## RESEARCH



# A cross-sectional study of individualand poly-bullying victimization and suicidal ideation among Chinese university and high school students: the roles of hopelessness and interpersonal relationships



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## Abstract

**Background** We aim to examine the associations between poly-bullying victimization (i.e., school-, family- and cyber-bullying ever and only) and suicidal ideation (SI) among Chinese university and high school students, and the roles of interpersonal relationships and hopelessness in the interested relationships.

**Methods** We included 17633 participants integrating data from the 2019 mental health survey in university students in Qinghai, China (N = 5700), and the Chinese Database of Youth Health in high school students (N = 11933) in Shandong. We applied multivariate logistic regression models to explore the associations between poly-bullying victimization and SI, by gender and level of schools. Stratification analyses were conducted by levels of hopelessness and interpersonal relationships. The role of hopelessness in the relationships between poly-bullying victimization and SI in university students was evaluated by fitting mediation analyses.

**Results** Exposure to specific forms of bullying victimization was positively associated with SI in students from both school levels. Cyberbullying victimization only was not significantly associated with SI in university students, but with significance in both female (OR: 1.70, 95% CI: 1.26–2.30) and male (OR: 2.69, 95% CI: 2.04–3.55) high school students. In university students, the association between school bullying only and SI was greater in female (OR: 2.38, 95% CI: 1.71–3.34) than males (OR: 1.33, 95% CI: 0.85–2.09); the strongest association was exhibited between the co-occurrence of family and school bullying victimization, and SI; a dose-response relationship was observed between number of victimization and SI, particularly among males. Interpersonal relationships did not significantly moderate the relationships between poly-bullying victimization and SI among university students. Hopelessness played significant mediating role in the relationships between *Family* + *School* bullying victimization and SI (29.40%) in males.

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**Conclusion** The exploration-oriented study provided an intricate mechanism of gender-specific differences in SI related to poly-bullying victimization. Tailored, gender-sensitive interventions and support systems for adolescents and young adults should be designed and implemented.

Keywords Bullying victimization, Suicide ideation, Hopelessness, Interpersonal relationships, Students, China

#### Introduction

Risk of suicide have increased globally, and has become the third leading cause of death among adolescents aged 15–19 (World Health Organization, 2020). Suicidal ideation (SI) refers to the cognitive process in which individuals think about, consider, or plan suicide, without necessarily engaging in any physical injury [1, 2]. The integrated motivational–volitional (IMV) model suggests that the presence of SI is a crucial step towards suicide attempt or suicide commitment [1], and serves as the strongest predictor of suicidal behavior. This indicates the importance of studying and understanding the presence of SI, especially among the young generations.

Traumatic life experience, such as family violence and school bullying, and their impact on SI among children and adolescents have been previously studied [3], indicating the traumatic exposure could increase the risk of SI. While most research has mainly focused on specific type of trauma event, such as sexual, emotional, or physical abuse, without considering the co-occurrence of multiple events. Poly- victimization is defined as exposure to multiple types of violence, not only physical but also emotional, sexual or community violence, abduction and witness of violence, which can be perpetrated by different aggressors such as parents, peers, siblings, romantic partners, and neighbors [4]. It was suggested that children [5] and adolescents who suffered from one type of victimization were more likely to expose to other types [6]. Specifically, the situation of co-occurrence of multiple bullying situations from either off-line scenarios or on-line ones [7–9], is called poly-bullying [10]. Poly-bullying victimization is a critical subset of poly-victimization, it could result in a cumulative burden of harm, thereby exacerbating the risk of adverse mental health outcomes and its associated SI and behaviors, compared to individuals who had no exposure or exposed to one type only [6].

Bullying has been recognized as an interpersonal violence issue that raises global concern for children and adolescents, it is a subset of aggressive behavior, which in turn is generally defined as "behavior intended to inflict injury or discomfort upon another individual" [9]. Since most bullying occurred without apparent provocation on the part of the targeted child or youth, it was considered to be a form of proactive aggression [9]. In educational settings, bullying is identified as unwanted and habitual aggressive behavior directed at others and has traditionally been categorized into physical, verbal, and relational forms [9]. Unlike traditional bullying often occurred in campus, bullying in the family (or part of domestic violence) [11] is often overlooked, such as sibling bullying [12], intimate partner violence [13] and parents' child abuse [14] can be considered as specific forms of family bullying [15]. Different terms have been used to describe these aggressive interactions in family, such as family bullying, family aggression, domestic violence, or childhood abuse [16, 17]. Furthermore, the emergence of the digital age and young people's widely use of social media has introduced a new issue, i.e., cyberbullying, which extended both the reach and impact of bullying beyond physical location [18]. Children and adolescents with multiple trauma exposure such as multiple forms of bullying were reported to be at higher risk of both adverse physical and psychological health consequences, in which the latter including psychiatric disorders, substance abuse, addictive behaviors, self-harm, and suicide [19, 20], with the cumulative effects expect to last throughout their lifespan. In this study, we will therefore focus on multiple bullying victimization of students group (family-, school- and cyber-bullying victimization ever and only).

Findings on the associations between co-occurrence of different types of bullying victimization and SI were mixed: some suggested a gender asymmetry [21, 22], some studies suggested greater suicide risk for girl victims of bullying [23, 24] and some indicated opposite conclusion [25, 26]. A meta-analysis showed that gender was not a significant moderator in the relationship between bullying and SI [27]. In addition, the feelings of repetitive thought patterns [28], emotion reactivity and dispositional mindfulness [29], were suggested could worsen mental health following exposed to bullying. On the other hand, it was indicated that positive interpersonal relationships such as parent-child bonds and peer connections along with satisfaction with academic achievements played role in reducing suicide risks related to bullying [3, 30].

