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Bully victimization and child and adolescent health: new evidence from the 2016 NSCH

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ABSTRACT

Purpose: To explore whether children with diagnosable health conditions are at greater risk of bully victimization and whether, among these children, bully victimization further elevates the risk of an array of health difficulties.
Methods: We examined a recent, nationally representative sample of children and adolescents aged 6–17 years who participated in the 2016 National Survey of Children's Health. Survey data pertaining to the children and adolescents covering bully victimization, health difficulties, and diagnosable health conditions were obtained from primary caregivers.
Results: The results suggest that children with diagnosable conditions are at significantly higher risk of being bullied, particularly among children with birth defects and developmental disorders (e.g., 50% or more are victims of bullying). Furthermore, the findings reveal that, among children with diagnosable conditions, those who are victims of bullying are significantly more likely to experience various health challenges, relative to nonvictims. While these findings are significant across age groups, 12- to 17-year-old youth are more likely to experience bullying in the presence of multiple developmental disorders, and when this occurs, these youth are more likely to manifest health difficulties than younger children.
Conclusions: The findings suggest that children with disabilities and chronic health conditions, who are at a significantly greater risk of being bullied, also suffer from further health difficulties when they are victimized by their peers. In conjunction with school-based interventions, primary care physicians may be ideally positioned to assess youth for victimization risk, provide counseling to youth victims, and reduce future victimization through office-based youth violence interventions.

Introduction

During the 2014–2015 school-year, 21% of youth aged 12–18 years reported bullying victimization, which can include direct acts of physical or verbal aggression or indirect behaviors such as social exclusion and spreading rumors [1]. Bullying has been defined as "aggressive behavior used to repeatedly harm or intimidate others with less power "[2]. Despite widespread recognition, the phenomenon of bullying remains embedded in schools across the country and poses a serious threat to physical and mental health [3–11]. Although a substantial body of research has accrued linking bullying victimization to a host of behavioral and mental health problems [11–14], physical health outcomes have garnered relatively little attention. This oversight is unfortunate, as poor physical health among bully victims can diminish life satisfaction [9] and manifest in multiple ways, including headaches, psychosomatic problems, skeletal-muscular pain, and sleep problems [4,6–8]. It is crucial, therefore, for scholars in this area to investigate health difficulties among students most at risk for bullying.

Of particular concern may be children with disabilities and special health needs who, in some cases, may be outwardly or conspicuously different from other children and make for an easier "target" than students without disabilities. Specifically, studies suggest that students with disabilities and/or chronic conditions

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are at greater risk of being bullied compared to students without these conditions [15,16]. Among students with disabilities, youth with behavioral, emotional, or developmental disabilities appear to be at the highest risk for being bullied [17], with students with autism incurring the greatest risk for repeated victimization [15]. Furthermore, among youth with autism, those with lower social skills and in mainstream classes report the highest victimization rates [18]. Among students with chronic health conditions, Sentenac et al. found each health condition subtype, including physical and motor impairments, chronic illnesses, and being overweight/obese, to be independently associated with heightened risk of being bullied, while all students with chronic conditions were at risk of multiple types of bullying [19]. Even so, little research exists on health difficulties among these diverse, diagnosed groups who are bully victims. In short, extant research has yet to focus on comparing specific health challenges among children with diagnosable conditions—including rare conditions—based on their victimization experiences. Scholars have yet to explore, for instance, whether, among youth with various disabilities and chronic conditions, those who are victims of bullying report a greater degree of daily health challenges relative to those who are not bullied. The present study seeks to address this gap in the literature. The findings of our study are worthwhile because they can reveal not only whether youth with a variety of diagnosable conditions are more likely to be bullied, but also whether bullied youth with diagnosable conditions experience greater health challenges relative to their nonbullied counterparts. To bridge this particular void in the literature, additional research is needed using larger samples of children with these diagnosed health conditions, preferably within the same study, to derive direct comparisons of the link between bullying and an array of health difficulties among children with various developmental disabilities or other diagnosable health conditions.

