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Commercial Sexual Exploitation Outcomes in a Community Sample of Youth

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ABSTRACT

Purpose: Researchers have suggested that victims of commercial sexual exploitation (CSE) have deleterious long-term outcomes; however, longitudinal trajectories of youth who experience CSE have not been explored. For the current study, the National Longitudinal Study of Adolescent to Adults Health (Add Health) survey was used to compare trajectories of youth who had experienced CSE with their nonexploited peers.

Methods: Propensity score matching was used to match youth at waves 1 and 2 who experienced CSE and who did not experience CSE but had similar risk profiles. Youth with low-risk profiles were also matched. Our sample included 430 youth who experienced CSE, a matched sample of 430 youth who did not experience CSE but had a similar risk profile, and a sample of youth who did not experience CSE and had low-risk profiles ($n = 782$). Outcomes of interest included psychological, behavioral, physical, and interpersonal well-being.

Results: Youth who had experienced CSE had higher levels of injection drug use, more police stops, more emergency room visits, and lower relationship satisfaction than their nonexploited peers. Well-being for individuals who experienced CSE as youth changed some over time, but those changes were comparable to the changes experienced by individuals of similar risk who did not experience CSE. Well-being measures for low-risk youth were universally higher compared to high-risk youth, regardless of CSE.

Discussion: Youth receiving drug treatment, experiencing delinquency, or being seen in emergency medical settings may benefit from CSE screening, so that victims can be identified and provided immediate and comprehensive services.

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IMPLICATIONS AND CONTRIBUTION

The commercial sexual exploitation of children is the commercial exchange of sex by an individual under age 18. Using innovative statistical methods in a large community sample, this study compared the longitudinal trajectories of youth who experienced commercial sexual exploitation to those who had not. Differences reveal areas for intervention and prevention.

The commercial sexual exploitation (CSE) of children, also referred to as child sex trafficking, is the exchange of sexual acts for goods, services, drugs, or money by an individual under the age of 18 [1]. Despite a lack of reliable prevalence data [2,3],

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experts believe that hundreds of thousands of children are commercially sexually exploited within the United States annually [4]. Children at most risk for CSE have complex histories of abuse and deprivation including childhood physical and sexual abuse, family violence, substance use, and juvenile justice and/or child welfare involvement [5,6]. Sexual minority youth [7,8] as well as Black, indigenous, and/or people of color [7,9] are thought to be at higher risk of experiencing CSE.

Many researchers have asserted that child victims of CSE experience uniquely deleterious outcomes. Specifically, child victims of CSE may have higher rates of post-traumatic stress, depression, and suicidality than their nonexploited peers [5]. Furthermore, the ability to engage in meaningful and healthy relationships may be difficult for survivors of childhood CSE, as many have trouble developing pro-social skills and attachments with others [10,11]. Anecdotal and empirical evidence suggests that CSE victims have frequent contact with state-level systems, including the justice system and child welfare [12–15]. Finally, research seems to indicate that childhood CSE victimization is likely related to ongoing instances of interpersonal violence, substance use, and involvement in commercial sex [16].

Unfortunately, there is a dearth of information about the life trajectories of youth who have experienced CSE victimization. Most of the research on the lives of CSE victims rely on retrospective survey data or qualitative interviews [17]. Accordingly, it is difficult to know the time order of life events, mental health symptomatology, or degree of system involvement. Furthermore, we know very little about how trajectories of youth who have experienced CSE differ from other high-risk youth, who may have many risk factors for CSE but have not exchanged sex. Such information has important implications for legislative reform, CSE-related programming, victim identification, and the prevention of [re]victimization. Specifically, understanding key areas service provision and developmental timeframes may offer guidance for psychoeducation, screening, and intervention.

The objective of the current paper is to employ propensity score matching techniques and examine longitudinal trajectories of youth who experienced CSE and contrast trajectories with those of youth who did not experience CSE but have high-risk profiles, and youth who did not experience CSE and have low-risk profiles (hereafter collectively the “non-CSE groups”). To achieve this objective, we analyzed representative youth data from the National Longitudinal Study of Adolescent to Adult Health (Add Health; 1994–2018) and sought to answer the following research questions:

1. Do individuals who experienced CSE as youth differ in their psychological, behavioral, physical, and interpersonal (i.e., “holistic”) well-being when compared to individuals who were at high risk of CSE but did not experience CSE, and individuals with lower risk who did not experience CSE at baseline?
2. How does well-being for individuals who have experienced CSE as youth change over time compared to both individuals who were at high risk of CSE during their youth but were not exploited, and individuals with lower risk who did not experience CSE?

