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Cyberbullying, Depression, Trend Analysis

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Prevalence and Trends of Depression among Cyberbullied Adolescents-- Youth Risk Behavior Survey, United States, 2011 – 2019

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Keywords: Cyberbullying, Depression, Trend Analysis

Abstract:

The difference in depression between non-cyberbullied and cyberbullied youth is not well understood. To describe the prevalence and trends in depression among cyberbullied adolescents. Using cross-sectional, nationally-representative data from the YRBS 2011 - 2019, we estimated the prevalence and trends of depression across the total years and within cyberbullied groups that include biological sex and race and ethnicity among adolescents. The results indicated the prevalence of depression was higher among those that were cyberbullied. Within the cyberbullied groups the total trend was higher than the non-cyberbullied, females had a higher prevalence of depression than males, and Hispanics had a higher prevalence of depression than blacks. Further, the results showed the trends for cyberbullied, males, females, whites, and blacks had significant linear increases, but Hispanics remained stable. Further, the non-cyberbullied trend was quadratic where there was no change from 2011-2015, but an increase occurred between 2015-2019. Depression is high among adolescents. It appears to be increasing among individuals that are cyberbullied, with the exception of Hispanics. These results are discussed with programming recommendations.

Introduction

Depression is one of the most common mental health problems among adolescents. According to the CDC (2021), approximately 1.9 million children aged 3-17 years old were diagnosed with depression. With depression affecting adolescents in multiple ways, multiple studies have indicated this specific group of young people also engage in smoking, alcohol use, anxiety, illicit drug use, and risky sexual behaviors (Brighi et al., 2012; Glew et al., 2005; Hinduja & Patchin, 2013; Kowalski & Limber, 2013; National Institute of Health, 2010). Further, adolescents with depression have also been linked to another behavior often linked with adolescents: cyberbullying. This study will contribute to the growing literature on adolescent behaviors by exploring the effect of depression on adolescent cyberbullying experience. However, this text will first delve into the prevalence of depression in adolescence, as well as the infiltration of cyberbullying in this age group.

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Literature Review

Depression in Adolescents

Depression can be an individualized experience, depending on the adolescents. They may face a range of emotional symptoms, such as feelings of sadness or hopelessness, low self-esteem, loss of interest in activities, and feelings of failure (Mayo Clinic, 2021). In addition, they may experience physical symptoms like loss of energy, difficulty concentrating, and easily irritated. Further, children who were diagnosed with depression were also more likely to have a diagnosis of anxiety and/or a behavioral disorder. In general, older adolescents have obtained higher depression scores than their younger peers (Grunbaum et al., 2002; Roberts et al., 1997; Schraedley et al., 1999).

A more complex pattern of depression emerges between males and females. Hankin et al. (1998) and Salk et al. (2016) asserted gender differences generally emerged between the ages of 13 to 15 years old and became more distinct between 15 and 18 years old. Further, Salk et al. found females' symptoms accelerated earlier in adolescence and males' symptoms accelerated later. More females (24%) exhibit symptoms of depression by age 20 compared to males (15%). These results are consistent with the latest version of the National Youth Risk Behavioral Survey (CDC, 2020) that shows females have a higher prevalence of depression. Depression not only differs between biological sexes, but it also differs across race and ethnicity. Prevalence research shows Hispanic adolescents had higher levels of depression compared to whites and blacks (CDC, 2019a). The differences between biological sex and race and ethnicity suggest further monitoring of these experiences is necessary. We thank a reviewer for pointing out biochemistry, genetics, personality, and environmental factors are relevant risk factors for depression. To remain consistent with the reports from the CDC and partly due to lack of data in the data set, this study uses age, biological sex [as the data do not contain a measure of gender], and race and ethnicity. This focus gives our study the same generalizability as the national report developed by the CDC using the YRBS.

