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Social Support and Perceptions of COVID-19-Related Emotional Impact on Mental Health Among Early Adolescents in Appalachia

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Research Article

Social Support and Perceptions of COVID-19-Related Emotional Impact on Mental Health Among Early Adolescents in Appalachia

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ABSTRACT

BACKGROUND: Young people who experience higher levels of social support from their schools and families have been shown to be less likely to develop symptoms of negative mental health outcomes such as depression and anxiety.[1-4] This raises questions concerning how young people's stress and psychological changes due to the COVID-19 pandemic as well as social support during this time have affected their overall mental health. The aim of this study was to assess the association between sources of parental- and school-level social support and youth perceptions of COVID-19-related emotional impact on mental health among early adolescent girls and boys in Appalachia.

METHODS: Using linear regression, we analyzed the first and third wave of survey data from the larger parent study (Young Mountaineer Health Study) cohort, collected in 20 middle schools throughout West Virginia in the fall of 2020 and fall of 2021 (N = 1349, mean age: 11.5, response rate: 80.7%).

RESULTS: Approximately half of participants reported knowing someone that had been sick with COVID-19. Those experiencing higher levels of perceived COVID-19-related emotional impact reported greater levels of depression, anxiety, and anger. Both parental and school-level social support were associated with better mental health outcomes.

CONCLUSIONS: Early adolescent perceptions of COVID-19-related emotional impact were associated with depression, anxiety, and anger and moderated by social support at home and in school among 11-12-year-old youth in Appalachia.

Keywords: early adolescents; COVID-19; mental health; stress; Appalachia.

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BACKGROUND

As of February 2022, the COVID-19 pandemic has taken the lives of over 928,000 people in the United States.[5] In addition to lives lost, the pandemic has created multiple challenges for families and children such as increased risk of financial hardship, job loss, school closures, social isolation, and fear of infection. Children and youth are at a high risk of stress related to the wider psychosocial impact of the pandemic.[6] A recent systematic review showed an overall increase in youth symptoms of anxiety, depression, and psychological distress due to the pandemic.[7] Given that adolescence is a common developmental period for the onset of many mental health disorders such as anxiety, depression, and schizophrenia early detection and prevention of mental health consequences of the pandemic has been called for.[8,9] An important concern associated with the pandemic is its potential impact on stress among younger adolescents (eg, 11- to 12-year-old) and how the pandemic may have impacted stress levels among

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specific subgroups (gender race, family structure, etc.) at this age. Such findings could be important for early detection and the development of interventions.

School-level social support can be vital to the mental development of students. School social support includes students having adults at their school that care about them, are kind and fair to them, that they feel safe around, notice when they are having a hard time and offer help, and/or that believes the student can help make the world a better place. Prior to the pandemic, students in most US states attended at least 180 days of in-person schooling with at least 5 hours of instruction a day. This does not include lunchtime, free periods, or after-school activities. Because of this, other than caretakers, the most present adults in students' lives are school personnel. Since school personnel spend so much time with students, they are well-positioned to recognize signs of poor mental health and provide support for students in need. Put simply, school-level social support plays an important role in the mental development of students. For example, a study in Finland demonstrated that students who report lower levels of school social support were 2.5 times as likely to show negative mental health symptoms, such as depression, compared to those who reported higher levels of school social support.[1] Further, students who reported no school social support were 8 times as likely to show negative mental health symptoms compared to those who reported low levels of school social support. This shows that even small amounts of social support can make a big difference compared to none at all. Other studies have reported similar findings.[10-14] The COVID-19 pandemic undoubtedly has disrupted the ability of schools to provide social support for their students. Thus, it is imperative to assess the importance of school-level support and how it may impact youth mental health among students in the United States.

Research has also identified parental social support as a protective factor for many negative health outcomes such as depression, anxiety, alcohol use, and chronic health conditions.[2-4] Parental social support includes young people having a caregiver who is able to make them feel better when they are upset, enjoys doing things with them, cheers them up when they are sad, gives them a lot of care and attention, and/or is easy to talk to. Further, research has shown that parental social support has positive impact on academic outcomes, create less negative reactions to parental monitoring, and decreases sexual risk-taking behaviors.[15-17] For instance, a recent study showed that youth who have low levels of parental social support and high friend social strain (decreased socialization and interactions with friends) suffer more from chronic health conditions, such as mental health, than those with low levels of parental social support alone.[4] Since the pandemic has been a time of separation from friends, these findings highlight the importance of parental social support during a pandemic that has had dramatic effects on ''friend social strain.''