The objective of the present study is to provide the most up-to-date and comprehensive findings on the link between bullying victimization and various health challenges among groups of children most at risk for being bullied due to their health status. We use data ideally suited for this objective: the 2016 National Survey of Children's Health (NSCH). Specifically, we contribute new findings on the prevalence of being bullied for subsets of children based on their underlying disability or diagnosable health condition. Also, due to the size of the sample and the scope of the data, we are able to identify the odds of an array health difficulties among children with diagnosable health conditions who are bullied compared to their nonbullied counterparts—something that has largely been overlooked in prior research. Consistent with the extant literature, we propose the following hypotheses:

1. Children with a diagnosed developmental disorder, severe birth defect, or chronic mental or physical health condition will incur significant increases in the odds of exposure to bullying victimization.
2. Children with multiple diagnosable health conditions within the health dimensions listed previously will incur the greatest risk of bullying.
3. Bully victims with diagnosable conditions will be significantly more likely to experience a variety of health challenges relative to nonvictims with diagnosable conditions.

Materials and methods

The 2016 NSCH is a survey of a cross-sectional weighted probability sample of noninstitutionalized children in the United States, ages 0 to 17 years. The survey was conducted by the U.S. Census Bureau, with funding for the survey being provided by the Health Resources and Service Administration's Maternal and Child Health Bureau. Parents, or other caregivers familiar with the child's health and medical care, were the survey respondents. Randomly selected addresses from civilian, noninstitutionalized households across the United States were mailed an invitation to complete a household screener and a child-level questionnaire on a secure, confidential website (or, if preferred, by paper) during the summer of 2016. After the completion of the screener, only one child from each home was randomly selected as the focal child, who would be the subject of the remainder of the survey. Importantly, the sample oversampled children 0–5 years and children with special health care needs. The data, which provide insight into multiple aspects of children's lives, are well suited to the present research question due to the inclusion of questions about bully victimization and various diagnosable health conditions and health difficulties. Furthermore, the large sample (~50,000) permits subanalyses examining differences in the relationships between bully victimization and health difficulties among children with a range or diagnosable illnesses and disorders, some of which are quite rare in the population (e.g., severe birth defects). As noted, the original sample consists over just over 50,000 children. However, since information on bullying victimization was not collected for infants/children aged 0–5 years, data for the present study are restricted to the combined 6–11 and 12- to 17-year-old subsamples, which consists of approximately 35,000 participants. Among this restricted sample, 33,690 had valid data on items pertaining to bullying/peer victimization. Finally, after the inclusion of key covariates, and indicators of diagnosable health conditions, listwise deletion was used to obtain final sample sizes ranging from 32,526 to 32,757 in the full models. Additional analyses were restricted to subsamples of varying sizes within various dimensions of diagnosable health conditions (e.g., severe birth defects, final sample size: 2095; chronic physical conditions, final sample size: 10,094; developmental disorders, final sample size: 3490; and mental health conditions, final sample size: 6450). Ancillary analyses suggest that subjects who were excluded from analyses due to missing data on key variables and/or covariates were not significantly different on key demographic variables (e.g., child age group, gender, race/ethnicity).

Measures

Bully victimization

In line with previous research using prior iterations of the NSCH [17,20], we used bullying items that rely on parent reports of children's experiences with bullying. Although parent reports of bully victimization likely underestimate the extent of victimization experiences [21], they have commonly been used as a means of detecting the occurrence of bully victimization in research on bullying and health among U.S. children [15]. The items used in the present study specifically asked parents/caregivers, “How well do each of the following phrases describe {Child's Name}: (1) {Child's Name} is bullied, picked on, or excluded by other children and (2) {Child's Name} bullies others, picks on them, or excludes them.” Response options to these items included definitely true (1), somewhat true (2), and not true (3). To identify victims of bullying, participants who responded definitely true or somewhat true to the first item were assigned a value of 1, whereas participants who responded not true were assigned a value or 0. To identify perpetrators of bullying, participants who responded definitely true or somewhat true to the second item were assigned a value of 1, whereas participants who responded not true were assigned a value or 0. Ultimately, children who were the victims of bullying, but not perpetrators (i.e., approximately 20% of the sample), were

assigned a value of 1 on our bully victimization outcome variable. Importantly, our final, dichotomous measure of bully victimization (in the absence of perpetration) is used as an outcome variable in our first set of analyses but is later used as the key independent variable in our subanalyses that are restricted to children with diagnosable health conditions.

