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Associations between History of Child Maltreatment and High-Risk Sexual Behaviors in Emerging Adulthood: The Role of Healthcare Access

By

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Degree to be Awarded: Master of Public Health

Epidemiology

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Abstract

Associations between History of Child Maltreatment and High-Risk Sexual Behaviors in Emerging Adulthood: The Role of Healthcare Access
By Jamie Pattee

Introduction: This study examined whether healthcare access modifies the association between child maltreatment and risky sexual behaviors in emerging adults.

Methods: Data from 12,706 young adults from the Add Health Study, a nationally representative cohort, were examined. The outcome measured was presence of one of the following risky sexual behaviors reported at Wave III: multiple sexual partners, transactional sex, known partner with an STD, no condom use, and the regret of being in a sexual situation due to drugs or alcohol. Exposures measured were child physical abuse, sexual abuse, and neglect. The effect modifier was complete healthcare access, defined as recently consulting a provider, having insurance coverage, and not having an instance of failure to get medical care when needed. Predictive margins were utilized to estimate prevalence ratios (PRs) for associations between childhood maltreatment and engagement in a high-risk sexual behavior stratified by biological sex and healthcare access.

Results: Females experienced less child maltreatment than males (19.9% vs. 26.3%). Males were slightly more likely than females to have complete healthcare access (10.2% vs. 9.3%). For females with limited healthcare access relative to females with complete access, the prevalence of high-risk sexual behavior was marginally higher among those with a history of physical abuse (PRs 1.12 vs. 1.08) and sexual abuse (PRs 1.22 vs. 0.99), but not neglect (PRs 1.16 vs. 1.17) when compared to females without a history of these respective maltreatments. For males with limited healthcare access relative to males with complete access, the prevalence of high-risk sexual behaviors was higher among those with a history of neglect (PRs 1.20 vs. 0.97), but not physical abuse (PRs 1.06 vs. 1.06) or sexual abuse (PRs 1.25 vs. 1.26) when compared to males without a history of these respective maltreatments. The difference magnitudes were small between groups with and without complete access and the 95% confidence intervals overlapped.

Discussion: Our findings indicate that there is likely no meaningful modification of the association between child maltreatment and high-risk sexual behavior by healthcare access. There is a need for improvement in sexual health services for young adults with a history of child maltreatment.

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Chapter I: Background and Literature Review

Add Health Study

Description

The National Longitudinal Study of Adolescent Health (Add Health) was created in the 1990s to understand adolescent health and behaviors. Data was gathered on respondents' social, economic, psychological, and physical well-being as well as contextual family and community environments. A nationally representative sample of adolescents have been followed with four subsequent surveys into adulthood: 1995 (Wave I), 1996 (Wave II), 2001-2002 (Wave III), 2008-2009 (Wave IV) and 2016-2018 (Wave V).[1]

Sampling

Researchers used a school-based design from 80 high schools and a paired feeder school across the US. 90,000 students were administered an in-school questionnaire and their school administrators answered a questionnaire about the schools. The sampling frame for a subsequent in-home interview was developed from the 1993-1994 school rosters. A grade and gender stratified core sample was selected from each school pair, creating a self-weighting nationally representative sample of American adolescents. Specific subpopulations were oversampled to provide sufficient numbers on vulnerable groups, including ethnic and disability samples. Because the year prior was used as the sampling frame, high school dropouts over two years were eligible for sample selection, decreasing bias due to those who did not graduate.[2]

Strengths and Weaknesses

The Add Health study is a large, nationally representative cohort that examines many psychosocial, environmental and health domains. It has had relatively high response rates

across follow-up waves, so attrition bias has been minimal. Its main limitation comes from a lack of in-depth measurement of specific standard scales due to the wide breadth of data gathering.[2]

Sexual Health and Risky Sexual Behaviors in Young Adults

Definitions

Sexual health, defined by the World Health Organization as the state of comprehensive well-being in relation to sexuality, is a fundamental aspect of overall health of individuals and their broader communities.[3] It depends on having access to: 1) accurate information about sex and sexuality, 2) knowledge about the consequences of risky sexual behaviors, 3) quality sexual health care, and 4) an environment that promotes sexual health. Sexual health is considered a priority within global health. One of the targets included in the 2015 Sustainable Developmental Goals ensures universal access to sexual and reproductive health-care services by 2030.[3]

There is inconsistency across the literature on how to define high risk sexual behaviors. Some researchers focus on the risks of sexual activity, ie. sexually transmitted infection (STI), pregnancy, and familial conflicts. Others focus on the partner, ie. IV drug user, casual, incentive-driven, and non-monogamous, and others focus on the sexual activity itself, ie. early debut, unprotected, paid, premarital, and under the influence of substances.[4] The CDC Youth Risk Behavior Survey, a biennial school-based cross-sectional survey, specifically identifies the following sexual risk behaviors: sexual initiation before age 13, number of lifetime sex partners over 3, number of sex partners during the previous 3 months over 1, and any alcohol or drug

use before last sexual intercourse. These behaviors in particular increase the risk of STIs, including HIV, and unintended pregnancy.[5]