Holder et al. (1999) detailed a four-stage approach to public health research. Central to this study, Holder et al. argued a first step is the production of comprehensive descriptive research on the problem--i.e., depression. The descriptive research should take place before interventions and other health efforts were to take place, or to better inform interventions and other health efforts. Descriptive research that tracks the patterns of depression are essential for future research to include testing models of depression, and this research will help to estimate the potential effectiveness of policy changes related to depression.

Monitoring of depression patterns over time is important among two subgroups. One subgroup comes in the context of socio-demographics. For instance, researchers have shown biological sex differences in depression prevalence (Salk et al., 2016). In addition, researchers have found racial and ethnic groups have prevalence differences in depression (CDC, 2019a). The continued monitoring of these subgroups is important for the planning and targeting prevention and intervention programs.

Cyberbullying in Adolescents

Socio-demographics, however, are not the only subgroups that are important to understand in regard to depression experiences with adolescents. Another subgroup worth monitoring is those victimized by cyber

bullying. The act of bullying in the physical world is the repeated, intentional aggressive behavior with the intent to intimidate a victim (Olweus, 1993; Patchin & Hinduja, 2016). Tactics of domination performed by a bully can induce fear, such as participating in physical aggression, theft of personal material, or threatening comments. Articulable harm (physical, emotional or mental) must occur to be considered physical bullying behavior. Cyberbullying is the “willful and repeated harm inflicted through the use of computers, cell phones, and electronic devices” (Hinduja & Patchin, 2015). Contrary to physical bullying, one direct act of cyberbullying is considered a form of bullying as it can be a continuous method of indirect victimization.

Cyberbullying can occur in many forms, such as posting untrue information (i.e., denigration), repetitive taunting or insults--harassment, or revealing personal information about an individual without permission (outing) (Gladden et al., 2014; Hinduja & Patchin, 2015; Vessey et al., 2014). These forms of cyber-aggression may be performed once or repetitiously, as well as initiated by one online user or a group. Furthermore, much like bullying in the physical sense, this online crime can be perpetrated by any demographic. Marcum et al. (2014) indicated females are more likely to commit cyberbullying due to the indirect nature of the crime.

Cyberbullying victimization has consistently been a pervasive issue for adolescent online users. The CDC (2017) found that national trends of cyberbullying victimization for teenage users remained relatively stable overall for both sexes and racial and ethnic groups at 14.9% from 2011 to 2017. In 2017 alone, females (19.7%) were cyberbullied more than males (9.9%), and white teenagers (17.3%) were cyberbullied more than blacks (10.9%) and Hispanics (12.3%) (CDC, 2017). Further, cyberbullying is a major public health concern for adolescents due to its serious consequences for mental, physical, and social health (Niemela et al., 2011; Vessey et al., 2014). Victims of cyberbullying are more likely to exhibit signs of smoking, alcohol use, anxiety, illicit drug use, risky sexual behaviors, and depression compared than those who do not experience cyberbullying (Brighi et al., 2012; Glew et al., 2005; Hinduja & Patchin, 2013; Kowalski & Limber, 2013; National Institute of Health, 2010).

Theoretically, cyberbullying is a reaction to stress or strain. Agnew (1992, 2001), in his General Strain Theory (GST), argued strained social relationships or the presentation of noxious events pressure individuals into coping. This is mediated by emotions that include anger and depression. To clarify, under this conception, an individual experiences cyberbullying and becomes depressed, and then the individual will cope in some way. Multiple studies have shown the connection between cyberbullying victimization, emotions, and deviant behavior (Bauman, Toomey, & Walker 2013; Patchin & Hinduja, 2011; Sampasa-Kanyinga, Roumeliotis, & Xu, 2014; Wallace, Patchin, & May, 2005). In regard to youth alcohol use, negative mental and social health consequences have been found to play a mediating role in the drinking behaviors of youth. Depression, anxiety, and stress reported by victims can encourage youth to use alcohol as a means to cope with or remove such negative emotions (Erol & Karpyak, 2015; Kowalski & Limber, 2013). Further, social anxiety, loneliness, and mistrust for others resulting from victimization can lead to delinquent behaviors including drinking through poor peers, school, and parental attachment and monitoring (Brighi et al., 2012, Nixon, 2014).

