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RESEARCH ARTICLE

Associations Between US High School Student and Parental Job Loss During the COVID-19 Pandemic and Adverse Mental Health Outcomes, Short Sleep, and Abuse by a Household Adult

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ABSTRACT

Background: Parental job loss has been associated with adverse mental health outcomes and child abuse. This study examines associations between student and parental/household adult (referred to as "parent" for brevity) job loss and these outcomes among US high school students during a period of high job loss—early in the COVID-19 pandemic.

Methods: Adolescent Behaviors and Experiences Survey (ABES) data from January to June 2021 were analyzed to obtain prevalence and adjusted prevalence ratios for select adverse mental health outcomes, short sleep, and emotional and physical abuse by a parent associated with student and parental employment status before and during the pandemic. The sample was composed of 7705 US high school students.

Results: Over half of students (55.1%, 95% CI: 52.4%−57.8%) reported emotional abuse by a parent. Parental and student job loss were associated with adverse mental health outcomes and emotional abuse by a parent. However, only parental job loss was associated with physical abuse by a parent, which was reported by 15.3% of students (95% CI: 13.3−17.3). Students who lost a job during the pandemic reported a high prevalence of persistent feelings of sadness and hopelessness (54.9%; 95% CI: 48.5–61.3) and poor mental health during the past 30 days (43.7%; 95% CI: 37.6–49.8).

Discussion: The high levels of adverse mental health outcomes and child abuse associated with parental and student job loss highlight the need for better supports in this area. Identification of the causes and potential interventions related to child maltreatment in the context of household economic stress could help reduce the burden of negative outcomes.

1 | Introduction

The early phase of the COVID-19 pandemic (March 2020 to June 2021), encompassing full or partial closures and staggered re-openings of schools and businesses, greatly affected the daily lives and economic and social dynamics of adolescents and adults. Research has shown that the COVID-19 pandemic and related changes to schooling and household economics (including parental job loss) affected adolescent mental health, sleep, academic attainment, and family relationships, including patterns of abuse [1–4].

Isolation resulting from closures of businesses and schools, and other major changes to social interactions or daily living (e.g., more time spent at home with family members), early in the COVID-19 pandemic led to significant increases compared to pre-pandemic levels in depressive symptoms and anxiety among adolescents [1–3]. Additionally, sleep disturbances were examined in nearly 20% of studies included in the systematic review, with 55.6% of adolescents reporting difficulty sleeping [2]. Short sleep is a noted risk factor for adverse mental health outcomes among adolescents [5, 6].

For US students, 2020, the first year of the COVID-19 pandemic, was a period of pronounced changes in schooling, with many students going to full-time remote learning or a hybrid modality (partial remote and partial in-person learning); in some cases, school closures and use of hybrid modality persisted into 2021 [7]. Research using COVID Experiences Survey data from October to November 2020 found US students aged 13−19 years who were in virtual learning were more likely to report high or very high stress (44.7% vs. 25.0%), report persistent depression symptoms (19.1% vs. 7.6%), and be considering suicide (13.5% vs. 3.8%) compared to students learning at school [8]. Negative effects of remote schooling [8, 9] may have been offset by the concomitant decrease in bullying reported across multiple countries, including the United States [10, 11].

In addition to changes in schooling, traditional or usual work routines were altered for a large percentage of Americans, both adults and adolescents. Data from Google Consumer Surveys from April through May 2020 revealed that approximately 35% of sampled US adult workers shifted from in-person jobs to remote work, while 10% reported being laid off or furloughed [12]. The US Census Bureau's Household Pulse Survey data from June 2020 indicated a higher percentage of exposure to employment loss among young adults, with 59% of sampled US workers aged 18−26 years reporting direct or household employment loss since the start of the COVID-19 pandemic [13]. An April 2020 cross-sectional study found that US adult workers who had lost their jobs during the pandemic reported higher symptoms of depression, anxiety, and stress compared to workers whose employment was unchanged [14]. Additionally, US adult workers who lost a job between March 1 and June 25, 2020, reported twice the number of mentally unhealthy days than those who did not lose a job [15].

Parental job loss during the pandemic often led to household economic uncertainty and disrupted family dynamics, with adverse consequences for household children and adolescents: such job loss was a predictor for increases in parent−child conflict and negative child affect [4, 16, 17]. A study of Colorado middle and high school students found that prevalence of emotional and physical abuse at home among students with an unemployed parent during the COVID-19 pandemic were significantly higher than among students whose parents had retained jobs during the pandemic [18]. The increased child maltreatment associated with job loss during the pandemic aligns with prior research examining the family stress model, where increased child maltreatment and parent−child conflict are associated with familial economic insecurity [19].