Trends in Risky Sexual Behavior

The US saw an overall decline in sexual risk behaviors including reduced sexual experience and improved contraceptive use from the 1990s to the early 2000s. This may reflect better access to contraception with expanded eligibility to Medicaid and State Child Health Insurance Program (S-CHIP). Notably, these behaviors then began to increase after 2006. Nonsexual risky behaviors such as drug, alcohol or tobacco use and involvement in a physical fight are strongly associated with sexual risk behaviors but follow different patterns over time. Namely, the early 2000s saw a reduction followed by an increase in teen sexual experience and teens having multiple sexual partners, while nonsexual risk behaviors increased in the 1990s and decreased in the 2000s. This suggests that behavioral disinhibition may predispose teens to participate in many different risky behaviors, though community trends of nonsexual and sexual risky behaviors do not necessarily influence each other.[6] Therefore, care must be made when designing interventions. They should be comprehensive, as addressing nonsexual risk exposures only, like alcohol use, may not affect sexual risk exposures.

Consequences of Risky Sexual Behaviors

Adverse outcomes of sexual behaviors, namely unintended pregnancy and STI incidence, have followed opposite trends. Teen pregnancy has been declining steadily over the past few decades, from 61.8 births per 1,000 females aged 15-19 in 1991, to 41.5 in 2007, to a record low of 16.7 in 2019.[7] This is likely due to increased access and acceptability of higher efficacy contraception as well as overall declines in fertility behaviors also seen among Western

European countries.[8] In contrast, STIs are at an all-time high. More than 2.5 million cases of chlamydia, gonorrhea and syphilis were reported in 2019, an increase of more than 100,000 cases from 2018.[9] Americans 15-24 years old account for over half of new STIs each year despite making up just 27% of the sexually active population.[10] This has been attributed to more frequent testing among higher risk groups, a rise in sexual risk behaviors, and a potential inverse relationship between oral contraception and long-acting contraceptive methods and condom use.[11]

These outcomes can have a variety of serious adverse long-term effects, signaling the importance of harm reduction programs. Despite the decrease in overall unintended pregnancies among teenagers, they are still occurring, and can affect the health of both the child and mother. Unintended pregnancy has been associated with both infant and maternal morbidity and mortality,[12] and STIs have been associated with various conditions that may lead to death or infertility.[13] We are also facing increasing antibiotic resistance to STIs, leading to a potential decreased ability to treat them in the future.[10]

Disparities exist among both unintended pregnancy and STI incidence, especially among racial minority and Hispanic groups when compared to non-Hispanic Whites.[8,12,13] This is likely due to both differences in access to quality sexual health care and differences in sexual network characteristics.[10] Therefore, mitigation of these risk behaviors and subsequent outcomes can lead to meaningful differences in our most vulnerable populations.

Childhood Maltreatment

Definitions

Researchers and government agencies have different definitions for child maltreatment, including various forms of abuse, neglect, and parental substance use.[14] The Add Health Study specifically asks about a subset of maltreatment exposures. Neglect is defined as the failure of a caregiver to provide for basic needs, like clothing, shelter, medical care, such that the child's well-being is threatened. Physical abuse is defined as any nonaccidental physical injury to the child.[14] Sexual abuse is often defined by forced involvement of a child in sexual activity for which they are unable to give informed consent or are not developmentally prepared.[15]

Epidemiology

Adult self-reported abuse and neglect can vary by study.[16] Data from the Behavioral Risk Factor Surveillance System (BRFSS), a nationally representative telephone survey administered from 2011-2014, shows that 18% of adults report being exposed to physical abuse before age 18, and 12% of adults report being exposed to sexual abuse before age 18. Notably, females were more likely to report a history of sexual abuse (16%) compared to males (7%).[17] A meta-analysis of studies looking at self-reported physical neglect between 1980-2008 estimates a prevalence of 19% in the US and Canada.[16]

According to the National Incidence Survey, conducted by the United States Department of Health and Human Services, children in low socioeconomic status households, defined as a household income below $15,000 a year, parental education less than high school level, or any household member participation in a social assistance program, were five times as likely to

experience maltreatment across all categories, three times as likely to be abused, and seven times as likely to be neglected.[18]