Based on McLeroy's ecological model for health promotion focusing attention on both individual and social environmental factors as targets for health promotion interventions, factors associated with individuals' health outcome should be assessed with a multi-level framework encompassing individual (e.g., knowledge, behavior, developmental history), interpersonal (e.g., formal/ informal social network and support systems), institutional (e.g., organizations, regulations), community (e.g., organizational relationships), and public policy (e.g., local or national laws and policies) [31]. Specifically, from the individual and interpersonal level, adolescence is marked by heightened sensitivity to peer relationships, identity formation, and academic pressures [32]. Bullying exposure during this stage often intersects with school-centric social dynamics and family expectations [9]. University students face distinct challenges, including autonomy development, broader social networks, and career-oriented stressors [33]. Due to the unidentical purposes and orientation of education, there are also differences in the mechanisms for education management between high schools and universities, which could lead to classroom cliques and performance-based stratification in high school students and introduction of broader social networks and digital stressors like cyberbullying in university school students. Geographical and cultural differences across China further shape these ecological interactions for adolescents' health outcome, Qinghai Province-is characterized by high-altitude ecosystems, ethnic diversity (e.g., non-Han minorities account for 49.5%), and pastoral economic constraints (Per Capita Disposable Income of All Households in 2023 ¥28,587) [34], which contrasts sharply with Shandong, an industrialized Han-dominant region (¥39,883) where Confucian achievement mandates and urban-rural disparities affect bullying behaviors and health through social dominance norms in adolescents and young adults [35, 36]. Therefore, within the ecological model for health promotion, it is necessary to explore the relationships between exclusive type or co-occurrence of multiple forms of bullying victimization exposures and SI and related mechanisms between different school-aged groups especially in different regions, which can help to provide important insights in understanding the complexities of adolescents' behaviors and health outcome.

Therefore, integrating data from of a mental health survey among university students in Qinghai and a publicly available dataset among high school students from Shandong province this study aimed to (1) examine the relationships between numbers, exclusive type and cooccurrence of different forms of bullying victimization and SI among high school and university students; and (2) assess the role of gender, interpersonal relationships and hopelessness in the relationships. Based on previous studies [19, 23], we made the following hypotheses: (1) The relationship between poly-bullying victimization and SI would be positively associated, and the strength would differ between males and females; (2) The relationship between poly-bullying victimization and SI would be mediated by hopelessness and moderated by interpersonal relationships, such that high level of hopelessness would play a bridging role in the relationship and good interpersonal relationships would weak the relationship.

#### Methods

#### Study design and sample

This cross-sectional study derived data from a large-scale school-based mental health survey in Qinghai Province (MHS-QH: university students) of Northwest China in December 2019, and the Chinese Database of Youth Health (DYH: high school students) in the survey of academic year of 2017/2018 and 2020/2021.

The details regarding implementation of Qinghai mental health survey were introduced in previous studies [5, 37], which recruited university students through a multistage stratified cluster sampling method. Four universities were selected based on their affiliation levels and classifications. Within each university, classes were selected using a stratified random sampling method based on students' majors, followed by cluster sampling within each selected class. Questionnaires were distributed to participants and collected after completion by study investigators, all of whom underwent uniform training prior to the on-site survey. Only fully enrolled students were included in the study. A total of 6500 questionnaires were distributed, with 6200 returned, resulting in a response rate of 95.4%. After excluding those with structural errors and those with 20% or more missing data, we had 5700 university students to be analyzed in the current study. The Ethics Committee of the Medical College of Qinghai University approved the study protocol (QHMC 2019-09). The survey process followed the principles of anonymity and voluntariness, with all involved participants provided the informed consent.

The database of youth health (DYH) derives from a dedicated program in Shandong Province of China, which investigated the health-related behaviors and health outcomes of secondary school students. It is the first publicly available dataset on Chinese adolescents' health and health-related behaviors. The DYH program consisted of a multi-wave survey conducting in the academic year 2015/2016, 2016/2017, 2017/2018 and 2020/2021, which was documented in previous studies [38, 39]. Surveys at each wave was conducted as an independent cross-sectional study, rather than using a repeated measure design. A total of 99,327 students from 186 secondary schools in 17 cities of Shandong province were initially recruited in the survey. The probability proportional to size (PPS) sampling method was adopted in the survey of academic year of 2017/2018 and 2020/2021 [40], we analyzed the data in the high school students of those two cross-sectional datasets, as which uniquely collected the key information (i.e., bullying, cyberbullying and SI) relevant to our research question. For each of the two waves, 100 public schools were randomly selected across 10 administrative regions, representative of the province's diverse geography, population, and socio-economic conditions. In each region, three high schools and

seven junior high schools were chosen, with each school having a minimum of 300 students and at least 100 students per grade. The current study included 11,933 high school students after data cleaning. The Chinese Database of Youth Health (DYH) involving human participants were reviewed and approved by Ethics Committee of Shandong University (20180517). Written informed consent was obtained from each participant.

In total, we included 17633 participants in the current study (5700 university and 11933 high school students). For details, see Supplementary Fig. 2 flow chart of the enrollment process.

#### Measurement

#### Socio-demographic characteristics

The DYH collected sociodemographic and lifestyle information, including age (in years), gender (male/female), ethnicity (Han/others), one-child in the family (no/yes), self-perceived household economic level (poor/general/ rich), self-perceived health status (poor/general/good), relationships with teacher and family (poor/general/ good), frequency of weekly physical exercise (never/1–2 times/3–5 times/>5 times). The MHS-QH collected all abovementioned information, and additionally collected grade (freshman/others), place of residence prior to entering the university (non-plateau/plateau area), academic pressure (low/normal/high), relationships with classmates (poor/general/good).

## Poly-bullying victimization

Poly-bullying victimization consisted of several forms of bullying victimization [4]. In this study, we classified bullying according to the primary setting in which it occurred. Exposure to poly-bullying victimization was defined based on the presence of family, school, or cyberbullying experiences in the university sample (MHS-QH), and on the presence of school and cyberbullying in the high school sample (DYH) without availability of family bullying. Figure 1 illustrates the typology of poly-bullying victimization among university students, and supplementary Fig. 1 presents the corresponding typology for high school students.

In university students, two questions were asked to measure family bullying victimization in the past 6 months, it was coded as with family bullying victimization if there was at least one positive answer. In MHS-QH and DYH, school bullying victimization and cyberbullying in the past year were assessed using one specific 'yes/ no' question. The details on the assessment of bullying exposure are presented in supplement Table 1.

Based on the data availability, we constructed the following exposure variables indicating bullying



Fig. 1 The typology of constructed poly-victimization of the current study in university students

victimization in MHS-QH: (1) family bullying ever (no/ yes/other; not available in DYH); (2) school bullying ever (no/yes/other); (3) cyberbullying ever (no/yes/other); (4) number of victimization (no/one/two/three); (5) types of victimization (no/ family bullying only/ school bullying only/ cyberbullying only/ family+school bullying/ cyberbullying + family bullying/ school bullying + cyberbullying/ three). The category "other", for example for the variable "family bullying ever", indicates exposure to school bullying or/and cyberbullying. In DYH, the variables were constructed in the same way, except for unavailability of family bullying victimization, i.e., (1) school bullying ever (no/yes/other); (2) cyberbullying ever (no/yes/other); (3) number of victimization (no/ one/two); (4) types of victimization (no/ school bullying only/ cyberbullying only/ school bullying + cyberbullying). It should be noted that, the reference group ('no') in all variables was referred to as those without any type of bullying victimization, which could help alleviate the 'noise' from other bullying when one particular bullying was under studied [8].

