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The hidden pain of bullying: somatic symptoms and physical health consequences

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Abstract

Background. Bullying is a pervasive public health issue among children and adolescents, associated not only with psychological distress but also with the development of physical health complaints.
The present study aims to explore the relationship between bullying victimization and somatic symptoms in youth, with particular attention to the Italian context, and to identify potential mechanisms and intervention strategies.
Materials and Methods. A narrative review of the literature was conducted to examine the association between bullying victimization and somatic symptoms in children and adolescents. Relevant studies were identified through a non-systematic search of major electronic databases, including PubMed, Scopus, and Google Scholar. Search terms included combinations of keywords such as bullying, cyberbullying, somatic symptoms, psychosomatic complaints, adolescents, and school-based intervention. Additional articles were identified by manually screening the reference lists of selected papers.
Results. Multiple studies indicate a consistent association between bullying victimization and increased prevalence of somatic symptoms among children and adolescents. In Italy, national programs have shown some success in reducing bullying, yet the problem remains significant. High affective empathy and limited emotional competence may increase vulnerability to psychosomatic outcomes.
Conclusions. Somatic symptoms in youth may be important indicators of bullying-related stress. Early identification, multidisciplinary care, and school-based prevention programs are essential.

Key words
- bullying
- somatic symptoms
- adolescents
- cyberbullying
- emotional regulation
- public health

INTRODUCTION

Bullying is defined as a persistent threatening and aggressive physical behavior or verbal abuse by an individual or a group, directed toward other people, especially those who are younger, smaller, weaker, or in some other situation of relative disadvantage [1].

Bullying is characterized by a power imbalance between the perpetrator and the victim, which may arise from disparities in physical strength, social status, or other contextual factors. It manifests in multiple forms, including direct physical aggression (such as hitting, kicking, or pushing), verbal aggression (encompassing taunting, name-calling, and threats), relational aggression (involving behaviors intended to harm social relationships or reputations, such as rumor-spreading and social exclusion), and cyberbullying, which occurs through digital platforms and communication technologies [2, 3].

METHODS

A non-systematic but comprehensive search was conducted using electronic databases including PubMed, Scopus, and Google Scholar. The search terms included combinations of bullying, cyberbullying, somatic symptoms, psychosomatic complaints, adolescents, and school-based intervention. Studies were selected if

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they addressed any form of bullying (physical, verbal, relational, cyber, or identity-based), involved child or adolescent populations, and explored the occurrence, mechanisms, or outcomes of somatic symptoms. Both cross-sectional and longitudinal studies were included, as well as meta-analyses, narrative reviews, and relevant reports from organizations. Particular attention was given to literature focusing on the Italian context and interventions implemented within Italy. The included studies were synthesized qualitatively to highlight epidemiological trends, psychological and biological mechanisms, and implications for clinical practice and public health strategies. Due to the narrative nature of this review, no formal quality assessment of studies or statistical meta-analysis was performed.

RESULTS

Types of bullying

Bullying can be broadly categorized into four types, each representing unique modes of aggression (*Table 1*):

- *physical bullying* involves direct acts of aggression such as hitting, kicking, or pushing. Although it is less commonly reported than verbal or relational forms of bullying, it tends to be more visible and easily recognized. Physical bullying is more prevalent among younger children, particularly those in elementary school, and its occurrence generally declines with age. It is typically more common among boys than girls, both as perpetrators and as victims [4, 5];
- *verbal bullying* consists in using words to harm, such as name-calling or insults. Verbal bullying is one of the most common forms of bullying across all age groups. It typically begins in early childhood and remains prevalent throughout adolescence. This form of bullying is frequently perpetrated by, and directed toward, both boys and girls [4-6];
- *relational bullying* involves behaviors intended to harm an individual's social relationships or reputation, such as spreading rumors, social exclusion, or manipulating friendships. This form of bullying is highly prevalent, particularly during adolescence. Its occurrence tends to increase with age and is most commonly observed in middle and high school. While relational bullying is more frequently associated with girls, boys also engage in such behaviors [7, 8];
- *cyberbullying* refers to bullying behaviors that occur through digital platforms such as social media, text messaging, or online forums. It has become increasingly common, particularly among adolescents and teenagers. While relatively rare among younger children, its prevalence rises significantly during middle school and peaks in high school. Both boys and girls engage in cyberbullying; however, girls are slightly more likely to be victims of relational forms of cyberbullying [9, 10];
- *sexual and identity-based bullying* involves harassment or victimization based on characteristics such as sexual orientation, gender identity, race, ethnicity, religion, or disability. This form of bullying disproportionately affects individuals from marginalized groups. It becomes more prevalent during adolescence, a period marked by intensified identity formation and social categorization. Victims are often LGBTIQ+ youth, students with disabilities, and members of racial or ethnic minority groups [11, 12].