Most studies on the employment-related effects of COVID-19 have focused on adult workers, with very limited research examining the potential effects that changes to student employment status may have on adolescent health. Research has shown that young adults (aged 18−26 years) who reported job loss during the COVID-19 pandemic experienced higher risks for symptoms of anxiety, worry, loss of interest, and depression [13]. However, data sources that would allow exploration of these same outcomes among adolescent workers are limited.

The Adolescent Behaviors and Experiences Survey (ABES) study was conducted by the Centers for Disease Control and Prevention (CDC) from January through June 2021 to collect nationally representative data on US high school students, with a focus on assessing the impact of the COVID-19 pandemic on health-related experiences and behaviors among these students. Previous studies have used these data to explore student mental health and abuse by parents during the pandemic, including some examination of the effects of parental job loss [20–22]. To date, research has not assessed the effects of student job loss during the COVID-19 pandemic. The current study expands this research by using ABES data to examine differences in adverse mental health outcomes, sleep sufficiency, and abuse by a household adult among US high school students by student and parental employment status before and job loss early in the COVID-19 pandemic.

2 | Methods

2.1 | Data Source

The survey, administered from January to June 2021, was an online questionnaire with 110 questions. Students completed the survey outside of school via a secure web-based platform. Permission from a parent or guardian was obtained before survey completion, and survey instructions were provided to the students in the form of an online video. The ABES study protocol was reviewed and approved by institutional review boards at the CDC and CDC's survey contractor (see 45 C.F.R. part 46; 21 C.F.R. part 56). The survey was available in English or Spanish [23].

CDC researchers adapted existing survey methodology and questions from the Youth Risk Behavior Survey (YRBS) to launch ABES rapidly during the COVID-19 pandemic [23, 24]. ABES methodology relied on a three-stage cluster sample design to obtain a representative sample of 9th through 12th-grade students from public and private schools in the 50 states and the District of Columbia. Survey weights were applied to account for nonresponse and oversampling of Black and Hispanic students [23]. The student response rate was 48% [24].

2.2 | Measures

2.2.1 | Student and Parent Employment Status

To obtain student employment status, the survey included the question, “During the COVID-19 pandemic, did you lose your

paying job even for a short amount of time?" Response options included, "I did not have a paying job before the COVID-19 pandemic started," "Yes," and "No." To obtain parental employment status, the survey asked, "During the COVID-19 pandemic, did a parent or other adult in your home lose their job even for a short amount of time?" Responses included, "My parents and other adults in my home did not have jobs before the COVID-19 pandemic started," "Yes," and "No." Henceforth, for brevity, all measures referencing "parent(s) or other household adults" are referred to as "parent" or "parental."

2.2.2 | Health Outcomes and Behaviors of Interest

The adverse mental health outcomes evaluated included persistent feelings of sadness or hopelessness, poor mental health during the past 30 days, and poor mental health during the pandemic. Short sleep was defined as fewer than 7 h of sleep per day. Adverse mental health outcomes and emotional and physical abuse by a parent or other adult in the home were analyzed as dichotomous variables. Table 1 provides the variables, ABES questions, and analytic coding for the outcomes and behaviors of interest analyzed in this study. For comparability, analytic coding that was established by prior analyses of ABES data was used in this study [21, 22]. Appendix A contains results of a sensitivity analysis for emotional abuse by a parent with responses of "rarely" combined with "never" instead of with "sometimes," "most of the time," or "always." The appendix sensitivity analyses were conducted to understand better the very high prevalences of reported emotional abuse by a parent with the original categorization.

2.2.3 | Sociodemographic Variables

Respondents were asked to provide their sex (coded as male or female), race and ethnicity (coded as White, non-Hispanic; Black, non-Hispanic; Asian, non-Hispanic; other or multi-race, non-Hispanic; Hispanic), and grade level (coded as 9th, 10th, 11th, and 12th grade). Household income was not included because it was not elicited by the survey.

2.3 | Data Analysis

Analyses were performed using SAS-callable SUDAAN, version 11.0.1. The weight, strata, and primary sampling unit variables included in the ABES data set were used in all analyses to account for the complex survey design. Potential confounders, including sex, grade level, and race/ethnicity, were identified a priori from relevant literature [20–22, 25]. The ABES sample was 7705 total respondents, with 7176 respondents providing their own employment status (missing = 529) and 7179 respondents providing parental employment status (missing = 526).

First, descriptive analyses were run using SAS PROC SURVEYFREQ to obtain weighted, unadjusted prevalence figures for student and parental employment status and the outcomes of interest by sociodemographic characteristics. Second, student employment status and parental employment status were examined individually via the model-building process. PROC RLOGIST with a stepwise approach was used to select from among a group of potential confounders: sex, race/ethnicity,

TABLE 1 | Variables, questions, and analytic coding for mental health outcomes, short sleep, and parental abuse. Adolescent Behaviors and Experiences (ABES), United States, January to June 2021.