#### Interpersonal relationships

We constructed the interpersonal relationships based on the responses to the relationships with family, relationships with teachers and relationships with classmates [3], categorized as poor/general/good. In the MHS-QH, 'poor' level indicates that at least one question on the relationships was answered with poor, 'good' level indicates that all three were answered with good, others were rated as 'general'. In the DYH, interpersonal relationships was constructed based on relationships with family and relationships with teachers [40] following the identical principle as it for the MHS-QH.

#### Hopelessness

In the MHS-QH, the hopelessness level of university students was measured using the 20-item Beck Hopelessness Scale (BHS) [41], with a 'yes/no' (1/0) response for each item. The scale was validated in Chinese population with a Cronbach's alpha of 0.834 [42]. Items 1, 3, 5, 6, 8, 10, 13, 15, 19 were reverse scoring items, and the total score ranged from 0 to 20 by summing up the scores of each item. Total score of less than 4, 4–8, 9–14 and more than 14 were categorized as the normal, mild, moderate and severe level of hopelessness, respectively. Since the BHS was only available for university students, the possible mediating effect of hopelessness between polybullying victimization and SI was only explored in the university students.

### Suicidal ideation

Lifetime suicidal ideation (SI) in the university students (MHS-QH) was assessed using the fourth (How willing

are you to actively attempt suicide? ) and fifth (To what extent do you wish to end your life by external force, that is, have "passive suicide wish"?) items of the Beck Scale for Suicidal Ideation (BSS) with answers of 'no / mild/ moderate to strong' [43], which is widely used as a selfreport screening tool [44]. Each question includes two independent contexts: (1) Recent Week (Past 7 Days) and (2) Most Depressed/Melancholic Period. Individuals with at least one positive response (mild or moderate to strong) to the two questions were classified as with SI. In the DYH, SI in the previous week was measured by two items (item 15 and 59) derived from the revised Hopkins' Symptom checklist (SCL-90-R), which is a self-reported instrument measuring psychological symptoms and psychopathologic features [45], and has been used in previous studies [46, 47]. It was asked: 'in the previous week, how much were you bothered by (item 15) the thoughts of ending your life? and (item 59) the thoughts of death or dying?'), which were answered from 1 to 5 ('not at all' to 'extremely often'). In the current study, presence of SI in high school students was defined as those with at least one response with the score of 2 or more.

#### Data analyses

As exploration-oriented, we examined the prevalence and associations and analyzed the data in the two groups individually. The sociodemographic and self-reported health characteristics for those with and without SI in the university and high school students and by gender, were described using the number (n) and percentage (%) with corresponding 95% confidence intervals (CIs), or the mean and standard deviation (SD). Logistic regression models were performed to assess the association between poly-bullying victimization and SI; by adjusting for covariates in respective dataset mentioned in the socio-demographic characteristics, ordinal variables were treated as categorical predictors in the fitted models. Additionally, gender stratified models were fitted to calculate the gender-specific estimates. The results were presented as odds ratio (OR) and its 95% CI. Stratification analyses were also conducted by the levels of hopelessness [normal (0-3), mild [4-8], moderate to severe [9–20]; only available for the university student participants] and by levels of interpersonal relationships [good, general or poor] overall and by gender.

PROCESS macro program in the SPSS (Version 27, International Business Machines (IBM) Incorporation, New York) [48] was used to test the mediating effect of hopelessness in the relationship between poly-bullying victimization and SI among university students overall and by gender, using Model 4 within the framework mediation [49]. Then, for the moderating role of interpersonal relationships, we used the Model 1. The direct and indirect effects were calculated in 5000 bootstrap samples, presented as a standardized coefficient and its 95% CI. The estimates from mediation models were adjusted for the abovementioned covariates.

In the sensitivity analysis, First, we re-defined the ascertainment of bullying victimization from the university students by not taking family bullying into account, making the categories of exposure the same information for university and high school students and by gender. Second, we redefined interpersonal relationships for university students by excluding classmate relationships and only including family and teacher relationships, ensuring alignment with the high school variable construction. All analyses were stratified by gender to account for potential gender-specific differences.

All typologies and models were constructed and interpreted separately for each sample, without assuming structural equivalence. In all models except the sensitivity analyses, the missing value was handled by multiple imputations using chained equations employing the 'mice' R package [50]. All data with exception of the mediation and moderation analyses were analyzed in R version 4.4.1 via RStudio, with a significant  $\alpha$  threshold of 0.05 (two-tailed).

#### Results

#### **Basic descriptions**

Among 17633 participants (55.6% females), 5700 university students (63.6% female; 45.6% Han) were with a mean age of 19.9 years (SD = 1.53) and 11933 high school students (51.8% female, 98.2% Han) with a mean age of 16.1 years (SD = 1.21), respectively (Table 1).

The prevalence of family bullying victimization in the university students was 27.5% (95% CI: 26.3–28.6%), which was higher in female than in male (29.0%, 95% CI: 27.5–30.5% vs. 24.8%, 95% CI: 22.9–26.7%). High school students reported significantly higher prevalence of school bullying victimization than the university students (11.1%, 95% CI: 10.3–11.9% vs. 9.0%, 95% CI: 8.4–9.5%), but lower prevalence of cyberbullying victimization (7.1%, 95% CI: 6.5–7.8% vs. 8.5%, 95% CI: 8.0–9.0%). Both male university and high school students reported significantly higher prevalence of school bullying ever and cyberbullying victimization ever than females (supplement Table 2).

Both university and high school students exposed to poly-bullying victimization exhibited a higher prevalence of SI compared to their non-victimized peers (Fig. 2 and supplement Tables 3 and 4). Notably, female university students with any form of bullying victimization reported higher prevalence of SI than their male counterparts particularly significant for school bullying victimization ever (59.8%, 95% CI: 54.5–64.9% vs. 41.6%, 95% CI, 35.7–47.7%), but without statistically significant gender difference in the prevalence of cyberbullying ever. Male high school students with cyberbullying victimization ever presented higher prevalence of SI than female peers (44.0%, 95% CI: 36.8–51.5% vs. 39.8%, 95% CI, 33.3–46.6%) but no statistically significant gender difference in SI related to school bullying victimization ever. The prevalence of SI in relation to the numbers and types of bullying victimization by gender is shown in supplement Table 2, with the greatest prevalence noted in the university students exposed to co-occurrence of family and school bullying victimization (female, 72.7%, 95% CI: 62.1–81.6%; male, 57.7%, 95% CI: 42.1–72.3%).