Methods

Data and sample

All methodology was reviewed and declared exempt from University of North Carolina at Chapel Hill’s Institutional Review Board due to it being a secondary data analysis. A total of 20,745 adolescents in Grades 7–12 during the 1994–1995 school year comprised the Wave I sample of nationally representative respondents from the Add Health dataset. Information from in-home youth interviews at Waves I and II (1996; $n = 14,738$;

Grades 8–12) was used to identify youth who had exchanged sex for anything of value prior to age 18. We used this as a proxy for CSE because at its most basic level, CSE is a commercial exchange involving sex. Although current understandings of CSE also encompass other actions (e.g., live streamed sexual acts, child sexual abuse material, sex tourism), exchange of sex for any item of value is uniformly considered CSE and meets all US federal legal definitions of child sex trafficking [1]. Additional information from Waves II, III (2001–2002; $n = 15,197$; ages 18–26), IV (2008–2009; $n = 15,701$; ages 24–32), and V (2016–2018; $n = 12,300$; ages 33–43) was used to examine longitudinal trajectories of the following: (1) youth who experienced CSE ($n = 430$) as well as (2) a matched sample of youth who did not experience CSE but had a similar risk profile ($n = 430$), and (3) a matched sample of youth who did not experience CSE and had low-risk profiles ($n = 782$). Descriptive information about CSE and non-CSE groups is reported in Table 1.

Measures

We employed several variables from waves in which relevant data were available to generally assess longitudinal trajectories across the three groups of youth with respect to their holistic well-being. Specifically, we included variables representing depression (Waves 2–5; multi-item scales similar to that used at Wave 1; the same eight items were used across Waves 1–4; only four of which were available at Wave 5) [18], anxiety diagnosis (Waves 4 and 5; 1 = ever diagnosed), post-traumatic stress disorder diagnosis (Waves 4 and 5; 1 = ever diagnosed), suicidal ideation (Waves 2–5; 1 = at all in the past year), self-suicide attempts (Waves 2–5; 1 = any in the past year), friend suicide attempts (Waves 2–5; 1 = any in the past year), belief you will live to age 35 (Waves 2 and 3; 1 = almost certain, 0 = otherwise), sex exchange (Wave 4; “How many times have you paid someone to have sex with you or has someone paid you to have sex with them?”; 1 = any in the past year), drug use since Wave 1 (Waves 2 and 3; 1 = yes), any drug use ever (Waves 4 and 5; 1 = yes), injection drug use (Waves 2–4; 1 = yes), count of drug types used (Waves 4 and 5; ranging from 0 to 7), number of police stops (Wave 3; response categories for “never,” “1 time,” and “2 or more times”), ever arrested (Waves 3–5; 1 = yes), not seeking needed healthcare (Waves 2–5; 1 = yes, in the past year), health problems worsening due to not seeking healthcare (Waves 3 and 4; 1 = yes, in the past year), number of emergency room (ER) visits in the past 5 years (Wave 3; ranging from 0 to 30 after removing one outlier with a value of 98), number of hospitalizations in the past 5 years (Wave 4; ranging from 0 to 20), perceived chances of getting HIV/AIDS (Wave 2; “What do you think your chances are of getting AIDS?”; from 1 = no chance to 5 = very high), ever told you have HIV/AIDS (Waves 3–5; 1 = yes), relationship happiness (Waves 4 and 5; response categories for “not too happy,” “fairly happy,” and “very happy”), intimate partner violence (IPV) victimization (Waves 4 and 5; 1 = any in the past year), and IPV perpetration (Waves 4 and 5; 1 = any in the past year).