Variable	Question	Analytic coding
Mental health		
Persistent feelings of sadness or hopelessness	During the past 12 months, did you ever feel so sad or hopeless almost every day for 2 weeks or more in a row that you stopped doing some usual activities?	Yes versus no
Poor mental health during the past 30 days	During the past 30 days, how often was your health not good? (Poor mental health includes stress, anxiety, and depression)	Always or most of the time versus never, rarely, or sometimes
Poor mental health during the pandemic	During the COVID-19 pandemic, how often was your mental health not good? (Poor mental health includes stress, anxiety, and depression)	Always or most of the time versus never, rarely, or sometimes
Sleep		
Short sleep	On the average school night, how many hours of sleep do you get?	< 7 versus ≥ 7 h or more
Abuse by a parent		
Emotional abuse	During the COVID-19 pandemic, how often did a parent or other adult in your home swear at you, insult you, or put you down?	Yes (rarely, sometimes, most of the time, or always) versus no (never)
Physical abuse	During the COVID-19 pandemic, how often did a parent or other adult in your home hit, beat, kick, or physically hurt you in any way?	Yes (rarely, sometimes, most of the time, or always) versus no (never)

and grade level. To determine which potential confounders remained, *p*-values were considered but the primary method for selection was determining if the results (prevalence and prevalence ratios) changed by 10% or more with the addition of a variable. Based on these criteria, sex and race/ethnicity were retained as adjustment variables for the final models. There may be residual confounding by factors that could not be included in the analyses because they were not assessed by the ABES survey; examples include family socioeconomic status, student geographic location, and pre-existing conditions such as depression or anxiety.

Using the final models, PROC RLOGIST was run to obtain adjusted prevalence ratios (aPRs). Weighted, unadjusted prevalences with non-overlapping confidence intervals (CIs) were considered to have statistically significant differences and aPRs with CIs excluding 1.0 were considered statistically significant [26, 27].

3 | Results

The study sample was 50.4% female and 49.6% male, with 49.8% of the sample reporting White, non-Hispanic as their race/ethnicity (Table 2). Additionally, the percentage of the sample fell slightly as grade level increased with 26.7% in 9th grade and 23.6% in 12th grade. Among all students in the sample, 9.0% reported they had lost jobs during the COVID-19 pandemic, and 59.8% reported not working before the COVID-19 pandemic (Table 2). For parental employment status, 27.4% of students reported parental job loss during the pandemic, and 3.7% of students reported their parent was not working before the pandemic. Non-Hispanic White and 12th grade students were more likely to be employed before the pandemic and to lose their jobs during the pandemic compared to their counterparts by race/ethnicity and grade level, respectively. By demographic characteristics, female, Hispanic, and 10th grade students reported the highest percentages of parental job loss during the pandemic.

As shown in Table 3, the most common experience reported was emotional abuse by a parent (55.1%; 95% CI: 52.4–57.8). Adverse mental health outcomes were also highly prevalent among students, and female students reported more than twice the prevalence of several adverse mental health outcomes compared to their male counterparts. The different grade levels showed similar prevalence for the adverse mental health outcomes, short sleep, and abuse by parent with the exception of physical abuse by parent; 9th grade students reported twice the abuse than 12th grade students (14.3% vs. 7.7%) (Table 3). Prevalences of adverse mental health outcomes, short sleep, and parental abuse varied across the race and ethnicity groups. Other or multi-race students reported the highest prevalence of emotional abuse by parent (61.5%), and Black, non-Hispanic students reported the highest prevalence of physical abuse by parent (15.0%) when compared to the other race and ethnicity groups. Compared to the other race and ethnicity groups, Black, non-Hispanic students reported the lowest prevalence for each mental health outcome and the highest prevalence of short sleep (60.3%).

Among students reporting job loss during the COVID-19 pandemic, the prevalence for each mental health outcome and emotional abuse by a parent was significantly elevated compared to prevalence among students who did not have a job pre-pandemic and who did not lose their job during the COVID-19 pandemic (Table 4). Students who lost their job during the COVID-19 pandemic had a prevalence of 43.7% for poor mental health during the past 30 days compared to 30.1% for those who had no job before the pandemic and 29.2% for those who retained their job. Students reporting job loss during the COVID-19 pandemic had statistically significant elevations for each of the adverse mental health outcomes, short sleep (aPR: 1.15; 95% CI: 1.03–1.28), and emotional abuse by a parent (aPR: 1.23; 95% CI: 1.13–1.35). Among students who had no job or before the pandemic or retained their jobs, prevalences for both emotional (53.9% vs. 53.6%, respectively) and physical (10.5% vs. 11.6%, respectively) abuse by a parent were similar. The emotional and physical abuse aPRs for students who had no job were both below 1.0. Physical abuse by a parent was the only outcome that was not significantly elevated for students reporting job loss compared to students who retained jobs during the pandemic. There were no significant differences between students who were unemployed before the pandemic and those who retained their jobs.