Diagnosable health conditions

Four distinct dimensions of diagnosable health conditions emerged in the data: severe birth defects, chronic physical conditions, developmental disorders, and mental health conditions. With the exception of blindness and deafness, which were not asked in reference to professional medical opinion, all items were asked in reference to whether (1) a doctor or health care provider had ever told the adult caregiver/parent that the child had the condition and (2) whether the child currently had the condition. Children of caregivers who responded in the affirmative to both these questions were coded as currently having the condition (1), whereas all other children were coded as not currently having the condition (0). Items designated as severe birth defects include deafness, blindness, cerebral palsy, Down syndrome, epilepsy, and other genetic condition. Items designated as chronic physical conditions include allergies, asthma, blood disorder, diabetes, heart condition, and arthritis. Items designated as developmental disorders include Tourette's syndrome, intellectual disability, learning disability, speech disorder, autism, and developmental delay. Finally, items designated as mental health conditions include depression, anxiety, conduct problems, attention-deficit/ hyperactivity disorder, and other mental health conditions. For each of these four dimensions of diagnosable health conditions, measures of "any condition" and "multiple conditions" were also created to assess whether these diagnosable conditions cluster (2 or more) to affect the probability of bully victimization (above and beyond the presence of a single condition).

Health difficulties

Parents/caregivers were asked whether, during the 12 months before the survey, the focal child had experienced any of the following: trouble breathing or other respiratory problems (such as wheezing or shortness of breath), difficulty eating or swallowing, difficulty digesting food (e.g., stomach/intestinal problems, constipation, or diarrhea), repeated or chronic physical pain (e.g., body pain, back pain), toothaches, and bleeding gums. Parents were also asked whether the child had serious difficulty concentrating, remembering, or making decisions, and whether the child had experienced frequent or severe headaches (including migraines). For each of these eight health difficulties, children were assigned a value of 1 if their parent responded that they had experienced the health difficulty during the past 12 months, and a value of 0 if their parent responded that they had not experienced the health difficulty in the past 12 months. We also created a binary measure of any health difficulty (vs. none), which constitutes approximately 28% of the 6- to 17-year-old sample.

Covariates

Included as covariates are child's age, child's race (black, Hispanic—white/other as reference category), child's sex, marital status of parents (married = 1), single-parent household, parental education [ranging from eighth grade or less (1) to doctorate or professional degree (9)], and household income. In a subset of models examining health difficulties among children with diagnosable conditions, the presence of multiple diagnosable conditions was also included as a covariate.

Plan of analysis

First, we examine our first and second hypotheses by estimating the proportion of victims of bullying by number of diagnosable health conditions (i.e., none, single, or multiple) within each of the four dimensions (e.g., severe birth defects, chronic physical conditions, developmental disorders, and mental health conditions). Next, we examine our third hypothesis by investigating the proportion of children with health difficulties by victim status among children with diagnosable health conditions. After conducting these preliminary bivariate analyses, we use logistic regression techniques to re-examine our hypotheses in a multivariate context.