Overall, rates of substantiated cases of physical and sexual abuse have gradually declined between 1992-2018 (53% and 62% respectively), but neglect has remained relatively stable.[19] For physical and sexual abuse, this is hypothesized to be the result of sustained economic improvement, increases in child protection agents, growing publicity, and new mental health treatment options. As for neglect, it is unclear why it differs so much from other types of maltreatment, though it is possible that it has not been subject to the same level of public awareness, is harder to prevent, and has been detected more frequently with improved investigational methods.[20]

It is important to note that the above trends only represent a subset of maltreatment, as a case is considered substantiated only if investigations of maltreatment by child protective services (CPS) agencies conclude that evidence of maltreatment exists. However, CPS agencies have been found to investigate maltreatment in a minority of the children that national surveys identify. This is theorized to be the result of a breakdown of reporting from sentinel sites like schools, inconsistent application of maltreatment criteria when screening cases, and issues with the use of centralized hotlines.[18]

Healthcare Access among Young Adults

Healthcare Access

Access to health care has been defined by the National Academies of Sciences, Engineering, and Medicine as "the timely use of personal health services to achieve the best possible health outcomes."[21] In the US, many barriers to access have been studied. The most

common barrier cited is a lack of health insurance coverage, which is associated with many adverse health outcomes and premature mortality. However, just because someone has insurance does not mean that they do not have other barriers to care. Inadequate transportation, limited community health resources, lack of acceptability of available care, and medical debt among both uninsured and insured people have been associated with declines in health.[22] This has been found with both acute and chronic illnesses.[23]

Sexual and reproductive healthcare access in particular has been even more limited. There have been substantial gains in covered sexual health services and medications like contraceptives since the 1990s nationally,[24] though significant differences in coverage exist from state to state.[25] Many young adults refrain from seeking sexual health care due to concerns about confidentiality, especially if they are on a parental insurance plan.[26] Once someone consults a provider, there is no guarantee of the quality of sexual health care given. Clinicians are often inadequately trained in comprehensive sexual health and do not routinely discuss patients' sexuality concerns.[27] Therefore, a population's healthcare access in general, especially that of young adults, is likely an overestimate of sexual and reproductive health access.

Trends based on Recent Changes in Policy

Young adults, commonly considered those aged 18-24, consistently have had some of the lowest insurance coverage of any age group. From the 1990s to the enactment of the Affordable Care Act (ACA) in 2010, the rate of uninsurance for this group was around one-third, nearly double the rate of Americans overall.[28,29] This finding was thought to be a result of this age group not having a common entry point into the health care system. There is also a lack of

advocacy for young adults, unlike for children and adolescents.[30] With the ACA, these uninsurance rates have decreased by nearly half, indicating dramatic gains in coverage, though effects were greatest in Medicaid expansion states. Medicaid expansion was also associated with a decrease in disparities among young adults in uninsurance rates by race/ethnicity, educational attainment and household income.[31] To date, only 39 states including DC have adopted Medicaid expansion.[32] Notably, the peak age of uninsurance has shifted up to age 26 with the introduction of the Young Adult Provision of the ACA, which allows those up to age 26 to be classified as dependents on their parents' health insurance.[33]

Chapter II: Manuscript

Introduction

Optimizing sexual health has become an important public health focus over recent years.[3] High-risk sexual behaviors can lead to adverse outcomes including STIs and unintended pregnancies which may potentiate long term, generational health impacts.[10,34] Unintended pregnancy has been associated with increased infant mortality, increased maternal mortality, and increased maternal depression, anxiety, and abuse.[12] STIs have been associated with HIV, cancer, pelvic inflammatory disease and ectopic pregnancy, which can lead to death and infertility.[13] Preventing behaviors that might lead to these outcomes is critical for a healthier population.

Individuals who have experienced child maltreatment are particularly susceptible to engagement in high-risk sexual behaviors. A history of child maltreatment is associated with early sexual initiation, multiple sexual partners, transactional sex, unprotected sex, and higher rates of self-reported STIs in young adulthood.[35,36] These findings are robust and pertain to several types of maltreatment, including sexual abuse, physical abuse, and neglect.[35,37,38] Many pathways linking childhood maltreatment to risky sexual behaviors and subsequent adverse outcomes have been hypothesized. For instance, these behaviors may be the result of comorbid trauma symptoms, emotional dysregulation, or early sexual contact.[37,38,39] However, factors that may mitigate risky sexual behaviors in those with a history of childhood maltreatment remain unclear. There is a need to better understand this relationship to improve outcomes in this population.

To date, there is little data exploring the relationship between adverse childhood events, sexual risk behaviors, and the role of healthcare access. Emerging adults have a high prevalence of adverse sexual outcomes and low rates of healthcare access, and thus may be an ideal group in which future interventions may be targeted.[10,28,40] In this study, we aimed to examine whether healthcare access modifies the association between child maltreatment and risky sexual behaviors in emerging adults utilizing the National Longitudinal Study of Adolescent Health. We also aimed to determine whether such an association may vary by type of child maltreatment in this population.