Historically, children and youth that grow up with financial hardship have been more likely than youth that grow up in better-off environments to depend on institutional structures such as schools to provide resources beyond education such as food, social support, and counseling.[18] Studies have also shown that youth self-reported economic stress has been related to higher levels of negative mental health outcomes (such as symptoms of anxiety and depression).[19,20] A meta-analysis including 44 studies showed that of all health outcomes, youth self-reported socioeconomic status (SES) showed the strongest relationship with mental health outcomes (low SES being related to higher reporting of negative mental health issues).[21] It should be noted that youth self-reported SES is used because this is what is perceived by the young person and therefore will affect their thoughts, beliefs, and behaviors surrounding their SES. It is therefore conceivable that youth perceptions of emotional impact related to the psychosocial changes brought about with the COVID-19 pandemic has affected young adolescents who live with financial scarcity, and depend on outside resources, greater than those from better-off backgrounds.[22] Thus, it is expected that with regards to the COVID-19 pandemic children and youth from lower-income families will report different levels of mental health indicators compared to children from higher-income families.

Numerous studies of gender differences in mental health have been conducted over the last 20 years. The seminal review work by Kawachi and Berkman,[23] showed that females generally tend to report higher psychological distress compared to males and pointed in particular to observed gender differences in their reliance on and mobilization of social support networks to combat mental health challenges. Another key reflection by Kawachi and Berkman[23] was that ''women's propensity for intimate social involvements may predispose them to the 'contagion of stress' when stressful life events afflict those to whom they feel emotionally close'' (p. 462). Recent studies suggest that adolescent girls are more likely than boys to

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react negatively to the pandemic due to this higher distress.[24] This is why it is also expected that girls will report different levels of mental health indicators compared to boys in this study.

In 2018, youth born between 1997 and 2012 reported higher levels of stress than any other age group before them.[25] This age group also showed a significant increase in the rates of serious psychological distress, major depression, and suicide compared to previous birth cohorts.[26] Given that these statistics were gathered and published prior to the COVID-19 pandemic and that the pandemic has caused many disruptions in young people's lives, one would expect that these negative health outcomes may have been exacerbated during the pandemic. Contemporary research has shown that the pandemic has caused increased rates of mental health symptoms[27]; however, no study to date has empirically tested whether youth perceptions of COVID-19-related emotional response or levels of social support are associated with mental health indicators such as depression, anxiety, and anger among young adolescents. Hence, the purposes of this study were to test: (1) the relations between levels of youth perceived COVID-19-related emotional impact and indicators of mental health (depression, anxiety, and anger) and (2) the relationship between parental and/or school-level social support on these outcomes.

METHODS

Participants

The present analyses are based on 2 waves (waves 1 and 3 out of 6) of survey data from the larger parent study, the Young Mountaineer Health Study (YMHS) cohort, where students enrolled in 20 public middle-schools in 5 counties in West Virginia are being followed twice per year from grades 6 through 8. Baseline (wave 1) data were collected in the fall of 2020 during the height of the pandemic and before vaccines had become widely available in the population. Wave 3 occurred 1 year later in the Fall of 2021 as more children returned to face-to-face methods of instruction. Across the 2 waves, of 1671 students that were enrolled in either face-to-face or hybrid school format (part in person, part virtual) at the time (ie, not in virtual-only format) and thus accessible to the study team, 1349 completed the study survey. The overall response rate was 80.7%.

Instruments

Dependent variables. In order to investigate mental health outcomes for adolescents, we chose 3 indicators; depression, anxiety, and anger which were all measured using the outpatient psychiatric rating scale[28] which has been widely used in both adult and adolescent populations. Depression was measured with 10 items (Cronbach's $\alpha = .91$). Items included ''In the past week I had little interest in doing things.'' Anxiety was measured with 3 items (Cronbach's $\alpha = .83$). Items included ''In the past week I felt tense.'' Anger was measured with 5 items (Cronbach's $\alpha = .88$). Items included ''In the past week I wanted to break or damage things.'' Response option for all 3 indicators were 1 = ''Never'' to 4 = ''Often.''