While all types can co-occur, studies have shown that verbal and relational bullying are more commonly reported than physical aggression [8, 13, 14].

Epidemiology

Bullying is a global issue, with prevalence rates varying by region, country, and study methodology [15-18]. According to a 2019 United Nations Educational, Scientific and Cultural Organization (UNESCO) report, nearly one-third of children worldwide reported experiencing bullying in the past month, with a smaller proportion experiencing it on six or more days within that period [15]. Regional differences are evident, with reported rates ranging from 22.8% in Central America to 48.2% in sub-Saharan Africa. Studies across multiple countries reveal similar variability. For example, a study involving 23 countries found that traditional bullying prevalence ranged from 8% to 50%, with an average of 27%. Another analysis of 28 countries reported prevalence rates ranging from 6.3% among girls in Sweden to 41.4% among boys in Lithuania. In the United States, approximately 29% of students report being victims of school-based bullying. In Norway, prevalence rates range between 8.3% and 12.5%, depending on the study [15, 17]. These variations highlight the complexity of accurately measuring bullying prevalence due to differences in definitions and methodologies.

According to the World Health Organization (WHO), boys are generally more likely than girls to engage in both traditional and cyberbullying behaviors. Although the prevalence of victimization from traditional bullying is relatively similar between boys and girls, girls are more frequently targeted through cyberbullying. While the overall rates of bullying perpetration have declined since 2014, the proportion of adolescents experiencing

Table 1
Types of bullying

Bullying types	Common age range	Prevalence trend
Physical	Elementary school	Declines with age
Verbal	All ages	Stable across age
Relational	Middle to high school	Increases with age
Cyberbullying	Middle to high school	Increases with technology access
Identity-based	Adolescence	Increases in diverse environments

bullying has remained largely unchanged. Additionally, over one in ten adolescents reported being cyberbullied during the same period, with girls (14%) more likely than boys (12%) to report such experiences. Although girls are less likely to cyberbully others, they are disproportionately affected as victims of cyberbullying. The prevalence of bullying perpetration peaks at age 15 for boys and age 13 for girls. Younger adolescents, in general, are particularly vulnerable to victimization. Moreover, boys are significantly more likely than girls to engage in physical fighting, with 15% of boys and 5% of girls reporting involvement (https://www.who.int/europe/initiatives/health-behaviour-in-school-aged-children-(hbsc)-study/highlights).

It is important to highlight that the interpretation of what constitutes bullying varies according to culture and age group. These differences may account for part of the large variation in prevalence rates reported across studies (*Table 2*).

Age and cultural differences in the perception of bullying

The interpretation of what constitutes bullying is deeply embedded within cultural norms and values and therefore varies considerably across societies.

Developmental factors play a role, as younger children are less likely to identify or report indirect or relational forms of aggression such as exclusion or rumor-spreading, while older adolescents become more sensitive to these subtler dynamics [19].

In bullying research, many studies rely on questionnaire-based responses, which limits the findings to children who are old enough to read, comprehend, and complete such instruments proficiently. Nevertheless, some investigations have explored much younger age groups, including children as young as four years old [20, 21]. It is important to recognize that the way younger children conceptualize bullying evolves with age. Early on, their understanding does not typically emphasize elements such as power imbalance, repetition, or intent to harm, which are more commonly identified by older children. Instead, younger children tend to describe bullying in terms of the negative impact on the victim or behaviors that deviate from what is perceived as normal, often regardless of whether the actions are repeated or unprovoked [22]. According to this broader interpretation, a child may be labeled a bully irrespective of intent.

