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Exploring relationships as mediators of treatment outcomes among commercially sexually exploited youth[★]



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ABSTRACT

Background: Research indicates that youth exposed to commercial sexual exploitation tend to have extensive histories of trauma, including physical abuse, sexual abuse, and neglect, which increases their vulnerability to exploitation. Trauma literature finds youth who present to treatment with greater behavioral health needs tend to have higher trauma scores than youth with fewer behavioral health needs (Copeland et al., 2007; Finkelhor et al., 2007).

Objective: There is, however, limited research on the role of youth strengths as a buffer against the outcomes associated with trauma. With this in mind, the purpose of this study was to examine the relationship between Adverse Childhood Experiences (ACE scores) and youth outcomes such as risk behaviors, behavioral needs, and impairment in functioning across major life domains. Secondly, we explored how this relationship might be better explained by examining youth strengths as mediators—specifically, peer relationships and the stability of significant relationships in the youth's life.

Participants and setting: Data on clients served in a treatment program specialized for commercially sexually exploited youth were used for this research.

Results: Results indicated that youth with higher ACE scores had a greater number of risk behaviors, behavioral needs, and impairment in functioning across major life domains. Findings of the mediation analysis provide some support that peer relationships and relationship stability, at least in part, mediates the relationship between ACEs and youth outcomes. Post hoc analyses indicated youth strengths mediated 9–18% of the total effect of ACE scores on youth outcomes.

Conclusions: Developing peer relationships and sustaining significant relationships can mitigate some of the adverse effects of trauma experienced by exploited youth.

1. Introduction

The trauma of commercial sexual exploitation impacts children's well-being, including their socioemotional, physical, and psychological development (Clarkson-Freeman, 2014). Commercial sexual exploitation of children (CSEC) is a severe form of trafficking committed against minors in which sex is exchanged for anything of value. When committed against a minor, force, fraud, nor

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coercion need to be present to classify the commercial sex act as exploitive (Public Law 106–386). The adverse effects of CSEC, including substance use, chronic medical conditions, sexually transmitted infections, depression, post-traumatic stress disorder, anxiety, self-injurious behaviors, oppositional behavior, aggression, criminal activity, and behavior problems at school, have been well established in the literature (Cole, Sprang, Lee, & Cohen, 2016; Countryman-Roswurm & Bolin, 2014; Greene, Ennett, & Ringwalt, 1999; Hossain, Zimmerman, Abas, Light, & Watts, 2010; Landers, McGrath, Johnson, Armstrong, & Dollard, 2017; Warf et al., 2013; Willis & Levy, 2002; Zimmerman et al., 2008).

Regardless of the trauma experienced by commercially sexually exploited youth, they also exhibit a variety of strengths to cope with their adverse experiences (Basson, Rosenblatt, & Haley, 2012; Gray, Luna, & Seegobin, 2012; Landers et al., 2017). Overall, however, the knowledge base on CSEC remains limited due to a lack of empirical research, and the current literature focuses more on studying the outcomes of trafficked persons in relation to deficits, rather than in relation to strengths or positive characteristics. This literature would be enhanced by including youth strengths in models of trauma predicting youth functioning and treatment outcomes. With this in mind, the goal of this study is to explore how the relationship between adverse experiences and emotional and behavioral health outcomes among exploited youth might be mediated by the presence of protective factors. In particular, we examine the mediating role of youth's interpersonal strengths.

2. Background

Research indicates that youth who present to treatment with greater behavioral health needs tend to have experienced greater trauma than youth with fewer behavioral health needs (Copeland, Keeler, Angold, & Costello, 2007; Finkelhor, Ormrod, & Turner, 2007). Felitti et al. (1998) first described the Adverse Childhood Experiences (ACEs) framework in their research examining the correlation between exposure to adverse events in childhood (e.g. abuse, neglect, family violence) and the development of adverse health outcomes in adulthood. Extant literature further demonstrates the association between trauma, as measured by the ACEs Questionnaire, and long-term emotional, behavioral, and physical health problems (Anda et al., 2002; Dube, Anda, Felitti, Edwards, & Croft, 2002, 2003; Hillis, Anda, Felitti, & Marchbanks, 2001). Initially a 7-item scale, the ACE study questionnaire has since been expanded to a 10-item scale including emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect, family violence, parental substance use, parental mental illness, parental divorce/separation or abandonment, and parental incarceration. Per convention, each of the ten ACEs are measured dichotomously to indicate whether or not one experienced the event, regardless of the number of incidences. One's ACE score is expressed as the total number of positively endorsed ACEs and ranges from zero to ten.

A graded dose-response effect has also been identified, whereby the intensity of a given outcome increases as the number of ACEs increases (Brown et al., 2009; Clarkson-Freeman, 2014; Dong et al., 2004). For instance, Felitti et al. (1998) found that participants with an ACE score of four or greater were up to twelve times more likely to experience adverse health outcomes as adults compared to participants with a lower ACE score. Similarly, Clarkson-Freeman (2014) and Kerker et al. (2015) found that children who experienced three or more ACEs had a higher risk of experiencing adverse emotional and behavioral health outcomes compared to children with no ACEs. High cumulative ACE scores have been associated with increased risk of suicide (Dube et al., 2001), depressive disorders and other mental health conditions (Chapman et al., 2004; Edwards, Holden, Anda, & Felitti, 2003; Kerker et al., 2015; Whitfield, Dube, Felitti, & Anda, 2005), alcoholism and illicit drug use (Anda et al., 2002; Dube et al., 2002, 2003), and greater engagement in high-risk behaviors (Hillis et al., 2001).