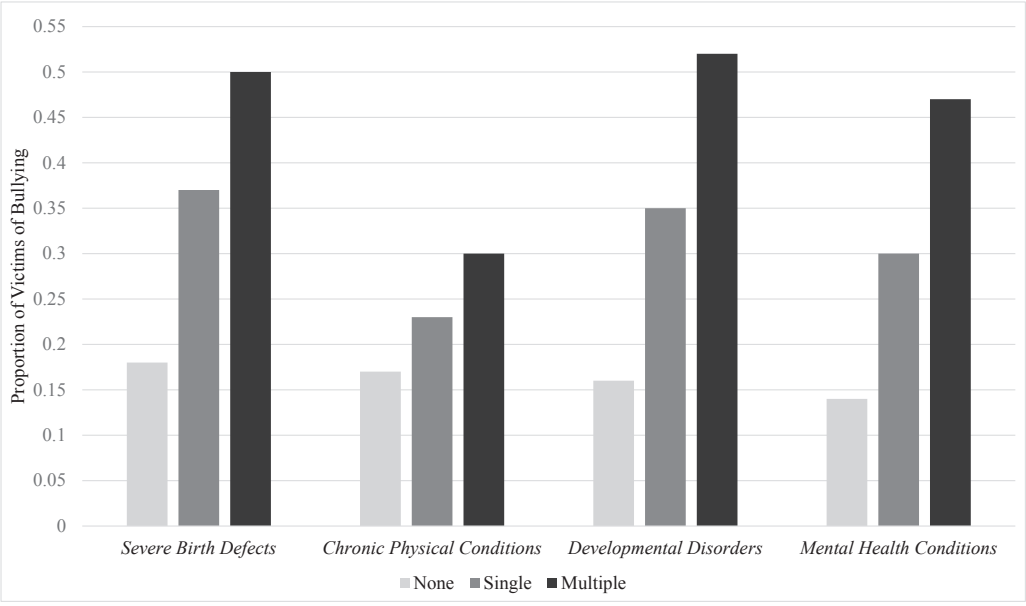

Fig. 1. The proportion of victims of bullying by number of diagnosable health conditions (age 6–17 years).

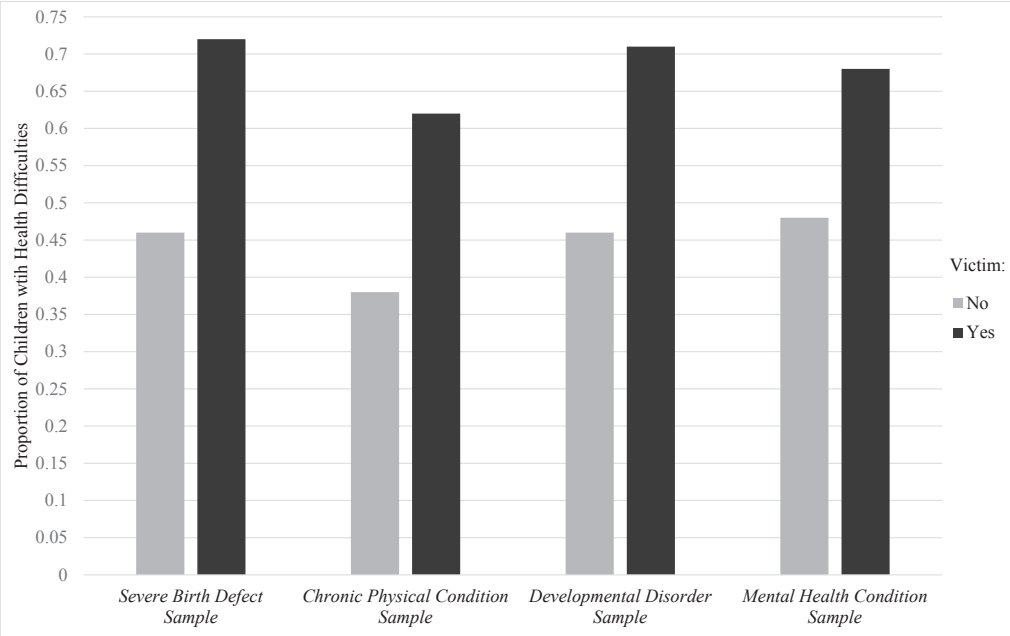

Fig. 2. Proportion of children with health difficulties by victim status among children with diagnosable health conditions.

To do so, we estimate the role of each of the diagnosable health conditions (and the clustering of such conditions) in the odds of bully victimization, net of covariates. Finally, we use logistic regression to assess the role of victimization in the odds of exhibiting chronic health difficulties among four separate subsamples designated by their particular diagnosable condition (i.e., a severe birth defect sample: 2,095, a chronic physical condition sample: 10,094, a developmental disorder sample: 3,490, and a mental health condition sample: 6450). We also report noteworthy results of ancillary analyses examining the hypotheses separately for younger and older children (e.g., ages 6–11 and 12–17 years).

