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ORIGINAL ARTICLE

Enduring Effects of Early Life Traumas on Adult Suicidal Ideation

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Abstract
Exposure to traumas early in life has been found to have a range of negative health effects later in adulthood, including a higher risk for suicidal behavior. Using data from the Waves I (1994/95) and IV (2008) of the National Longitudinal Study of Adolescent to Adult Health ($N = 14{,}385$; 49.35% female; M_{age} in Wave IV = 29), this study examines the effects of exposure to three different types of early life traumas—emotional abuse, physical abuse, and sexual abuse before the age of 18—on adult suicidal ideation. Guided by the stress process model incorporated with a life-course perspective, potential mediating roles of psychological distress, subjective powerlessness, and perceived social rejection were also investigated. A series of regression and Karlson-Holm-Breen (KHB) mediation analyses were performed using Stata 14 to assess the total, direct, and indirect effects. All three early life trauma measures were found to be significantly and independently associated with a higher risk of suicidal ideation in adulthood. A substantive portion (between 30 and 50%) of the effects was mediated by psychological distress (i.e., depression and anxiety), subjective powerlessness, and perceived social rejection. The general policy implications of this study include evaluating suicidal individuals for prior childhood abuse experiences and assessing abuse survivors for suicidality.

Keywords Physical abuse · Sexual abuse · Emotional abuse · Suicidal ideation

Introduction

Traumas are disturbing experiences that results in disruptive feelings intense enough to have a long-lasting negative effect on a person's attitudes, behavior, and other aspects of functioning (American Psychiatric Association, 2013). Early life exposures to traumas in forms of physical (i.e., any deliberate and unwanted physical contact; e.g., slapping, kicking), sexual (i.e., any unwanted sexual contact; e.g., touching in a sexual way, raping), and emotional (i.e., non-physical abusive behaviors; e.g., intimidating, insulting) abuse has been found to have a range of negative health effects later in adulthood (Assini-Meytin et al., 2021; Norman et al., 2012). Among these, one of the most troubling outcomes is probably the development of suicidal behaviors (i.e., ideation, plan, attempt, and death by suicide). Numerous studies have documented that survivors of childhood abuse were several times more likely to think about, plan, attempt, and die by suicide compared with their counterparts without such a history (Assini-Meytin et al., 2021; Briere et al., 2016; Brodsky & Stanley, 2008; Devries et al., 2014; Ihme et al., 2022).

Although past research has established a strong association between exposure to childhood traumas and increased suicidality (i.e., the risk of suicide, usually indicated by suicidal ideation or attempt) in adulthood, considerable gaps and limitations remain in the literature. For example, relatively few studies have concurrently assessed different subtypes of childhood traumas in relation to adult suicidality (Assini-Meytin et al., 2021; Charak et al., 2016; Briere et al., 2016), whereas, more commonly, a single form of maltreatment has been studied in isolation (for comprehensive reviews, see Devries et al., 2014; Fergusson et al., 2013; Mironova et al., 2011; Zatti et al., 2017). Given that a significant portion of abuse victims report exposure to multiple

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forms of abuse (Finkelhor et al., 2007), analysis of a single form of abuse by itself may inflate its apparent relationship with suicidality and neglect the impact of other co-occurring forms that may potentially better explain this relationship.

Moreover, with some notable exceptions (Assini-Meytin et al., 2021; Briere et al., 2016), much of the studies of early life traumas and adult suicidality have been limited to clinical samples (e.g. Berardelli et al., 2022; Brodsky et al., 2001; Charak et al., 2016, Ihme et al., 2022, Luk et al., 2021; Read et al., 2001; Roy, 2005). Further research on large community samples is necessary because clinical samples tend to exclude well-adjusted survivors of childhood traumas since these samples are likely to constitute the negative extreme of trauma outcomes. This can skew the research results towards a stronger association between childhood abuse and adult suicidality. In contrast, community samples tend to include more well-adjusted abuse victims since a certain level of wellness is required to accomplish routine tasks (e.g., school obligations, occupational tasks, family responsibilities, or household activities).

More importantly, previous research on the relationship between childhood traumas and adult suicidality has been largely pragmatically based and there has been very limited effort to understand which variables may mediate the influence of childhood traumas on suicidal behaviors in adulthood (Berardelli et al., 2022; Ihme et al., 2022; Puzia et al., 2014). Thus, the processes through which early trauma experiences confer risk for adult suicidality are unclear. This gap is consistent with the current need in suicide literature to move beyond determining what factors confer risk for suicide, and toward understanding how they exert their deleterious effects (Brent, 2011; Nock, 2012). Such an endeavor would potentially lead to greater clarity in targets for intervention strategies.