Barbieri et al.’s (2019) systematic review of GST revealed multiple studies that found cyberbullying was a potential strain. In addition, their review showed that cyberbullying had a link with depression. The

issue, for the current study, is the connection between cyberbullying (i.e., strain) and depression (i.e., emotional response to strain). Following Barbieri et al.'s (2019) logic, those who experience cyberbullying see it as a strain or noxious event that leads to depression. As one reviewer pointed out, the possibility remains cyberbullying may be an outcome of other sources of strain. We believe the logic of Agnew (1992) provides a clear path for our view of the causality of strain (i.e., cyberbullying) leading to the emotional response (i.e., depression) for the present study. Future research should examine the extent cyberbullying occurs as a result of depression, but this would require a different stressor. Our view of Agnew's (1992) theory is strain -> emotional response -> coping. For depression to result in cyberbullying, a different strain needs to be present to invoke depression. Further, this does not coincide with the established research from Barbieri et al.'s (2019) systematic review. The present study, then, is following the temporal ordering from Agnew (1992) and Barbieri et al.'s (2019) systematic review. To date, no study has examined the extent to which cyberbullying has a link with depression over a long period of time.

Present Study

This study contributes to the evidence base regarding the prevalence and trends of depression among cyberbullying. YRBS data were used to examine prevalence and national trends in depression among individuals by self-reported cyberbullying and by sex and race/ethnicity. The CDC (2015) provided four domains of chronic disease to optimize public health's efficiency and effectiveness: epidemiology and surveillance (i.e., monitor trends and track progress); environmental approaches (i.e., promote health and support healthy behaviors); health care system interventions (i.e., improve the effective delivery and use of clinical and other high-value preventive services); and community programs linked to clinical services (i.e., to improve and sustain management of chronic conditions) (CDC, 2015). This study is consistent with the first domain as its intent is to monitor trends—specifically cyberbullying and depression, but doing so informed by criminological theory (i.e., Agnew's General Strain Theory) to learn how prevalence changes in cyberbullying are connected with changes in the prevalence of depression.

In addition, this study contribution can be extended to providing information that can be utilized to improve prevention and treatment efforts that are found in the third domain, Health Care Systems Intervention, serving to reduce instances of depression among cyberbullying and illuminating potential areas to manage the risk of depression. To make this contribution to the literature, the study is guided by the following two questions:

1. To what extent does depression prevalence differ by being cyberbullied, cyberbullied biological sex, and cyberbullied race/ethnicity?
2. Among cyberbullied individuals, to what extent did depression trends vary by biological sex (male/female) and race/ethnicity (non-Hispanic black, non-Hispanic white, or Hispanic)?

Methods

For this study, we used data from the Centers for Disease Control and Prevention (CDC, 2017) National Youth Risk Behavior Survey (YRBS). The purpose of the YRBS is to monitor the incidence and prevalence of priority health risk behaviors of U. S. adolescents biennially from 1991-2019 (CDC, 2019b). The YRBS data are collected every two years using a complex survey design. A three-stage cluster sampling design was

used to produce a nationally representative sample of students in grades 9-12. All school (i.e., public, private, and Catholic) students, in grades 9-12, in the United States and the District of Columbia were included in the sampling frame, and Puerto Rico and the Virgin Islands were excluded. The selection of schools occurred systematically, based on probability that was proportional to school enrollment. All classes in a required subject, or all classes meeting during a particular period of the day, depending on the school, made up the sampling frame (CDC, 2019b). To adjust for non-response and oversampling of Black and Hispanic students, the CDC used a weighting factor (CDC, 2019b). The final weights of the sample were scaled so students would be equal to the total sample size (CDC, 2019b). Further, the weighted proportions of students would match the grade population projections for each survey year (CDC, 2019b).

The survey had a 71% response rate, with a sample size of 70,923. The sample was weighted to be nationally representative of high school students in the United States. We used data from 2011 through 2019 because the CDC did not begin collecting data on cyberbullying until 2011, and they have continued to collect this data since this period. In addition, the CDC collected whether the individual had a suicide plan during this period.