Parental job loss was also associated with adverse outcomes. Students reporting parental job loss during the COVID-19 pandemic had a significantly higher prevalence of poor mental health during the pandemic (46.2%) compared to students whose parents had no job before the pandemic (33.1%) or who did not lose their job (33.9%) (Table 5). Compared to students whose parents retained jobs during the pandemic, the aPRs for students whose parents lost jobs were statistically significant for all adverse mental health outcomes, emotional abuse by a parent (1.17; CI: 1.11−1.24), and physical abuse by a parent (1.63; CI: 1.36−1.95). Physical abuse by a parent was also elevated among students whose parents did not have jobs before the pandemic (1.48; CI: 0.99−2.22), with the result approaching statistical significance. For all other outcomes, prevalences were similar among students whose parents were unemployed before the pandemic and those whose parents retained their jobs. The aPR for physical abuse by a parent (1.63; CI: 1.36−1.95) among students reporting parental job loss was statistically significant (Table 4). Student job loss compared to student job retention was associated with a lower, nonsignificant elevation for physical abuse by a parent (1.21; CI: 0.90−1.63) (Table 5). Students reporting job loss had higher prevalence figures for all adverse mental health outcomes, short sleep, and emotional abuse by a parent compared to students reporting parental job loss, although CIs overlapped for some outcomes (Tables 4 and 5).

For student and parental employment status, the prevalence figures for emotional abuse for a parent were high (50%−70%) and the aPRs for student job loss and parental job loss were statistically significant (1.30 and 1.32, respectively) (Tables 4 and 5). Prevalence estimates decreased to approximately 30%−40% but remained statistically significant for both student and parent job loss when a more stringent categorization of emotional abuse by a parent was used (Appendix A).

TABLE 2 | Weighted prevalence figures for student and parental job loss during the COVID-19 pandemic by sociodemographic characteristics of the study population. Adolescent Behaviors and Experiences (ABES), United States, January to June 2021.

Characteristics	Unweighted sample	Weighted % in study population (95% CI)	Student employment status[a]		Parent employment status[a]	
			% Not working before the COVID-19 pandemic (95% CI)	% Reporting job loss during the COVID-19 pandemic (95% CI)	% Reporting parent not working before the COVID-19 pandemic (95% CI)	% Reporting parental job loss during the COVID-19 pandemic (95% CI)
All	7705	—	59.8 (56.5–63.1)	9.0 (7.6–10.3)	3.7 (3.0–4.4)	27.4 (25.1–29.8)
Sex						
Female	3999	50.4 (46.9–53.9)	61.8 (58.0–65.7)	9.7 (8.1–11.3)	2.8 (2.1–3.6)	30.4 (27.9–32.9)
Male	3678	49.6 (46.1–53.1)	57.5 (53.7–61.3)	8.1 (6.2–10.0)	4.5 (3.6–5.5)	24.4 (21.8–27.1)
Race/ethnicity						
White, non-Hispanic	3461	49.8 (41.5–58.1)	53.6 (50.3–56.8)	10.3 (8.3–12.3)	3.5 (2.6–4.5)	23.6 (21.1–26.0)
Black, non-Hispanic	1189	12.9 (8.8–16.9)	59.1 (53.0–65.3)	9.6 (6.9–12.4)	5.0 (3.0–7.0)	23.6 (20.0–27.3)
Asian, non-Hispanic	350	4.9 (2.0–7.8)	77.1 (71.0–83.1)	4.3 (2.2–6.4)	2.9 (0.8–5.1)	36.0 (28.1–44.0)
Other or multi-race, non-Hispanic[b]	594	7.0 (5.0–9.0)	60.2 (53.2–67.2)	9.7 (6.0–13.3)	5.0 (2.5–7.5)	22.9 (16.8–29.0)
Hispanic	2038	25.4 (19.6–31.2)	68.5 (64.4–72.6)	6.9 (5.0–8.8)	3.3 (1.9–4.7)	36.7 (32.6–40.8)
Grade level						
9th grade	2144	26.7 (23.9–29.5)	72.3 (68.7–75.9)	3.5 (2.3–4.7)	4.1 (3.0–5.3)	27.9 (23.4–32.3)
10th grade	1949	25.5 (23.0–27.9)	66.4 (62.4–70.4)	5.8 (4.5–7.0)	3.0 (1.8–4.2)	28.1 (25.4–30.8)
11th grade	1858	24.3 (22.3–26.3)	55.4 (49.6–61.2)	8.3 (6.2–10.3)	3.6 (2.3–4.9)	26.5 (23.1–29.8)
12th grade	1731	23.6 (21.1–26.0)	43.4 (39.8–47.1)	19.0 (16.4–21.7)	4.1 (2.7–5.5)	27.1 (23.8–30.5)

Abbreviation: CI = confidence interval.
[a]Denominator includes all students who responded to the question, regardless of whether they or their parents were employed before the COVID-19 pandemic.
[b]Other or multi-race, non-Hispanic includes American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, and non-Hispanic multiracial.