Data analysis

We first estimated a binary logistic regression model in which CSE was specified as the outcome (i.e., 1 = youth experienced CSE [$n = 431$], 0 = youth did not experience CSE [$n = 19,354$]), and all relevant risk factors from Wave I were specified as model predictors (all variables conceptualized as risk factors are listed

Table 1
Sample description and balance tests between CSE and non-CSE youth before and after propensity score matching procedures

Wave I variables	Prematching				SMD	Minimum	Maximum	Postmatching					
	Non-CSE (n = 19,354)		CSE (n = 431)					Non-CSE (n = 430)		CSE (n = 430)		Group differences, p value	SMD
	n or mean	% or SD	n or mean	% or SD				n or mean	% or SD	n or mean	% or SD		
Gender identity													
Female	9,822	50.7%	146	33.9%	<.001	-	-	133	30.9%	145	33.7%	.382	
Male	9,532	49.3%	285	66.1%		-	-	297	69.1%	285	66.3%		
Racial/Ethnic identity													
Non-Hispanic White	10,278	53.1%	221	51.3%	<.001	-	-	220	51.2%	220	51.2%	.862	
Non-Hispanic Black	4,302	22.2%	131	30.4%		-	-	123	28.6%	131	30.5%		
Hispanic	3,318	17.1%	59	13.7%		-	-	63	14.7%	59	13.7%		
Asian/Other	1,453	7.5%	20	4.6%		-	-	24	5.6%	20	4.7%		
Family structure													
Two parent	10,166	52.5%	204	47.3%	.096	-	-	201	46.7%	204	47.4%	.913	
Stepfamily	3,197	16.5%	70	16.2%		-	-	65	15.1%	70	16.3%		
Single parent	4,792	24.8%	127	29.5%		-	-	131	30.5%	127	29.5%		
Other	1,199	6.2%	30	7.0%		-	-	33	7.7%	29	6.7%		
Youth immigration status													
1st or 2nd Generation	4,451	23.0%	66	15.3%	<.001	-	-	69	16.0%	66	15.3%	.779	
3+ Generation	14,903	77.0%	365	84.7%		-	-	361	84.0%	364	84.7%		
Safe neighborhood													
Yes	17,121	88.5%	365	84.7%	.016	-	-	382	88.8%	364	84.7%	.070	
No	2,233	11.5%	66	15.3%		-	-	48	11.2%	66	15.3%		
Parent education ^a	4.69	1.60	4.52	1.54	.030	0.13	1	7	4.61	1.51	4.52	1.54	.374
Youth age	15.64	1.75	15.02	1.31	<.001	0.39	11	21	14.99	1.66	15.03	1.31	.716
Neighborhood satisfaction ^b	3.90	1.02	3.86	1.12	.423	0.03	1	5	3.91	1.05	3.86	1.12	.489
Community violence index ^c	0.43	0.87	0.95	1.30	<.001	-0.62	0	5	0.93	1.28	0.94	1.30	.916
School connectedness (α = 0.77) ^d	3.74	0.86	3.52	0.96	<.001	0.24	1	5	3.58	0.94	3.52	0.96	.400
Delinquent behavior index ^e	2.79	2.74	4.78	4.03	<.001	-0.71	0	15	4.87	3.73	4.76	4.00	.672
Depression (α = 0.80) ^f	0.71	0.49	0.86	0.58	<.001	-0.29	0	3	0.83	0.55	0.85	0.57	.451
Family belonging (α = 0.75) ^g	3.96	0.70	3.86	0.80	.003	0.14	0	12	3.83	0.74	3.86	0.80	.560
Teachers caring ^h	3.54	0.99	3.23	1.22	<.001	0.32	1	5	3.26	1.04	3.23	1.22	.718
Friends caring ⁱ	4.24	0.80	4.12	0.93	.004	0.17	1	5	4.15	0.81	4.12	0.93	.640

Bivariate chi-squared tests for categorical variables and two-tailed t-tests for continuous variables were conducted between youth with no minor sex exchange and youth with minor sex exchange for all variables used to generate propensity scores. Significant p values at the .05 level are bolded. CSE = commercial sexual exploitation; SD = standard deviation; SMD = standardized mean difference.