Results

The results indicate that victimization was more common among children with diagnosable health conditions, particularly those with multiple diagnosable conditions (see Fig. 1), yielding some support for hypotheses 1 and 2. This association was especially pronounced in the case of severe birth defects, developmental disorders, and mental health conditions, and less pronounced in the case of chronic physical conditions. To illustrate, while only 18% of children with no birth defects were the victims of bullying, 50% of children with multiple birth defects were the victims of bullying. In a similar manner, only 16% of children with no developmental disorders were the victims of bullying, yet 52% of children with multiple developmental disorders were victims of bullying. Similar patterns emerged in the case of mental health conditions (14% vs. 47%). Importantly, this pattern of results was less pronounced in the case of chronic physical conditions, with 17% of children with no chronic physical conditions being the victims of bullying and 30% of children with multiple chronic physical conditions being the victims of bullying.

Figure 2 illustrates the bivariate associations between victimization and health difficulties (e.g., headaches, breathing difficulties, physical pain, stomach problems, etc.) among four subsamples defined by the presence of one or more diagnosable health conditions within the designated dimensions discussed previously. Overall, and in line with our third hypothesis, a higher proportion of children with one or more diagnosable conditions who experienced victimization also experienced health difficulties, relative to children with diagnosable conditions who did not experience peer victimization. For instance, among children with one or more birth defects, 46% of nonvictims exhibited one or more health difficulties, yet 72% of victims exhibited one or more health difficulties. This

Table 1
Dimensions of diagnosable health conditions and bully victimization: The National Survey of Children's Health (2016)*

Bully victimization							
Severe birth defects		Chronic physical conditions		Developmental disorders		Mental health conditions	
Health condition	OR (CI)	Health condition	OR (CI)	Health condition	OR (CI)	Health condition	OR (CI)
Deafness	2.40 (1.95–2.95)	Allergies	1.55 (1.46–1.64)	Tourette's syndrome	3.51 (2.29–5.36)	Depression	5.18 (4.62–5.81)
Blindness	2.85 (2.35–3.45)	Asthma	1.60 (1.47–1.74)	Intellectual disability	4.17 (3.37–5.16)	Anxiety	4.18 (3.86–4.52)
Cerebral palsy	3.00 (2.00–4.48)	Blood disorder	1.55 (1.07–2.24)	Learning disability	3.60 (3.29–3.93)	Conduct problems	4.25 (3.88–4.65)
Down syndrome	2.25 (1.33–3.81)	Diabetes	1.28 (0.93–1.76)	Speech disorder	3.14 (2.80–3.53)	Attention-deficit/ hyperactivity disorder	3.22 (2.98–3.48)
Epilepsy	2.31 (1.76–3.03)	Heart condition	1.86 (1.51–2.29)	Autism	6.81 (5.90–7.86)	Other	3.57 (3.24–3.93)
Other genetic condition	2.94 (2.60–3.31)	Arthritis	2.65 (1.81–3.88)	Developmental delay	4.53 (4.06–5.05)	—	—
Single condition	2.56 (2.32–2.83)	Single condition	1.48 (1.39–1.58)	Single condition	2.74 (2.48–3.03)	Single condition	2.55 (2.34–2.77)
Multiple Conditions	4.15 (3.23–5.34)	Multiple conditions	2.00 (1.81–2.20)	Multiple conditions	5.35 (4.80–5.96)	Multiple conditions	5.23 (4.83–5.66)

* Controls for child's age, child's race (black, Hispanic–white/other as reference category), child's sex, marital status of parents, single-parent household, parental education, and household income were included in each model. Results were robust to alternative model specifications. $n = 32{,}526–32{,}757$.

general pattern also emerged in the other samples. Among children with one or more chronic physical conditions, 38% of nonvictims exhibited one or more health difficulties, yet 62% of victims exhibited one or more health difficulties. Similarly, among children with one or more developmental disorders, 46% of nonvictims exhibited one or more health difficulties, yet 71% of victims exhibited one or more health difficulties. Differences were attenuated only slightly in the mental health condition sample—48% of nonvictims exhibited one or more health difficulties, while 68% of victims exhibited one or more health difficulties.