TABLE 3 | Weighted prevalence of mental health outcomes, short sleep, and parental abuse by sociodemographic characteristics of the study population. Adolescent Behaviors and Experiences (ABES), United States, January to June 2021.

Characteristics	Persistent feelings of sadness or hopelessness (95% CI)	Poor mental health during the past 30 days (95% CI)	Poor mental health during the pandemic (95% CI)	Short sleep (< 7 h per night) (95% CI)	Emotional abuse by parent (95% CI)	Physical abuse by parent (95% CI)
All	44.2 (41.5–46.8)	31.1 (28.5–33.6)	37.1 (34.6–39.6)	50.3 (47.4–53.2)	55.1 (52.4–57.8)	11.3 (10.1–12.4)
Sex						
Female	56.5 (53.4–59.5)	41.6 (38.3–44.9)	48.9 (45.6–52.3)	52.4 (49.0–55.8)	62.8 (59.5–66.1)	11.6 (10.0–13.1)
Male	31.4 (29.1–33.7)	19.6 (17.5–21.8)	24.4 (22.2–26.6)	47.9 (44.5–51.3)	46.8 (44.2–49.4)	10.9 (9.6–12.1)
Race/ethnicity						
White, non-Hispanic	43.8 (40.3–47.2)	32.8 (29.6–36.1)	40.1 (37.4–42.9)	50.3 (47.1–53.5)	56.4 (52.4–60.4)	9.8 (8.5–11.1)
Black, non-Hispanic	39.7 (35.8–43.6)	25.6 (21.9–29.3)	28.0 (23.0–32.9)	60.3 (54.5–66.1)	49.6 (44.0–55.3)	15.0 (11.3–18.7)
Asian, non-Hispanic	40.2 (34.2–46.2)	29.1 (23.4–34.8)	33.7 (27.2–40.2)	50.1 (34.6–65.5)	59.2 (54.6–63.8)	12.9 (8.2–17.7)
Other or multi-race, non-Hispanic[a]	50.4 (43.4–57.4)	30.3 (24.3–36.3)	36.5 (28.1–44.8)	52.7 (45.5–60.0)	63.2 (57.9–68.6)	14.3 (11.5–17.2)
Hispanic	46.4 (42.1–50.8)	31.1 (27.8–34.5)	36.8 (33.1–40.6)	45.8 (40.6–51.1)	52.5 (48.0–56.9)	11.2 (9.2–13.2)
Grade level						
9th grade	43.3 (38.5–48.0)	30.2 (26.6–33.8)	35.8 (31.4–40.3)	44.4 (40.9–48.0)	58.0 (54.1–61.9)	14.3 (11.9–16.6)
10th grade	44.6 (40.8–48.4)	31.3 (27.7–34.8)	37.2 (33.3–41.2)	50.4 (46.8–54.1)	54.4 (51.5–57.4)	11.9 (9.9–13.9)
11th grade	44.7 (40.6–48.7)	30.2 (26.6–33.9)	37.8 (34.1–41.4)	50.9 (46.5–55.3)	53.9 (49.4–58.5)	10.6 (8.2–13.0)
12th grade	44.4 (40.7–48.1)	32.8 (28.9–36.7)	37.9 (33.9–41.9)	56.0 (51.5–60.4)	53.8 (49.9–57.6)	7.7 (6.3–9.2)

Abbreviations: CI = confidence interval.
[a]Other or multi-race, non-Hispanic includes American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, and non-Hispanic multiracial.

TABLE 4 | Weighted prevalence and adjusted[a] prevalence ratios (aPRs) of mental health outcomes, short sleep, and parental abuse by student employment status during the COVID-19 pandemic[b]. Adolescent Behaviors and Experiences (ABES), United States, January to June 2021.

	Student had no paying job before the pandemic		Student lost job during the pandemic		Student did not lose job during the pandemic	
	Unadjusted (%) (95% CI)	aPR (95% CI)	Unadjusted (%) (95% CI)	aPR (95% CI)	Unadjusted (%) (95% CI)	aPR (95% CI)
Persistent feelings of sadness or hopelessness	43.8 (41.1–46.4)	0.98 (0.91–1.06)	54.9 (48.5–61.3)[c]	1.22 (1.09–1.37)[c]	42.7 (39.1–46.3)	REF
Poor mental health during the past 30 days	30.1 (27.4–32.9)	0.99 (0.89–1.10)	43.7 (37.6–49.8)[c]	1.41 (1.21–1.63)[c]	29.2 (26.4–32.0)	REF
Poor mental health during the pandemic	36.7 (33.8–39.6)	1.02 (0.94–1.12)	48.7 (43.0–54.4)[c]	1.33 (1.16–1.51)[c]	34.8 (31.6–37.9)	REF
Short sleep (< 7 h per night)	49.4 (45.9–53.0)	0.99 (0.93–1.07)	58.1 (52.9–63.3)	1.15 (1.03–1.28)[c]	49.8 (46.4–53.2)	REF
Emotional abuse by parent	53.9 (51.4–56.5)	0.99 (0.93–1.05)	67.9 (61.7–74.1)[c]	1.23 (1.13–1.35)[c]	53.6 (49.3–58.0)	REF
Physical abuse by parent	10.5 (9.0–12.1)	0.89 (0.73–1.07)	14.3 (11.2–17.5)	1.21 (0.90–1.63)	11.6 (9.7–13.4)	REF