Stress Process Model and Life-Course Perspectives

The association between early life traumas and adult suicidality is perhaps best understood through the lenses of stress process model and life-course perspectives (Pearlin & Bierman, 2013; George, 2013). When incorporated, these perspectives provide a useful framework to better understand the mechanisms through which childhood adversities increase adult suicide risk. According to the stress process model of mental health, stressful life events both increase psychological distress (e.g., depression, anxiety, substance abuse) and erode the personal (e.g., sense of control, mastery) and social resources (e.g., actual or perceived social support) that are crucial to individuals' well-being (Pearlin & Bierman, 2013). Life-course perspective, on the other hand, takes a long view of individual outcomes, often covering decades or longer (George, 2013). One of the key tenets of the life-course perspective is that events, experiences, and environments early in the life course may impact a variety of outcomes (e.g., health, economic status) later in the life course. This perspective also emphasizes the importance of timing, arguing that negative exposures during critical periods (e.g., childhood) have unusually powerful effects on subsequent life course outcomes. Guided by the stress process model incorporated with a life-course perspective, we consider three classes of potential mediators in this study: psychological distress, subjective powerlessness, and perceived social rejection.

Role of Psychological Distress

A relatively large body of research integrates life-course perspective with the stress process model of mental health to investigate the long-term effects of childhood traumas and adversities on mental health in adulthood (Avison, 2010; Benjet et al., 2010; Wu et al., 2021). In this line of research, much of the discussions to explain how earlier circumstances can affect later health and well-being focus on stress proliferation, a process that places people exposed to a serious adversity at risk for later exposure to additional adversities (Pearlin et al., 2005). Childhood traumas are potent in their capacity to trigger the proliferation of stressors, given the magnitude of their onerousness. Proliferated stressors may emerge over the life course and be in the form of additional trauma, stressful life events other than trauma, or chronic strains in important domains of life, all of which are manifested through increased psychological distress later in life.

Studies have convincingly demonstrated that early stressors have enduring effects on individuals' psychological distress, even 50–60 years later. For instance, Benjet et al., (2010) found that experiencing physical abuse and neglect in childhood was the strongest and most consistent predictor of all four classes of disorders examined (depression, anxiety, substance use, and externalizing disorders) over all three life course stages (childhood, adolescence, and adulthood). Roberts et al., (2004) found that childhood sexual abuse was associated with a range of mental health outcomes in adulthood, including depression and anxiety. Similarly, a study conducted on adult psychiatric outpatients found that risk of depressive disorder was strongly related to history of childhood emotional abuse (Gibb et al., 2007). Both internalizing disorders such as depression and anxiety (Sareen et al., 2005) and substance use disorders such as heavy smoking and alcohol abuse (Covey et al., 2012; Hufford, 2001) have been well-known risk factors of suicidality among adults. As well, there is some evidence that psychological distress mediates the effects of particular traumas on suicidal behaviors (Berardelli et al., 2022; Bergen et al.,

2003; Poindexter et al., 2020). For example, using a path analysis model, Berardelli et al., (2022) found that emotional abuse and neglect indirectly increased suicidal ideation via hopelessness. Similarly, Poindexter et al., (2020) found that cumulative interpersonal trauma was indirectly related to suicidal ideation through depressive symptoms.

Role of Subjective Powerlessness

Another potential mechanism that might explain the long-lasting effects of childhood traumas on adult suicidality is sense of control, the belief that one is an effective force in control of his or her own life (Atilola et al., 2021). The sense of control is crucial for mental health, as it makes people attentive, active, and ultimately more effective in dealing with the problems they encounter in their life course. It indicates a self-assurance that directly counteracts demoralization and distress. However, when a person is exposed to events that are unavoidable and genuinely beyond the control, the person develops a general sense of subjective powerlessness (Ross & Mirowsky, 2009). While a strong sense of control bolsters the will to think about problems and do something about them, subjective powerlessness leads to the belief that outcomes are beyond one's control, determined instead by chance, fate, or powerful others. A person who feels powerless may see little reason to seek possible solutions and thus may not take effective actions against stressors. As stressors proliferate over the life course, experiencing traumas early in the life may result in a destructive level of subjective powerlessness later in life. Thus, it is reasonable to anticipate that low levels of sense of control (i.e., subjective powerlessness) might underlie the links between trauma experiences early in life and suicidality in adulthood. There is circumstantial evidence to support this possibility, given that sense of control have been linked both with suicidal behaviors (Evans et al., 2005) and with early life trauma (Bak et al., 2005; Shaw & Krause, 2002).

Role of Perceived Social Rejection

Finally, childhood traumas may lead to adult suicidality through increasing perceived social rejection, the negative belief that one is not liked by others and is deliberately excluded from social relationships or social interactions (Cacioppo & Hawkley, 2009). Exposure to adverse life events early in the life course may invoke general feelings of mistrust and negative appraisals against others, which may lead to the belief that one's social needs are not being met by either the quantity or the quality of one's current social relationships. Psychological distress symptoms, shame, and stigma associated with abuse may indeed create real interpersonal difficulties, effects of which might continue or even get worse in adulthood. There is some evidence that childhood traumas can lead to perceived social rejection later in life. Several studies have found that a history of childhood trauma was associated with loneliness, perceived peer rejection, or poorer social support in adulthood (Lev-Wiesel & Sternberg, 2012; Merz & Jak, 2013). Thus, increased levels of perceived social rejection may partly explain the increased suicidality among abuse victims, given the importance of perceived interpersonal relationships in protecting against suicidal outcomes (Joiner et al., 2009).