While the CSEC literature emphasizes the role of trauma in increasing children's vulnerability to victimization (e.g. Basson et al., 2012; Choi, 2015; Cole et al., 2016; Gragg, Petta, Bernstein, Eisen, & Quinn, 2007; Reid, 2011; Sewell, 2012; Walker, 2013), only one study has applied the ACEs framework to this population. Naramore, Bright, Epps, and Hardt (2017) compared ACEs among youth arrested for trading sex with those of youth arrested for other, non-sexual offenses among a juvenile justice population and found that youth who traded sex had higher rates for each individual ACE and higher overall ACE scores. In another study, Landers et al. (2017) found much higher rates of emotional and behavioral health needs among commercially sexually exploited (CSE) youth compared to what has been found among the general population of children entering the child welfare system (e.g. Kiesel, Fehrenbach, Small, & Lyons, 2009). One of the implications of these findings is that we may expect to find a greater severity of emotional and behavioral health needs among youth who have experienced CSEC compared to other high-risk youth (e.g. juvenile justice or child welfare involved). What has been largely unexamined in the literature, however, are protective factors that may mediate against the negative effects of severe and complex trauma, such as that experienced by sexually exploited youth.

Research has shown an inverse relationship between trauma and both affective and interpersonal strengths measured by the Behavioral and Emotional Rating Scale (Dorsey et al., 2012). These studies suggest that youth with a greater number of identified and developed strengths, particularly interpersonal strengths, tend to have fewer behavioral health needs compared to those with fewer strengths (Accomazzo, Israel, & Romney, 2015; Whitson, Bernard, & Kaufman, 2013). Interpersonal relationships have been emphasized in the literature as having a significant impact on youth emotional and behavioral development. Adolescents with close relationships to family and friends are less likely to engage in risky or delinquent behaviors and are less likely to experience mental health problems (e.g. Berndt & Keefe, 1995; Brendgen, Vitaro, & Bukowski, 2000; Fomby, Molborn, & Sennott, 2010; Helsen, Vollebergh, & Meeus, 1997; O'Connor, 1998).

There is, however, limited research on the role of youth strengths as a buffer against the negative outcomes empirically shown to be associated with trauma. One study by Fomby et al. (2010) found that access to extended kin and supportive community relationships among youth experiencing family instability significantly reduced engagement in delinquent behaviors. Sege et al. (2017) found that individuals exposed to four or more ACEs who felt supported by family and friends as children had significantly lower rates of poor health and depression as adults compared to those who lacked supportive relationships. This research points to the

important role that positive relationships may play in mediating the negative effects of childhood trauma.

3. Study purpose

The literature described above suggests that youth strengths may serve as protective factors in buffering against adverse emotional and behavioral health outcomes predicted by trauma, and that interpersonal relationships may be particularly important in this role. There is, however, limited empirical research to date on the mediating role of strengths, particularly among exploited youth. The current study builds upon the extant literature on adverse childhood experiences to explore interactions between variables at the interpersonal and individual levels that impact emotional and behavioral health outcomes of CSE youth.

The overarching goal of this study was two-fold. First, we examined the relationship between adverse experiences and youth outcomes, specifically emotional and behavioral health needs and risk behaviors, among a sample of CSE youth. Second, we explored how this relationship might be better explained by considering the impact of youth interpersonal relationships as mediators. The study was guided by the following three research questions:

- 1) What is the prevalence of ACEs among CSE youth?
- 2) What is the relationship between cumulative ACE scores and youth outcomes?
- 3) Is the relationship between ACE scores and youth functioning mediated by characteristics of their interpersonal relationships, specifically relationships with peers and the stability of significant personal relationships?

In line with previous research, it was hypothesized that there would be a strong, positive relationship between ACE scores and each of the youth functioning areas assessed. Although the added focus on interpersonal relationships is largely exploratory, it was hypothesized that peer relationships and relationship stability would better explain the relationship between ACE scores and youth functioning. Specifically, we expected that well-developed interpersonal relationships would better explain how ACEs impact youth outcomes.

4. Methods

This study used data from an ongoing evaluation of Citrus Helping Adolescents Negatively impacted by Commercial Exploitation (CHANCE), a Specialized Therapeutic Foster Care (STFC) program and Community Response Treatment (CRT) team developed to meet the unique needs of commercial sexual exploited youth developed by Citrus Health Network, a Federally Qualified Health Center. Key components of the STFC Program include placement in a stable and secure family. CHANCE foster parents are specially trained in both the behavioral and emotional needs of this population and the unique social factors related to commercial sexual exploitation. They are available twenty-four hours per day, 7 days a week, to respond to crises or to the need for special therapeutic interventions. The CRT clinical team works with youth placed in a variety of settings across the continuum of care of Miami-Dade County including traditional foster homes, relative placement, or placement with biological family. An effort is made to stabilize youth in their current environment or assist in the transition of the youth to an appropriate living situation. All CHANCE clients receive intensive clinical and support services.