Abbreviations: aPR = adjusted prevalence ratio, CI = confidence interval, REF = reference group.
[a]Adjusted for sex and race/ethnicity.
[b]Derived from the question, "During the COVID-19 pandemic, did you lose your paying job even for a short amount of time?" Answer options were: (1) "I did not have a job before the COVID-19 pandemic started," (2) "Yes," (3) "No."
[c]Denotes statistical significance (non-overlapping confidence intervals in comparison to other employment status groups for prevalence results and confidence interval does not include 1.0 for prevalence ratios).

TABLE 5 | Weighted prevalence and adjusted[a] prevalence ratios (aPRs) of mental health outcomes, short sleep, and parental abuse by parental employment status during the COVID-19 pandemic[b]. Adolescent Behaviors and Experiences (ABES), United States, January to June, 2021.

	Parent had no paying job before the pandemic		Parent lost job during the pandemic		Parent did not lose job during the pandemic	
	Unadjusted (%) (95% CI)	aPR (95% CI)	Unadjusted (%) (95% CI)	aPR (95% CI)	Unadjusted (%) (95% CI)	aPR (95% CI)
Persistent feelings of sadness or hopelessness	44.3 (35.7–52.9)	1.11 (0.93–1.32)	53.3 (48.9–57.6)	1.25 (1.17–1.35)[c]	41.1 (38.8–43.4)	REF
Poor mental health during the past 30 days	27.5 (19.9–35.2)	1.00 (0.77–1.30)	38.2 (33.5–42.8)	1.30 (1.18–1.43)[c]	28.5 (26.2–30.7)	REF
Poor mental health during the pandemic	33.1 (25.0–41.3)	1.03 (0.83–1.29)	46.2 (42.0–50.5)[c]	1.32 (1.22–1.43)[c]	33.9 (31.5–36.3)	REF
Short sleep (< 7 h per night)	53.2 (44.3–62.0)	1.04 (0.89–1.23)	51.3 (46.8–55.9)	1.04 (0.97–1.12)	49.8 (46.7–52.8)	REF
Emotional abuse by parent	49.2 (39.4–59.0)	0.96 (0.82–1.13)	62.3 (58.4–66.1)	1.17 (1.11–1.24)[c]	52.6 (49.7–55.5)	REF
Physical abuse by parent	14.6 (9.0–20.2)	1.48 (0.99–2.22)	15.3 (13.3–17.3)	1.63 (1.36–1.95)[c]	9.4 (8.4–10.4)	REF

Abbreviations: aPR = adjusted prevalence ratio, CI = confidence interval, REF = reference group.
[a]Adjusted for sex and race/ethnicity.
[b]Derived from the question, "During the COVID-19 pandemic, did a parent or other adult in your home lose their job even for a short amount of time?" Answer options were: (1) "My parents and other adults in my home did not have jobs before the COVID-19 pandemic started," (2) "Yes," (3) "No."
[c]Denotes statistical significance (non-overlapping confidence intervals in comparison to other employment status groups for prevalence results and confidence interval does not include 1.0 for prevalence ratios).

4 | Discussion

This study found that adverse mental health was common among high school students in the early phase of the COVID-19 pandemic and that student and parental job loss during the pandemic were associated with worse mental health outcomes, as well as abuse by a parent. Student job loss was most strongly associated with poor mental health during the past 30 days and during the pandemic. Persistent feelings of sadness, short sleep, and emotional abuse by a parent were also statistically significant among students reporting job loss, while physical abuse by a parent was not significantly associated with student job loss. In contrast, parental job loss was strongly associated with physical abuse by a parent and, to a lesser but still statistically significant extent, adverse mental health outcomes and emotional abuse by a parent. While only parental job loss was associated with physical abuse by a parent, both student and parental job loss were associated with adverse mental health outcomes, and students reporting job loss had higher prevalences of adverse mental health outcomes.