Control variables. Race (white vs all other), youth self-reported family income status (assessed with the question ''How well off financially do you think your family is in comparison to other families in West Virginia?'' Response options ranged from 1 = ''much worse off'' to 7 = ''much better off''), and gender was assessed with a 4-category question pertaining to 1 = boy, 2 = girl, 3 = gender nonconforming, 4 = other. Due to low number of respondents in the latter 2 groups (n = 34) those responses were omitted from the analysis resulting in a dichotomized variable (girls = 1, boys = 0). We also controlled for individual experiences of COVID-19 (''Do you personally: (1) know anyone who has been sick with COVID-19 and (2) know someone who died from COVID-19?'' Response options: me, a parent/caregiver, another family member, a friend, someone else) were employed as dichotomized control variables.

Independent variables. Students' perception of COVID-19-related emotional impact was assessed with 5 questions designed for this study headed by the statement: ''How true are the following statements about you'': ''Because of COVID-19 I am: (1) stressed, (2) lonely, (3) bored, (4) sad, (5) angry.'' Response options that ranged from 1 = ''not true at all'' to 5 = ''very true'' were summed to form a scale ranging from 5 to 25 (Skew = .81, Kurtosis = −.40, Cronbach's $\alpha = .85$). To further substantiate this new measure, an exploratory factor analysis was assessed and indicated a solid 1 factor model (KMO = .84, $\chi^2 = 2547.2$, $p < .001$, all communalities above 3, 1 factor explained 63% of the variance). Parental social support was assessed with 5 questions from the questionnaire for children and youth (CRPBI-30)[29] headed by the statement: ''These next questions are about your relationship with your primary caregiver. Are the following statements not like primary caregiver, like primary caregiver, or a lot like primary caregiver?'': ''My primary caregiver: (1) is able to make me feel better when I am upset, (2) enjoys doing things with me, (3) cheers me up when I am sad, (4) gives me a lot of care and attention (5) is easy to talk to.'' Response options that ranged from 1 = ''not like'' to 3 = ''a lot like'' were summed to form a scale ranging from 5 to 15 (Skew = −1.45, Kurtosis = 1.49, Cronbach's $\alpha = .87$). School social support was assessed with 5 questions from first subscale on the school as a protective factor measure (Mann et al.,

unpublished data, February 2020), headed by the statement: ''The following questions ask you to think about your school. Please select the response that best captures your experience.'': ''The adults at my school: (1) care about me, (2) are fair and kind to me, (3) are safe to be around, (4) notice when I'm having a hard time and offer to help me, (5) believe I can make the world a better place.'' Response options that ranged from 1 = ''strongly disagree'' to 5 = ''strongly agree'' were summed to form a scale ranging from 5 to 25 (Skew = −1.33, Kurtosis = 2.06, Cronbach's $\alpha = .86$). To further substantiate this newer measure, an Exploratory Factor Analysis was assessed and indicated a solid 1 factor model (KMO = .86, $\chi^2 = 3034.88$, $p < .001$, all communalities above 3, 1 factor explained 66% of the variance).

Procedure

The YMHS employs a network that consists of an investigative team, study manager, 3 county data collection leaders, and 20 supervising contact agents (1 in each school), to organize all data collection efforts. All 5 county superintendents and 20 school principals approved participation in the study. In September 2020, an introductory letter was sent to all parents and caregivers to notify them about the study where they were offered the opportunity to opt-out of participation. The institutional review board of West Virginia University approved all study protocols (#1903499093A001). Data collection was supervised by research staff. Students were accessed either inside schools or during designated classroom hours from home, depending on accessibility based on state and county mitigation efforts to the COVID-19 pandemic at the time.

Data Analysis

Data were analyzed with a series of hierarchical linear regression models in SPSS version 27. Each model employed depression, anxiety, or anger as the dependent variable with the controls (race, income, gender, covid experience of illness, and death) entered on the first step. On the next step key variables of interest (covid emotional impact, parent social support, and school social support) were entered. We ran these 3 models in each wave to assess if there were differences in the trends of association across time points. Table 1 includes descriptive statistics for all study variables. Tables 2-4 include the multivariate ordinary least squares regression findings.