Measures

Multiple measures were used for this study. A single item was used to capture the dependent measure, depression: 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? The answer choices were coded as 0 no and 1 yes. A single item was used to capture the independent measure of cyberbullying: during the past 12 months, have you ever been electronically bullied? Bullying could occur through texting Instagram, Facebook, or other social media. The answer choices were coded as 0 no and 1 yes.

Following CDC (2019 a, b) guidelines and previous research (Johns et al., 2020; Merlo et al., 2020; Szucs et al., 2020; Underwood et al., 2020), three measures were used as controls. First, the responses to the question "What is your sex?" as our measure of biological sex were coded as (0) female and (1) male. Second, the responses to two questions "What is your race?" and "What is your ethnicity?" were combined as our measure of race/ethnicity, coded as follows: (1) white, (2) black, and (3) Hispanic. Responses to the following question "In what grade are you?" was the measure of grade, coded as follows: (1) 9th grade, (2) 10th grade, (3) 11th grade, and (4) 12th grade. Finally, we use the calendar year in this study.

Data Analysis Plan

The data analysis takes place in a series of steps. The first step is a presentation of the descriptive statistics for sex, race/ethnicity, and grade, as this provides an opportunity to learn about the distribution of individuals in the study. Subsequent steps are designed to be part of the trend analysis providing information to address our research questions and to monitor the changes in these measures. Before presenting the steps of the trend analysis, several other researchers have performed trend analyses using these data or parts of these data to monitor other behaviors (Adams, 2006; Chen, Watson, Michael, & Carlson, 2021; Ivey-Stephenson, 2020; Johns et al. 2020). These studies show a multitude of methods to perform trend analyses. The approach for this study was put forth by the CDC (2019 a, b), and it was used so the results would be consistent with those from this agency.

The second step is a presentation of the total prevalence of depression for the entire study period, and stratified by groups (e.g., non-cyberbullying, cyberbullying, sex and race/ethnicity). The third step, following CDC (2019a) guidelines, is a presentation of a series of pairwise t-test where we examine the prevalence differences across groups (e.g., total, non-cyberbullying, cyberbullying, sex and race/ethnicity). Given our sample size, t-statistics are considered that are equal to or above 2, or equal to or below -2.00 as significant. The 95% CI and the Cohen's d statistic (i.e., standardized difference) are presented to determine the size of the difference between the groups.

In the fourth step, we perform trend analysis in accordance with CDC (2019b) guidelines. The study does not attempt to provide a trend analysis diverging from other steps provided by CDC (2019b). That is, we follow the steps of performing a trend analysis as recommended by the CDC (2019b) for the YRBS data. This study used logistic regression analyses where depression is the dependent measure, controlling for sex, race/ethnicity (all four levels), and grade (9, 10, 11, and 12)³ We recognize some may suggest additional measures to include in these models. We are following the development of trend analyses as recommended by the CDC for the use of the YRBS data.

To determine if the trend is linear or non-linear, our series of logistic regressions occur in the following format:

- 1) testing for linear trends using a model that only contains an orthogonal version of year (i.e., linear time), but also controlling for sex, race/ethnicity, and grade; and
- 2) testing for quadratic trends by performing the same logistic regression again with both linear and quadratic orthogonal versions of year (i.e., linear and quadratic time) while controlling for sex, race/ethnicity, and grade (CDC, 2019b).

In both logistic sets of models, only the highest-order time measure (i.e., linear or quadratic time) is interpreted. Time measures are interpreted only if they have a p-value that was equal to or smaller than 0.05. If the linear time measure is the highest-order time measure that is significant and the odds ratio is below 1, there is evidence of a linear decrease; however, if the odds ratio is greater than 1, there is evidence of a linear increase (CDC, 2019 a, b). If the quadratic time measure is the highest-order time measure that is significant at the 0.05 level, we consider this as evidence of a quadratic change (CDC, 2019 a, b) where segments of the trend have changed direction. When this occurred, the adjusted prevalence and standard error by year was calculated and exported this information into the Joinpoint software. Joinpoint software was used to determine the specific years where the non-linear trends change (CDC, 2019b).