## The associations between poly-bullying victimization and SI

Compared with students without any bullying victimization exposure, those with bullying victimization were positively associated with SI in both genders (Fig. 3 and supplement Table 4), but there was no statistical significance (P > 0.05) in the association between cyberbullying only and SI in the university students. Specifically, there was no significant gender difference in the association between family bullying only (OR: 1.95, 95% CI: 1.63-2.33 vs. OR: 1.52, 95% CI: 1.16-1.98) and SI, but it was higher in female university students than that in males between bullying only (OR: 2.38, 95% CI: 1.71-3.34 vs. OR: 1.33, 95% CI: 0.85-2.09) and SI. Cyberbullying ever was positively associated with SI in both genders. Conversely, in the high school students, the ORs for SI in relation to school bullying and cyberbullying were greater in male than in females, while with overlapping 95% CIs. There was significant association between cyberbullying only and SI in both female (OR: 1.70, 95% CI: 1.26-2.30) and male (OR: 2.69, 95% CI: 2.04-3.55) high school students. Exposure to combined family and school bullying victimization presented the greatest association with SI among all exposure types in both female (OR: 4.21, 95% CI: 2.48-7.11) and male (OR: 3.31, 95% CI: 1.55-7.08) university students.

Number of victimizations was associated with SI in a dose-response pattern in the university students, especially for the males (one, OR: 1.47, 95% CI: 1.16–1.86; two, OR: 1.86, 95% CI: 1.27–2.72; three, OR: 4.32, 95% CI: 1.86–10.05; Fig. 3). The trend was not the same in the high school students.

## The role of hopelessness and interpersonal relationship in the association between bullying victimization and SI

The results for the interpersonal relationships-stratified analyses are shown in supplement Fig. 1 and supplement Table 6 for university students, supplement Fig. 1 and supplement Table 7 for high school students, the significant associations were noted especially in with general or poor interpersonal relationships.

## Table 1 Basic characteristics of participants

	University students ( <i>n</i> , %)			High school students ( <i>n</i> , %)			
	Overall	Female	Male	Overall	Female	Male	
Total (n = 17633)	(n=5700)	3628 (63.6%)	2072 (36.4%)	(n=11933)	6186 (51.84%)	5747 (48.16%)	
Mean age (SD)	19.95 (1.53)	19.87 (1.54)	20.09 (1.52)	16.17 (1.21)	16.16 (1.20)	16.18 (1.23)	
Ethnicity							
Han	2600 (45.6%)	1656 (45.6%)	944 (45.6%)	11,720 (98.22%)	6077 (98.24%)	5643 (98.19%)	
Others ^ (Tibetan, Hui, etc.)	3057 (53.6%)	1409 (53.8%)	1108 (54.3%)	213 (1.78%)	109 (1.76%)	104 (1.81%)	
Missing	43 (0.8%)	23 (0.6%)	20 (1.0%)	-	-	-	
Only-child status							
No	4250 (74.6%)	2853 (78.6%)	1389 (67.4%)	8113 (67.99%)	4789 (77.42%)	3324 (57.84%)	
Yes	1145 (20.1%)	618 (17.0%)	527 (25.4%)	3820 (32.01%)	1397 (22,58%)	2423 (42.16%)	
Missing	305 (5.3%)	157 (4.3%)	148 (7.1%)	-	-	-	
Family economy status							
Rich	294 (5.2%)	169 (4 7%)	125 (6.0%)	1961 (1643%)	986 (15 94%)	975 (16 97%)	
General	4316 (75 7%)	2826 (77 9%)	1490 (71 9%)	9064 (75 96%)	4761 (76 96%)	4303 (74 87%)	
Poor	1009 (17 7%)	578 (15.9%)	431 (20.8%)	908 (7.61%)	439 (7 10%)	469 (8 16%)	
Missing	81 (1.4%)	55 (1 5%)	26 (1 3%)	-	-	-	
Self-perceived health	01 (1.170)	55 (1.570)	20 (1.570)				
Good	2587 (45.4%)	1560 (43.0%)	1027 (49.6%)	6754 (56 60%)	3211(51.01%)	3543 (61 65%)	
Goberal	2307 (43.470)	1030 (53 4%)	056 (46 1%)	2808 (24 20%)	1674 (27 06%)	1224 (21 30%)	
Bad	102 (3 406)	1939 (33.470)	78 (3 8%)	2090 (24.29%)	1301 (21.03%)	080 (17 05%)	
Missing	192 (3.4%) 26 (0.5%)	114 (3.1%)	70 (3.0%) 11 (0.5)	2201 (19.11%)	1301 (21.03%)	960 (17.03%)	
Wookly physical oxoreica	20 (0.3%)	13 (0.4%)	11 (0.3)	-	-	-	
Never	971 (17 404)	602 (16 60%)	210 (10 604)	607 (5 0004)	207 (4 9004)	210 (5 2004)	
	021 (14.4%)	002 (10.0%)	219 (10.0%)	4082 (24 210()	297 (4.60%)	510 (5.59%) 1 ( ) ( ) ( ) ( )	
1–2 limes	3140 (55.2%)	2130 (58.7%)	1016 (49.0%)	4082 (34.21%)	2380 (38.57%)	1696 (29.51%)	
3–5 limes	992 (17.4%)	496 (13.7%)	496 (23.9%)	5305 (44.95%)	2785 (45.02%)	2580 (44.89%)	
> 5 times	/24 (12.8%)	395 (10.9%)	333 (16.1%)	1879 (15.75%)	/18 (11.61%)	1161 (20.21%)	
Missing	12 (0.2)	5 (0.1%)	8 (0.4%)	-	-	-	
	4004 (05.00()	2122 (06 200)	17(2 (05 00()	(240 (52 200())	2242 (54.020()	2006 (52 210)	
Good	4894 (85.9%)	3132 (86.3%)	1/62 (85.0%)	6348 (53.20%)	3342 (54.03%)	3006 (52.31%)	
General	706 (12.4%)	443 (12.2%)	263 (12.7%)	4363 (36.56%)	2270 (36.70%)	2093 (36.42%)	
Poor	58 (1.0%)	32 (0.9%)	26 (1.3%)	1222 (10.24%)	574 (9.27%)	648 (11.27%)	
Missing	42 (0.7%)	21 (0.6%)	21 (1.0%)	-	-	-	
Relationship with teachers				/			
Good	2104 (36.9%)	12/9 (35.2%)	825 (39.8%)	3883 (32.54%)	1914 (30.94%)	1969 (34.26%)	
General	3450 (60.5%)	22/6 (62./%)	11/4 (56./%)	6425 (53.84%)	3523 (56.95%)	2902 (50.50%)	
Poor	127 (2.2%)	65 (1.8%)	62 (3.0%)	1625 (13.62%)	749 (12.11%)	876 (15.24%)	
Missing	19 (0.3%)	8 (0.2%)	11 (5.0%)	-	-	-	
Grade							
Freshmen	2619 (45.9%)	1745 (48.1%)	874 (42.2%)	-	-	-	
Others	3039 (53.4%)	1860 (51.3%)	1179 (56.9%)	-	-	-	
Missing	42 (0.7%)	23 (0.6%)	19 (0.9%)	-	-	-	
Place of residence							
Non plateau	965 (16.9%)	618 (17.0%)	347 (16.7%)	-	-	-	
Plateau	4563 (80.1%)	2914 (80.3%)	1649 (79.6%)	-	-	-	
Missing	172 (3.0%)	96 (2.6%)	76 (3.7%)	-	-	-	
Academic pressure							
Low	320 (5.6%)	152 (4.2%)	168 (8.1%)	-	-	-	
Normal	3600 (63.2%)	2249 (62.0%)	1351 (65.2%)	-	-	-	
High	1772 (31.1%)	1221 (33.7%)	551 (26.6%)	-	-	-	
Missing	8 (0.2%)	6 (0.2%)	2 (0.1%)	-	-	-	
Relationship with classmates							
Good	2707 (47.5%)	1688 (46.5%)	1019 (49.2%)	-	-	-	
General	2898 (50.9%)	1891 (52.1%)	1007 (48.6%)	-	-	-	