RESULTS

Table 1 includes descriptive statistics for all study variables. The mean score of the COVID-19-related emotional impact scale was 11.7 (range 5-25) which is skewed toward the lower end. Majority of the study population were female (52.6%) and white (85.6%). The mean score of the school social support variable was 13.20 (range 5-15) and the mean score of the parental social support variable was 20.98 (range 5-25). Approximately half the participants reported knowing at least 1 person that had been sick with COVID-19 or reported having the virus themselves, and 8.5% reported having known someone who died because of the virus. Although race, family structure, and individual experiences of COVID-19 were not significant, the variables were still included in each model to demonstrate that they did not affect the relationship of the other predictors with the outcome.

Table 1. **Descriptive Statistics for All Study Samples**

	n	%
Total	1349	
Gender		
Female	660	52.6
Male	594	47.4
Race		
White	1155	85.6
All other	194	14.4
Family structure		
Lives with both biological parents	650	48.2
Other forms	699	51.8
Individual experiences of COVID-19		
Know someone who has been sick with COVID-19		
Yes	599	48.9
No	627	51.1
Know someone who died from COVID-19		
Yes	114	8.5
No	1235	91.5
	Mean	**SD**
Youth perceived COVID-19-related emotional impact (range 5-25)	11.70	5.97
Youth self-reported family income status (range 1-7)	3.06	1.36
Parental social support (range 5-15)	13.20	2.43
School social support (range 5-25)	20.98	3.96

Depression

Table 2 includes the results from the hierarchical multiple linear regression analyses for depression in waves 1 and 3. Across both waves, the variables included accounted for between 33% (W1 $R^2 = .33$) and 31% (W3 $R^2 = .31$) of the variance in depression. For wave 1 data, gender, youth self-reported family income status, Covid-related emotional impact, parental social support, and school social support were all significantly associated with depression. Girls and those reporting lower family income reported slightly increased depression. For every 1-point increase in parental social support, the depression score decreased by .21, and for every 1-point increase in school social support, depression decreased by .15 points. The largest

Table 2. **Regression Coefficients (Dependent Variable: Depression)**

	Wave 1			Wave 2		
	Parameter Estimate (SE)	**Standardized Estimate**	**p-Value**	**Parameter Estimate (SE)**	**Standardized Estimate**	**p-Value**
Intercept	26.57 (1.79)		<.001	24.14 (1.35)		<.001
Control variables						
Race	−.36 (.59)	−.02	.546	.54 (.57)	.02	.340
Youth self-reported family income	.36 (.14)	.06	.012	.37 (−.14)	.06	.007
Gender	1.72 (.38)	.11	<.001	2.96 (.36)	.18	<.001
Knows someone who has been sick with COVID-	.06 (.06)	.02	.370	−.77 (.50)	−.04	.120
Knows someone who died from COVID-19	−.49 (.66)	−.02	.459	.37 (.42)	.02	.384
Independent variables						
Youth perceived COVID-19-related emotional impact	.52 (.03)	.40	<.001	.56 (.03)	.37	<.001
Parental social support	−.69 (.09)	−.21	<.001	−.48 (.07)	−.16	<.001
School social support	−.29 (.05)	−.15	<.001	−.35 (.04)	−.19	<.001

Table 3. **Regression Coefficients (Dependent Variable: Anxiety)**

	Wave 1			Wave 2		
	Parameter Estimate (SE)	**Standardized Estimate**	**p-Value**	**Parameter Estimate (SE)**	**Standardized Estimate**	**p-Value**
Intercept	7.45 (.68)		<.001	6.31 (.48)		<.001
Control variables						
Race	−.19 (.23)	−.02	.400	.13 (.20)	.02	.509
Youth self-reported family income	.08 (.05)	.04	.160	.11 (.05)	.05	.021
Gender	.59 (.14)	.11	<.001	1.38 (.13)	.24	<.001
Knows someone who has been sick with COVID-	.01 (.02)	.01	.744	−.41 (.18)	−.06	.021
Knows someone who died from COVID-19	−.23 (.25)	−.03	.353	.15 (.15)	.03	.328
Independent variables						
Youth perceived COVID-19-related emotional impact	.16 (.01)	.35	<.001	.17 (.01)	.33	<.001
Parental social support	−.20 (.03)	−.17	<.001	−.08 (.03)	−.08	.001
School social support	−.05 (.02)	−.07	.019	−.09 (.02)	−.14	<.001

