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Article

Relationship of Maternal Age and Adverse Childhood Experiences (ACEs) with Traumatic Sequelae in Commercially Sexually Exploited Youth

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Abstract: The impact of early maternal age on several outcomes (e.g. mental health issues, delinquency, aggression, impulsivity, victimization and interpersonal difficulties) has been studied since the late 1980s. Research has demonstrated links between exposure to adverse childhood experiences (ACEs) and trauma related outcomes such as substance abuse, interpersonal and self-directed violence, and sexual risk-taking, to name a few. The current study analyzed the incidence of ACE exposure and mental health outcomes (e.g. suicidal behaviors or self-harm, psychiatric hospitalizations, and substance use) as related to early maternal age in youth known to have experienced trafficking or sexual abuse. General demographics and incidence of various experiences and clinical presentations (e.g. ACE exposure, age of mother at birth of youth and age at first birth), and history of self-harm, substance use and psychiatric hospitalization were examined in a sample of 225 youth referred for services subsequent to experiences of sex trafficking or exploitation. Relationships between ACE exposure and maternal age related to mental health outcomes was also examined. Trafficked and exploited youth reported rates of ACE exposure and poor mental health outcomes at far greater rates than the general population. Significant findings were related to early maternal age and engaging in self-harm or suicidal behaviors. Previously anticipated mediational analyses were not conducted due to the sample size and lack of correlations. Findings highlight the significant ACE exposure and high needs of exploited, trafficked and abused youth and related mental health outcomes, emphasizing the need for early and comprehensive preventive and therapeutic interventions.

Keywords: trafficked youth and trauma; ACEs; early maternal age; teen pregnancy; exploitation and trauma; self-harm; psychological trauma

1. Introduction

According to U.S. federal definitions outlined in the U.S. Trafficking Victims Protection Act [1], sex trafficking is "the recruitment, harboring, transportation, provision, obtaining, patronizing, or soliciting of a person for the purpose of a commercial sex act, in which the commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age." Since the establishment of these definitions, terms such as sex trafficking, commercial sexual exploitation of children (CSE or CSEC) and domestic minor sex trafficking (DMST) have been used largely interchangeably, though there may be some differences. Relatedly, there has been a greater focus on understanding the vulnerability factors related to trafficked and exploited youth and the impact of their abuse experiences through the establishment of the National Human Trafficking Resource Center [2] and additional resources and funding through the Victims of Crime Act [3]. Research stemming from these initiatives and others highlight the significant impact of

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trafficking and sexual exploitation on mental health and other domains of functioning (e.g. educational, occupational, physical health, access to housing and other resources), requiring varied, comprehensive, and ideally integrated services for survivors [4]. Studies have also begun exploring risk factors contributing to vulnerability in youth, including histories of child abuse and neglect, intimate partner violence, runaway behavior or homelessness, and low levels of education to name a few. Despite these advances, the field is still in its infancy in understanding our trafficked youth. As such, it is imperative to develop a better understanding of what factors or early life experiences may contribute to a vulnerability to being engaged in the life and the subsequent impact. The current study was designed to focus on the possible impact of early maternal age on increased ACE exposure in a sample of trafficked and exploited youth and their relationship to engaging in self-harm or suicidal behaviors, psychiatric hospitalization, and substance use.

The literature has suggested that early maternal age and childhood adversity contribute to early initiation into sexual behavior and substance use [5–7], as well as negative physical and mental health outcomes. Early maternal age is generally considered as being younger than 20. Within the United States, recent statistics suggest more than 147,000 teen pregnancies a year, as official reports track live births to mothers between the ages of 15 and 19 [8]. Various studies have suggested that early maternal age impacts intelligence, academic achievement, mental health issues, delinquency, aggression, impulsivity, and interpersonal difficulties in offspring [1,5–7,9]. Elaborating further, Cederbaum and colleagues [5] found a significant relationship between having a teen mother and early initiation into sexual activity, though the authors did not distinguish between consensual activity versus abuse or exploitation. Teen mothers are 2.2 times more likely to have a child placed in foster care (a known risk factor for trafficking) compared to mothers aged 20- 21 [10]. Additionally, specifically relevant to risk of exploitation or trafficking, at least one older study has suggested that children of teen parents are 2-3 times more likely to run away [11].