The results of this study align with pre-pandemic findings that economic and other stressors are associated with increased emotional and physical abuse throughout childhood by a parent [18, 28, 29]. Material hardships and parental mental health (e.g., stress, depression) are well-established risk factors for child maltreatment [30–34]. A systematic review of pre-pandemic studies primarily within the US found housing stress was associated with an increased likelihood of caregiver or child self-reported maltreatment and child protective services reports [31]. Analyses of 2009−2018 US county-level data found that higher food insecurity rates were significantly associated with increased child maltreatment rates [32]. Changes to a family's disposable income may also be a predictor of increased child maltreatment [35]. Parental characteristics including anger, personal stress, and self-esteem were all statistically significant child abuse risk factors according to a 2009 meta-analysis [34]. Employment status, including job loss, is likely to influence these same economic and personal well-being stressors.

The early phase of the COVID-19 pandemic included many economic stressors, along with psychological stressors such as isolation and concerns about severe outcomes of infection. A national survey of US adults in March to April 2020 found that parents' perceived social isolation and recent employment loss were associated with self-reported verbal aggression against their child, even after controlling for sociodemographic factors including income and parental depression [36]. Remote schooling, social distancing, and sheltering in place during the COVID-19 pandemic appear to have made children more vulnerable to maltreatment through increased family isolation, mental stress, and loss of employment (temporary or permanent), and restricted access to critical support systems [37]. Physical and emotional parental abuse were elevated in economically stressed households before the COVID-19 pandemic, and results from the current study indicate parental job loss during the pandemic was associated with increased physical abuse, and, to a lesser extent, emotional abuse. Student job loss during the pandemic was associated with increased parental emotional abuse.

Students who had no paying job before the COVID-19 pandemic and students who retained jobs during the pandemic had similar prevalence of adverse mental health outcomes. These prevalence figures were relatively high (approximately 30%−40%) and likely reflective of the pandemic's overall mental health impact; 2011−2021 YRBS data indicate increased adverse mental health compared to the pre-pandemic levels [38]. Students who lost their jobs and those whose parents lost a job during the COVID-19 pandemic had significantly higher prevalence of adverse mental health outcomes than those who previously had no paid job or retained jobs. Economic support from the government was available during the public health emergency, but the findings of increased prevalence of adverse mental health outcomes and abuse suggest that this support may not have been enough to mitigate the combined economic and mental health effects of student or parental job loss.

More than half of the study participants reported sleeping fewer than 7 h. Short sleep was modestly elevated among students who lost jobs during the COVID-19 pandemic but was not associated with parental job loss. Evidence suggests that the relationship between sleep disturbances and mood disorders (e.g., depression) may be bidirectional in adolescents, similar to the relationship seen among adults [5]. In this study, the student's job loss may have led to sleep problems, which may have in turn affected mental health; alternatively, job loss may have led to negative mental health outcomes, which in turn affected sleep. A recent meta-analysis found associations between short sleep and mood disturbances, along with other adverse mental health outcomes [39]; the high prevalence of short sleep among these students, regardless of student or parental job status and loss, may contribute to the high prevalence of adverse mental health outcomes observed in the current study.

4.1 | Limitations

The limitations of the ABES data are described elsewhere [24]. The data are cross-sectional, so causality cannot be assessed. Exact date of survey administration is not available, and changes in instructional model of school (in-person, hybrid, virtual) or COVID-19 vaccination availability during the administration period (January to June 2021) could have affected responses. The mental health variables indicate well-being and do not provide a diagnosis of any health conditions (e.g., depression or anxiety). The overall response rate was 18.1%.

Because ABES focused on capturing a broad range of behaviors and experiences of adolescents during the COVID-19 pandemic, it lacks information on household economics, household income, geographic location of the student, and other work-related variables (for example, the reason student was working, average number of hours worked, reason for job loss, type of work) needed to contextualize the effects of job losses. In addition, survey questions on ABES do not ascertain the family structure, which family adult lost their job, and that adult's role in household economics. Similarly, knowing whether the student's pay is an important part of household income is crucial for understanding the effects of student job loss. The presence of

contextual information could help elucidate the role of household economic stress in the observed association between student job loss and increased emotional abuse.

Despite these limitations, the ABES data offer several strengths. The ABES data are from a large, nationally representative sample of adolescents so results are more likely to reflect the outcomes and behaviors accurately within the population of interest. The ABES survey is one of only a few adolescent-based questionnaires that include questions on student and parental job status during the COVID-19 pandemic, allowing researchers to examine a relevant and understudied topic in conjunction with health outcomes and behaviors. Additionally, the ABES survey is composed of 110 questions on a variety of health outcomes and behaviors which allowed for examination of several important mental health and health behavior measures in this study.

5 | Conclusions

With nearly 6 million US workers aged 16–19 years [40], and a smaller number of younger teens employed as well, understanding how employment influences the health of adolescent workers is key for future research and intervention efforts. This study highlights the importance of considering the role of youth employment, as well as parental employment, in adolescent mental health and physical and emotional safety within the family. The findings of adverse effects of student and parental job loss highlight the importance of understanding the influence of family economic circumstances, including financial contributions from adolescents' employment, on mental health and family safety. In addition, the study results emphasize the complexity of the associations between adverse mental health outcomes, physical and emotional abuse, and sociodemographic factors such as race/ethnicity. The combination of remote learning, student and parental job loss, and limited social outlets during the pandemic likely led to increased time in close proximity for many households.