Table 4. **Regression Coefficients (Dependent Variable: Anger)**

	Wave 1			Wave 2		
	Parameter Estimate (SE)	**Standardized Estimate**	**p-Value**	**Parameter Estimate (SE)**	**Standardized Estimate**	**p-Value**
Intercept	14.42 (1.05)		<.001	13.22 (.74)		<.001
Control variables						
Race	−.35 (.35)	−.03	.318	.08 (.31)	.01	.798
Youth self-reported family income	.20 (.08)	.07	.014	.22 (.08)	.06	.005
Gender	.11 (.22)	.01	.611	1.26 (.20)	.14	<.001
Knows someone who has been sick with COVID-	.04 (.04)	.026	.321	−.86 (.27)	−.08	.002
Knows someone who died from COVID-19	−.42 (.39)	−.03	.279	.10 (.23)	.01	.663
Independent variables						
Youth perceived COVID-19-related emotional impact	.23 (.02)	.32	<.001	.24 (.02)	.30	<.001
Parental social support	−.30 (.05)	−.17	<.001	−.23 (.04)	−.14	<.001
School social support	−.18 (.03)	−.17	<.001	−.20 (.02)	−.20	<.001

association to depression in wave 1 was Covid-related emotional impact with a 1-point increase leading to higher depression score by .40.

Wave 3 data follows then same trend, gender, youth self-reported family income status, Covid-related emotional impact, parental social support, and school social support were all significantly associated with depression. Girls and those reporting lower family income reported slightly increased depression. For every 1-point increase in parental social support, the depression score decreased by .16, and for every 1-point increase in school social support, depression decreased by .19 points. The largest association to depression in Wave 3 was Covid-related emotional impact with a 1-point increase increasing depression by .37. Importantly, those findings hold when controlling for prior COVID-19-related experiences.

Anxiety

Table 3 includes the results from the hierarchical multiple linear regression analyses for anxiety in both wave 1 and 3. Across both waves, the variables included accounted for between 22% (W1 $R^2 = .22$) and 25% (W3 $R^2 = .25$) of the variance in anxiety. For wave 1 data, gender, Covid-related emotional impact, parental social support, and school social support were all significantly associated with anxiety. Girls reported slightly increased anxiety. For every 1-point increase in parental social support, the anxiety score decreased by .17, and for every 1-point increase in school social support, anxiety decreased by .07 points. The largest association to anxiety in wave 1 was Covid-related emotional impact with a 1-point increase leading to higher anxiety score by .35.

Wave 3 data shows gender, youth self-reported family income status, Covid-related emotional impact, parental social support, and school social support all significantly associated with anxiety. Girls and those reporting lower family income and knowing someone sick, reported slightly increased anxiety. For every 1-point increase in parental social support, the anxiety score decreased by .08, and for every 1-point increase in school social support, anxiety decreased by .14 points. The largest association to anxiety in wave 3 was Covid-related emotional impact with a 1-point increase increasing anxiety by .33.

Anger

Table 4 includes the results from the hierarchical multiple linear regression analyses for anger in both wave 1 and 3. Across both waves, the variables included accounted for between 23% (W1 $R^2 = .23$) and 25% (W3 $R^2 = .25$) of the variance in depression. For wave 1 data, self-reported family income, Covid-related emotional impact, parental social support, and school social support were all significantly associated with anger. For every 1-point increase in parental social support, the anger score decreased by .17, and for every 1-point increase in school social support, anger decreased by .17 points. The largest association to anger in wave 1 was Covid-related emotional impact with a 1-point increase leading to higher anger score by .32.

Wave 3 data shows gender, youth self-reported family income status, knowing someone sick, Covid-related emotional impact, parental social support, and school social support all being significantly associated with anger. Boys and those reporting lower family income or knowing someone sick reported slightly increased anger. For every 1-point increase in parental social support, the anger score decreased by .14, and for every 1-point increase in school social support, depression decreased by .20 points. The largest association to depression in wave 3 was Covid-related emotional impact with a 1-point increase leading to higher depression by .30.