- ^a Coded using the highest value across available parental figures, ranging from 1 = no school/up to eighth grade completion, 7 = professional training after college.
- ^b Measured with the following item: "On the whole, how happy are you with living in your neighborhood?," where 1 = not at all and 5 = very much.
- ^c Count index of any amount of exposure to six types of community violence (e.g., saw someone shot or stabbed, someone pulled a knife or gun on you, you were jumped) in the past 12 months, with values ranging from 0 to 6.
- ^d Three-item scale with items measuring agreement with statements about feeling close to others at school, feeling a part of the school, and being happy to be at the school, where 1 = strongly disagree and 5 = strongly agree.
- ^e Count index of 15 delinquent behaviors (e.g., stole property, sold drugs, damaged property) exhibited at all in the past 12 months, with values ranging from 0 to 15;
- ^f 9-item scale with items measuring various depressive symptoms within the past week where 0 = never or rarely and 3 = most or all of the time.
- ^g 9-item scale with items measuring various depressive symptoms within the past week where 0 = never or rarely and 3 = most or all of the time.
- ^h Five-item scale measuring the extent to which youth felt connected to their family, where 1 = not at all and 5 = very much.
- ⁱ Measured with the following item: "How much do you feel that your teachers care about you?," where 1 = not at all and 5 = very much.

in Table 1). Predicted probabilities were estimated for each youth, which can be interpreted as the predicted probability of a particular youth experiencing CSE, conditional upon their scores across risk factors included in the model. We then defined the logit of the predicted probability $\hat{e}(x)$ and the propensity score $\hat{q}(x)$ as follows [19]:

$$\hat{q}(x) = \log[(1 - \hat{e}(x)) / \hat{e}(x)].$$

Propensity score greedy matching (1-to-1 nearest neighbor within a caliper, without replacement) was then used to locate

optimal matches between youth who experienced CSE and youth who did not experience CSE but possessed similar levels of risk as indicated by their propensity scores. Given the large number of youth who did not experience CSE relative to youth who did experience CSE, as well as the sizeable common support region of propensity scores (see Figure A1) [19], we selected a conservative caliper size of 0.10 standard deviations of the propensity score, meaning that CSE and non-CSE youth could only be matched if their propensity scores were within 0.10 standard deviations of each other. All but one CSE youth were retained following the matching procedure, resulting in 430 CSE youth and 430 non-

CSE matched youth. Prematching and postmatching balance tests (i.e., chi-squared tests for categorical covariates, and two-tailed *t*-tests and estimation of standardized mean differences for continuous covariates [20]) were conducted to confirm whether matching procedures sufficiently balanced the CSE and non-CSE matched groups on all risk factors. The matching process was not sensitive to our selection of a conservative caliper, as a caliper of 0.25 standard deviations yielded similar results.

Next, we sought to identify a low-risk non-CSE group of youth, as indicated by their possession of predicted probability values falling outside the lower bound range of predicted probabilities possessed by the CSE and non-CSE matched youth. This resulted in a low-risk non-CSE group of 782 youth in which the highest predicted probability of experiencing CSE was still lower than the lowest predicted probability of experiencing CSE among the CSE and non-CSE matched groups.

To assess general differences in longitudinal trajectories across the three groups of youth, we conducted bivariate statistical tests (i.e., chi-squared tests for categorical covariates, analysis of variance for continuous covariates) and used nonparametric tests when warranted (e.g., Fisher's exact test, Kruskal-Wallis analysis of variance). When differences were statistically significant ($p < .05$) across the three groups, supplemental tests were conducted to determine which of the three groups of CSE and non-CSE youth differed significantly.

Results

Propensity score matching

Table 1 displays information related to prematching and postmatching covariate balance between CSE youth and their non-CSE matched counterparts. Prior to propensity score

matching, CSE and non-CSE youth differed significantly with respect to all covariates except for family structure and neighborhood satisfaction. Following propensity score matching, the CSE and non-CSE groups did not differ significantly across all covariates, with standardized mean differences across continuous covariates ranging from -0.05 to 0.06 (compared to a prematch range of $-.71$ to 0.39). Taken together, the postmatching results suggested that the CSE and non-CSE groups were sufficiently balanced across all specified risk factors following propensity score matching.