An Italian study published in 2002 compared definitions of bullying provided by teachers and students aged 8 to 14 years. The findings revealed that older students were more likely to classify a wider range of behaviors as bullying, including social or gender-based exclusion and verbal bullying, compared to teachers. Educators, on the other hand, tended to overlook these relational or verbal forms, focusing instead on more overt behaviors such as physical aggression, even when their descriptions aligned more closely with fighting than with bullying [23].

However, cultural context remains a decisive factor in shaping both recognition and reporting. For instance, research conducted in Scandinavian countries demonstrates that behaviors like social exclusion or rumor dissemination are consistently categorized as bullying and systematically monitored in school settings, reflecting a strong societal emphasis on equity and inclusion [24, 25].

Recent research underscores additional complexity: while racial and ethnic minority youth report comparable or even higher levels of victimization behaviors than their majority peers, they are less likely to label those experiences as "bullying" when asked via definition-based measures [26, 27].

In sub-Saharan African contexts, such as Ghana or Uganda, bullying is often equated with physical violence, while verbal or relational aggression is less likely to be recognized, reflecting broader socialization patterns where direct confrontation is more salient [28].

Cyberbullying adds another layer of cultural variation, since its salience is tied to digital penetration and attitudes toward online interaction. In East Asian countries such as South Korea and Japan, cyberbullying is a predominant concern, often linked to cultural patterns of group conformity and social reputation [29].

Ethnic and cultural harassment further illustrates how minority stress frameworks apply to bullying. In

Table 2
Reported bullying prevalence

Macro-area	Range of reported prevalence	Examples from reviewed studies
Europe [15]	25%	Sweden (6.3% girls), Lithuania (41.4% boys), Norway (8.3-12.5%)
North America [15, 17]	29.0-31.7%	About 19.5% of high school students reported being bullied on school property in the past 12 months, and 15.7% reported being cyberbullied during the same period
Central America [15]	22.8%	Sexual bullying is prominent. Psychological/relational bullying 7.5% as the highest regional median
South America [15, 16]	30-40%	Brazil 20% cyberbullying among 9-17 years of age internet users
Middle East [15, 18]	41.1-45.1%	Physical and sexual bullying are prominent
Asia [15]	7-40%	7% in Tajikistan is the global low; 29% in Philippines
North Africa [15]	42.7%	Physical and sexual bullying are prominent
Sub-Saharan Africa [15, 18]	48.2%	Highest reported regional physical-bullying prevalence. Less frequent psychological/relational bullying
Caribbean [15, 16]	30-40%	Limited data

multicultural school settings in the United States, discriminatory harassment based on race or immigrant status is explicitly recognized as bullying, with institutional mechanisms for redress. Yet minority and immigrant youth remain disproportionately vulnerable to bias-based bullying, which is consistently associated with more severe mental health and academic consequences than non-bias bullying, including depression, suicidal ideation, and school disengagement [30, 31].

These findings highlight how cultural, ethnic, and age-related differences shape not only prevalence estimates but also the reactions of victims, peers, and educators. They emphasize the importance of developing culturally responsive measurement tools and interventions that are sensitive to diverse populations.

Bullying in Italy

The 2023 National Institute of Statistics (Istituto Nazionale di Statistica, ISTAT) survey "children and youth: behaviors, attitudes, and future plans" involved over 39,000 young people aged 11 to 19 across Italy, focusing on bullying and cyberbullying. About 68.5% reported experiencing at least one offensive or violent episode, and 21% were victims of repeated bullying. The most common forms included verbal abuse, social exclusion, and online attacks, with a higher impact on minority groups such as foreign nationals, LGBTIQ+ youth, and neurodivergent individuals. Repeated bullying affected 20% of youth in Southern Italy, slightly less than in other regions where rates ranged from 21% to 22.1% [32, 33].

A study using data from 28 countries in Europe and North America in 1997-98 found that the proportion of students being bullied in Italy varied. The prevalence was lower than in some other countries, such as Lithuania, where 38.2% of girls and 41.4% of boys reported being bullied [34]. More recent data from the UNESCO report "Behind the numbers" indicates that Italy has seen a significant decrease in the prevalence of bullying. Italy was one of six countries that has seen a decrease in the prevalence of bullying, physical fights and physical attacks [15]. Italy has invested significantly in research and evaluation of anti-bullying interventions and programs. Evaluations of the school-based programs, "No Trap!" (beginning in 2008) and *kiusaamista vastaan* (KiVA), (beginning in 2013) have demonstrated their effectiveness in reducing school violence and bullying in Italian schools. Italy is also one of two countries that report teacher training on online safety and the prevention and reporting of cyberbullying [35-37].