DISCUSSION

Our results show that among 11- to 12-year-old youth in Appalachia, and during the height of the pandemic before vaccines had become available in the population, youth self-reports on mental health outcomes (depression, anxiety, and anger) varied considerably by COVID-19-related emotional impact (higher for those experiencing greater levels of emotional impact) and by levels of social support at home and in school (higher in participants reporting lower levels of support). Importantly, these findings hold despite controlling for gender, race, youth self-reported family income status, and prior experiences of COVID-19, such as being sick with the virus or knowing someone that had been sick with the virus or having experienced death due to the virus in one's immediate environment.

Our regression models indicated that youth perceived COVID-related emotional response, parental support, and school support are all related to youth mental health indicators in the expected direction. Thus, (1) perceived COVID-related emotional impact is strongly related to youth depression, anxiety, and anger (increased emotional impact leads to higher reporting of negative mental health indicators) and (2) levels of parental and school social support serve to decrease youth mental health indicators regardless of race, family income, gender, and COVID-19 experiences.

Conclusions

Studies show that youth who experience high levels of stress and negative mental health are more likely to be disengaged in the classroom, have lower grades, and drop out of school.[30-33] A series of studies has also indicated that youth coping and regulatory abilities

are related to academic performance and grade point average.[34] The consequences of not addressing youth stress and mental health not only affect academic outcomes in adolescence, but can also lead to physiological, psychological, and emotional problems in adulthood.[35] Among 11- to 12-year-old youth in Appalachia, girls reported greater overall levels of mental health indicators compared to boys. Youth perceived family income status was also inversely related to these mental health indicators. Our findings show that strengthening levels of social support, both in the homes of early adolescents, as well as by caring adults in schools, can decrease levels of depression, anxiety, and anger in 11- to 12-year-old adolescents. Our findings support the importance of targeted interventions to youth, specifically girls and those from low-income families, to provide the coping skills and resources needed to alleviate negative mental health outcomes and perceived COVID-19-related emotional impact.

Limitations

Our study has both strengths and limitations. We were able to collect data from a particularly vulnerable group of young adolescents during the midst of the COVID-19 pandemic from a diverse set of rural, suburban, and urban areas in West Virginia (WV) with high response rates.[36] On the other hand, our report is based on cross-sectional data which precludes us drawing causal inferences from the findings. However, the temporal association of events may be particularly challenging to assess given the rapid changes associated with the COVID-19 pandemic. Additionally, all data were self-reported rendering recall bias unaccounted for.

IMPLICATIONS FOR SCHOOL HEALTH

This study demonstrates that many early adolescents self-reported loneliness, sadness, boredom, stress, and anger during the COVID-19 pandemic and that those students experienced higher rates of depression, anxiety, and anger as measured by validated scientific measures. This finding suggests that early adolescent students' perceptions of the emotional impact of COVID-19 may be a reliable indicator of likely clinical mental health challenges. As such, we recommend that middle school teachers, counselors, and administrators carefully assess student self-reports of COVID-19-related emotional impacts, being especially careful not to assume that student concerns related to their mental health can be easily dismissed or responses delayed.

Additionally, both family and school-related social support moderated the levels of depression, anxiety, and anger among struggling early adolescent students. For depression and anxiety, family social support appeared to have a moderately larger protection on student mental health outcomes while school social support also helped moderate negative outcomes. For anger, family and school social support appeared to offer equal protection. In all cases, the combination of family and school social support offered early adolescent students the best protection from negative mental health outcomes. As such, it seems especially important for schools and families to work in concert when providing social support to early adolescents. School-based approaches to promoting student well-being that support school-family partnerships, eg, the Whole School, Whole Community, Whole Child Model, may have been especially important and relevant during the initial and middle phases of the COVID-19 pandemic.

Finally, although this study was conducted during the pandemic, these findings also suggest schools and families continue to enhance their partnerships during the current recovery phase of the COVID-19 pandemic. Having faced a global trauma, it is likely that many early adolescents are still recovering from the past and current impacts of COVID-19 and that school-family partnerships will remain important for the foreseeable future. At a minimum, this data suggests that working together to increase social support at school and in families will help moderate rates of depression, anxiety, and anger. However, the positive impacts associated with adults ensuring supportive environments at school and at home for vulnerable students are likely to extend to a much wider range of benefits—eg, improved academic achievement and decrease substance use—and to be an essential element in the recovery of this generation of students' sense of security and wellbeing.

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