Felitti et al. [12] explored the relationship of early childhood experience to later physical illness, advancing the notion of adverse childhood experiences (ACEs). In the course of their research, they compiled a list of seven types (later expanded to ten) of adverse experiences in three general categories (abuse, neglect, household dysfunction). Adverse childhood experiences (ACEs) include physical, emotional, and sexual abuse, exposure to domestic violence, physical and emotional neglect, exposure to mental illness in the home, exposure to substance use, and incarceration of a household member [12,13]. The research team simply tallied how many of these categories respondents endorsed. Correlations were then explored between ACEs and both risk factors for poor health outcomes (e.g. depression, substance use, obesity, large number of sexual partners) and presence of actual disease (e.g. cancer, stroke, diabetes, heart disease) [12]. Their seminal study was the first to highlight that ACEs were correlated with risk factors and poor physical health, as well as a notable dose-response relationship, wherein the greater the amount of ACE exposure, the more risk factors present and the poorer the health outcomes. More specifically, those who endorsed a history of four or more ACEs evidenced significantly worse risk and outcomes. Since that point, Hughes et al. [13] have suggested that an ACE count of 4 be considered clinically significant, while Merrick et al. [14] have noted that exposure to 6 or more ACEs is associated with a 20-year shorter lifespan.

High rates of ACE exposure in youth predicts substance use and mental health issues [15–17], especially when considering juvenile justice involved youth [18]. Moreover, there appears to be a dose-dependent relationship between ACEs and concerning outcomes such as substance abuse, interpersonal and self-directed violence, sexual risk-taking and poor physical health [19–24]. One systematic review and meta-analysis found that individuals who experienced 4 or more ACEs were over 5 times more likely to use illicit drugs and alcohol and over 30 times more likely to have had a suicide attempt than peers who experienced no ACEs [25]. Additionally, Carr at al. (2020) found that 10.9% who engaged in self-harm, 11.4% of those who aggressed against others and 11.4% of those who engaged in "dual harm" experienced 5 or more ACEs [19].

Based on the above, the current study sought to examine relationships between early maternal age, ACEs exposure and mental health outcomes of a history of self-harm or suicidal behaviors, psychiatric hospitalization, and substance use in a sample of juvenile justice involved females with a

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history of exploitation or being trafficked who were referred for treatment. It was reasoned that early maternal age in general, whether youths' mothers were a teen at participating youths' birth or gave birth to a sibling while in their teen years, would have an impact on youths' functioning. It was expected that early maternal age would contribute to poorer mental health outcomes for youth enrolled in the program (e.g. suicidal behaviors, psychiatric hospitalization and substance use). It was hypothesized that the current sample would experience greater ACE exposure than the general population, which in turn would correlate with poorer mental health outcomes. Finally, it was anticipated that earlier maternal age would coincide with increased ACE exposure, which in turn would result in poorer mental health outcomes.

2. Methods:

2.1 Sample

Participants in the current sample were derived from an initial sample of 242 youth referred between late 2017 and early 2022 to a nonprofit organization in an urban county in the southwestern US. The organization seeks to break the cycle of revictimization and system involvement for youth and assist them in reclaiming their narratives and persisting forward through comprehensive supports (e.g. on-site school, trauma therapy center, art therapy, and paid internships). Upon acceptance into the program, youth complete various assessments and participate in a clinical interview. General demographic information was collected. As related to maternal age, information was gathered related to participating youths' mothers at participants' birth. The study also collected information on youths' mothers' age at the time of their first birth [e.g. whether their mother was a teen mother at any point]. Information pertaining to demographic information and maternal age was provided both by youth, and when available, family members participating in the intake process. Youth were also administered the CYW Adverse Childhood Experiences Questionnaire for Adolescents: Self-Report (ACE-Q) [26] to assess their exposure to 19 types of adverse experiences. Pertaining to mental health outcomes, self-report and documentation provided by referring agencies were used to collect information on histories of psychiatric hospitalization, suicidal behaviors or self-harm and substance use.