Bullying remains a significant public health concern in Italy, despite ongoing efforts to curb its prevalence. Research has consistently demonstrated a direct association between bullying victimisation and the development of somatic complaints among Italian children, such as headaches, stomachaches, and sleep disturbances, indicating that the impact of bullying extends beyond psychological harm to physical well-being [38]. Moreover, cyberbullying has emerged as a parallel and equally concerning phenomenon. Italian studies have shown that cybervictimisation is significantly correlated with both psychological distress and physical symptoms, reinforcing the complex and multidimensional effects of online harassment [39]. Although national intervention programs and school-based strategies have contributed to some reductions in bullying rates, the persistence of both traditional and cyberbullying suggests that more comprehensive and sustained efforts are needed. These should include educational campaigns, psychological support services, and continuous monitoring, all of which must be tailored to address the evolving dynamics of youth aggression and its health-related consequences in the Italian context.

DEFINITION AND CLINICAL SIGNIFICANCE OF SOMATIC SYMPTOMS

Somatic symptoms refer to physical complaints, such as headaches, fatigue, dizziness, abdominal pain, and sleep disturbances, that are not fully explained by organic medical conditions. According to the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5), somatic symptom disorder (SSD) involves the presence of these physical symptoms in conjunction with excessive thoughts, feelings, or behaviors related to health concerns, resulting in functional impairment [40]. The prevalence of recurrent somatic complaints in adolescents is considerable, ranging from 2% to 10%, with up to 50% of youths reporting isolated somatic symptoms [41]. These symptoms are associated with increased health service use, school absenteeism, and long-term risk of psychiatric comorbidities [42, 43].

BULLYING AS A LONGITUDINAL PREDICTOR OF SOMATIC SYMPTOMS

Emerging evidence identifies bullying as a significant psychosocial risk factor for the development of somatic symptoms. Bullying victimization is consistently associated with a higher prevalence of somatic complaints in adolescents.

Children and adolescents identified as bully-victims, victims, or bullies exhibited a significantly elevated risk of experiencing psychosomatic problems, including headaches, compared to their uninvolved peers [38, 44, 45].

Various forms of bullying victimization, including physical aggression, verbal abuse, and social exclusion, collectively accounted for approximately 6% of the variance in subjective well-being (SWB) among children, with variations observed across regions, age groups, gender, geographic settings, and socio-economic backgrounds. This proportion is likely to be higher among subgroups directly exposed to repeated victimization. More frequent bullying experiences were consistently associated with lower levels of SWB. Notably, while these forms of victimization had a significant negative impact, the persistence of relatively stable SWB levels suggests that homeostatic mechanisms may play a mediating role. Furthermore, diminished SWB has been linked to increased physical complaints, highlighting the potential psychosomatic pathway through which bullying affects children's health [46].

In a study by Espejo-Siles *et al.*, experiences of bullying victimization were significantly associated with increased somatic symptoms at the time of assessment and persisted one year later [47].

A prospective study by Fekkes *et al.* provided evidence that children exposed to bullying developed a greater number of somatic symptoms within a six-month period, supporting a unidirectional causal relationship in which bullying precedes and contributes to the onset of physical health complaints [48].

Hunter and colleagues found that both victims and perpetrators of bullying were nearly twice as likely to report sleep difficulties compared to uninvolved peers [49]. A meta-analysis by van Geel *et al.* involving over 360,000 children and adolescents, confirmed that peer victimization is linked to significantly more sleep problems, particularly among younger children [50].

The biological plausibility of bullying-induced somatic symptoms centers on chronic stress and its impact on neuroendocrine and immune function. Sustained exposure to psychosocial stressors like bullying is thought to dysregulate the hypothalamic-pituitary-adrenal (HPA) axis, resulting in elevated cortisol levels and inflammatory responses that may manifest as physical symptoms. A study found that bullied children had higher cortisol reactivity to stress compared to nonbullied peers, suggesting heightened HPA axis activity. Conversely, other studies have observed blunted cortisol responses in maltreated or bullied children, indicating potential HPA axis dysregulation [51, 52]. Chronic activation of the HPA axis can lead to sustained cortisol secretion, which, over time, may suppress immune function and increase inflammation. Elevated levels of pro-inflammatory cytokines, such as IL-1β and TNF-α, have been associated with stress-related conditions and can contribute to physical symptoms like fatigue, sleep disturbances, and pain [53-55].