Table 1 illustrates the results of models in which bully victimization was regressed on each of the diagnosable health conditions, after accounting for a number of covariates. With the lone exception of diabetes, each of the 23 diagnosable health conditions was associated with significant increases in the odds of bully victimization, yielding additional support for our first hypothesis. Furthermore, within each dimension of diagnosable health conditions, some health conditions were associated with a significantly greater increase in the odds of bully victimization than others. For instance, among chronic physical conditions, arthritis (OR = 2.65, CI = 1.81–3.88) was associated with significantly larger increases in the odds of victimization than either allergies (OR = 1.55, CI = 1.46–1.64) or asthma (OR = 1.60, CI = 1.47–1.74). Moreover, among developmental disorders, autism (OR = 6.81, CI = 5.90–7.86) was associated with significantly larger increases in the odds of victimization than any other developmental disorder (and any other diagnosable condition). In the case of mental health conditions, depression (OR = 5.18, CI = 4.62–5.81) was associated with significantly larger increases in the odds of victimization than most of the other examined mental health conditions, with the exception of conduct problems (i.e., CIs pertaining to the depression and conduct problems estimate overlap). The results also indicate that, regardless of the dimension of diagnosable health conditions being examined, exhibiting multiple conditions is associated with significantly higher odds of bully victimization than exhibiting only a single condition, yielding additional support for our second hypothesis. Even so, exhibiting any severe birth defects, developmental disorders, or mental health conditions corresponds to significantly greater increases in the odds of bully victimization than exhibiting multiple chronic physical conditions, implying that the link between chronic physical conditions and bully victimization is less pronounced. The results of ancillary analyses in which the sample was split into children ages 6–11 and 12–17 years indicate that the association between multiple diagnosable developmental disorders and bully victimization is significantly more pronounced among older children (OR = 6.55, CI = 5.65–7.59) than among younger children (OR = 4.20, CI = 3.57–4.94), despite being statistically significant for both groups.

Finally, Table 2 displays the association between bully victimization and the manifestation of health difficulties among children with diagnosable health conditions (across four dimensions), net of covariates. Across the eight health difficulties examined, bully victimization is consistently associated with significantly greater odds of headaches, trouble breathing, trouble swallowing, stomach difficulties, physical pain, bleeding gums, and concentration difficulties among children who already possess diagnosable illnesses or disorders, which supports our third hypothesis. Overall, bully victimization was associated with significantly larger increases in the odds of exhibiting any of the health difficulties in the chronic physical conditions sample (OR = 2.46, CI = 2.22–.273) relative to the mental health conditions sample (OR = 1.81, CI = 1.62–2.03). Thus, although the results in Table 1 indicate that children with chronic physical conditions have lower odds of being bullied relative to children with birth defects, developmental disorders, or mental health conditions, the results in Table 2 indicate that, when victimized, they are significantly more likely to experience health difficulties relative to youths with mental health conditions who are victimized. Ancillary analyses suggest that the results displayed in Table 2 generally hold across children grouped by age (i.e., 6–11 years of age vs. 12–17 years). However, the association between bully victimization and experiencing one or more health difficulties among children diagnosed with developmental disorders was significantly more pronounced among children ages 12–17 years (OR = 3.15, CI = 2.60–3.80) than among children ages 6–11 years (OR = 2.07, CI = 1.68–2.55).