The Present Study

Using data from a nationally representative sample of U.S. individuals, the current study examines two questions: (1) the extent to which exposure to early life traumas (emotional, physical, and sexual abuse) are associated with suicidality in adulthood; and (2) the extent to which psychological distress, subjective powerlessness, and perceived social isolation mediate the link between childhood trauma and suicidality in adulthood. Relying on stress process model and life-course perspectives, it is expected that all three forms of trauma exposure will be associated with a higher risk of suicidal behavior in adulthood, and increased levels of psychological distress, subjective powerlessness, and perceived social rejection will at least partly mediate this association.

Methods

Data

Data for this study came from the Waves I (1994/95) and IV (2008) of the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative study of 20,745 American adolescents from 134 middle and high schools in 80 communities (Bearman et al., 1997). The Wave IV study was designed as a third follow-up of the nationally representative sample of adolescents first interviewed in 1994 and 1995. This wave enabled researchers to study developmental and health trajectories across the life course of adolescence into adulthood. At the time of the Wave IV interview (N = 15,701), the participants were 24 to 32 years old, assuming adult roles and responsibilities. The analytic sample for this study included respondents who were interviewed in Waves I and IV, had a valid sample weight, and had a complete data on dependent variable in Wave IV. These restrictions reduced the analytic sample to 14,385 individuals. Missing data on the independent variables were imputed using the chained equations (MICE) procedure in Stata 14, averaging results across 10 imputation samples.

MICE was selected because it allowed to specify separate conditional distributions for each imputed variable. All analyses were weighted to adjust for the complex sampling design (Chen & Chantala, 2014).

Measures

Suicidal ideation in adulthood. Wave IV interview included questions about both suicidal ideation and suicide attempt. However, suicide attempt was rare; only 1.5% (N = 191) of the analytic sample reported a suicide attempt at Wave IV, which is known to cause small-sample bias including unreliable coefficients (Allison, 2001). Due to the small number of respondents who reported suicide attempt, analyses in the current study focused on suicidal ideation only. Suicidal ideation was based on responses to the question: "During the past 12 months, did you ever seriously think about committing suicide?" Individuals who answered "yes" were coded 1 on a dichotomous outcome indicating suicidal ideation (Yıldız, 2020).

Early life traumas. Following Benson (2014), early life traumas—emotional abuse, physical abuse, and sexual abuse—were measured using respondents' retrospective reports of maltreatment in Wave IV study. Emotional abuse was based on responses to the question: "Before your 18th birthday, how often did a parent or other adult caregiver say things that really hurt your feelings or made you feel like you were not wanted or loved?" Physical abuse was measured using the question: "Before your 18th birthday, how often did a parent or adult caregiver hit you with a fist, kick you, or throw you down on the floor, into a wall, or down stairs?" Finally, sexual abuse was based on responses to the question: "Before your 18th birthday, how often did a parent or other adult caregiver touch you in a sexual way, force you to touch him or her in a sexual way, or force you to have sexual relations?" Responses were recoded to create 3 dichotomous measures, with 1 indicating at least one report of maltreatment in question.

Psychological distress. Measures of both internalizing (i.e., depression and anxiety) and substance use (i.e., heavy smoking, alcohol abuse, cannabis abuse, drug abuse) disorders were included to capture psychological distress at Wave IV. Depression was assessed by 5 item version of Center for Epidemiological Studies Depression (CES-D) scale asking about the depressive symptoms occurring in the previous week: (a) bothered by things that usually don't bother you, (b) felt you could not shake off the blues, (c) had trouble keeping your mind on what you were doing, (d) felt depressed, and (e) felt sad (Shrout & Yager, 1989). Response categories included never/rarely (0), sometimes (1), a lot of the time (2), and most or all of the time (3). Possible scores for the summed measures ranged from 0 to 15 and the items were shown to demonstrate a very good internal consistency (α = 0.79). Anxiety was measured by 4 items headed by the question "How much do you agree with each statement about you as you generally are now, not as you wish to be in the future?" Items were: (a) I worry about things, (b) I am not easily bothered by things (reverse coded), (c) I get stressed out easily, and (d) I don't worry about things that have already happened (reverse coded). Response categories ranged from strongly disagree (1) to strongly agree (5). Possible scores for the summed measures ranged from 4 to 20 (α = 0.70).