CHANCE is founded on the principles of trauma-informed care, including the following key components: (1) understanding symptoms and behaviors as a response to trauma, (2) ensuring physical, psychological, and emotional safety first and foremost, (3) providing opportunities for survivors to develop or regain a sense of control over their lives, and (4) focusing on client strengths rather than deficiencies (Hopper, Bassuk, & Olivet, 2010). The CHANCE program provides a comprehensive array of intensive, trauma-informed clinical services and supports to youth using an individualized wraparound approach. These services include individual, group, and family therapy, targeted case management, psychoeducation, life skills development, and 24/7 crisis support.

While there are a few trauma-based therapeutic interventions for youth that are well-supported by research evidence, including Trauma-Focused Cognitive Behavioral Therapy (TF-CBT; Deblinger, Mannarino, Cohen, & Steer, 2006; Deblinger, Mannarino, Cohen, Runyon, & Steer, 2011), Eye Movement Desensitization and Reprocessing (EMDR; Rodenburg, Benjamin, de Roos, Meijer, & Stams, 2009), and Prolonged Exposure Therapy for Adolescents (PE-A; Foa, McLean, Capaldi, & Rosenfield, 2013; Gilboa-Schechtman et al., 2010), these interventions have not yet been evaluated to assess their effectiveness with sexually exploited youth. The CHANCE program adopts TF-CBT as its primary therapeutic intervention, but incorporates a flexible approach to service delivery that includes provision of services in the home or other community-based locations and allowing for an extended engagement period before trauma-processing begins. Applying the Wraparound Model (www.nwi.pdx.edu), furthermore, means that services do not focus exclusively on the youth, but also extend to identify and address the needs of the whole family to ensure the youth's ongoing safety and well-being. Given that these are youth in the child welfare system and most experienced maltreatment within their family prior to their exploitation, the CHANCE program works closely with local child welfare agencies to ensure that safety concerns are addressed with the youth's parents or permanent caregivers through their child welfare case plan.

Assessment protocols used by CHANCE identify the nature and extent of youth's trauma experiences, exploitation history, emotional, behavioral and physical health needs, educational needs, and strengths. Assessments are completed at baseline (program admission) and three-month intervals thereafter. The study uses secondary analysis of data collected as part of the CHANCE evaluation to investigate the research questions articulated above. Informed consent and assent was obtained for all youth and his or her parent(s) whose data are used in this research.

Table 1
Demographic Characteristics of Sexually Exploited Youth (n = 178).

		n	%
Gender	Male	9	5.1%
	Female	168	94.4%
	Transgender	1	.6%
Race/ Ethnicity	Black/African American ^a	85	47.8%
	White ^a	2	1.1%
	Other ^b	5	2.8%
	Hispanic/ Latino	86	48.3%
Age at Admission	12 years	4	2.2%
	13 years	8	4.5%
	14 years	15	8.4%
	15 years	32	18.0%
	16 years	51	28.7%
	17 years	59	33.1%
	18 years	9	5.1%

^a Non-Hispanic.

^b Asian/Pacific Islander or Multi-racial.

4.1. Sample

All youth admitted to CHANCE for whom at least two waves of data were available for analysis (baseline and 3-month follow-up) were included in the study. The data presented in the study include data collected between October 2013 and December 2018 on 178 youth with baseline and follow-up data. These youth represent 94% of the total sample recruited for this research. The large majority of youth identified as female (94.4%). Just over half of youth identified as black (51.7%) and 48.3% identified as Hispanic. The mean age of youth was 15.86 years (SD = 1.34). Demographic characteristics for the 178 youth included in this study are shown in Table 1.

4.2. Measures

Secondary analysis of data from the Child and Adolescent Needs and Strengths – Commercially Sexually Exploited (CANS-CSE) (<http://praedfoundation.org/tools/the-child-and-adolescent-needs-and-strengths-cans/florida/>) was conducted. The *Child and Adolescent Needs and Strengths* (CANS) is a widely-used multi-purpose tool designed to support service planning, identify appropriate levels of care, facilitate quality improvement initiatives, and monitor outcomes of services. Research suggests that the CANS is a reliable measure with an average intraclass correlation of .80 (Anderson, Lyons, Giles, Price, & Estle, 2003). The CSE version builds on the original CANS tool by incorporating the unique needs and strengths of CSE youth. Therapists in the CHANCE program complete the CANS-CSE at intake using information from interviews with youth, their caregivers, and other individuals with knowledge of the youth's behavior and history, as well as relevant information from their case files. A follow-up assessment occurred after three months of treatment.

4.2.1. Dependent variables

The study examined three youth need areas from the CANS-CSE as dependent variables: risk behaviors, emotional and behavioral health needs, and life domain functioning. Each of these are domains on the CANS-CSE that incorporate multiple individual variables. The risk behavior area is comprised of ten variables: suicide risk, self-mutilation, other self-harm, danger to others, sexual aggression, runaway, delinquency, judgement, intentional misbehavior, and exploitation of others. The emotional and behavioral health needs area encompasses eight variables: impulsivity/hyperactivity, depression, anxiety, oppositional behavior, conduct problems, adjustment to trauma, anger control, and substance abuse. Functioning across major life domains (life domain functioning) incorporates the following eight dimensions: family functioning, living situation, social functioning, use of recreational time, job functioning, development, legal, and sexuality.