Methods

Sample

Data from Wave I (1994-1995) and Wave III (2001-2002) from the Add Health Study were examined. Wave I is made up of 20,745 adolescents in grades 7-12, aged 12-19. Wave III captured 15,197 of the original participants (response rate 77.4%) at their transition to adulthood with an in-home interview when the participants were aged 18-27.[2] Those who had sampling weights for both waves were included (n=14,322) in the analytic sample. Many sexual history questions asked in Wave III were only applicable to vaginal intercourse, so participants who did not identify as 100% heterosexual or had missing sexual orientation data (n=1,483) were excluded from the analysis, leaving a total sample size of 12,706 young adults (age 18-27).

Measures

Risky Sexual Behaviors. The outcome measured was presence of a risky sexual behavior reported at Wave III. We examined five risky sexual behaviors often found in the literature based on their comprehensive assessment of the risk of the partner as well as risk of the sexual

activity itself.[4,5] These behaviors included having 3 or more sexual partners within the past 12 months, having transactional sex within the last 12 months, having a known partner with an STD in the last 12 months, no condom use during last vaginal intercourse, and regretting being in a sexual situation in the last 12 months due to using drugs or drinking. We chose to dichotomize this variable to none vs. 1 or more. Only 18.2% of the sample reported 2 or more risky sexual behaviors, as opposed to 59.6% reporting 1 or more, and we chose to prioritize an outcome that is relevant to a larger percentage of the population.

Childhood Maltreatment. The exposures included three types of childhood maltreatment, including physical abuse, sexual abuse, and neglect of basic needs. Presence of these was considered specifically before sixth grade. The Add Health survey assessed physical abuse by asking, “How often had your parents or other adult care-givers slapped, hit, or kicked you?” Consistent with prior research, responses were coded 1 if three or more instances of physical abuse occurred, and 0 if less than three instances were reported.[41,42] Sexual abuse was assessed by asking, “How often had one of your parents or other adult care-givers touched you in a sexual way, forced you to touch him or her in a sexual way, or forced you to have sexual relations?” Neglect of basic needs was assessed by asking, “How often had your parents or other adult care-givers not taken care of your basic needs, such as keeping you clean or providing food or clothing?” For both sexual abuse and neglect, responses were coded 1 if that type of maltreatment had ever occurred, and 0 if it had not. A maltreatment summation variable was also created, in which participants were categorized into experiencing 0 types of maltreatment, 1 type of maltreatment, or 2 or more types of maltreatment.

Healthcare access. The effect modifier was determined by using a model developed by the US Institute of Medicine Committee on Monitoring Access to Personal Health Care Services. They identify three barriers to use of health services: 1. Structural, including availability and transportation, 2. Financial, including insurance coverage, reimbursement, and public support, and 3. Personal, including acceptability, cultural, language, and education/income.[43] To assess structural barriers, we looked at whether the participant consulted a doctor or nurse in the past 2 years, the recommended time frame for certain health screenings.[44] To assess the financial barrier, we looked at whether the participant reported having insurance consistently throughout the prior 12 months. To assess personal barriers, we used the Add Health question, "Has there been any time in the past 12 months when you thought you should get medical care, but you did not?" Participants who had consulted a doctor or nurse in the past 2 years, had consistent insurance over the past year, and did not have an instance in which they failed to get medical care when they thought they should, were coded as 1, and were considered to have complete healthcare access. Otherwise, they were coded as 0, and were considered to have limited healthcare access.

Demographic characteristics. Age, ethnicity, and race were gathered from Wave III in-home surveys. For ethnicity, participants answered the question, "Are you of Hispanic or Latino origin?". For race, participants could select from one or more of the following categories: white, black or African American, American Indian or Native American, and Asian or Pacific Islander. If a participant reported identifying with more than one race, they were categorized as multiracial. Socioeconomic status (SES) was assessed by highest educational attainment of the adolescents' parents obtained from Wave I in-home and parental interviews. These included

less than high school, high school or GED, some college or postsecondary school, and college graduate.

Analysis

We used survey procedures in SAS Callable SUDAAN to account for sampling weights. Predictive margins were utilized to estimate the unadjusted (cPR) and adjusted (aPR) prevalence ratios for associations between the different types of childhood maltreatment and engagement in a high-risk sexual behavior.[45] All models were stratified by biological sex and further by healthcare access to assess differences in levels of child maltreatment, health care utilization, and high-risk sexual behaviors.[35] The original data collection received Institutional Review Board approval, and this secondary analysis was approved by the Emory University Institutional Review Board.