2.2 ACE-Q

The CYW Adverse Childhood Experiences Questionnaire for Adolescents: Self-Report (ACE-Q) is a self-report measure designed to assess ACE exposure in youth ages 13-19. The measure includes the original ten ACEs (Part 1) and has been expanded to include additional early life stressors (e.g. foster care placement, family separation through immigration or deportation, community violence; Part 2). Youth note how many ACEs they have experienced in both Part 1 and Part 2. Overall ACEs and results in each part were examined for the current study. While there are technically no clinical cut scores, based on the findings of Hughes et al. [13] and Merrick et al. [14], cases were categorized as 4+ ACEs and 6+ ACEs in addition to general exposure.

2.3 Analyses

Basic demographics were collected and cross tabulated to examine associations between variables. Pearson correlations, nonparametric correlations and point-biserial correlations were calculated where appropriate, dependent upon the nature of the variables. While it was expected to be able to conduct a mediational analysis to examine ACE exposure's impact on the relationship between early maternal age and mental health variables (self-harm/suicidality, hospitalization, substance use), the lack of significant correlations prevented such an analysis. Analyses were conducted through the use of SPSS.

3. Results:

3.1. Demographics

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An initial review of the sample removed cases that had significant data missing, leaving 225 youth. Of these, 79 youth provided information on their mothers' age when they themselves were born. A total of 78 youth provided information on their mothers' age when they gave birth to their first child, which may or may not be the specific youth enrolled in the current program. Related to the 79 youth, the average age at the time of the study was 19.19 (SD=2.298), with 15.89 (SD=1.634) being the average age of referral. The sample included 5.4% Caucasian, 37% African-American/Black, 54.3%, Latinx, and 3.3% identified as mixed.

Maternal age at first child's birth ranged from 13-34 (n=78, M=19.60, SD=4.694), with 61.5% of mothers having been a teen at the time of their first child. For program involved youth, maternal ages ranged from 15-42 (n=79, M=23.82, SD=6.016) at their personal birth, with youth being the product of teen pregnancy 27% of the time. ACE exposure was examined, both as a total ACE-Q score and as totals for Part 1 and Part 2. For the 79 youth who provided information, youth experienced an average of 9.30 [SD=4.014, endorsing the full range between 1 and 17 ACEs, with a median of 10] ACEs, with an average of 5.69 on Part 1 and 4.37 on Part 2. More specifically, 87.3% of youth experienced 4 or more ACEs, while 84.6% experienced 6 or more ACEs. By extension, only 12.7% experienced 3 or less ACEs.

Pertaining to self-harm, 50.6% of participants (n=79) either endorsed having engaged in self-harm or suicidal behaviors in the past, or there was clear documentation of such in the record. Relatedly, 54.4% of the sample evidenced or reported a history of psychiatric hospitalization. Perhaps most astoundingly, 80% of participants in the study (63 youth) either endorsed or had documented histories of problematic substance use.

3.2. Relationship between Variables

Just under 10% of youth (n=72) born to young mothers reported a history of self-harm or suicidal behavior, with almost 13% indicating they had a history of psychiatric hospitalization (n=71). Pertaining to early maternal age and substance use, 22% of youth (n=72) providing relevant information and born to teenaged mothers endorsed substance use or abuse. Interestingly, relationships between these mental health outcomes and having a mother who gave birth to a sibling while a teen appear to be markedly stronger. In the current sample, approximately 30% had a history of self-harm or suicidal ideation (n=62), 36% had a history of psychiatric hospitalization (n=61) and almost 55% endorsed problematic use of substances (n= 62).