Each item was scored on a hierarchical scale of severity from 0 to 3 where lower scores indicate no evidence of a problem and higher scores represent severe problems for youth on needs domains. Scores of "2" or "3" on items were considered actionable items in that these were areas in which treatment should be targeted. For the current analysis, each item was dichotomized such that scores of "0" and "1" were recoded as "0" and scores of "2" and "3" were recoded as "1" (Lyons, 2009). Dichotomized scores for each item were then summed to create a count of actionable items within both domains for each youth. Therefore, actionable risk behaviors had a possible range from 0 to 10. Both actionable behavioral needs and actionable life domain functioning had a possible range from 0 to 8. The internal consistency alphas for actionable risk behaviors, actionable behavioral needs, and actionable life domain functioning was .85, .84, and .86, respectively. For mediation analyses, a summative score of actionable risk behaviors, behavioral needs, and life domain functioning was calculated for the follow-up CANS-CSE assessment after three months of treatment.

4.2.2. Independent variable

Questions from the CANS-CSE were used to extrapolate ACEs and create an ACE score for each youth. Some CANS-CSE questions

assess the domains of the 10 items on the ACE questionnaire. ACE questions from the CANS-CSE were dichotomized to ascertain whether youth experienced a given ACE. Since a rating of “0” indicates that the youth did not have a history of the given ACE, all ratings of “0” remained the same. Ratings greater than “0” indicated that youth had a history of the ACE with varying severity. The study was only interested in whether youth experienced a given ACE. Therefore, ratings of “1,” “2,” and “3” were recoded as “1” representing a positive indication of an ACE occurring. A total score was calculated for each youth from a cumulative count of ACEs with a positive indication. The resulting total ACE score had a possible range of 0 to 10 for each youth. The Cronbach’s alpha for the ten CANS-CSE items included in the ACE scores was .74. ACE scores calculated at baseline were used for mediation analyses.

4.2.3. Mediating variables

The CANS-CSE includes measures for several youth strengths. This study focused on two strengths in particular that relate to interpersonal relationships: peer relationships and relationship stability. Peer relationships refer to the youth’s interpersonal relationships with same age peers. Relationship stability refers to lasting relationships with significant adults, generally a family member, caregiver or other individual. Therapists rated youth on a hierarchical scale from 0 to 3 with lower scores indicating greater strengths and higher scores indicating severity of a problem. However, scores for these strengths were reverse scored for the analysis so that lower scores designate that the youth does not possess the given strength. After being reverse scored, lower scores for peer relationships corresponded with youth who possessed little to no social skills to facilitate positive relationships or do not have positive relationships with peers. Higher scores indicated that youth were well-liked by peers and possessed the ability to develop and maintain positive relationships with same age peers. Lower scores for relationship stability indicated fewer stable relationships whereas higher scores indicated several stable relationships that are likely to persist in the future. An assessment of youth strengths at baseline were used for mediation analyses.

4.3. Analysis

Three strategies were used to examine mediated effects. Analyses for this study were first conducted via [Baron and Kenny’s \(1986\)](#) stepwise strategy commonly used to explore and model mediation effects. First, the total effect was estimated by establishing a relationship between the independent variable (ACE score) and each of the dependent variables: risk behaviors, emotional and behavioral health needs, and functioning at home and in the family. Estimating the relationship between the mediator variables (peer relationships and relationship stability) and the independent variable (ACE score) constituted the next step of the mediation analysis. The analysis then examined the effect of the mediator variables on each dependent variable. Each of these relationships needed to be statistically significant for a mediation model to apply. Lastly, the direct effect was estimated by regressing each of the dependent variables on ACE score (independent variable) controlling for the mediator variables. According to this strategy, evidence of some mediation is inferred when controlling for the mediator is observed to substantially reduce the variance in the dependent variable explained by the independent variable. Full mediation can be inferred when, after controlling for the mediators, the variance explained by the ACE score is no longer significant ([Baron & Kenny, 1986](#)).

Mediation effects were also examined with the Sobel test of mediation ([Sobel, 1982](#)). Sobel’s test produce a z-score used to indicate whether a significant reduction in the indirect effect occurred. To supplement, the statistical significance of the indirect (mediated) effect of ACE scores on each of the dependent variables assessed through youth strengths was estimated using 10,000 bootstrapped samples and 95% confidence intervals ([Preacher & Hayes, 2004](#)). A significant indirect effect is evidence of a mediation effect. Analysis of mediation effects was conducted using STATA 13 ([StataCorp, 2013](#)). Results for each of six mediation models are illustrated via path diagrams.