Heavy smoking index (HSI) was used to capture tobacco use (Chaiton et al., 2007). It uses a six-point scale calculated from the time to first cigarette after waking and the number of cigarettes smoked per day. The scale produced a good internal consistency for the sample (α = 0.89). Alcohol abuse measure was based on 4 DSM–IV alcohol abuse symptoms: (a) drinking interfered with the responsibilities at work or school, (b) drinking could have gotten yourself or others hurt, or put yourself or others at risk, including unprotected sex, (c) had legal problems because of drinking, like being arrested for disturbing the peace or driving under the influence of alcohol, or anything else, and (d) had problems with family, friends, or people at work or school because of drinking. Dichotomized items were summed to form a scale ranged from 0 to 4 (α = 0.94). Same DSM–IV abuse questions were also asked for respondents' favorite drug, which formed the drug abuse measure that ranged from 0 to 4 (α = 0.96).

Subjective powerlessness. Following previous studies (Evans et al., 2005; Shaw & Krause, 2002), subjective powerlessness was assessed by 4 questions asking about how often respondents (a) felt that they were unable to control the important things in their life, (b) felt confident in their ability to handle their personal problems (reverse coded), (c) felt that things were going their way (reverse coded), and (d) felt that difficulties were piling up so high that they could not overcome them. Possible scores for the summed measures ranged from 0 to 16 and the items were shown to demonstrate a good internal consistency (α = 0.72).

Perceived social rejection. Perceived social rejection was measured by 3 items asking respondents about their feelings on their social relationships: (a) How often do you feel isolated from others? (b) You felt that people disliked you during the past seven days, (c) In your day-to-day life, how often do you feel you have been treated with less respect or courtesy than other people? Response categories for these items ranged from 0 = never to 3 = most of the time or all of the time. Scores were summed to form a scale that ranged from 0 to 9. Internal consistency of this scale was low (α = 0.55), which is noted as a limitation.

Control variables. Sex was coded 1 for female and 0 for male. Age at Wave IV was calculated in years. Family structure measure was obtained from Wave I questionnaire and coded 1 if the respondent lived with both biological parents and 0 otherwise. College status was coded 1 for those having at least a college degree, and 0 otherwise. Total household income in Wave IV was scored in thousands of dollars. Unemployment status was coded 1 for currently unemployed at Wave IV and 0 otherwise. Marital status categories included single (reference category), married, and cohabitating. Parental status was scored by the number of children. Finally, race/ethnicity categories were obtained from Wave I questionnaire and included Non-Hispanic White (reference category), African American, Hispanic, and Other.

Analytic Strategy

The analyses began with a presentation of the descriptive statistics for all of the variables included in the study. Then, direct and mediated effects of childhood traumas on suicidal ideation were assessed using a series of regression models. Tests of mediation follow conditional requirements as proposed by Baron & Kenny (1986), where (a) the independent variable is associated with the mediators, (b) the independent variable predicts the dependent variable, (c) mediators are associated with the dependent variable in the presence of the independent variable, and (d) when both the independent variable and the mediators are included in the model, the original focal relationship between independent and dependent variables is eliminated or reduced. To achieve condition (a), the mediators (depression, anxiety, heavy smoking, alcohol abuse, drug abuse, and subjective powerlessness) were linearly regressed on the childhood traumas (emotional, physical, and sexual abuse) first. For conditions (b), (c), and (d), suicidal ideation was regressed on childhood traumas only in the first model, control variables added in the second model, and the mediators added in the third model.

Although Baron and Kenny's (1986) steps provide strong support for mediation hypotheses, in non-linear probability models, they are not enough to assess the magnitudes of each specific mediating effects relative to the total effect. Thus, to precisely decompose the total effect of early life traumas on suicidal ideation into the sum of direct and indirect effects through mediators (i.e., depression, anxiety, heavy smoking, alcohol abuse, drug abuse, subjective powerlessness, and perceived social rejection), the recently developed KHB method was employed next (Karlson et al., 2012). KHB method is able to separate changes in coefficients due to rescaling (i.e., changes in variance of the y^*) from true changes in coefficients that result from adding more variables to the model. KHB method is also appropriate for this study because it enables researchers to decompose the total effect of multiple independent variables in a logit model into the sum of direct and indirect effects. It allows the researcher to see the magnitude of one specific mediating effect, conditional on the presence of other mediators in the model and makes it possible to find contrasts among and determine the relative magnitude of each specific mediating effect (Yıldız, 2020). Moreover, the method allows us to include control variables into the models (as concomitants). KHB method was implemented by user-written *khb* command in Stata 14 (Kohler et al., 2011).

Results

Descriptive Statistics

The descriptive statistics for all of the variables in the analyses are presented in Table 1. Overall, 7.12% (N = 945) of the respondents reported suicidal ideation at Wave IV. Nearly half of the respondents reported emotional abuse (47.23%), 17.88% reported physical abuse, and 5.05% reported sexual abuse before the 18th birthday. With regards to the demographic characteristics, results indicate that the sample has a balanced gender composition and a heterogeneous racial composition. The typical respondent was nearly 29 years old in the fourth wave of data collection. The mean household income was around $62,600, 30.45% of the respondents were college graduates, and 4.46% were unemployed at the time of interview. In terms of marital status, a significant portion of the participants were either married (42.42%) or were cohabiting with a partner (20.09%). The mean number of children was around 1.