Examining rates of ACE exposure as related to maternal age, of those youth who were born to a teen mother (n=49), the mean ACE exposure was 10, with 13 youth having been exposed to 4 or more ACEs and 12 youth being exposed to 6 or more ACEs. Even more concerning, if youth were born to a mother whose first pregnancy was in her teens (n=49), 26 of these youth were exposed to 4 or more ACEs and 25 had 6 or more exposures. As the sample is not parametric related to any variables, nonparametric correlations were conducted. Regarding continuous variables of maternal age, both for youth in the program and first birth, and the relationship to ACE exposure, there was no significant correlation as measured by either Kendall's tau or Spearman's rho for either condition [r_T=-.097, p<.298 and r(58)=-.111, p<.400 for enrolled youth being first born to a teen mother and r_T=-.013, p<.898 and r(50)=-.010, p<.946 for the mother having a child as a teen]. Similarly, point biserial correlations using maternal age as a categorical variable also did not yield significant results (r_{pb}=.014, p=.921 and r_{pb}=-.035, p=.810). These results prevented the initially intended mediation analysis. Results indicate significant negative correlations between both early maternal age at first birth [r(50)=-0.311, p=.025] and at youth's birth [r(59)=-0.512, p<.001] and a self-reported history of engaging in self-harm or suicidal behavior. However, point biserial correlations only found a significant negative correlation between maternal age at youth's birth and self-harm or suicidal behaviors [see Table 1]. Statistically significant correlations were not found amongst the other outcomes.

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Table 1. Correlations Among Maternal Ages, ACEs and Mental Health Outcomes.

		S/H or Suicidal Behaviors	Psychiatric Hospitalization	Substance Use	ACE 4+	ACE 6+
Teen Mom at First Birth	Pearson Correlation	.160	.073	-.177	-.068	-.010
	Sig. (2-tailed)	.214	.578	.365	.630	.942
	N	62	61	62	52	52
Teen Mom at Youth's Birth	Pearson Correlation	-.287*	.162	.096	.047	.130
	Sig. (2-tailed)	.015	.178	.422	.724	.327
	N	72	71	72	59	59
ACEs 4+	Pearson Correlation	.087	.084	.154	--	--
	Sig. (2-tailed)	.449	.472	.182	--	--
	N	77	76	77	--	--
ACEs 6+	Pearson Correlation	.167	.176	.130	--	--
	Sig. (2-tailed)	.149	.130	.265	--	--
	N	76	75	76	--	--

*Significant at the .05 level.

4. Discussion:

The current study sought to expand the field's understanding the prevalence of early maternal age and high ACE exposure in a sample of trafficked and exploited youth, as these experiences are believed to contribute to vulnerability of experiencing such abuses. By extension, we explored associations between these early experiences and the later development of suicidal behaviors, psychiatric hospitalization and substance use. As a whole, results strongly reiterate the prevalence of early and multiple adverse childhood experiences (ACEs) in the histories of youth who have experienced trafficking and exploitation and the significant mental health impact upon youth. Across the board, the current sample far surpasses national averages in experiences of being born to teen mothers, ACE exposure, and adverse mental health outcomes. While the CDC estimated teen birth rates to be 16.7 per 1,000 females in 2019 [27], over a quarter of the youth in the current sample were born to teen mothers. It is also important to note that over 60% of youth were born to mothers who were teens at the time of their first child. As noted by Hoffman [10], children born to teen parents are more likely to disengage from school, become teen parents themselves, require the assistance of Medicaid and CHIP, experience abuse and neglect, enter the foster care system, and have involvement with the criminal justice system. Moreover, children born to unmarried teen mothers who have not finished school are nine times more likely to experience poverty [28]. It is important to highlight these experiences are known vulnerability factors for trafficking and exploitation [4]. It should also be recognized that while many mothers were no longer teens when they gave birth, average ages in both categories reflect young maternal ages on the whole, which may impact parental skill, regulation, financial stability, educational attainment and various other factors. Recent CDC statistics [28] suggest that nearly 1 in 6 adults, or around 15% of the population have experienced 4 or more ACEs. Those who experienced 6 or more ACEs die an average of 20 years earlier than those with less exposure [29]. A large majority of youth in this study have experienced 6 or more ACEs. Even in accounting for the fact that the initial inclusion criteria consists of an ACE [e.g. sexual abuse], experiences with in the current sample are far more significant than the general population and above levels of exposure found to be correlated with deleterious impacts. While of course correlation is not causation, these results lend greater support for the notion that early adverse experiences, whether they be those recognized as ACEs or having a mother who became pregnant as a teen likely contribute to later vulnerability of trafficking and exploitation.