Discussion

We sought to uncover the prevalence of bullying victimization among children with diagnosable health conditions, as well as the relative risk of various health challenges among victims and nonvictims with diagnosable health conditions. Overall, findings supported our first and second hypotheses that bullying victimization was significantly more common among those with diagnosable health conditions, particularly those with multiple diagnosable conditions. These associations were pronounced in the case of severe birth defects, developmental disorders, and mental health conditions, and less pronounced in the case of chronic physical conditions. The most pronounced cases were those children with developmental disorders (especially autism) and severe birth defects and who had multiple conditions, with 50% or more of these children experiencing bullying. Furthermore, the pattern of findings also provides general support for our third hypothesis, as bullied children with diagnosable health conditions were significantly more likely to report various health difficulties compared to nonbullied children with diagnosable health conditions. This pattern held across the diagnosable health conditions examined, with only slight attenuation found in the mental health subsample. A set of ancillary analyses indicated that, although these findings are significant across age groups, 12- to 17-year-old youth are more likely to experience bullying in the presence of multiple developmental disorders, and when this occurs, these youth are more likely to manifest health difficulties than younger children. To our knowledge, the present study is the most comprehensive, nationally representative investigation of the link between bullying victimization and health difficulties among children with diagnosable conditions to date.

The present study expands upon extant research findings to suggest that children with disabilities and chronic health conditions, who are at a significantly greater risk of being bullied, also suffer from further health difficulties when peer victimization occurs. Thus, children with disabilities face additional challenges with their daily health as they cope with health problems such as headaches and stomachaches associated with their victimization. In the case of children with multiple developmental disorders, daily health challenges are significantly elevated among the 12- to 17-year-old subsample of bully victims relative to the 6- to 11-year-old subsample of victims. Peer ridicule and victimization may be especially distressing to the older subsample due to the relative conspicuousness of developmental disabilities among older children/adolescents and the increased negative attention that it may garner from peers.

Broadly speaking, these findings offer important implications to both medical professionals and educators. First, these findings highlight the need for medical professionals to consider peer victimization when evaluating health risks for children with diagnosable health conditions and recognize that these health risks can emerge for young children and adolescents alike. Primary care physicians may be in a particularly unique position to assess these

Table 2
Bully victimization and health difficulties among children with diagnosable health conditions: NSCH (2016)*

Health difficulties	Headaches	Trouble breathing	Trouble swallowing	Stomach difficulties	Physical pain	Toothaches	Bleeding gums	Difficult to concentrate	Any difficulty
Subsample	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)
Severe birth defects (n = 2095)									
Bully victimization	2.34 (1.80–3.05)	1.72 (1.38–2.15)	1.79 (1.32–2.43)	2.09 (1.70–2.56)	2.28 (1.87–2.78)	1.71 (1.19–2.46)	2.63 (1.76–3.91)	3.04 (2.55–3.63)	2.32 (1.89–2.84)
Chronic physical conditions (n = 10,094)									
Bully victimization	1.95 (1.67–2.29)	1.52 (1.37–1.68)	2.34 (1.82–3.02)	2.33 (2.06–2.64)	2.32 (2.06–2.62)	1.83 (1.44–2.32)	2.06 (1.54–2.75)	4.26 (3.76–4.84)	2.46 (2.22–2.73)
Developmental disorders (n = 3490)									
Bully victimization	1.81 (1.41–2.31)	1.49 (1.23–1.80)	1.68 (1.22–2.30)	1.81 (1.51–2.17)	1.90 (1.58–2.29)	1.33 (0.97–1.82)	2.19 (1.52–3.14)	2.77 (2.43–3.17)	2.04 (1.74–2.38)
Mental health conditions (n = 6450)									
Bully victimization	1.62 (1.37–1.91)	1.61 (1.39–1.85)	1.69 (1.30–2.21)	1.73 (1.51–1.97)	1.70 (1.49–1.94)	1.51 (1.17–1.97)	1.72 (1.30–2.27)	2.29 (2.06–2.54)	1.81 (1.62–2.03)

* Controls for age, race (black, Hispanic–white/other as reference category), child's sex, marital status of parents, single-parent household, parental education, household income, and multiple diagnosable conditions were included in each model. Results were robust to alternative model specifications (results are similar when examining samples with single or multiple diagnosable health conditions).