	University students ( <i>n</i> , %)			High school students ( <i>n</i> , %)			
	Overall	Female	Male	Overall	Female	Male	
Poor	86 (1.5%)	44 (1.2%)	42 (2.0%)	-	-	-	
Missing	9 (0.2%)	5 (0.1%)	4 (0.2%)	-	-	-	
Hopelessness (SD)	6.27 (3.53)	6.21 (3.46)	6.40 (3.67)	-	-	-	
Suicide ideation							
No	3413 (61.3%)	2070 (58.2%)	1343 (66.8%)	7800 (65.36%)	4059 (65.62%)	3741 (65.09%)	
Yes	2152 (37.7%)	1485 (41.8%)	667 (33.2%)	4133 (34.64%)	2127 (34.38%)	2006 (34.91%)	
Missing	135	73	62	-	-	-	

#### Table 1 (continued)

Note: Other ethnic group includes Tibetan, Hui, etc

SD: Standard deviation; NA: Not applicable (Missing value)

Supplement Table 8 shows the associations between bullying victimization exposures and SI stratified by levels of hopelessness (only available in university students). Overall, the association gradually strengthened or became significant as the levels of hopelessness increased, especially in the male university students.

We further identified the significant mediating role of hopelessness in the relationships between types of victimization and SI in university students (Fig. 4 and Supplement Table 9). In females, hopelessness played significant mediating role in the relationships between family bullying victimization only, school bullying victimization only, family+school bullying and SI with 8.43%, 5.36% and 14.80% of the effect. In males, hopelessness played a proportion of 16.81% effect in the relationship between family+school bullying victimization and SI, 16.24% in family+cyberbullying victimization and SI, and 29.40% in family+school+cyberbullying victimization and SI.

Moderating analyses showed no significant moderating role of interpersonal relationships in the relationships between types of victimization and SI in university students (supplement Table 10).

#### Sensitivity analysis

We then run the models based on the constructed variables of victimization exposures in university students without considering the family bullying victimization that was not available for the high school students, which revealed consistent patterns as the models in the high school students (supplementary Table 10). Adjusted models excluding interpersonal relationships revealed consistent results as the original models indicating (Supplementary Table 12). Poly-bullying victimization exhibited a stronger association with SI among male university students with "good" family/teacher relationships compared with those with poor relationships, suggesting a buffering effect.

## Discussion

By integrating data from two datasets with a total of 17,633 university and high school students, we comprehensively assessed family-, school- and cyberbullying victimization ever and only in one setting, found that ever exposed to family-, school- or cyber-bullying victimization were positively associated with SI, among university and high school students, which aligned with previous studies [18, 51]. Notably, there was no significant association between cyberbullying only and SI among university students. However, in high school students, cyberbullying only was significantly associated with SI. A previous study of 27,030 Chinese middle and high school students reported significant associations between multiple types of victimization (property, physical, verbal, and relational victimization) and SI [52].

Our results demonstrated an evident dose-response pattern in the relationship between the number of bullying victimization and SI. Individuals who were polyvictims were more frequently subjected to bullying and were targeted by multiple forms of aggression, leading to a continuous buildup of psychological challenges. In addition, individuals' resilience levels could be negatively affected by poly-bullying victimization [53], the accumulation of negative victimization experiences over time may contribute to SI [54].

We identified the difference by gender in the two levels of schools in several aspects. Females were particularly vulnerable to the psychological consequences of bullying victimization, potentially influenced by increased emotional vulnerability [55]. The correlation between cyberbullying victimization only and SI among university students was not pronounced in the current study, this divergence might be partially explained by the younger age [56] and associated immature capacity of dealing with conflicts. Younger individuals, i.e., high school students in our study, have potentially weaker social capability than adults, which could be severely impaired by bullying victimization and were at higher risk of suicidal behaviors [2]. Consequently, they may be more vulnerable to the multifaceted nature of cyberbullying. Subsequent





Fig. 2 The prevalence of suicidal ideation among participants with and without victimization. Note: Due to differences in SI measurement (lifetime vs. past week) between university and high school samples, prevalence rates and odds ratios are not directly comparable

to experiencing cyberbullying, these students may find themselves struggling to navigate their emotional turmoil [18], which frequently resulted in social isolation and a cascade of adverse consequences, even the suicidal outcomes.