Multivariate Analyses

Moving on to the multivariate analyses, recall the previous discussion of those conditions necessary for mediation to occur. Condition (a) (the early life traumas must associate with mediators) is tested using a series of ordinary least squares regression models and is illustrated in Table 2. Results in Table 2 indicated that condition (a) is achieved for some associations, but not others. Controlling for other factors, emotional abuse was significantly associated with all proposed mediators in the expected directions. Similarly, physical abuse was significantly associated with all proposed mediators but anxiety. Finally, sexual abuse was significantly associated with depression, drug abuse, subjective powerlessness, and perceived social rejection, but not with anxiety, heavy smoking and alcohol abuse, after controlling for other factors.

Table 1 Descriptive Statistics (N = 14,385)

	% or Mean	St.D.	Min	Max
Dependent Variable				
Suicidal ideation (%)	7.12			
Key Independent Variables				
Emotional abuse (%)	47.23			
Physical abuse (%)	17.88			
Sexual abuse (%)	5.05			
Mediators				
Depression	2.59	2.54	0	15
Anxiety	12.29	2.95	4	20
Heavy smoking	1.17	1.61	0	6
Alcohol abuse	0.45	0.86	0	4
Drug abuse	0.13	0.53	0	4
Subjective powerlessness	4.82	2.94	0	16
Perceived social rejection	2.26	1.69	0	9
Controls				
Female (%)	49.35			
Age	28.95	1.74	25	34
Lived with both parents (%)	54.86			
College (%)	30.45			
Household income (in $1,000)	62.6	37.6	2.5	150
Unemployed (%)	4.46			
Marital Status (%)				
Single	37.49			
Married	42.42			
Cohabitation	20.09			
Children	0.92	1.13	0	5
Race (%)				
White	68.82			
African American	15.92			
Hispanic	9.28			
Other race	5.99			

Logistic regression results for suicidal ideation are shown in Table 3. Model 1 illustrates the effects of early life traumas on adult suicidal ideation when no other predictor variables were included. As expected, all trauma measures—emotional abuse ($b = 0.84$; $p < .001$), physical abuse ($b = 0.36$; $p < .01$), and sexual abuse ($b = 0.77$; $p < .001$)—were significantly associated with a higher risk of suicidal ideation in adulthood. Substantively, the findings do not change after the addition of important controls in Model 2. This finding fulfills the condition (b) of the mediation, which requires the key independent variables, namely early life traumas, to be significant predictors of the outcome variable, suicidal ideation in adulthood. For control variables, being unemployed ($b = 0.77$; $p < .001$) is associated with a higher risk suicidal ideation, whereas having a college degree ($b = -0.40$; $p < .01$), being married ($b = -0.48$; $p < .001$), African American ($b = -0.34$; $p < .01$), and Hispanic ($b = -0.54$; $p < .01$) are associated with a lower risk of suicidal ideation.

Model 3 in Table 3 shows logistic regression results when the proposed mediating mechanisms are added. Controlling for other factors, depression ($b = 0.10$; $p < .001$), anxiety ($b = 0.09$; $p < .001$), subjective powerlessness ($b = 0.13$; $p < .001$), and perceived social rejection ($b = 0.22$; $p < .001$) were significantly associated with a higher risk of suicidal ideation, whereas heavy smoking, alcohol abuse, and drug abuse were not among the significant predictors. Thus, condition (c) of the mediation, which requires mediators to be associated with the dependent variable in the presence of the key independent variables, was only achieved for depression, anxiety, subjective powerlessness, and perceived social rejection. Inclusion of the proposed mediators into the model reduced the original coefficient of early life traumas substantively. The coefficient of physical abuse even lost its significance. It should be noted that, however, significant effects of emotional ($b = 0.43$; $p < .01$) and sexual ($b = 0.54$; $p < .01$) abuse on suicidal ideation remained, suggesting that proposed mechanisms were unable to fully mediate the effect of these traumas. Still, condition (d) was partly achieved, as original effects of traumas were eliminated or at least reduced with the inclusion of mediators.

Mediation Analyses

As noted earlier, to precisely decompose the effect of early life traumas on adult suicidal ideation into the sum of direct and indirect effects, KHB analysis was conducted next. In this analysis, emotional, physical, and sexual abuse were defined as the key independent variables; depression, anxiety, heavy smoking, alcohol abuse, drug abuse, subjective powerlessness, and perceived social rejection were defined as mediators; and all control variables from the previous analyses were included as concomitants (i.e., gender, age, family structure, college degree, income, unemployed status, marital status, number of children, and race). Table 4 reports the results of the decomposition for each trauma measures.