After determining the specific years where the non-linear change takes place, the study examined both line segments for linearity by creating two data sets one for the years before the change occurred and one for the years after the change occurred. Then, the logistic regression analysis was reran using each data set controlling for sex, race/ethnicity, grade, and an orthogonal measure of linear time (CDC, 2019b). If the linear time measure odds ratio was significant and less than 1, there was evidence of a linear decrease. If the odds ratio for linear time was significant and greater than 1, there was evidence of linear increase (CDC, 2019b). In all of the logistic regression analyses, the models were stratified by sex and controlled for race/ethnicity and grade, or when stratified by race/ethnicity, controlled for sex and grade.

All of the analyses were performed using Stata 15.1. In order to account for the complex survey design, we used the svy commands. Further, our use of the weights allowed us to make population-based statements of our results without the issue of missing data bias similar to other researchers that have used these data (Schneider, Krawczyk, Xuan, & Johnson, 2018). Joinpoint software was used when a quadratic trend was detected.

Results

Table 1. *Demographic Characteristics — Youth Risk Behavior Survey, United States, 2011-2019.*

Characteristic	percent	No.	LL	UL
Sex				
Female	49.41	36497	48.40	50.41
Male	50.59	36108	49.59	51.60
Race/Ethnicity				
White	60.19	31398	57.38	63.00
Black	15.00	12263	13.45	16.55
Hispanic	24.80	19828	22.50	27.10
Grade Level				
Ninth	27.25	18923	26.51	27.99
Tenth	25.68	18215	25.04	26.32
Eleventh	23.98	18171	23.52	24.44
Twelfth	23.09	17090	22.61	23.57

Note: LL = Lower Limit; UL = Upper Limit

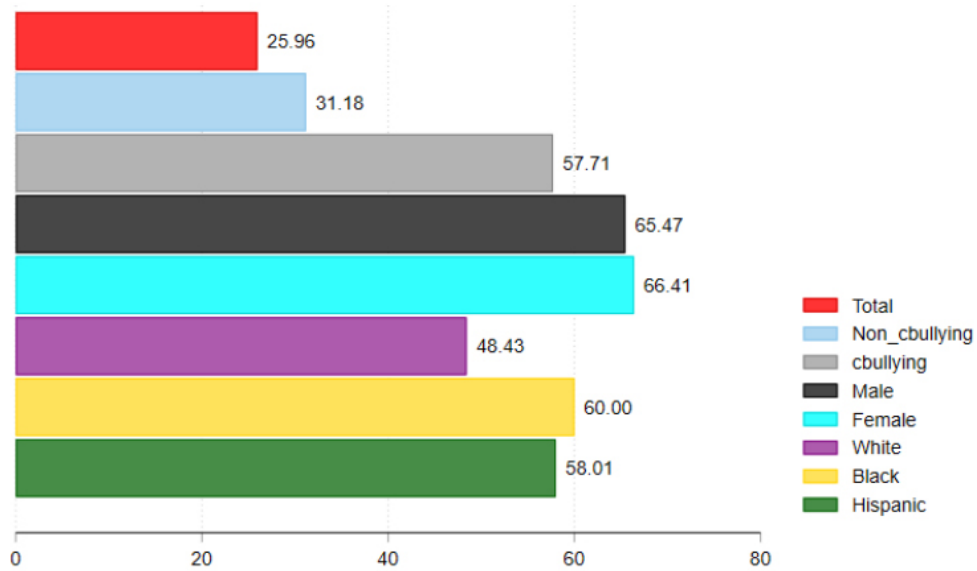
Table 1 reports the distribution of the socio-demographic controls for the whole sample, and the depression total prevalence and within socio-demographics. Of the participants, 50.59% were male and 60.19% were White. A little over 27% were in the 9th grade. Approximately 60.00% of cyberbullying had depression, as can be seen in Figure 1.