It is then not surprising, in light of these results, that trafficked and abused youth in this sample evidenced negative metal health outcomes in far greater proportions than the population at large.

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National estimates of self-harming behavior in adolescents appear to hover around 17%, in contrast to 50% of youth in the current study [30]. Relatedly, while odds ratios were not calculated due to the nature of sample for direct comparison, Hughes et al (2017) [13] found that odds ratios related to experiencing 4 or more ACEs and engaging in self-harm or suicidal behaviors was more than 7 times as frequent. While rates of psychiatric admission for adolescents is hard to estimate, Egorova et al. (2018) suggest that admission rates were 5.5. per 1000 youth in the US [31], compared to 54% of the current sample. The same study emphasized strong relationships between exposure to 4 or more ACEs and various types of substance use or abuse (ORs ranging from 2-7 related to problematic, moderate or severe alcohol or substance use), which has been echoed in the literature by other studies. Consistent with this literature, 70% of our sample endorsed problematic substance use or abuse. These results are mirror other studies that have found associations between young maternal age and substance use [32,33]. Future studies would not only benefit from a larger, more diverse sample, but an expanded examination of the extent or severity of the mental health impact (e.g. severity of depressive symptomology], as well as an understanding of specific substance use and frequency. Based on the nature of the study, it was impossible to ascertain whether mental health issues were present prior to trafficking and exploitation, contributing to vulnerability, or whether they emerged afterwards. However, it is reasonable to believe some mental health struggles were present before experiences of trafficking and exploitation, which only served to exacerbate outcomes measured. Future studies would clearly benefit from a more specific analysis of the specific development and course of these and other mental health outcomes.

Clearly this study expected to find significant correlations between maternal age, ACE exposure and the three mental health outcomes examined. Such relationships did not emerge, which is believed largely related to a lack of variability in the sample. More specifically, as has been emphasized repeatedly above, trafficked and sexually exploited youth have a high incidence of being born to young mothers, high ACE exposure and significant mental health needs, as was evident in our sample. In developing the current study, it was believed that early maternal age would be related to increased exposure to ACEs, which in turn would contribute to worse mental health outcomes. This expected association was believed to be reflective of the strain and demands upon young mothers in raising children, as well as the cumulative drain on mothers who have numerous children at a young age. While the nature of the current sample prevented more fine-grained analyses of these relationships, the current sample highlights the high incidence of early maternal age and ACEs exposure in this sample of trafficked and sexually exploited youth. By extension, it further emphasizes the importance of future studies designed to understand the relationship of these early experiences with the later development of negative mental health outcomes to assist in the development of both preventive and therapeutic interventions.

Some limitation must be acknowledged. While this is the first study to our knowledge examining the prevalence of early maternal age, ACE exposure and various mental health outcomes specifically in a sample of trafficked and exploited youth, the sample is a relatively small convenience sample from a particular geographic location, referred largely from the juvenile justice system. Additionally, studies have suggested the importance for controlling for variables such as ethnicity, limited maternal education, youth educational level, parenting skills and parental substance use, as these factors also have bearing on mental health outcomes [5,32,34]. As such, studies on larger, more diverse [ethnically, educationally, geographically, etc.] is recommended to enable the ability to control for and assess relationships with other variables. While the present study focused on an aggregate count of ACE exposure, the field would also benefit from a greater understanding as to how various ACEs or combinations specifically contribute to risk.

Considering the above results, it is advisable for developmentally appropriate family planning education to begin prior to puberty so that every youth is aware and empowered to make decisions regarding their reproductive health. To minimize ACE exposure and preemptively address correlated negative mental health outcomes and build resilience, especially for youth born to teenage mothers, efforts should be made so every youth has equitable access to mental health services and other community supports. Specifically, services should focus on emotion awareness and regulation

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skills, stress management, healthy coping, developing safe relationships, processing trauma and navigating community resources and support for teenage parents and their families.

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Conflicts of Interest: The authors declare no conflict of interest.

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