Results

Table 1 summarizes the weighted distributions for demographic characteristics, childhood maltreatment exposures, health access, and risky sexual behaviors of the 12,706 young adults. The participants' ages ranged from 18-27 with a mean age of 21 years. Eleven percent identified as Hispanic or Latino. Seventy-four percent identified as White, 17% as Black or African American, 3% as American Indian or Native American, 4% as Asian or Pacific Islander, and 3% as multiracial. Thirty-one percent of parents had graduated college, 30% had some college or postsecondary school, 27% had a high school equivalence, and 12% had less than a high school level of education.

Females experienced less child maltreatment (19.9%) than males (26.3%). Females experienced more physical abuse (12.8%) than neglect (8.1%) and sexual abuse (4.1%), while

males experienced more overall physical abuse (15.0%) and neglect (14.5%) than sexual abuse (4.2%). Females were more likely than males to have consulted a doctor or nurse within the last 2 years (97.0% vs. 86.0%), had insurance throughout the past year (66.8% vs. 60.0%), and not have an instance in which they needed medical care but did not get it (79.6% vs. 77.2%). Despite the majority of the population having these three individual markers of access, when aggregated, the percentage of the population who had all three markers dropped precipitously (9.8%). Males were slightly more likely than females (10.2% vs. 9.3%) to have all three criteria of health access.

Males and females had similar rates of engagement in risky sexual behaviors (59.0% vs. 60.4%), but males overall had more partners in the last year, more transactional sex, and more instances in which they regretted having sex under the influence of drugs or alcohol compared to females. More males had 2+ risky sexual behaviors than females (20.8% vs. 15.2%).

Table 2 shows the distributions of population by healthcare access and biological sex. For both males and females, those who had a history of neglect or physical abuse had a higher percentage of complete healthcare access. Those who did not report any type of maltreatment were more likely to have limited healthcare access (80.9% vs. 72.6% for females; 74.2% vs. 69.0% for males), while those who reported one or more types of maltreatment were more likely to have complete healthcare access.

Tables 3 and 4 show unadjusted associations between demographics and childhood maltreatment and high-risk sexual behaviors stratified by sex and healthcare access. For demographic and SES categories, there were no appreciable differences in the PRs between the groups with complete healthcare access and with limited healthcare access when stratified by

sex. There are multiple small associations between child maltreatment and engagement in high-risk sexual behaviors in the limited healthcare access group. However, the magnitude of differences between those with complete healthcare access and those with limited healthcare access do not exceed .15 and the confidence intervals overlap.

Tables 5 and 6 show associations between childhood maltreatment and high-risk sexual behaviors after adjustment for age, ethnicity, race, and parental education stratified by sex and healthcare access. For females with limited healthcare access relative to females with complete access, the prevalence of engagement in a high-risk sexual behavior is marginally higher among those with a history of physical abuse (PRs of 1.12 vs. 1.08) and sexual abuse (PRs of 1.22 vs. 0.99), but not neglect (PRs of 1.16 vs. 1.17) when compared to females who do not have a history of these respective maltreatments. There are also higher prevalences for females with limited healthcare access with 1 form of maltreatment (PRs of 1.11 vs. 1.06) and 2+ forms of maltreatment (PRs of 1.25 vs. 1.16) when compared to those with no history of maltreatment. For males with limited healthcare access relative to males with complete access, the prevalence of engagement in high-risk sexual behaviors is higher among those with a history of neglect (PRs of 1.20 vs. 0.97), but not physical abuse (PRs of 1.06 vs. 1.06) or sexual abuse (PRs of 1.25 vs. 1.26) when compared to males who do not have a history of these respective maltreatments. There are also higher prevalences for males with limited healthcare access with 1 form of maltreatment (PRs of 1.12 vs. 0.95), but not for 2+ forms of maltreatment (PRs of 1.24 vs. 1.28). For all of these groups however, the 95% confidence intervals overlap and the magnitudes of the differences are small.

Discussion

Our findings indicate that there is likely no meaningful modification of the association between child maltreatment and high-risk sexual behavior by healthcare access. The magnitudes of the differences in associations between groups with complete healthcare access and limited healthcare access were small. Measures were also imprecise as the 95% confidence intervals were wide.

This adds to the literature because existing studies examining the association between healthcare access and risky sexual behaviors in adults have found positive associations but have not differentiated between those with and without a history of child maltreatment. The Behavioral Risk Factor Surveillance System found that adults who reported high risk sexual behaviors were less likely to have healthcare access,[46] and other publications have found that a lack of health insurance coverage and contact with clinical providers have been associated with adverse sexual health outcomes.[11,47] Therefore, the protective effects of healthcare access seen in these studies may not apply to those with a history of child maltreatment.