5. Results

To address the first research question, prevalence rates were assessed for each of the ten ACE items for youth enrolled in the CHANCE program. Emotional neglect (85.4%, $n = 152$), physical neglect (78.7%, $n = 140$), emotional abuse (70.8%, $n = 126$), and sexual abuse (68.5%, $n = 122$) were the most common ACEs youth experienced. A large proportion of youth also experienced family violence (57.9%, $n = 103$), physical abuse (55.1%, $n = 98$), and parental abandonment, separation, or divorce (52.8%, $n = 94$). Although ACEs related to household dysfunction were experienced to a lesser degree, these prevalence rates were also high. The least common ACEs were parental incarceration (38.2%, $n = 68$), parental mental illness (27.0%, $n = 48$), and parental substance abuse (20.8%, $n = 37$). The distribution of overall ACE scores is shown in [Fig. 1](#). Three-fourths of the sample (74.7%; $n = 133$) experienced four ACEs or more. The number of ACEs youth were exposed to ranged from 1 to 10 with an average ACE score of 5.6 ($SD = 2.5$).

The second research question examined the relationship between cumulative ACE scores and the areas of youth risk behaviors, emotional and behavioral health needs, and functioning. Bivariate analyses among variables are shown in [Table 2](#). The number of actionable risk behaviors ranged from 0 to 10 with youth averaging 2.7 actionable risk behaviors. Youth also averaged 4.5 for actionable behavioral needs and 4.2 for actionable life domain functioning with possible scores ranging between 0 and 8 items for both areas. Bivariate analysis showed that ACE scores were positively correlated with both of the recoded strengths items assessed in the subsequent analysis and each of the dependent variables.

The third research question examined whether the relationship between ACE scores and youth functioning was mediated by youth peer relationships and the stability of significant personal relationships. The first step of the mediation analysis examines whether there is a significant relationship between the mediator variables and the independent variable ([Baron & Kenny, 1986](#)). As shown in [Figs. 2 and 3](#), results suggest there was a significant association between ACE scores and both peer relationships and relationship

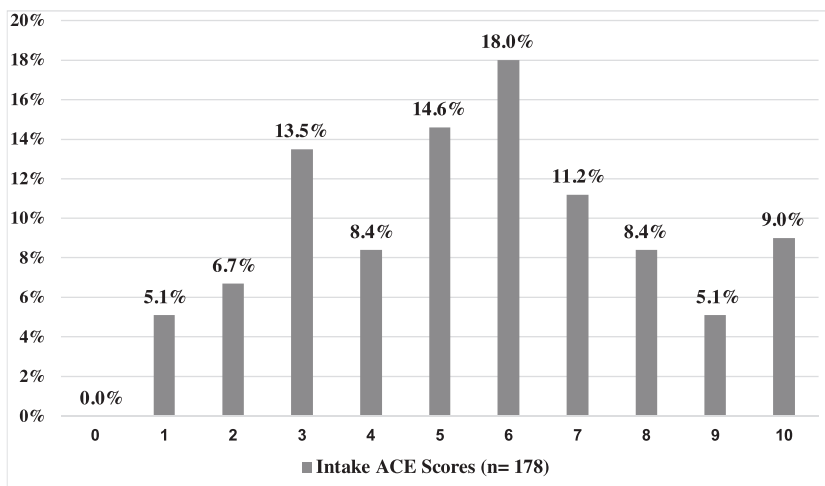


Fig. 1. Distribution of Cumulative ACE Scores.

Table 2
Descriptive Statistics and Correlations between the Independent, Mediator, and Dependent Variables (n = 178).

	Mean (SD)	Min	Max	1.	2.	3.	4.	5.
<i>Independent Variable</i>								
1. ACE Scores	5.55 (2.49)	0	10					
<i>Mediator Variables</i>								
2. Peer Relationships	1.02 (.73)	0	3	-.17*				
3. Relationship Stability	1.02 (.84)	0	3	-.18*	.47***			
<i>Dependent Variables</i>								
4. Risk Behaviors	2.67 (2.39)	0	10	.46***	-.40***	-.34***		
5. Behavioral Needs	4.46 (2.38)	0	8	.32***	-.45***	-.36***	.61***	
6. Life Domain Functioning	4.15 (2.23)	0	8	.44***	-.45***	-.29***	.65***	.58***

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

stability. The remaining analyses and accompanying path diagrams present the results of a series of regressions examining the relationship between ACE scores and each of the dependent variables while modeling youth interpersonal strengths as potential mediators.

5.1. Peer relationships

Fig. 2 presents the results of the mediation analyses modeling peer relationships as the mediator for each area assessed. ACE scores significantly predicted actionable risk behaviors ($b = .314, p < .001$). When actionable risk behavior was regressed on peer relationships and ACE scores, both ACE scores ($b = .290, p < .001$) and peer relationships ($b = -.473, p < .05$) were statistically significant. However, the indirect effect of ACE scores on actionable risk behaviors through peer relationships was observed to be non-significant, indicating no mediation effect.