Group differences

Psychological well-being. Across 22 measures of psychological well-being, 15 (68%) were significantly different between the 3 groups (Table 2). Specifically, compared to their low-risk non-CSE counterparts, both the CSE and non-CSE matched groups yielded the following: (1) higher levels of past-week depressive symptoms at Waves 2, 3, 4, and 5; (2) higher rates of post-traumatic stress disorder diagnosis at Wave 5; (3) higher rates of past-year suicidal ideation at Waves 2, 4 and 5; (4) higher rates of past-year suicide attempts at Waves 2 and 5; (5) higher rates of past-year suicide attempts among friends at Waves 2, 3, and 5; and (6) lower levels of certainty about living to age 35 at Waves 2 and 3. Supplemental analyses indicated that the CSE and non-CSE matched groups, specifically, did not differ significantly from one another across these measures.

Behavioral well-being. Across 14 measures of behavioral well-being, 12 (86%) were significantly different between the 3 groups (Table 3). Relative to the low-risk non-CSE group, CSE and non-CSE matched groups yielded the following (1) higher rates of past-year sex exchange at Wave 4; (2) higher rates of drug use

Table 2
Longitudinal trajectories of psychological well-being across groups

Variable	n	Minimum	Maximum	Non-CSE, low	Non-CSE,	CSE	Group differences, <i>p</i> value
				risk	matched	Mean or proportion	
W2 Depression ($\alpha = 0.79$)	1,066	0	3	0.54	0.78	0.83	<.001
W3 Depression ($\alpha = 0.79$)	1,165	0	3	0.47	0.61	0.56	<.001
W4 Depression ($\alpha = 0.83$)	1,172	0	3	0.51	0.67	0.71	<.001
W5 Depression ($\alpha = 0.82$)	914	0	3	0.42	0.62	0.72	<.001
W4 Anxiety (1 = ever diagnosed)	1,173	0	1	0.08	0.11	0.10	.345
W5 Anxiety	911	0	1	0.19	0.21	0.25	.148
W4 PTSD (1 = ever diagnosed)	1,173	0	1	0.01	0.03	0.03	.207
W5 PTSD	910	0	1	0.05	0.08	0.12	.002
W2 Suicidal ideation (1 = at all in the past year)	1,060	0	1	0.07	0.15	0.16	<.001
W3 Suicidal ideation	1,133	0	1	0.04	0.06	0.05	.338
W4 Suicidal ideation	1,161	0	1	0.03	0.09	0.10	<.001
W5 Suicidal ideation	886	0	1	0.03	0.07	0.11	<.001
W2 Suicide attempt, self (1 = any in the past year)	1,060	0	1	0.03	0.06	0.09	.004
W3 Suicide attempt, self	1,133	0	1	0.01	0.01	0.01	.983
W4 Suicide attempt, self	1,161	0	1	0.01	0.02	0.02	.106
W5 Suicide attempt, self	889	0	1	0.01	0.03	0.04	.005
W2 Suicide attempt, friends (1 = yes, in the past year)	1,055	0	1	0.06	0.20	0.17	<.001
W3 Suicide attempt, friends	1,129	0	1	0.03	0.10	0.06	<.001
W4 Suicide attempt, friends	1,160	0	1	0.05	0.04	0.05	.902
W5 Suicide attempt, friends	887	0	1	0.03	0.07	0.10	.001
W2 Believe you will live to age 35 (1 = almost certain, 0 = otherwise)	1,061	0	1	0.56	0.45	0.40	<.001
W3 Believe you will live to age 35	1,157	0	1	0.79	0.63	0.67	<.001

Significant *p* values at the .05 level are bolded.

CSE = commercial sexual exploitation; PTSD = post-traumatic stress disorder; W2 = Wave 2; W3 = Wave 3; W4 = Wave 4; W5 = Wave 5.

Table 3
Longitudinal trajectories of behavioral well-being and system involvement across groups