Our results suggest that having health access alone is not sufficient to modify high-risk sexual behaviors among young adults with a history of child maltreatment. Thus, improvement of existing healthcare services to include more effective sexual health services is warranted. This may include comprehensive training for healthcare providers in discussing, diagnosing, and treating sexual health issues, especially with a trauma-informed care lens. Many providers do not adequately address sexual health, and interventions must be of a moderate to high intensity in order to be effective.[48] Despite many patients considering sexual health as essential, providers often feel uncomfortable initiating discussions and lack confidence in

addressing patient concerns.[49] Furthermore, care is highly dependent on location as rates of risk behavior screening among adolescents are low in urgent care, emergency care and hospital settings,[50] and patients who have higher risk behaviors are less likely to have primary care providers and have a higher rate of emergency care visits.[51] Thus, hospitals could implement sexual health screens and interventions in urgent and emergent care settings to capture more young adults. Other settings which serve individuals with a history of child maltreatment such as medical homes or mental health clinics may be well positioned to screen and intervene on high-risk sexual behaviors.

Ultimately, there were very low percentages of young adults who had complete health care access, which could take a long time to remediate. Therefore, interventions outside of the healthcare system, including sexual health education in schools or extracurricular programs, as well as public health campaigns, may be more effective at accessing a greater proportion of the population, including individuals with a history of child maltreatment.

This study has several strengths. The Add Health study population is large, nationally representative, and has a high response rate. We have incorporated a relatively comprehensive view of engagement in risky sexual behaviors and healthcare access that many studies lack. Finally, this is the only study we are aware of that explores associations of sexual health behaviors and health access in those with a history of child maltreatment.

There are several limitations to note. This study is subject to recall bias, as maltreatment events prior to sixth grade were retrospectively recalled during emerging adulthood. Maltreatment events and sexual behaviors were self-reported, so they may have been misclassified. Since the survey specified vaginal intercourse in many of its sexual health

questions, we had to exclude anyone who did not identify as 100% heterosexual, so we were unable to study a particularly vulnerable subpopulation. We also were unable to look at the effect of having teen parents, which may be associated with risky sexual behaviors,[52] as this was not assessed in the survey. The Wave III interviews were conducted in 2001-2002, which is prior to enactment of the ACA, so uninsurance rates among this age group are lower now, and results may not generalize to young adults today.

Further research should be done to examine risky sexual behaviors among all sexual orientation identities as we know that those who do not identify as primarily heterosexual are more at risk for adverse outcomes and subpar healthcare experiences.[53,54] In addition, it would be useful to replicate findings in other groups surveyed after enactment of the ACA. In the meantime, we can certainly work to improve sexual healthcare for young adults with a history of child maltreatment.

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Tables

Table 1. Descriptive characteristics of study participants (n=12706)

Variable	Both Sexes n (SE or %)	Female (n=6400) n (SE or %)	Male (n=6306) n (SE or %)
Age (years)	21.40 (.11)	21.31 (.12)	21.48 (.12)
Sex (male)	6306 (53.43)	n/a	n/a
Hispanic/Latinx	2061 (11.65)	997 (11.20)	1064 (12.03)
Race			
White	7953 (73.69)	3964 (73.59)	3989 (73.78)
Black or African American	2733 (16.59)	1498 (17.40)	1235 (15.88)
American Indian or Native American	373 (2.38)	169 (1.89)	204 (2.80)
Asian or Pacific Islander	961 (3.95)	441 (3.82)	520 (4.06)
Multiracial	485 (3.39)	233 (3.30)	252 (3.48)
Highest Household Parental Education			
College Graduate	4126 (31.12)	2043 (30.72)	2083 (31.49)
Some College/ Postsecondary School	3629 (30.09)	1790 (29.48)	1839 (30.69)
High School/ GED	3126 (27.08)	1613 (28.07)	1513 (26.14)
Less than High School	1628 (11.71)	850 (11.74)	778 (11.69)
Childhood Maltreatment Type			
Neglect of Basic Needs	1347 (11.49)	521 (8.12)	826 (14.53)
Physical Abuse (3+ times)	1741 (13.97)	803 (12.84)	938 (14.97)
Sexual Abuse	514 (4.15)	270 (4.06)	244 (4.23)
Childhood Maltreatment Sum			
No Maltreatment	9062 (76.76)	4837 (80.13)	4225 (73.70)
1 Form of Maltreatment	2151 (18.25)	993 (16.13)	1158 (20.18)
2+ Forms of Maltreatment	596 (4.99)	242 (3.74)	354 (6.12)
Healthcare Access			
Consulted doctor or nurse in past 2 years	11558 (91.10)	6185 (96.97)	5373 (85.96)
Had Insurance consistently in past year	8102 (63.08)	4318 (66.75)	3784 (59.88)
No failure to seek medical care in past year	9827 (78.33)	4997 (79.64)	4830 (77.19)
Saw doctor or nurse, had insurance, and had no failure to seek medical care	1320 (9.75)	668 (9.29)	652 (10.15)
Ever Had Vaginal Intercourse	11104 (87.85)	5608 (87.87)	5496 (87.84)
Early Sexual Initiation (Before 15yo)	1900 (15.54)	910 (15.29)	990 (15.77)
Risky Sexual Behavior			
Any	7148 (59.60)	3637 (60.36)	3511 (58.93)
3+ Partners in Last Year	1776 (14.37)	612 (9.13)	1164 (18.96)
Transactional Sex in Last Year	277 (1.99)	54 (.85)	223 (2.99)