Affective empathy, or the capacity to emotionally share others' experiences, has also been implicated. Espejo-Siles *et al.* found that higher levels of social and emotional competencies were associated with lower levels of somatic symptoms one year later. In contrast, elevated affective empathy was linked to greater somatic symptom reporting both concurrently and longitudinally [47]. This association may be mediated by poor emotional regulation, as supported by MacDonald and Price, who showed that college students with high affective empathy reported more internalizing symptoms. In contrast, cognitive empathy was not significantly linked to somatic symptoms, suggesting a differential role of empathy subtypes [56].

This aligns with prior findings where emotional intelligence and social skills were inversely related to various problem behaviors, including internalizing disorders and psychosomatic complaints [57, 58]. Supporting this, studies have shown that adolescents with alexithymia are more likely to report increased somatic symptoms [59]. Thus, enhancing emotional competence may serve both preventative and therapeutic roles in adolescent health.

PUTATIVE STRATEGIES AND FUTURE DIRECTIONS

Given the established link between bullying victimization and the emergence of somatic symptoms in youth, future clinical and research efforts must emphasize early identification, multidisciplinary intervention, and targeted prevention.

Clinicians should be trained to recognize somatic complaints, particularly recurrent symptoms such as headaches, fatigue, or abdominal pain, as potential red flags for underlying psychosocial distress, including peer victimization.

Routine use of structured psychosocial screening tools in pediatric and adolescent settings may aid in the timely detection of bullying and associated psychological sequelae. Psychotherapeutic approaches, especially cognitive-behavioral therapy (CBT), have shown promise in addressing somatization and underlying emotional dysregulation. Integrating emotional skills training, stress-reduction techniques, such as mindfulness-based interventions, and trauma-informed care into clinical practice could help mitigate both psychological and physiological manifestations of chronic stress in bullying victims. Family-centered approaches and school-based mental health services should be prioritized, particularly in moderate to severe cases, to address environmental contributors and promote systemic resilience.

From a public health standpoint, school-wide anti-bullying programs that incorporate peer mediation, social-emotional learning (SEL), and empathy development may reduce victimization rates and buffer against somatic symptom onset.

Tailored interventions may be needed for students with high affective empathy, who appear especially vulnerable to internalizing distress. Early identification and support for bullied students and those with emotional dysregulation could reduce long-term somatic and psychological sequelae.

CONCLUSIONS

The relationship between bullying victimization and somatic symptoms highlights the profound impact of psychosocial stress on both mental and physical health in adolescents. Bullying not only fosters emotional distress but also contributes to chronic physiological changes, which can manifest as physical complaints like headaches, fatigue, and sleep disturbances. These somatic symptoms may serve as critical, though not exclusive, indicators of underlying psychological distress, particularly for those who have experienced persistent peer victimization. They should be interpreted as part of a wider psychosocial assessment rather than as standalone markers. Clinicians should be vigilant in recognizing these symptoms, as they provide an opportunity for early intervention and support for both the psychological and physical well-being of bullied youth. Furthermore, the implementation of comprehensive school-based programs and trauma-informed care, coupled with family and community involvement, is essential for addressing the root causes of bullying and mitigating its harmful effects on adolescents' overall health. By fostering environments that promote emotional resilience, social-emotional learning, and peer support, we can reduce the prevalence of bullying and its associated health consequences, ultimately supporting healthier and more adaptive developmental trajectories for youth.

Authors' contributions

All Authors contributed equally to the conception, design, drafting, and critical revision of the manuscript. All Authors approved the final version and agree to be accountable for all aspects of the work.

Conflict of interest statement

The Authors declare that there are no conflicts of interest related to the conduct or findings of this study. No financial or personal relationships with other people or organizations have inappropriately influenced this work.

Artificial intelligence use statement

Artificial intelligence (AI) tools were used solely to assist with language editing and proofreading of this manuscript. No AI tools were used for data analysis, content generation, interpretation of results, or decision-making.

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