Table 2. *Prevalence Differences of Depression among Cyberbullied Adolescents by Sex and Race/Ethnicity Youth Risk Behavior Survey, United States, 2011 – 2019.*

Comparison	Difference	t-test	LL	UL	Cohen's d
Total vs Non-cyberbullied	0.05	8.81	8.80	8.82	0.12
Total vs cyberbullied	-0.29	-30.67	-30.69	-30.65	-0.60
Total vs Male cyberbullied	-0.17	-13.73	-13.75	-13.70	-0.36
Total vs Female cyberbullied	-0.34	-32.21	-32.23	-32.19	-0.73
Total vs White cyberbullied	-0.27	-22.71	-22.74	-22.69	-0.56
Total vs Black cyberbullied	-0.27	-11.78	-11.82	-11.73	-0.55
Total vs Hispanic cyberbullied	-0.35	-22.08	-22.11	-22.05	-0.75
Non-cyberbullied vs cyberbullied	-0.34	-36.59	-36.61	-36.57	-0.73
Female cyberbullied vs Male cyberbullied	0.17	11.13	11.10	11.16	0.35
White cyberbullied vs Black cyberbullied	0.00	0.12	0.08	0.17	0.01
White cyberbullied vs Hispanic cyberbullied	-0.08	-4.44	-4.48	-4.40	-0.17
Hispanic cyberbullied vs Black cyberbullied	0.09	3.23	3.18	3.28	0.18

Note: LL = 95% Confidence Interval Lower Limit; UL = 95% Confidence Interval Upper Limit

Figure 1. Prevalence of Adolescent Depression among Cyberbullying, by Sex, Race/Ethnicity, and Survey Year — Youth Risk Behavior Survey, United States, 2011-2019.



Note: Non_cbullying = Non-Cyberbullied; cbullying = Cyberbullied

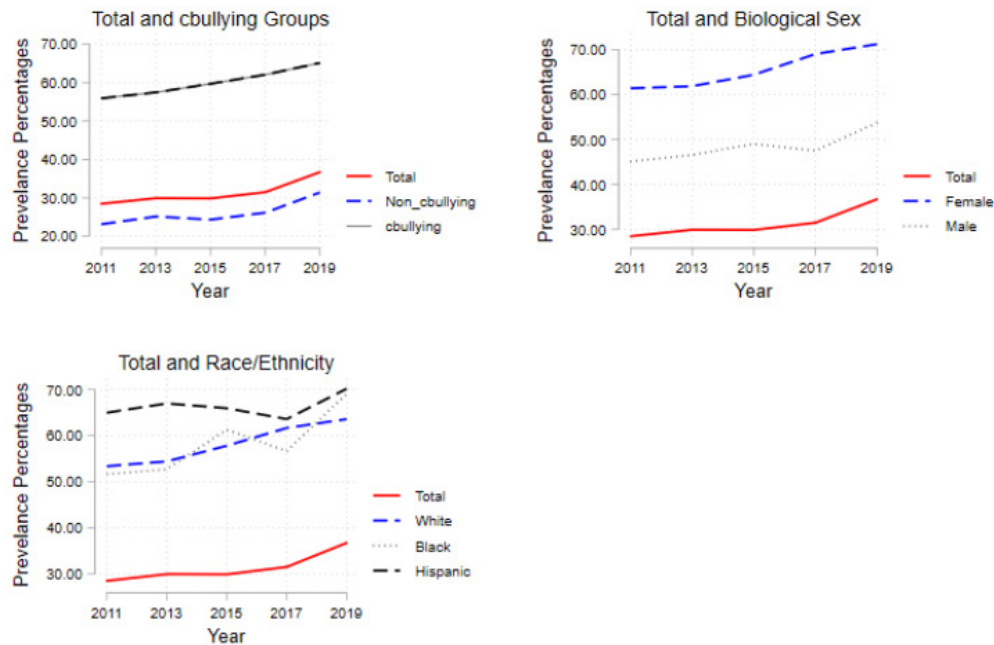


Figure 2. Trends of Adolescent Depression among Cyberbullying, by Sex, Race/Ethnicity, and Survey Year Youth Risk Behavior Survey, United States, 2011 – 2019.