Results also indicate that ACE scores significantly predicted actionable behavioral needs ($b = .318, p < .001$). When actionable behavioral needs was regressed on ACE scores and peer relationships, ACE scores ($b = .259, p < .001$) and peer relationships ($b = -1.158, p < .001$) were significant, indicating that a direct relationship between ACE scores and actionable behavioral needs remained. The bootstrapped analysis revealed a significant indirect effect ($b = .059, p < .05, 95\%$ confidence interval [CI] = .002, .115) indicating peer relationships mediated a portion of the relationship between ACE score and behavioral needs. The mediated effect indicated that a higher ACE score was associated with fewer positive relationships with peers and that positive relationships with peers were associated with fewer actionable behavioral needs. The effect of peer relationships was confirmed to be statistically significant according to Sobel mediation tests with approximately 18.4% of the total effect of ACE scores on actionable behavioral needs being mediated by peer relationships ($z = 2.11; p < .05$).

ACE scores were also observed to significantly predict actionable life domain functioning ($b = .417, p < .001$). There was a significant indirect effect of ACE scores ($b = .042, p < .05, CI = -.0004, .084$) on actionable life domain functioning through peer relationships, indicating peer relationships mediated a portion of the relationship between ACE score and life domain functioning. Still, there remained a direct relationship between ACE scores and actionable risk behaviors. The mediated effect indicated that a

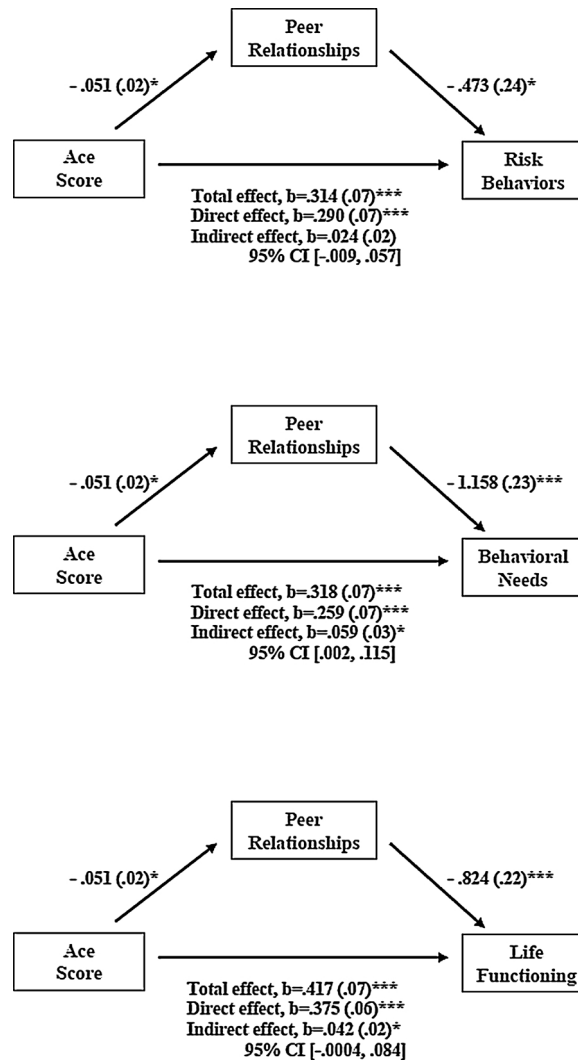


Fig. 2. Path Diagrams for the Relationship between ACE Scores and Youth Risk Behaviors, Behavioral Needs, and Life Domain Functioning as Mediated by Peer Relationships.

higher ACE score was associated with fewer positive relationships with peers and that positive relationships with peers were associated with fewer actionable needs pertaining to the life domain functioning domain. The effect of peer relationships was confirmed to be significant according to Sobel mediation tests with approximately 10% of the total effect of ACE scores on actionable life functioning needs being mediated ($z = 1.97; p < .05$).

5.2. Relationship stability

Fig. 3 presents the results of the mediation analyses modeling relationship stability as the mediator for each area assessed. ACE scores significantly predicted actionable risk behaviors ($b = .314, p < .001$). When actionable risk behavior was regressed on relationship stability and ACE scores, a significant direct effect remained. However, the indirect effect of ACE scores on actionable risk behaviors through relationship stability was observed to be non-significant, indicating no mediation effect.

ACE scores also significantly predicted actionable behavioral needs ($b = .318, p < .001$). A significant direct effect remained when actionable behavioral needs was regressed on ACE scores ($b = .265, p < .001$) and relationship stability ($b = -.894, p < .001$). Higher ACE scores were still associated with a greater number of actionable behavioral needs. The bootstrapped analysis revealed a significant indirect effect ($b = .053, p < .05, CI = .007, .099$), indicating relationship stability mediated a portion of the relationship between ACE scores and behavioral needs. The mediated effect indicated that a higher ACE score was associated with less stable relationships with significant adults, and that stable relationships were associated with fewer actionable behavioral needs. Sobel mediation tests confirmed the effect of relationship stability was statistically significant, with approximately 18.4% of the total effect of ACE scores on actionable behavioral needs being mediated by relationship stability ($z = 2.11; p < .05$).