Results show that the total effect of emotional abuse on suicidal ideation, 0.84, is decomposed into a direct part, 0.43, and an indirect part, 0.41. In relative terms, the indirect effects constitute 48.78% of the total effect. Breaking down the indirect effects into its components, it was found that the substantial part of the indirect effect was via perceived social rejection (17.87%) and subjective powerlessness (12.47%), followed by anxiety (8.38%) and depression (7.30%). Heavy smoking, alcohol abuse, and drug abuse, on the other hand, did not have any significant mediating effects above and beyond other mediators and control variables.

As for physical abuse, the total effect, 0.36, is decomposed into a direct part, 0.18, and an indirect part, 0.18. It should be noted that the direct effect was not significant (as in the main logistic regression analyses). In relative terms, the indirect effects constitute almost half of the total effect

Table 2 Early Life Traumas and Mediators (OLS Regression Coefficients)

	Depression	Anxiety	Heavy Smoking	Alcohol Abuse	Drug Abuse	Subjective Powerlessness	Perceived Social Rejection
Key independent variables							
Emotional abuse	.61***	.78***	.21***	.14***	.06***	.80***	.70***
Physical abuse	.39***	.16	.26***	.13***	.06**	.36***	.25***
Sexual abuse	.58***	.21	.11	.04	.09*	.62***	.31***
Controls							
Female	.43***	1.61***	−.38***	−.22***	−.04**	.38***	−.11*
Age	.02	−.01	−.03*	−.01	−.01	.02	.02
Lived with both parents	−.06	−.05	−.15**	−.01	−.02	−.03	−.03
College	−.53***	−.08	−.76***	.03	−.09***	−.67***	−.14**
Income	−.01	−.01	−.01	.01	.01	−.01	−.01
Unemployed	.94***	.34*	.56***	.07	.19***	1.59***	.41***
Married	−.45***	−.06	−.13**	−.16***	−.11***	−.62***	−.31***
Cohabitation	−.24**	.13	.12*	.02	−.03	−.28**	−.19***
Children	.07*	−.01	.08***	−.04***	.02	.19***	−.01
African American	.43***	−.69***	−.94***	−.37***	−.17***	.12	.13*
Hispanic	.09	.02	−.87***	−.23***	−.05*	−.05	−.05
Other race	.23*	−.08	−.32***	−.17***	−.07***	.53***	.08
Constant	2.11***	11.8***	2.89***	.92***	.32**	4.49***	1.85***
R^2	.09	.12	.14	.07	.04	.12	.10
F	61.09***	64.78***	58.91***	26.46***	11.65***	66.48***	44.23***
N	14,385						

*** p < .001, ** p < .01, * p < .05

(49.68%). Breaking down the indirect effects into its components, it was found that the substantial part of the indirect effect was via perceived social rejection (14.84%), followed by subjective powerlessness (13%), and depression (10.74%). Anxiety, heavy smoking, alcohol abuse, and drug abuse, on the other hand, did not have any significant mediating effects above and beyond other mediators and control variables.

Finally, results for the sexual abuse indicate that the total effect, 0.77, is decomposed into a direct part, 0.54, and an indirect part, 0.23. In relative terms, the indirect effects constitute 30.43% of the total effect. Breaking down the indirect effects into its components, it was found that the substantial part of the indirect effect was via subjective powerlessness (10.5%), followed by perceived social rejection (8.53%), and depression (7.53%). Anxiety, heavy smoking, alcohol abuse, and drug abuse, on the other hand, did not have any significant mediating effects above and beyond other mediators and control variables.

Discussion

This study examined (1) the associations between early life traumas—emotional, physical, and sexual abuse—and adult suicidal ideation and (2) some of the potential underlying mechanisms of these associations. Relying on the previous literature on childhood trauma, life-course perspective on mental health, and suicide, it was expected that each trauma measure would be independently associated with a higher risk of suicidal ideation in adulthood, and psychological distress, subjective powerlessness, and perceived social rejection would at least partly mediate these associations. Major findings, limitations, and implications of the study are discussed next.

All types of childhood traumas examined in this study—emotional, physical, and sexual abuse before the 18th birthday—were significantly and independently associated with a higher risk of suicidal ideation in adulthood. These findings underscore the necessity of concurrent consideration of different forms of childhood abuse, such that the unique effects of different forms of abuse may be ascertained. Majority of the previous studies on the issue had focused on one type of trauma in isolation (Devries et al., 2014). As noted earlier, this is problematic given that different forms of traumas tend to co-occur (Finkelhor et al., 2007); thus the observed effect of a particular trauma on an outcome may be confounded by another type of trauma or simply reflect general maltreatment. The findings of this study contribute to the literature in this respect by showing that each form of abuse had a specific, independent effects on suicidal ideation. It should also be noted that this study used a nationally representative sample, unlike many previous studies on the issue that have been limited to clinical samples (Berardelli et al., 2022; Charak et al., 2016; Ihme et al., 2022).

