	-	-	-	1379 (80.9)	14,986 (61.4)	<0.0001
No				300 (19.1)	8962 (38.6)	
Intimate Partner Aggression						
Yes	1379 (7.2)	300 (2.8)		-	-	
No	16,365 (92.8)	8962 (97.2)	<0.0001			

Abbreviations (from top to bottom): AI/AN, American Indian/Alaska Native; nH, non-Hispanic; Asian/NH/PI, Asian/Native Hawaiian/Other Pacific Islander ACEs, Adverse Childhood Experiences; Widowed/Div/Sep, Widowed/Divorced/Separated; ACE, Adverse Childhood Experience.

Table 3

Unstandardized estimates for associations between intimate partner aggression, PTSD, depression, and substance abuse and adverse childhood experiences among men and women, National Epidemiologic Survey on Alcohol and Related Conditions, 2004–2005.

Latent variable	Intimate partner aggression			PTSD			Depression			Substance abuse		
	Est.	SE	P-value	Est.	SE	P-value	Est.	SE	P-value	Est.	SE	P-value
Men												
Neglect	−0.093	0.088	0.289	0.013	0.007	0.054	−0.005	0.008	0.466	−0.030	0.020	0.131
Phys/Psy	−0.046	0.072	0.518	0.017	0.005	0.001	0.025	0.006	<0.001	0.074	0.016	<0.001
Sexual	0.196	0.054	<0.001	0.016	0.004	<0.001	0.017	0.005	0.002	0.009	0.012	0.446
PV	0.168	0.062	0.007	−0.005	0.004	0.317	−0.003	0.005	0.608	−0.001	0.011	0.931
PIP	0.032	0.058	0.586	0.008	0.003	0.020	0.005	0.003	0.173	0.015	0.009	0.089
IPA ^a				0.246	0.096	0.010	0.097	0.080	0.224	0.143	0.060	0.017
Women												
Neglect	−0.047	0.042	0.268	0.008	0.008	0.311	−0.006	0.010	0.525	−0.029	0.010	0.006
Phys/Psy	0.091	0.049	0.061	0.026	0.007	<0.001	0.046	0.009	<0.001	0.041	0.009	<0.001
Sexual	0.056	0.053	0.283	0.044	0.033	0.179	0.023	0.018	0.194	0.023	0.018	0.195
PV	0.046	0.037	0.212	0.003	0.006	0.547	−0.019	0.007	0.009	0.002	0.006	0.806
PIP	0.011	0.029	0.708	−0.001	0.006	0.835	0.012	0.007	0.087	0.017	0.007	0.018
IPA ^a				0.064	0.045	0.152	0.128	0.066	0.054	0.194	0.090	0.031

Abbreviations (from top to bottom, and left to right): Phys/Psy, Physical/psychological abuse; PV, Witnessing parental violence; PIP, Parental incarceration/psychopathology; IPA, Intimate Partner Aggression; Est., Unstandardized estimate; SE, Standard error; PTSD, posttraumatic stress disorder.

^a Intimate partner aggression on PTSD, depression, substance abuse; Bolded numbers are statistically significant at $p < 0.05$.

Unstandardized estimates of mediation pathways of adverse childhood experiences and intimate partner aggression via posttraumatic stress disorder, substance abuse, and depression among men and women.

Table 4

Latent variable	Posttraumatic stress disorder			Substance abuse			Depression		
	Est.	SE	P-value	Est.	SE	P-value	Est.	SE	P-value
Men									
Neglect	0.003	0.002	0.119	-0.004	0.003	0.183	-0.001	0.001	0.517
Physical/Psychological Abuse	0.004	0.002	0.069	0.011	0.005	0.036	0.002	0.002	0.233
Sexual Abuse	0.004	0.002	0.018	0.001	0.002	0.456	0.002	0.001	0.238
Parental Violence	-0.001	0.001	0.366	0.000	0.002	0.931	0.000	0.001	0.624
Parental Incarceration/Psychopathology	0.002	0.001	0.071	0.002	0.002	0.200	0.000	0.000	0.344
Women									
Neglect	0.001	0.001	0.422	-0.006	0.003	0.087	-0.001	0.001	0.547
Physical/Psychological Abuse	0.002	0.001	0.188	0.008	0.004	0.049	0.006	0.003	0.069
Sexual Abuse	0.003	0.003	0.328	0.005	0.004	0.275	0.003	0.003	0.289
Parental Violence	0.000	0.000	0.572	0.000	0.001	0.808	-0.002	0.002	0.115
Parental Incarceration/Psychopathology	0.000	0.000	0.837	0.003	0.002	0.103	0.002	0.001	0.189

Abbreviation (from left to right): Est., Unstandardized estimate; SE, Standard error.

Bolded numbers are statistically significant at $p < 0.05$.