In order to address our first research question, Table 2 presents a series of pairwise t-tests to examine the differences in prevalence of depression within several groups. Of the differences, three were positive indicating total vs. non-cyberbullied, female cyberbullied vs. male cyberbullied, and Hispanic cyberbullied vs. black cyberbullied groups had higher prevalence of depression. In addition, eight differences were also found, but they were negative indicating cyberbullied, males cyberbullied, females cyberbullied, whites cyberbullied, blacks cyberbullied, and Hispanics cyberbullied compared to the total sample had higher prevalence, those cyberbullied compared to non-cyberbullied, and Hispanics cyberbullied compared to whites had higher prevalence of depression. For all of the differences, the Cohen's d indicated the differences ranged from small to large.

Table 3. *Trends of Depression among Cyberbullied Adolescents by Sex and Race/Ethnicity — Youth Risk Behavior Survey, United States, 2011-2019.*

Group	2011	2013	2015	2017	2019	Linear	Quadratic 1	Year 1	Year 2	Quadratic 2	Year 1	Year 2
Total	28.46	29.92	29.87	31.47	36.71	None	None			None		
Non- Cyberbullied	23.13	25.15	24.35	26.14	31.41	None	None	2011	2015	Increased	2015	2019
Cyberbullied	55.9	57.45	59.7	62.06	65.1	Increased	None			None		
Female cyberbullied	61.41	61.88	64.43	69.04	71.24	Increased	None			None		
Male cyberbullied	45.11	46.57	49.03	47.5	53.76	Increased	None			None		
White cyberbullied	53.36	54.4	57.8	61.67	63.59	Increased	None			None		
Black cyberbullied	51.62	52.68	61.31	56.63	69.08	Increased	None			None		
Hispanic cyberbullied	64.98	66.99	65.95	63.59	70.19	None	None			None		

Discussion

Generally, rates of depression have increased in recent years among the adolescent population in the United States. In the context of cyberbullying, there have been a limited number of studies into these trends, especially from 2011 to 2019. In order to address this gap, this study used national level data of cyberbullying and depression to address two questions:

- 1) To what extent does depression prevalence differ by being cyberbullied, cyberbullied biological sex, and cyberbullied race/ethnicity?
- 2) Among cyberbullied individuals, to what extent did depression trends vary by biological sex (male/female) and race/ethnicity (non-Hispanic black, non-Hispanic white, or Hispanic)?

The results that address these questions can guide implications for health service policy.

When considering the first question, the results showed a number of groups who experienced cyberbullying victimization had a higher prevalence of depression compared to the total population overall. This result is consistent with studies examining the link between depression and cyberbullying (Hinduja & Patchin, 2019; Kowalski & Limber, 2013), and examining the prevalence of depression and cyberbullying

(Twenge, 2020). It is not surprising given the impact of cyberbullying. To clarify, cyberbullying victimization serves as a source of stress or strain that theoretically influences greater levels of depression as a noxious event through the lens Agnew's (1992, 2001) GST.

The trends showed depression is increasing for both males and females who experience cyberbullying. This is consistent with rates among the general population of youth in the United States, as both males and females have experienced increases in depression overall in recent years (CDC, 2020). In addition to biological sex, the results showed depression is increasing for the white and black racial groups. This increase in depression among cyberbullied whites and blacks is also consistent with the trend in the overall population for both racial groups (CDC, 2020). However, the strain from the cyberbullying victimization appears to be influencing these groups into greater rates of depression than the overall trend. This finding is important as negative emotionality is also often a mediating factor contributing to delinquent and health risk behaviors (e.g., substance abuse) and the formation of anti-social environments such as poor school, peer, and parental bonds (Agnew, 2001; Brighi et al., 2012, Erol & Karpyak, 2015; Nixon, 2014). These trend changes suggest these groups are important to monitor, and they are in need for interventions and treatment. The results from the current study have implications for initiatives that are in accordance with the third domain of the CDC's Four Domains of Chronic Disease Prevention (CDC, 2015) regarding public health and healthcare policy recommendations.