Table 3 Early Life Traumas, Mediators, and Suicidal Ideation in Adulthood (Logistic Regression Coefficients)

	Model 1	Model 2	Model 3
Early life traumas			
Emotional abuse	0.84***	0.79***	0.43**
Physical abuse	0.36**	0.37**	0.18
Sexual abuse	0.77***	0.70***	0.54**
Controls			
Female		0.07	−0.10
Age		−0.01	−0.01
Lived with both parents		−0.01	0.01
College degree		−0.40**	−0.11
Income		−0.01	0.01
Unemployed		0.77***	0.33
Married		−0.48***	−0.32*
Cohabitation		−0.18	−0.12
Children		−0.01	−0.05
African American		−0.34**	−0.34*
Hispanic		−0.54**	−0.45*
Other race		0.03	−0.03
Mediators			
Depression			0.10***
Anxiety			0.09***
Heavy smoking			0.06
Alcohol abuse			0.08
Drug abuse			0.02
Subjective powerlessness			0.13***
Perceived social rejection			0.22***
Constant	-3.18***	-2.64**	-5.54***
Pseudo R^2	0.05	0.07	0.19
Wald χ^2	318.04***	452.18***	1395.5***
N	14,385		

*** p < .001, ** p < .01, * p < .05

Table 4 Decomposition of Total Effect of Early Life Traumas on Suicidal Ideation into Direct and Indirect Effects (N = 14, 385)

	β / (SE)	95% CI	Confounding percentage
Emotional abuse			
Total effect	0.84*** (0.12)	0.60, 1.09	100%
Direct effect	0.43*** (0.13)	0.18, 0.68	51.22%
Indirect effect	0.41*** (0.07)	0.27, 0.55	48.78%
via depression	0.06*** (0.01)	0.04, 0.09	7.30%
via anxiety	0.07*** (0.02)	0.04, 0.11	8.38%
via heavy smoking	0.01 (0.01)	−0.00, 0.02	1.38%
via alcohol abuse	0.01 (0.01)	−0.00, 0.01	1.26%
via drug abuse	0.00 (0.00)	−0.00, 0.02	0.13%
via subjective powerlessness	0.11*** (0.02)	0.06, 0.15	12.47%
via perceived social rejection	0.15*** (0.03)	0.10, 0.20	17.87%
Physical Abuse			
Total effect	0.36** (0.13)	0.11, 0.61	100%
Direct effect	0.18 (0.13)	−0.07, 0.43	50.32%
Indirect effect	0.18** (0.07)	0.05, 0.32	49.68%
via depression	0.04*** (0.01)	0.02, 0.06	10.74%
via anxiety	0.01 (0.01)	−0.00, 0.03	3.92%
via heavy smoking	0.02 (0.01)	−0.00, 0.03	4.00%
via alcohol abuse	0.01 (0.01)	−0.00, 0.02	2.89%
via drug abuse	0.00 (0.00)	−0.00, 0.00	0.29%
via subjective powerlessness	0.05*** (0.01)	0.02, 0.08	13.00%
via perceived social rejection	0.05*** (0.01)	0.03, 0.08	14.84%
Sexual abuse			
Total effect	0.77*** (0.18)	0.41, 1.13	100%
Direct effect	0.54** (0.18)	0.18, 0.90	69.57%
Indirect effect	0.23*** (0.07)	0.10, 0.37	30.43%
via depression	0.06** (0.02)	0.02, 0.10	7.53%
via anxiety	0.02 (0.01)	−0.01, 0.05	2.48%
via heavy smoking	0.01 (0.01)	−0.00, 0.02	0.77%
via alcohol abuse	0.00 (0.00)	−0.00, 0.01	0.41%
via drug abuse	0.00 (0.01)	−0.01, 0.01	0.22%
via subjective powerlessness	0.08*** (0.03)	0.03, 0.13	10.50%
via perceived social rejection	0.07** (0.02)	0.02, 0.11	8.53%

*** p < .001, ** p < .01, * p < .05

Compared to physical and sexual abuse, childhood emotional abuse was studied less with regards to adult suicidality, likely because it is often assumed to be less damaging (Trickett et al., 2009). One of the reasons why it may have been assumed so is that it does not fulfill the criterion of the DSM-5 (APA, 2013), which defines trauma as 'exposure to actual or threatened death, serious injury or sexual violence" (p.271). However, this study demonstrated that emotional abuse was the most common form of maltreatment experienced by Add Health study participants, and substantively, its impact on suicidal ideation in adulthood was stronger than that of sexual and physical abuse. The unique and robust association between emotional abuse and suicidal ideation highlight the need for greater empirical attention to emotional abuse as being equally important as other forms of childhood abuse in conveying risk for suicidality.