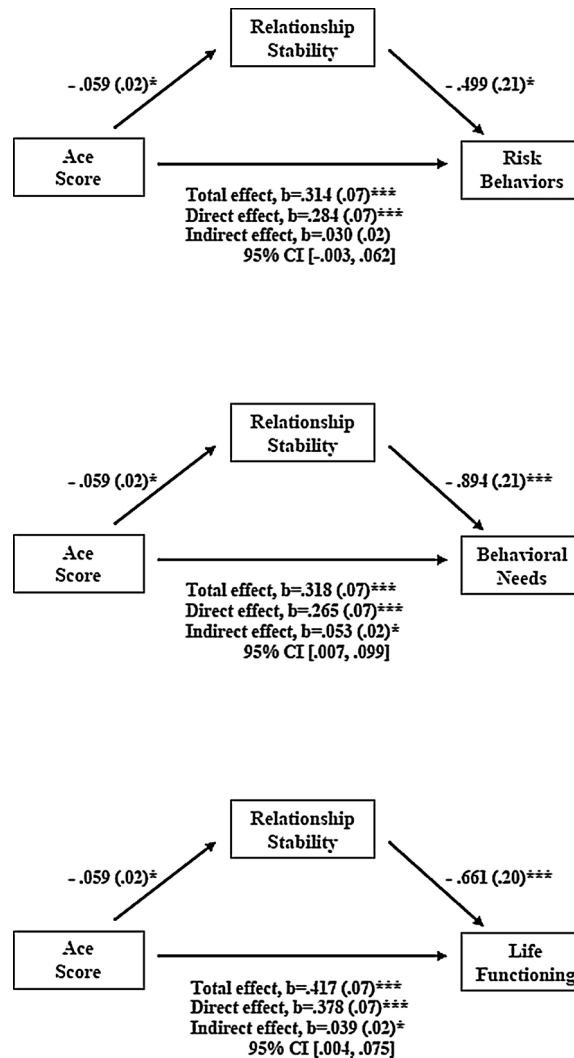


Fig. 3. Path Diagrams for the Relationship between ACE Scores and Risk Behaviors, Behavioral Needs, and Life Domain Functioning Mediated by Relationship Stability.

Finally, ACE scores significantly predicted actionable needs pertaining to life domain functioning ($b = .417, p < .001$). Still, there remained a significant direct relationship between ACE scores and life domain functioning when actionable life domain functioning was regressed on ACE scores ($b = .378, p < .001$) and relationship stability ($b = -.661, p < .001$). The indirect effect of ACE scores on needs pertaining to actionable life domain functioning through relationship stability was statistically significant, indicating relationship stability mediated a portion of the relationship between ACE score and life domain functioning ($b = .039, p < .05, CI = .004, .075$). Higher ACE scores were associated with less stable relationships with significant adults, and stable relationships were associated with fewer actionable life domain functioning deficits. The mediated effect was confirmed to be significant according to Sobel mediation tests, with approximately 9.4% of the total effect of ACE scores on actionable life domain functioning being mediated ($z = 1.96; p = .05$).

6. Discussion

This study explored the relationship between adverse experiences and youth risk behaviors, behavioral needs and functioning needs across various life domains among a sample of commercially sexually exploited (CSE) youth in the child welfare system and whether youth strengths mediated this relationship. The first research question examined the prevalence of ACEs among a sample of CSE youth. Emotional neglect, physical neglect, emotional abuse, and sexual abuse were the most prevalent ACEs experienced by this population. Research on risk factors of CSE suggests that traumatic experiences such as these makes predation of dependent youth easier for exploiters (Gragg et al., 2007). Most compelling are results pertaining to the number of ACEs experienced by youth in this study. The average number of ACEs was 5.6 for this sample with a mode of six ACEs. Further, 9% of youth were exposed to all ten

ACEs. These figures are higher than those reported by other studies of ACEs among other special populations of children such as youth involved in the juvenile justice system (Baglivio et al., 2014). Given that a high cumulative ACE score is defined as a person experiencing four or more ACEs, implications for the health and well-being of CSE youth are disturbing (Dube et al., 2001). Three quarters of this sample of CSE youth exhibited a high cumulative ACE score. This finding highlights the importance of using various forms of evidence-based trauma therapies to address the multiple and complex adverse experiences of these youth. In addition, maintaining consistent treatment providers with this population is essential as youth with extensive trauma histories have difficulty establishing trust which can impact the therapeutic process. CSE youth require time and consistent interactions with treatment providers to feel safe enough to expose and process their extensive trauma histories. Finally, caregivers of CSE youth would benefit from training on the impact of trauma on children and trauma informed care. Educated caregivers are better able to provide consistent environments and encourage effective strategies to deal with a trauma response.

Through the second research question, we explored the relationship between ACE scores and youth risk behaviors, emotional and behavioral health needs, and impairments in life domain functioning. As hypothesized, a significant, positive relationship was found between ACE scores and each of the areas assessed. This finding is consistent with previous research that youth who present to treatment with greater behavioral health needs tend to have higher trauma scores than youth with fewer behavioral health needs (Copeland et al., 2007; Finkelhor et al., 2007).