Variable	n	Minimum	Maximum	Non-CSE, low risk	Non-CSE, matched	CSE	Group differences, <i>p</i> value
				Mean or proportion	Mean or proportion	Mean or proportion	
W4 Sex exchange (1 = any in the past year)	993	0	1	0.00	0.03	0.02	.039^a
W2 Drug use, since W1 (1 = yes)	1,055	0	1	0.03	0.10	0.15	<.001
W3 Drug use, since W1	1,146	0	1	0.07	0.26	0.20	<.001
W4 Drug use, ever	1,165	0	1	0.33	0.64	0.58	<.001
W5 Drug use, ever	912	0	1	0.07	0.15	0.17	<.001
W2 Injection drug use (1 = yes)	1,057	0	1	0.00	0.01	0.06	<.001^{a,b}
W3 Injection drug use (1 = yes, in past year)	1,146	0	1	0.00	0.01	0.00	.853 ^a
W4 Injection illegal drug use (1 = yes, ever)	1,165	0	1	0.00	0.01	0.02	.153 ^a
W4 Count of drug types used	1,165	0	4	0.43	1.03	1.01	<.001
W5 Count of drug types used	912	0	7	0.10	0.21	0.34	<.001
W3 Number of police stops	1,150						<.001^b
Never				0.95	0.75	0.70	
1 time				0.04	0.07	0.13	
2 or more times				0.01	0.18	0.16	
W3 Ever been arrested (1 = yes)	1,155	0	1	0.01	0.17	0.22	<.001
W4 Ever been arrested	1,159	0	1	0.08	0.43	0.45	<.001
W5 Ever been arrested	885	0	1	0.10	0.40	0.46	<.001

Significant *p* values at the .05 level are bolded.

CSE = commercial sexual exploitation; W2 = Wave 2; W3 = Wave 3; W4 = Wave 4; W5 = Wave 5.

^a Nonparametric test used.

^b Indicates significant difference between CSE and non-CSE matched groups.

at Waves 2, 3, 4, and 5; (3) higher rates of injection drug use at Wave 2; (4) higher counts of drug types used at Waves 4 and 5; (5) higher number of police stops at Wave 3; and (6) history of being arrested at Waves 3, 4, and 5. Supplemental analyses indicated that the CSE and non-CSE matched groups differed significantly with respect to injection drug use at Wave 2 (6% of CSE youth vs. 1% of non-CSE matched youth) and number of police stops at Wave 3 (70% of CSE youth vs. 75% of non-CSE matched youth indicated never having been stopped by police).

Physical well-being. Across 12 measures of physical well-being, 7 (58%) were significantly different between the 3 groups (Table 4). Relative to their low-risk non-CSE counterparts, more CSE youth and non-CSE matched youth did not seek needed healthcare in the past year at Waves 3, 4, and 5, and had health problems get

worse in the past year due to not seeking healthcare at Waves 3 and 4. Moreover, low-risk non-CSE youth, on average, reported fewer ER visits in the past 5 years at Wave 3 compared to their CSE and non-CSE matched counterparts. On this front, CSE youth yielded a higher average number of ER visits (2.23) than non-CSE matched youth (1.67) at Wave 3. Finally, at Wave 2 the groups differed in their perceived chances of getting HIV/AIDS, such that CSE and non-CSE matched groups yielded higher levels of perceived chances than the low-risk non-CSE group.

Interpersonal well-being. The groups differed significantly with respect to each of the 6 measures in this domain (Table 5). Relative to their low-risk non-CSE counterparts, both the CSE and non-CSE matched groups yielded the following: (1) lower levels of relationship happiness at Waves 4 and 5; (2) higher levels of

Table 4
Longitudinal trajectories of health and healthcare utilization across groups

Variable	n	Minimum	Maximum	Non-CSE, low risk	Non-CSE, matched	CSE	Group differences, <i>p</i> value
				Mean or proportion	Mean or proportion	Mean or proportion	
W2 Did not seek needed healthcare (1 = yes, in the past year)	1,067	0	1	0.18	0.26	0.23	.057
W3 Did not seek needed healthcare	1,160	0	1	0.18	0.32	0.28	<.001
W4 Did not seek needed healthcare	1,173	0	1	0.13	0.26	0.31	<.001
W5 Did not seek needed healthcare	912	0	1	0.14	0.25	0.33	<.001
W3 Health problem got worse because did not seek healthcare (1 = yes, in the past year)	1,159	0	1	0.04	0.09	0.10	.001
W4 Health problem got worse because did not seek healthcare	1,173	0	1	0.04	0.10	0.10	<.001
W3 Number of ER visits, past 5 years	1,133	0	30	1.02	1.67	2.23	<.001^a
W4 Number of hospitalizations, past 5 years	1,147	0	20	0.53	0.46	0.47	.737
W2 Chances of getting HIV/AIDS (1 = no chance, 5 = very high)	1,060	1	5	1.84	2.20	2.32	<.001
W3 Ever told you have HIV/AIDS (1 = yes)	1,133	0	1	0.00	0.10	0.10	.488 ^b
W4 Ever told you have HIV/AIDS	1,151	0	1	0.00	0.00	0.00	1.000 ^b
W5 Ever told you have HIV/AIDS	911	0	1	0.00	0.00	0.00	.484 ^b

Significant *p* values at the .05 level are bolded.