Our study highlighted a critical intersection between family and school bullying victimization, revealing a significant relationship with SI in university students, for both genders. The detrimental impact on SI from family bullying undermines self-esteem and emotional resilience, fostering chronic stress and a pervasive sense of hopelessness [7]. This toxic family environment impaired mental health, increasing the risk of mood disorders [22], as victims often feel trapped and unworthy of support. Simultaneously, school bullying heightened feelings of isolation, stripping victims of safe spaces and reinforcing their vulnerability [57]. The cumulative effects of these experiences cultivated despair, anxiety, and social



Fig. 3 The associations between bullying victimization and suicidal ideation. Notes: Models for university students, were adjusted for age, gender, ethnic, only-child status, family economic status, self-reported health, relationship with teachers, relationship with family members; relationship with classmates; Models for high school students, were adjusted for age, gender, ethnic, only-child status, family economic status, self-reported health, relationship with teachers, relationship with family. Gender was not adjusted for in the gender stratified models

withdrawal, ultimately elevating the risk of SI [58]. Previous studies have confirmed the negative psychological consequences of ongoing bullying victimization, distorted one's worldview and made suicide appear as a desperate escape from emotional turmoil [22]. While whether it was the case in high school students cannot be verified in the current study, which should be explored in further study.

Stratified analyses by different levels of interpersonal relationships among university students revealed some differences, but the moderating role of interpersonal relationships was not substantiated. Our interpersonal relationship variable was synthesized from three key components: family relationships, teacher relationships, and peer relationships. Although some empirical studies have highlighted the importance of multiple social and interpersonal factors in adolescent suicidality [59, 60], no literature has yet comprehensively examined the potential effects of different levels of interpersonal relationships. Peer support was identified could be one of the factors protecting bullying victims from SI [59]. Positive interpersonal connections served as a source of emotional support, thereby fostering resilience against stressors such as bullying [61], which aligned with the buffering hypothesis positing that robust social support can mitigate the negative effects of adverse experiences, including victimization and the risk of suicidal behaviors [62].

There was significant mediating role of hopelessness in the relationship between school bullying victimization and SI in university male students, and family bullying victimization and SI in females. Males were more severely impacted by school bullying, where peer interactions undermine their sense of competence and relatedness, fostering distress and isolation [63]. For females, family bullying disrupted emotional regulation, increasing hopelessness and worsening mental health, which elevated suicidal risk [23]. According to self-determination theory [64], unmet psychological needs drive distress; bullying primarily threatens males' competence, while females face challenges in familial relationships.

Our study helped to provide evidence for a better understanding on psychological implications of polybullying victimization and SI among Chinese youth in



Fig. 4 The mediating effects of hopelessness in the association between bullying victimization and SI. Note: Odds ratios were adjusted for age, gender, ethnic, only-child status, family economic status, self-reported health, relationship with teachers, relationship with family; relationship with classmates. Indirect effects were calculated by bootstrap and were presented as unstandardized effect; Direct effect was presented as unstandardized effect

school. The first strength was that, we expand the conceptual framework by integrating multiple forms of bullying-specifically family, school, and cyberbullying, and we examined their cumulative effects on SI, which provided more insights beyond some studies focusing on single victimization exposure [65, 66]. In addition, the grouping of bullying victimization in our study used without any type of bullying as the reference group, which alleviated the concern of impact from other bullying and improved the comparability of results across different combinations of traumatic events. Furthermore, we took advantage of combining survey data with quantitative data from public sources, enriching the comprehensiveness and geographic diversity of our findings. However, several limitations should be noted. First, the crosssectional design of the study induced the uncertainty of temporal ordering and precluded and conclusion of causality, which corresponds to the fact that the mediation analysis is hypothesis-generating, further longitudinal studies should be performed. Second, although we assessed three aspects of bullying separately, only simple questions were utilized rather than well-validated scales [9], and the exposure variables were constructed with the absence of information related to family bullying and relationships with classmates in high school students; for the outcome variable, two items from the Beck Hopelessness Scale was employed in the university students, and SI was measured as past-week ideation using two items from the SCL-90-R in the high school sample, although we did a series of sensitivity analyses for cross-validation, due to the lack of harmonization in measurement such as different assessment tools and timeframe used in the two datasets, the generalizations of results from the crossgroup comparisons should be made cautiously since it was exploration-oriented, and should be further harmonized and studied.

In conclusion, our study indicated that Chinese university and high school students present gender-specific differences in the relationships between poly-bullying victimization and SI, and related mechanisms. Specifically, the co-occurrence of family and school bullying exhibit the strongest associations with SI than other exposures, especially in female university students. No significant association was found between cyberbullying alone and SI among university students. In contrast, cyberbullying only was significantly associated with SI in high school students. Hopelessness mediated the relationship between family bullying and SI in female university students and between school bullying and SI in males. Our findings emphasized the necessity for tailored, gendersensitive prevention, interventions and support systems for adolescents and young adults to enhance resilience and alleviate the health impact from bullying.

#### Abbreviations

CI	Confidence interval
DYH	Chinese Database of Youth Health
MHS-QH	Mental health survey in Qinghai Province
OR	Odds ratio
SI	Suicide ideation

#### **Supplementary Information**

The online version contains supplementary material available at https://doi.or q/10.1186/s12939-025-02472-9.

Supplementary Material 1

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#### Author contributions

Zixuan Cao and Li Lu designed the study. Zixuan Cao, Zi-wei Li and Li Lu conducted the data collection, analyzed, and interpreted the data, and drafted the manuscript. Sha Lai, Zhongliang Zhou, Qing Shen and Shou Liu critically revised the manuscript. All the authors approved the final version of this article for publication. All authors revised the manuscript for critical content and approved the final version of the manuscript.

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#### Data availability

The DYH dataset should be applied officially. Please contact Dr. Li Lu (li.lu@xjtu. edu.cn) for the data availability of university students.

#### Declarations

#### Ethics approval and consent to participate

The study was conducted in accordance with the ethical standards of the Declaration of Helsinki. The Ethic Committee of Medical College of Qinghai University approved the mental health survey in Qinghai Province in accordance with the Declaration of Helsinki. The Chinese Database of Youth Health (DYH) involving human participants were reviewed and approved by Ethics Committee of Shandong University (20180517).

#### **Consent for publication**

Written informed consent to participate in this study was provided by the participants / participants' legal guardian/ next of kin.

#### **Competing interests**

The authors declare no competing interests.