Partner(s) with History of STD	784 (6.19)	472 (7.69)	312 (4.88)
No Condom Use Last Vaginal Intercourse	5738 (46.30)	3167 (51.60)	2571 (41.67)
Regretted Sex under the Influence	1782 (15.36)	648 (10.70)	1134 (19.44)
Risky Sexual Behavior Sum			
No Risky Sexual Behaviors	5005 (40.40)	2525 (39.64)	2480 (41.07)
1 Risky Sexual Behavior	5025 (41.41)	2728 (45.14)	2297 (38.11)
2+ Risky Sexual Behaviors	2123 (18.19)	909 (15.22)	1214 (20.83)

Table 2. Distribution of population by Healthcare Access (insurance coverage throughout past year, consulted doctor or nurse during past 2 years, and no failure to seek medical care in past year) and Biological Sex

Variable	n (%) Complete Healthcare Access Female	n (%) Limited Healthcare Access Female	n (%) Complete Healthcare Access Male	n (%) Limited Healthcare Access Male
Childhood Maltreatment Type				
Neglect of Basic Needs	57 (8.55)	460 (8.06)	98 (14.97)	713 (14.44)
Physical Abuse (3+ times)	126 (19.43)	674 (12.22)	141 (21.77)	789 (14.32)
Sexual Abuse	41 (6.02)	228 (3.84)	23 (3.74)	213 (4.26)
Childhood Maltreatment Sum				
No Maltreatment	465 (72.64)	4335 (80.87)	412 (68.97)	3762 (74.15)
1 Form of Maltreatment	134 (21.53)	855 (15.61)	141 (23.97)	1007 (19.84)
2+ Forms of Maltreatment	39 (5.83)	202 (3.52)	49 (7.06)	296 (6.01)
Ever Had Vaginal Intercourse	579 (86.95)	4992 (88.07)	573 (88.21)	4851 (87.89)
Early Sexual Initiation (<15yo)	94 (15.63)	810 (15.26)	109 (16.96)	863 (15.64)
Risky Sexual Behavior				
Any	383 (59.96)	3235 (60.47)	393 (64.93)	3076 (58.36)
3+ Partners in Last Year	79 (10.23)	529 (9.03)	138 (22.15)	1006 (18.56)
Transactional Sex in Last Year	9 (1.11)	44 (0.80)	27 (3.38)	190 (2.88)
Partner(s) with History of STD	59 (9.75)	408 (7.46)	48 (5.25)	260 (4.83)
No Condom Use Last Intercourse	328 (50.28)	2822 (51.77)	268 (42.94)	2280 (41.66)
Regretted Sex under the Influence	96 (13.30)	549 (10.45)	157 (25.77)	962 (18.74)
Risky Sexual Behavior Sum				
No Risky Sexual Behaviors	259 (40.04)	2243 (39.53)	225 (35.07)	2220 (41.64)
1 Risky Sexual Behavior	262 (42.73)	2452 (45.43)	239 (39.32)	2032 (38.06)
2+ Risky Sexual Behaviors	121 (17.23)	783 (15.04)	154 (25.61)	1044 (20.30)

Table 3. Unadjusted associations between Covariates and High-Risk Sexual Behavior among Females with Complete Healthcare Access and those who had Limited Healthcare Access