Intervention is key in order to decrease cyberbullying occurrences in adolescence, and in turn, psychological maladjustment (Lee, 2021). Early responses of risk factors and/or occurrences of cyberbullying can help youth receive the mental health treatment they need to cope with what has occurred. Untreated depressive symptoms in youth can result in additional mental issues, frequently anxiety disorders (Garber & Weersing, 2010). The key is communication between the school system, parents, and students in order to benefit the student (Cox, 2005).

Initiatives by law enforcement, the education system, and healthcare professionals have been used to reform online behaviors of youth. Patchin and Hinduja (2016) found cyberbullying in adolescent populations are best addressed through informal sanctions rather than formal sanctions by law enforcement that can lead to embarrassment, judgment, and distrust. Esbensen et al. (2012) evaluated a multi-week program involving law enforcement informing youth on the methods of cyberbullying, the negative consequences of such behavior, means of reporting victimization, and advice for fostering positive online relationships and avoiding inappropriate behaviors. Programs such as these can create prosocial online interaction, increase bonds with young people and police, and avoid formal criminal procedures in addressing cyberbullying. Additionally, previous research demonstrates schools that work to protect students from victimization through rules and sanctions, empathy and social skills training, education on digital citizenship, counseling from healthcare professionals and improving parental involvement can control inappropriate behavior such as cyberbullying and curb resulting mental health consequences (Hutson et al., 2018).

Additional means of coping with depression arising from cyberbullying would be seeking Internet interventions based on cognitive behavioral therapy. Schroder, Berger, Westermann, Klein, and Moritz (2016) showed these forms of therapy had a small to medium effect size in reducing instances of depression. These types of interventions would assist individuals experiencing depression from cyberbullying to pro-socially cope rather than coping through substance use and abuse as Agnew (1992) would suggest, and others have

found when examining GST when using depression as an emotional response to strain (Agnew, 2008).

Limitations of the current study should be recognized. One limitation is that the data apply only to youths who attend school, and therefore, the data are not representative of all individuals in this age group. Another limitation is we are not able to gauge the amount of under or over-reporting of these behaviors, but previous research shows good test-retest reliability. Data are not collected from every state or local school district, and those that did may not have included all of the standard questions. Further, the data are collected in a cross-sectional rather than a longitudinal manner, so the results only indicate association rather than causality.

In addition, a limitation of the study rests in the measurement of cyberbullying and depression. These are single item indicators, and they may restrict the amount of the content of domains captured in this study. While this is an issue, we believe they provide enough information for it to be important because they are the measures used to nationally gauge the extent of each of these issues. One could argue that temporal ordering is a problem in this study. Our view is that the causal logic stance was informed by following the logic from Agnew's (1992) theory and Barbieri et al.'s (2019) systematic review. Finally, we aggregated race and ethnicity in a manner that only captures white, black, and Hispanics. An additional category "other" is possible, but we chose to keep our analysis as close to the official report from the Youth Risk Behavior Survey.

The limitations suggest multiple areas for future research. First, these data highlight the importance of researching this topic among different cyberbullied populations (e.g., emerging adults or adults). In addition, studies that have broader measures of cyberbullying and depression may be helpful in better understanding these trends. Studies of these populations have the potential to provide important public health information that is in accordance with the First Domains of the CDC's Four Domains of Chronic Disease Prevention (CDC, 2015) regarding epidemiological and surveillance data for depression.

Despite the limits and suggestions of future research, the present study shows that depression is increasing among cyberbullied youth. This is occurring among both genders and white and black racial groups. Future studies using different measures of depression or cyberbullying, collecting data from different groups, that are longitudinal with explanatory measures, and provide the opportunity for unstudied categories of race/ethnicity will be important. For now, the current study's results are valuable to health services policy initiatives and managing risk of depression among youth.

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