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#### References

- O'Connor RC, Kirtley OJ. The integrated motivational-volitional model of suicidal behaviour. Philos Trans R Soc Lond B Biol Sci. 2018;373(1754).
- Barzilay S, Brunstein Klomek A, Apter A, Carli V, Wasserman C, Hadlaczky G, et al. Bullying victimization and suicide ideation and behavior among adolescents in Europe: a 10-Country study. J Adolesc Health. 2017;61(2):179–86.
- Longobardi C, Iotti NO, Jungert T, Settanni M. Student-teacher relationships and bullying: the role of student social status. J Adolesc. 2018;63:1–10.
- Finkelhor D, Ormrod RK, Turner HA, Hamby SL. Measuring poly-victimization using the juvenile victimization questionnaire. Child Abuse Negl. 2005;29(11):1297–312.
- Lu L, Jian S, Dong M, Gao J, Zhang T, Chen X, et al. Childhood trauma and suicidal ideation among Chinese university students: the mediating effect of internet addiction and school bullying victimisation. Epidemiol Psychiatr Sci. 2020;29:e152.
- Cyr K, Chamberland C, Clément M, Wemmers JA, Collin-Vézina D, Lessard G, et al. The impact of lifetime victimization and polyvictimization on adolescents in Québec: mental health symptoms and gender differences. Violence Vict. 2017;32(1):3–21.
- Wolke D, Tippett N, Dantchev S. Bullying in the family: sibling bullying. Lancet Psychiatry. 2015;2(10):917–29.
- Lucas-Molina B, Pérez-Albéniz A, Solbes-Canales I, Ortuño-Sierra J, Fonseca-Pedrero E. Bullying, cyberbullying and mental health: the role of student connectedness as a school protective factor. Psychosoc Interv. 2022;31(1):33–41.
- 9. Olweus D. School bullying: development and some important challenges. Annu Rev Clin Psychol. 2013;9:751–80.
- Borualogo IS. Poly-bullying victimisation in Indonesia: prevalence and factors related to children exposure to multiple bullying incidents, and its correlation to subjective well-being. Behav Sci Law. 2025;43(1):114–34.
- Piquero AR, Jennings WG, Jemison E, Kaukinen C, Knaul FM. Domestic violence during the COVID-19 pandemic - evidence from a systematic review and meta-analysis. J Crim Justice. 2021;74:101806.
- Toseeb U, Wolke D. Sibling bullying: a prospective longitudinal study of associations with positive and negative mental health during adolescence. J Youth Adolesc. 2022;51(5):940–55.
- Lutgendorf MA. Intimate partner violence and women's health. Obstet Gynecol. 2019;134(3):470–80.
- Rodriguez CM, Granger DA, Leerkes EM. Testosterone associations with parents' child abuse risk and at-risk parenting: a multimethod longitudinal examination. Child Maltreat. 2021;26(1):50–62.
- Plamondon A, Bouchard G, Lachance-Grzela M. Family dynamics and young adults' well-being: the mediating role of sibling bullying. J Interpers Violence. 2021;36(9–10):Np5362–84.
- Olumide AO, Adebayo E, Oluwagbayela B. Gender disparities in the experience, effects and reporting of electronic aggression among secondary school students in Nigeria. BMJ Glob Health. 2016;1(3):e000072.
- Herrenkohl TI, Sousa C, Tajima EA, Herrenkohl RC, Moylan CA. Intersection of child abuse and children's exposure to domestic violence. Trauma Violence Abuse. 2008;9(2):84–99.
- Peprah P, Oduro MS, Okwei R, Adu C, Asiamah-Asare BY, Agyemang-Duah W. Cyberbullying victimization and suicidal ideation among in-school adolescents in three countries: implications for prevention and intervention. BMC Psychiatry. 2023;23(1):944.
- Feng JY, Hsieh YP, Hwa HL, Huang CY, Wei HS, Shen AC. Childhood polyvictimization and children's health: a nationally representative study. Child Abuse Negl. 2019;91:88–94.
- Hughes K, Bellis MA, Hardcastle KA, Sethi D, Butchart A, Mikton C, et al. The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. Lancet Public Health. 2017;2(8):e356–66.
- Jonas S, Khalifeh H, Bebbington PE, McManus S, Brugha T, Meltzer H, et al. Gender differences in intimate partner violence and psychiatric disorders in England: results from the 2007 adult psychiatric morbidity survey. Epidemiol Psychiatr Sci. 2014;23(2):189–99.
- Bhavsar V, Hatch SL, Dean K, McManus S. Association of prior depressive symptoms and suicide attempts with subsequent victimization: analysis of population-based data from the adult psychiatric morbidity survey. Eur Psychiatry. 2020;63(1):e51.