As for the mediation analyses, the findings were mixed. The proposed mediators accounted for between 30 and 50% of the total effects of early life traumas on adult suicidal ideation. The effect of emotional abuse on suicidal ideation was significantly mediated by depression, anxiety, subjective powerlessness and perceived social rejection. The effects of physical and sexual abuse, on the other hand, were significantly mediated by depression, subjective powerlessness, and perceived social rejection only. The direct effect of physical abuse even lost its statistical significance after accounting for the indirect effects through proposed mediators. Overall, perceived social rejection and subjective powerlessness were found to be the stronger mediators compared to depression and anxiety. No significant mediating effect

was found for substance use disorders. These findings are important as they uncover some of the mechanisms underlying the association between early life traumas and suicidal ideation in adulthood. It appears that adults with a history of childhood trauma are at higher risk of suicidal behaviors, partly because they have increased psychological distress especially in forms of internalizing symptoms, lower levels of sense of control, and higher levels of perceived negative relationships with others.

It should also be noted that significant relationships between emotional and sexual abuse and suicidal ideation persisted even after adjusting for the proposed mediators. It is possible that childhood traumas exert some part of their effects via other mental health outcomes (e.g., anger, anti-social behavior, and delinquency) and psychosocial mechanisms (e.g., perceived social support, mastery, problem-solving behavior, and maturity) that were not addressed in this study. It is also possible that different types of trauma experiences may translate into suicide-related behavior through different mechanisms. Further studies are needed to better understand the mediating mechanisms through which early trauma experiences confer risk for adult suicidality.

Limitations

The findings should be interpreted within the context of the limitations of the study. First, this study is limited in terms of measures for some variables. Childhood traumas were measured using a retrospective self-report instrument. Although this type of measurement is widely used, it is possible that recall or response biases may have influenced participants' reports of abuse. It should be noted, however, that individuals' recollection of negative childhood experiences tends to be fairly accurate and free of mood-congruent recall biases (Fergusson et al., 2011). Nonetheless, it may be beneficial for future studies to consider other methods of ascertaining experiences with early childhood traumas (e.g., interview-based approaches). One-item and dichotomous measure of suicidal ideation was previously used by many researchers (e.g., Boyda et al., 2020; Yıldız & Solakoglu, 2019), but a better-constructed dimensional tools such as Adult Suicidal Ideation Questionnaire (Reynolds, 1991) would probably provide a better capture of suicidal ideation among adults. It is also important to note here that the term "committing suicide" is considered stigmatizing and no longer used by current researchers. Similarly, internal consistency of the perceived social rejection measure was low. A better constructed scale would probably provide a more reliable measure of individuals' perceived interpersonal relationships. Unfortunately, alternative scales were not available in Wave IV questionnaire.

Second, as cross-sectional data were used, the temporal ordering of suicidal ideation and proposed mediators cannot be determined since both were measured at Wave IV. It is highly possible that suicidal ideation preceded some of the proposed mediators, as the questionnaire item used to measure suicidal ideation covered the 12 months-period before the interview, whereas the items used to assess proposed mediators were either covered the current time of the interview or only the past several weeks. It is assumed that individuals' depression, anxiety, substance use disorders, subjective powerlessness and perceived social rejection were at the same levels 12 months before Wave IV. Although the theoretical approach and past research guiding these analyses improve our ability to infer directionality, further research employing a fully longitudinal design is required before firm causal inferences can be made.

Conclusion and Implications

Despite these limitations, this study has contributed to our understanding of the association between childhood traumas and adult suicidality. All types of traumas examined in this study were found to be significantly and independently associated with a higher risk of suicidal ideation in adulthood. The proposed mediators together accounted for between 30 and 50% of the total effects of early life traumas on adult suicidal ideation.

The policy implications of these results are several. First, the relationship between childhood traumas and suicidal ideation found in this study once again shows how critical it is to evaluate suicidal individuals for childhood abuse experiences, and to assess clinically presenting abuse survivors for suicidality (Briere & Scott, 2014). In the first instance, information that a given suicidal person has a history of childhood traumas may encourage the clinician to consider one of several empirically based therapies currently available for individuals abused as children, some of which take suicidality directly into account (e.g., Courtois & Ford 2012). In a similar vein, clinicians treating abuse survivors should be aware of the link between childhood traumas and suicidality to encourage the clinicians to utilize treatments that have been shown to be helpful in reducing suicidal behavior (Bongar & Sullivan, 2013). For example, Dialectical Behavioral Therapy (DBT), Mindfulness-Based Cognitive Therapy (MBCT), and Cognitive Behavioral Analysis System of Psychotherapy (CBASP) address interpersonal problems at an early stage and provide approaches to deal with suicidal thoughts (Ihme et al., 2022). Given the strong mediating role of perceived social rejection and subjective powerlessness, creation of programs (e.g. support group, one-to-one mentoring, coaching, etc.) to improve interpersonal skills and boost sense of control for people who experienced childhood traumas might be effective in preventing suicidal outcomes. In this regard, DBT and CBASP may be especially helpful as they both address problematic

self-images and interpersonal relationships to treat suicidal and other self-destructive behaviors (Linehan, 1987; McCullough, 2003).

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