Parental job loss during the COVID-19 pandemic was associated with increased risk for student physical abuse by a parent, and both parental and student job loss were linked to increased risk for student emotional abuse by a parent. Child maltreatment, including physical and emotional abuse, is a serious problem that can lead to cognitive, psychological, and physical health outcomes later in life [41]. Longitudinal research has found associations between physical abuse by parents and delinquency, drug abuse, depression, and anxiety, while emotional abuse has been associated with psychosis, posttraumatic stress disorder, and injection drug use [41–43]. Additional understanding of the causes and potential areas for intervention related to child maltreatment could help reduce both the current burden and future negative outcomes.

The inclusion of questions related to work, as well as questions about the household's economic situation, in surveys involving youth could help close large data gaps for this high-risk population. More robust data, particularly from longitudinal studies, could facilitate a deeper understanding of the complexities behind adolescent employment status, mental health, family safety, economic security, and stressors. Increasing awareness among school counselors and community resources of the observed linkages between job loss and poor adolescent mental health, and physical and emotional abuse by parents could encourage early identification of and provision of resources to families facing job loss.

Author Contributions

Taylor M. Shockey led the study conceptualization, conducted the data analyses, and led the writing of the manuscript. Sharon R. Silver helped with the study conceptualization, interpretation of results, and contributed to the writing of the manuscript. Jonetta J. Mpofu participated in development of the ABES survey and provided critical guidance for analyzing the data.

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The authors have nothing to report.

Disclosure

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the National Institute for Occupational Safety and Health (NIOSH) or the Centers for Disease Control and Prevention (CDC).

Ethics Statement

The ABES study protocol was reviewed and approved by the institutional review boards at the CDC and ICF International, CDC's survey contractor (see 45 C.F.R. part 46; 21 C.F.R. part 56).

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data used in the study are publicly available and can be downloaded directly from the CDC website: https://www.cdc.gov/healthyyouth/data/abes/data.htm.

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Appendix A

See Table A1.

TABLE A1 | Weighted prevalences and adjusted[a] prevalence ratios (aPRs) of emotional abuse by a parent (rarely, sometimes, most of the time, or always)[b] and emotional abuse by a parent (sometimes, most of the time, or always)[b] by student and parental employment status during the COVID-19 pandemic[c], sensitivity analyses. Adolescent Behaviors and Experiences (ABES), United States, January to June 2021.

	Student had no paying job before the pandemic		Student lost job during the pandemic		Student did not lose job during the pandemic	
	Unadjusted (%) (95% CI)	aPR (95% CI)	Unadjusted (%) (95% CI)	aPR (95% CI)	Unadjusted (%) (95% CI)	aPR (95% CI)
Emotional abuse by parent (rarely, sometimes, most of the time, or always)	53.9 (51.4–56.5)	0.99 (0.93–1.05)	67.9 (61.7–74.1)	1.23 (1.13–1.35)	53.6 (49.3–58.0)	REF
Emotional abuse by a parent (sometimes, most of the time, or always)	29.9 (27.8–32.0)	0.95 (0.86–1.06)	41.2 (36.4–46.0)	1.30 (1.11–1.51)	30.2 (27.5–32.9)	REF
	Parent had no paying job before the pandemic		**Parent lost job during the pandemic**		**Parent did not lose job during the pandemic**	
Emotional abuse by parent (rarely, sometimes, most of the time, or always)	49.2 (39.4–59.0)	0.96 (0.82–1.13)	62.3 (58.4–66.1)	1.17 (1.11–1.24)	52.6 (49.7–55.5)	REF
Emotional abuse by a parent (sometimes, most of the time, or always)	27.8 (21.1–34.6)	1.01 (0.79–1.30)	38.3 (34.8–41.9)	1.32 (1.20–1.46)	28.3 (26.3–30.3)	REF

Abbreviations: aPR = adjusted prevalence ratio, CI = confidence interval, REF = reference group.
[a]Adjusted for sex and race/ethnicity.
[b]Derived from the question, "During the COVID-19 pandemic, how often did a parent or other adult in your home swear at you, insult you, or put you down?" with emotional abuse by a parent categorized as either (A) combined responses of "rarely," "sometimes," "most of the time," or "always"; or (B) combined responses of "sometimes," "most of the time," or "always."
[c]Derived from the question, "During the COVID-19 pandemic, did you lose your paying job even for a short amount of time?" Answer options were: (1) "I did not have a job before the COVID-19 pandemic started," (2) "Yes," (3) "No."