Most importantly, the third research question examined whether youth strengths—specifically, peer relationships and relationship stability, mediate the relationship between ACE scores and youth status and functioning. This study used longitudinal data to explore how relationship mediators affected youth outcomes. Consistent with our hypothesis, results from the mediation analyses provide some support that positive relationships with peers and having lasting relationships, at least in part, mediate the effect of ACE scores on behavioral health needs and life domain functioning. Specifically, we expected strengths in these two areas would reduce the deleterious effects of trauma, as measured by the ACE scores, on youth risk behaviors, behavioral health needs and life functioning domains. Our findings showed youth who had positive relationships with peers and stable relationships with significant adults had fewer emotional and behavioral health problems and difficulties with functioning at home, school, and the community as early as three months into treatment. This finding may be associated with the emphasis on the engagement phase in the CHANCE program and the related efforts to build strong relationships with youth within the first three months. However, our findings did not support a mediation effect of peer relationships nor relationship stability as it pertains to risk behaviors. Both peer relationships and relationship stability accounted for some of the variance in the relationship between ACE score and risk behaviors. However, this reduction was not substantial enough to infer a mediating effect. This may be a consequence of the small sample available for this study, and/or that a mediating effect takes longer than three months to manifest.

A greater proportion of the mediation effect involved the domain of behavioral health needs. Results from Sobel mediation tests indicated 18.4% of the total effect of ACE scores on youth behavioral health needs was mediated by youth strengths. About 10% of the total effect on life domain functioning was mediated by peer relationships and relationship stability. Despite significant findings, a substantial portion of the variance in youth outcomes was not accounted for by peer relationships and relationship stability.

Our findings regarding youth strengths as mediators are consistent with previous findings in the literature that strengths can function as a buffer against behavior problems and negative outcomes shown to be associated with trauma (Accomazzo et al., 2015; Dorsey et al., 2012; Gray et al., 2012; Whitson et al., 2013). Strengths may be used to combat cognitive distortions and false beliefs of shame, culpability, and self-worth by providing youth with an alternative cognitive framework that encourages resiliency, improved psychological functioning, and a positive self-concept (Abu-Ali & Al-Bahar, 2011; Gray et al., 2012; Smith, 2013). Our study findings expand on this research by showing the importance of addressing two areas in treatment planning: the facilitation of youth skills in developing peer relationships and skills in sustaining significant relationships.

The implications of this study provide further support for the use of various forms of trauma-focused therapy that view the identification and development of strengths as protective factors. A targeted treatment plan that addresses the trauma of multiple adverse experiences is integral (Gray et al., 2012). Study implications also highlight the importance of using assessment protocols with CSE youth that identify youth strengths as well as behavioral health needs and life functioning challenges. As noted earlier, the CHANCE program uses the Child and Adolescent Needs and Strengths-Commercially Sexually Exploited (CANS-CSE) as a clinical assessment tool. Therapists use the CANS results to inform treatment planning strategies including the use of strengths in treatment planning, and the development of strengths in areas such as skills in peer relationships and sustainability of significant positive relationships in their lives.

Although this study adds to the limited body of research on the impact of youth strengths as mediators in the relationship between adverse experiences and youth functioning, there are some limitations to note. First, data for the study were limited to a single treatment program for commercially sexually exploited youth with a limited program capacity. As such, the sample size for the study was small. There was also an overrepresentation of females. Another limitation is the fact that ACE items were extrapolated from the CANS-CSE. As such, there are some inconsistencies between measurements of ACEs with the CANS-CSE versus through the ACE questionnaire. In most cases, this may have led to the underestimation of some ACEs and, subsequently, ACE scores.

The vulnerabilities of CSE youth are well documented and extant literature demonstrates the association between trauma and behavioral health problems. This study adds to the limited literature that considers the role that youth strengths play in this relationship and provides support for a strengths-based treatment approach for CSE youth. In addition, the study findings are useful for therapeutic programs for this population because it pinpoints youth strength areas that will improve youth outcomes. Overall, the findings indicate that developing youth skills in developing peer relationships and sustaining significant relationships can mitigate some of the adverse effects of the trauma experienced by exploited youth. Group therapy is highly recommended for this population as youth will have the opportunity to gain skills in social interactions, develop problem solving skills, and conflict resolution skills in

a supported environment. The findings also reinforce the use of peers as supports for youth and building strong networks of support for young people who have experienced CSE to help them in their recovery.

Finally, our findings are consistent with the research that indicates that healthy relationships with peers and significant adults are key determinants of health and well-being of children and adolescents (Bernat & Resnick, 2009). It is important to consider that a point of entry into a system of care for many youth involved in commercial sexual exploitation may be an outpatient primary care setting such as a pediatric clinic, family planning clinic, urgent care or emergency room. This study emphasized the importance of training for nurses, physicians and all direct care staff on the indicators of commercial sexual exploitation as these patients will rarely self-identify and the impact of trauma on these youth. Indicators of commercial sexual exploitation may be found in the history, mental status, or physical findings. Once identified then appropriate medical care and guidance can be provided to minimize the impact of trauma on physical health.

Treatment planning that focusses on sustained significant relationships should be incorporated into the treatment process for CSE youth. Interventions that enhance or develop stable interactions with healthy adults are critical for these youth. For example, CSE youth may benefit from family therapy that addresses the impact of CSE and other forms of trauma with the goal of increasing empathy and improving communication. Youth who lack stable and appropriate adult interactions may benefit from a stable and consistent adult mentor to be a positive connection in their life.

Declaration of Competing Interest

None.

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