- Soares FC, Hardman CM, Rangel Junior JFB, Bezerra J, Petribú K, Mota J, et al. Secular trends in suicidal ideation and associated factors among adolescents. Braz J Psychiatry. 2020;42(5):475–80.
- Ahmad K, Beatson A, Campbell M, Hashmi R, Keating BW, Mulcahy R, et al. The impact of gender and age on bullying role, self-harm and suicide: evidence from a cohort study of Australian children. PLoS ONE. 2023;18(1):e0278446.
- Laukkanen E, Honkalampi K, Hintikka J, Hintikka U, Lehtonen J. Suicidal ideation among help-seeking adolescents: association with a negative selfimage. Arch Suicide Res. 2005;9(1):45–55.
- Niedhammer I, Pineau E, Rosankis E. The associations of psychosocial work exposures with suicidal ideation in the National French SUMER study. J Affect Disord. 2024;356:699–706.
- Holt MK, Vivolo-Kantor AM, Polanin JR, Holland KM, DeGue S, Matjasko JL, et al. Bullying and suicidal ideation and behaviors: a meta-analysis. Pediatrics. 2015;135(2):e496–509.
- Zou H, Huang J, Zhang W, Wu J, Wu W, Huo L. The effect of cyberbullying victimization and traditional bullying victimization on suicidal ideation among Chinese female college students: the role of rumination and insomnia. J Affect Disord. 2023;340:862–70.
- Zhao H, Gong X, Huebner ES, Yang X, Zhou J. Cyberbullying victimization and nonsuicidal self-injury in adolescents: testing a moderated mediating model of emotion reactivity and dispositional mindfulness. J Affect Disord. 2022;299:256–63.
- Sampasa-Kanyinga H, Lalande K, Colman I. Cyberbullying victimisation and internalising and externalising problems among adolescents: the moderating role of parent-child relationship and child's sex. Epidemiol Psychiatr Sci. 2018;29:e8.
- McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. Health Educ Q. 1988;15(4):351–77.
- Zhang Y, Qin P. Comprehensive review: understanding adolescent identity. Stud Psychol Sci. 2023;1(2):17–31.
- Henri D, Morrell L, Scott G. Student perceptions of their autonomy at university. High Educ. 2018;75:507–16.
- Qi W, Liu SH, Zhou L. The law of population regional differentiation in qinghai-Tibet plateau and the application of Hu Huanyong's line thought (in Chinese). Acta Geogr Sin. 2020;75(2):255–267.
- 35. Statistics QPBo. Qinghai statistical yearbook 2024. 2024.
- Statistics SPBo. Statistical bulletin of national economic and social development of Shandong Province in 2024. 2024.
- Lu L, Dong M, Jian S, Gao J, Ye L, Chen H, et al. Sex differences in the factors associated with sleep duration in university students: a cross-sectional study. J Affect Disord. 2021;290:345–52.
- Li L, Zhang Y, Fan M, Cao B. Sleep and mental health among Chinese adolescents: the chain-mediating role of physical health perception and school adjustment. BMC Psychol. 2024;12(1):228.
- Dong X, Ding L, Zhang R, Ding M, Wang B, Yi X. Physical activity, screen-based sedentary behavior and physical fitness in Chinese adolescents: a crosssectional study. Front Pediatr. 2021;9:722079.
- 40. Zhang S, Luo W, Dong X, Chen W, Yi X, Zhou W, et al. A dataset on the status quo of health and health-related behaviors of Chinese youth: a longitudinal large-scale survey in the secondary school students of Shandong Province. Chin Med Sci J. 2022;37(1):60–6.
- 41. Beck AT, Weissman A, Lester D, Trexler L. The measurement of pessimism: the hopelessness scale. J Consult Clin Psychol. 1974;42(6):861–5.
- 42. Ma Z, He Q, Nie G, Jia C, Zhou L. Reliability and validity of short Beck hopelessness scale in psychological autopsy study among Chinese rural elderly. Int Psychogeriatr. 2020;32(4):525–31.
- Beck AT, Kovacs M, Weissman A. Assessment of suicidal intention: the scale for suicide ideation. J Consult Clin Psychol. 1979;47(2):343–52.
- 44. van Spijker BA, van Straten A, Kerkhof AJ. The effectiveness of a web-based self-help intervention to reduce suicidal thoughts: a randomized controlled trial. Trials. 2010;11:25.
- McGough J, Curry JF. Utility of the SCL-90-R with depressed and conductdisordered adolescent inpatients. J Pers Assess. 1992;59(3):552–63.
- Meng H, Li J, Loerbroks A, Wu J, Chen H. Rural/urban background, depression and suicidal ideation in Chinese college students: a cross-sectional study. PLoS ONE. 2013;8(8):e71313.
- Favaro A, Santonastaso P. Suicidality in eating disorders: clinical and psychological correlates. Acta Psychiatr Scand. 1997;95(6):508–14.

- Hayes AF, Rockwood NJ. Conditional process analysis: concepts, computation, and advances in the modeling of the contingencies of mechanisms. Am Behav Sci. 2020;64(1):19–54.
- Igartua JJ, Hayes AF. Mediation, moderation, and conditional process analysis: concepts, computations, and some common confusions. Span J Psychol. 2021;24:e49.
- Rubin DB, Schenker N. Multiple imputation for interval estimation from simple random samples with ignorable nonresponse. J Am Stat Assoc. 1986;81(394):366–74.
- Wang GF, Han AZ, Zhang GB, Xu N, Xie GD, Chen LR, et al. Sensitive periods for the effect of bullying victimization on suicidal behaviors among university students in China: the roles of timing and chronicity. J Affect Disord. 2020;268:12–9.
- Wang H, Bragg F, Guan Y, Zhong J, Li N, Yu M. Association of bullying victimization with suicidal ideation and suicide attempt among school students: a school-based study in Zhejiang Province, China. J Affect Disord. 2023;323:361–7.
- Víllora B, Larrañaga E, Yubero S, Alfaro A, Navarro R. Relations among polybullying victimization, subjective well-being and resilience in a sample of late adolescents. Int J Environ Res Public Health. 2020;17(2).
- Fei WJ, Tian S, Xiang HS, Geng YR, Yu JC, Pan CW et al. Associations of bullying victimisation in different frequencies and types with suicidal behaviours among school-going adolescents in low- and middle-income countries. Epidemiol Psychiatric Sci. 2022;31.
- Grama DI, Georgescu RD, Coşa IM, Dobrean A. Parental risk and protective factors associated with bullying victimization in children and adolescents: a systematic review and meta-analysis. Clin Child Fam Psychol Rev. 2024;27(3):627–57.
- Kowalski RM, Giumetti GW, Schroeder AN, Lattanner MR. Bullying in the digital age: a critical review and meta-analysis of cyberbullying research among youth. Psychol Bull. 2014;140(4):1073–137.
- 57. Bhatia R. The impact of bullying in childhood and adolescence. Curr Opin Psychiatry. 2023;36(6):461–5.

- Koyanagi A, Oh H, Carvalho AF, Smith L, Haro JM, Vancampfort D, et al. Bullying victimization and suicide attempt among adolescents aged 12–15 years from 48 countries. J Am Acad Child Adolesc Psychiatry. 2019;58(9):907–e184.
- Barzilay S, Klomek AB, Apter A, Carli V, Wasserman C, Hadlaczky G, et al. Bullying victimization and suicide ideation and behavior among adolescents in Europe: a 10-country study. J Adolesc Health. 2017;61(2):179–86.
- Sheng J, Yang Y, Lin P, Xiao Y, Sun Y, Fei G, et al. The association of school bullying victimization and suicidal ideation among school-aged adolescents in Yixing City, China. J Affect Disord. 2024;365:518–26.
- French KA, Dumani S, Allen TD, Shockley KM. A meta-analysis of work-family conflict and social support. Psychol Bull. 2018;144(3):284–314.
- 62. Johnson J, Wood AM, Gooding P, Taylor PJ, Tarrier N. Resilience to suicidality: the buffering hypothesis. Clin Psychol Rev. 2011;31(4):563–91.
- Attell BK, Kummerow Brown K, Treiber LA. Workplace bullying, perceived job stressors, and psychological distress: gender and race differences in the stress process. Soc Sci Res. 2017;65:210–21.
- Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. Am Psychol. 2000;55(1):68–78.
- Schonfeld A, McNiel D, Toyoshima T, Binder R. Cyberbullying and adolescent suicide. J Am Acad Psychiatry Law. 2023;51(1):112–9.
- Kafka JM, Moracco KBE, Taheri C, Young BR, Graham LM, Macy RJ, et al. Intimate partner violence victimization and perpetration as precursors to suicide. SSM Popul Health. 2022;18:101079.

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