CSE = commercial sexual exploitation; ER = emergency room; W2 = Wave 2; W3 = Wave 3; W4 = Wave 4; W5 = Wave 5.

^a Indicates significant difference between CSE and non-CSE matched groups.

^b Nonparametric test used.

Table 5
Longitudinal trajectories of relationship dynamics across groups

Variable	n	Minimum	Maximum	Non-CSE, low risk	Non-CSE, matched	CSE	Group differences, <i>p</i> value
				Mean or proportion	Mean or proportion	Mean or proportion	
W4 Relationship happiness	934						<.001^a
Not too happy				0.07	0.06	0.12	
Fairly happy				0.17	0.32	0.26	
Very happy				0.76	0.62	0.62	
W5 Relationship happiness	751						.001
Not too happy				0.05	0.07	0.11	
Fairly happy				0.29	0.37	0.42	
Very happy				0.66	0.56	0.47	
W4 IPV victimization (1 = any in the past year)	1,117	0	1	0.12	0.29	0.29	<.001
W5 IPV victimization	861	0	1	0.08	0.16	0.18	.001
W4 IPV perpetration (1 = any in the past year)	1,119	0	1	0.07	0.17	0.15	<.001
W5 IPV perpetration	858	0	1	0.05	0.09	0.10	.021

Significant *p*-values at the .05 level are bolded.

CSE = commercial sexual exploitation; IPV = intimate partner violence; W2 = Wave 2; W3 = Wave 3; W4 = Wave 4; W5 = Wave 5.

^a Indicates significant difference between CSE and Non-CSE matched groups.

IPV victimization in the past year at Waves 4 and five; and (3) higher levels of IPV perpetration in the past year at Waves 4 and 5. The CSE and non-CSE matched groups differed significantly in terms of relationship happiness at Wave 4, such that a relatively larger share of the CSE group indicated being “not too happy” in their relationship.

Discussion

After applying rigorous propensity score matching techniques, findings from this national longitudinal sample of youth demonstrate large differences in holistic well-being between low-risk and all high-risk youth across data collection waves, regardless of CSE victimization. These differences are both statistically and clinically significant and remain so across the lifespan. These findings echo those of previous studies underscoring the impact of childhood trauma on long-term health and wellness. Of note, there is a disproportionate representation of male-identified youth in the CSE group. These findings echo previous studies examining CSE using the Add Health dataset [21–24]. Previously, studies have posited potential reasons for this disproportionate representation, including sexual/gender minority status [23]. Although outside of the goals of the current manuscript, it is worth noting the confirmatory nature of these findings.

Furthermore, results highlight more similarities than differences in terms of well-being over time between those who experienced CSE and those with similar risk profiles that had not exchanged sex. Key differences, however, included injection drug use (Wave 2; Grades 8–12), more police stops (Wave 3, ages 18–26), more visits to the ER (Wave 3; ages 18–26), and lower relationship satisfaction (Wave 4; ages 24–32) for those with a history of CSE. We also found that the holistic well-being for individuals who experienced CSE as youth changed some over time, but that those changes were largely comparable to the well-being changes experienced by individuals with high profiles of risk, who did not experience CSE as youth.

There are several possible reasons why we did not see more differences in outcomes between youth who had, and had not, experienced childhood CSE. Previous research has found that most known survivors of CSE have complex histories of trauma

outside of CSE, which may put them at differential risk of deleterious outcomes [11]. For example, researchers have found that traffickers are more likely to groom youth with histories of drug use, abuse, and/or poverty [11]. Importantly, these risk factors are not fundamentally different from the risk factors for other social problems impacting youth such as delinquency, truancy, and gang involvement [25]. Notably, not all youth at risk of exploitation will be victimized. However, the increased risk of risky sexual behavior including involvement in commercial sex goes beyond childhood as demonstrated in the current study through the findings that those who do, and do not, exchange sex but have similar risk profiles as youth have similar engagement in commercial sex 17–20 years later.