	Complete Healthcare Access cPR	**95%CI**	**Limited Healthcare Access cPR**	**95%CI**
Exposure/ Covariate				
Age (years)				
22-27yo	ref		ref	
18-22yo	0.78	(0.65, 0.93)	0.88	(0.83, 0.94)
Hispanic/Latinx	0.94	(0.71, 1.23)	0.92	(0.82, 1.02)
Race				
White	ref		ref	
Black or African American	0.99	(0.81, 1.21)	0.95	(0.89, 1.03)
American Indian or Native American	1.11	(0.66, 1.87)	0.77	(0.57, 1.04)
Asian or Pacific Islander	0.71	(0.38, 1.34)	0.71	(0.57, 0.87)
Multiracial	0.85	(0.54, 1.33)	1.06	(0.91, 1.25)
Highest Household Parental Education				
College Graduate	ref		ref	
Some College/ Postsecondary School	1.03	(0.83, 1.27)	1.07	(0.98, 1.16)
High School/ GED	1.09	(0.85, 1.39)	1.08	(1.00, 1.17)
Less than High School	1.07	(0.79, 1.43)	0.99	(0.90, 1.09)
Childhood Maltreatment Type				
Neglect of Basic Needs	1.17	(0.90, 1.52)	1.14	(1.05, 1.24)
Physical Abuse (3+ times)	1.10	(0.90, 1.35)	1.13	(1.05, 1.21)
Sexual Abuse	1.07	(0.74, 1.55)	1.20	(1.06, 1.37)
Childhood Maltreatment Sum				
No Maltreatment	ref		ref	
1 Form of Maltreatment	1.08	(0.89, 1.30)	1.12	(1.04, 1.20)
2+ Forms of Maltreatment	1.23	(0.89, 1.70)	1.22	(1.08, 1.39)

Table 4. Unadjusted associations between Covariates and High-Risk Sexual Behavior among Males with Complete Healthcare Access and those who had Limited Healthcare Access

	Complete Healthcare Access cPR	**95%CI**	**Limited Healthcare Access cPR**	**95%CI**
Exposure/ Covariate				
Age (years)				
22-27yo	ref		ref	
18-22yo	0.96	(0.83, 1.10)	0.86	(0.81, 0.91)
Hispanic/Latinx	1.08	(0.90, 1.31)	1.01	(0.93, 1.09)
Race				
White	ref		ref	
Black or African American	1.15	(0.94, 1.41)	0.98	(0.89, 1.09)
American Indian or Native American	1.19	(0.82, 1.72)	1.07	(0.93, 1.23)
Asian or Pacific Islander	0.75	(0.47, 1.21)	0.64	(0.52, 0.80)
Multiracial	1.06	(0.74, 1.51)	1.12	(0.96, 1.31)
Highest Household Parental Education				
College Graduate	ref		ref	
Some College/ Postsecondary School	1.15	(0.94, 1.41)	0.98	(0.91, 1.06)
High School/ GED	1.19	(0.93, 1.52)	1.03	(0.94, 1.13)
Less than High School	0.99	(0.70, 1.42)	0.95	(0.84, 1.07)
Childhood Maltreatment Type				
Neglect of Basic Needs	1.04	(0.84, 1.29)	1.19	(1.09, 1.30)
Physical Abuse (3+ times)	1.06	(0.88, 1.27)	1.06	(0.97, 1.16)
Sexual Abuse	1.26	(0.93, 1.69)	1.27	(1.12, 1.44)
Childhood Maltreatment Sum				
No Maltreatment	ref		ref	
1 Form of Maltreatment	0.98	(0.80, 1.21)	1.12	(1.03, 1.21)
2+ Forms of Maltreatment	1.30	(1.06, 1.59)	1.26	(1.12, 1.42)

Table 5. Association between Childhood Maltreatment and High-Risk Sexual Behaviors adjusted for age, race/ethnicity, and SES for Females

	Complete Healthcare Access aPR	95% CI	Limited Healthcare Access aPR	95% CI
Exposure				
Childhood Maltreatment Type				
Neglect of Basic Needs	1.17	(0.90, 1.53)	1.16	(1.07, 1.26)
Physical Abuse (3+ times)	1.08	(0.89, 1.32)	1.12	(1.04, 1.21)
Sexual Abuse	0.99	(0.63, 1.55)	1.22	(1.08, 1.39)
Childhood Maltreatment Sum				
No Maltreatment	ref		ref	
1 Form of Maltreatment	1.06	(0.88, 1.28)	1.11	(1.04, 1.20)
2+ Forms of Maltreatment	1.16	(0.81, 1.68)	1.25	(1.10, 1.40)

Table 6. Association between Childhood Maltreatment and High-Risk Sexual Behaviors adjusted for age, race/ethnicity, and SES for Males

	Complete Healthcare Access aPR	95% CI	Limited Healthcare Access aPR	95% CI
Exposure				
Childhood Maltreatment Type				
Neglect of Basic Needs	0.97	(0.75, 1.26)	1.20	(1.09, 1.31)
Physical Abuse (3+ times)	1.06	(0.88, 1.28)	1.06	(0.97, 1.15)
Sexual Abuse	1.26	(0.92, 1.73)	1.25	(1.09, 1.43)
Childhood Maltreatment Sum				
No Maltreatment	ref		ref	
1 Form of Maltreatment	0.95	(0.76, 1.18)	1.12	(1.04, 1.21)
2+ Forms of Maltreatment	1.28	(1.03, 1.59)	1.24	(1.09, 1.41)