youth for bullying risk as children with disabilities have more regular contact with pediatricians. This provides physicians with an opportunity to offer ongoing counseling to youths with disabilities who are also bullying victims. Previous research has found office-based youth violence interventions conducted by primary care physicians to be effective in reducing bullying victimization [22]. However, further research has found that pediatricians rarely screen for peer victimization and lack confidence in providing counseling to youth victims. Specifically, 67% of practicing pediatricians reported that they rarely ask youth about peer victimization [22], and only 17% of pediatricians reported that their medical training prepared them to counsel youth on preventing victimization [23]. To enhance physician comfort with and likelihood of providing youth violence assessments and counseling, training physicians in youth violence counseling during their early educational experiences such as medical school or residency would offer the greatest opportunity for success and maximize youth outcomes [23]. To be sure, there are multiple competing demands and associated time constraints in the daily practice of the primary care physician. Thus, educational preparation could be effectively extended to nursing and other medical staff that often screen or collect initial information before the physician-patient encounter.

While primary care settings are a potentially important avenue for intervention, bullying prevention programs must extend beyond the doctor's office to address the issue of bullying where it most frequently occurs—in the schools. School-wide educators must be engaged using comprehensive antibullying techniques. Rather than intervening with the victim alone, a systemic intervention should target the entire social system of victims, bullies, and bystanders. In fact, a meta-analysis on the effectiveness of school-based bullying programs found that more comprehensive programs that targeted multiple disciplines had greater reductions in bullying frequency than programs targeting only one specific discipline [24]. A meta-analysis by Polanin et al [25]. also found comprehensive bullying prevention programs to significantly increase bystander intervention in bullying incidents. One example of a comprehensive bullying prevention program that involves the entire social system is the Bully-Proofing Your Schools approach, which seeks to increase understanding and incidence of bullying through psychoeducational activities within the classroom, peer mediation, counseling groups for bullying victims, and social skills and empathy training for children referred for bullying [26]. It remains to be seen, however, if these bullying prevention programs can be implemented under less than ideal conditions and brought to scale while still maintaining fidelity to the intervention's active ingredients.

Despite the strengths of the present study, there are several important limitations worth noting. First, the cross-sectional structure of the data precludes definitive causal inferences. Relatedly, we cannot identify the mechanisms involved that would elucidate the link between exposures to bullying victimization and health outcomes. Longitudinal designs that facilitate the needed temporality are required to illuminate the causal pathways between exposure to bullying victimization and health difficulties experienced. Second, to the extent that parents are not aware of the child's victimization experiences, the use of parental reports of victimization may underestimate the prevalence of bully victimization in the sample [27]. When possible, future research should seek to corroborate the current results using child reports of the frequency of victimization. Third, it would have been preferable to have additional details on the type of bullying experienced (e.g., verbal, physical, severity, etc.) and the situational context under which the victimization occurred. For example, did these bullying episodes occur while at school or in other contexts? Finally, although we took care to account for important confounds with

respect to the included covariates, there may be other unobserved variables that could have impacted the identified associations.

Given the long-term negative physical and mental health consequences of bullying that can cause impaired functioning well into adulthood, it is important to recognize the substantially elevated risk of exposure to bullying for children with severe birth defects, chronic mental and physical health conditions, and developmental disabilities, such as autism. The health risks incurred among bully victims is a topic that is ripe for interdisciplinary collaboration between epidemiologists, developmental psychologists, criminologists, and a number of health and social scientists with expertise in child development, health, and interpersonal conflict. The importance of theoretical and empirical cross-fertilization and knowledge sharing in the study of bullying is vital to finding solutions to this prevalent public health concern. Furthermore, primary care physicians and their associated medical staff, who have increased access to and rapport with youth, are in a unique role to assess and counsel children and adolescents as a means of attenuating the adverse effects of bullying. These physicians should provide special attention to children and youths with disabilities and chronic health conditions when assessing bullying victimization to prevent bullying from further interfering with their daily functioning. In addition to this avenue of prevention, continued testing and scale-up potential of evidence-informed antibullying programs in schools should be pursued. Finally, additional longitudinal research examining the situational dynamics of the bullying event and its precursors and consequences is advised.

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