The differences that were observed between youth who affirmed having experienced CSE and other high-risk youth offer support for much of the existing literature. Specifically, we observed that youth who had experienced CSE had higher rates of injection drug use early in their trajectories (i.e., Grades 8–12). This is similar to the findings of Reid et al. [26] wherein drug use was found to be a key differentiating factor among six distinctive profiles of childhood risk for CSE. Importantly, the directionality of injection drug use among sexually exploited youth in this study is unclear [27]; however, substance use generally—and early on-set drug use in particular—is well-documented as co-occurring with CSE [11]. Similarly, our finding that youth who have experienced CSE had more visits to the ER and greater numbers of police stops than their nonexploited peers is supported in the extant literature. Many of the activities associated with CSE are both physically risky [28] and criminogenic [29]. Thus, contact with ER personnel and law enforcement seems not only likely, but inevitable.

Differences in the interpersonal well-being patterns of individuals who had experienced CSE and those who had not are somewhat more novel. Although there has been research to suggest that interpersonal relationships for youth who have experienced CSE are difficult and/or strained [10,11], much of the research examining relationship patterns among trafficked youth is retrospective in nature and therefore has a high likelihood of bias [17]. This is the first study to look longitudinally at youth who have experienced CSE victimization, and surveys examining relationship satisfaction were not retrospective.

Accordingly, study findings suggest there is something unique about experiencing CSE during adolescence that contributes to difficulty connecting with future romantic partners.

We found that well-being measures for low-risk youth were universally different from high-risk youth, regardless of whether they had experienced CSE. Specifically, all measures of well-being were significantly higher for individuals who were low-risk youth. Similar to the extant literature on both polyvictimization [30] and adverse childhood experiences [31,32], it is clear that compounded victimization remains the strongest indicator of future victimization and well-being.

Limitations

First, Wave 1 in-home data were collected from a subset of youth originally interviewed in schools. Many youths experiencing CSE may not attend school and therefore would not have been eligible for survey participation. Furthermore, participants were not asked details about who they had exchanged sex with or the circumstances surrounding the exchange. Participants who had been exploited by a third party may not have been aware of any commercial exchange, and therefore may not have affirmed the questions. Similarly, youth who received dinner or shelter after performing a sexual act may not have viewed it as an exchange and therefore not affirmed the question. Some questions across waves varied, thereby limiting our ability to track small changes across waves for all variables of interest. Variables measuring past abuse and sexual orientation were not used to generate propensity scores due to the retrospective nature of the data. Furthermore, the study uses baseline data from the 1994–1995 school year. As many legislative changes and cultural shifts have occurred since 1994 regarding CSE, sex generally, and commercial sex in particular, our findings will benefit from replication with contemporary samples. Propensity score matching is also not without limitations, including its inability to incorporate unobserved covariates that influence selection processes and other challenges [33]. Although we are reassured by our careful selection of variables used for propensity score estimation, same-size retention following matching, and the extent of covariate balance achieved, future studies could implement other techniques for comparison, such as propensity score weighting and subclassification analyses [34]. Finally, the Add Health survey is self-reported and some questions, including the experience of CSE during Wave 2 and the experience of child maltreatment in Wave 4, are retrospective in nature which may introduce some recall bias.

Implications and conclusions

The current study offers some important implications for prevention and intervention for sexually exploited youth. Specifically, the minimal differences on most variables between high-risk youth and youth who had experienced CSE suggested that CSE prevention programming for all high-risk youth may be both appropriate and warranted. Current study findings support the use of policies that include CSE programming for youth who are either at high risk of CSE or confirmed victims, as both sets of youth may be at a differentially high risk of a host of negative outcomes when compared to their low-risk peers. Furthermore, youth receiving treatment in the areas where we do find differences among CSE and non-CSE groups may be excellent places to begin routine CSE screening, so that victims can be identified and

provided immediate, comprehensive services. Future research should further explore the informal channels through which these youths engage in help-seeking and service provision, thereby illuminating new and understudied opportunities to connect and intervene with these vulnerable children and youth.

Supplementary Data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.jadohealth.2022.08.028>.

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