

Precollege and In-College Bullying Experiences and Health-Related Quality of Life Among College Students

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abstract

BACKGROUND AND OBJECTIVES: Bullying is a commonly occurring problem behavior in youths that could lead to long-term health effects. However, the impact of school bullying experiences on health-related quality of life (HRQOL) among college students has been relatively underexplored. This study aimed to describe school bullying experiences and to empirically examine their associations with HRQOL among college students in Taiwan.

METHODS: Self-administered survey data (response rate 84.2%) were collected from 1452 college students in 2013 by using proportional stratified cluster sampling. Different types of bullying experiences (ie, physical, verbal, relational, and cyber) before and in college, for bullies and victims, were measured. HRQOL was assessed by the World Health Organization Quality of Life (WHOQOL-BREF) Taiwan version.

RESULTS: College students with cyber bullying-victimization experiences before college (β 0.060) reported significantly higher HRQOL in physical health. Regarding social relationships, those with verbal (β -0.086) and relational (β -0.056) bullying-victimization experiences, both before and in college, reported significantly lower HRQOL, whereas those with verbal (β 0.130) and relational (β 0.072) bullying-perpetration experiences in both periods reported significantly higher HRQOL. Students with cyber bullying-victimization experiences in college (β 0.068) reported significantly higher HRQOL in the environment domain. Last, the effects of verbal and relational bullying-victimization experiences on psychological HRQOL could be mediated and manifested through depression.

CONCLUSIONS: Various types of bullying experiences occurring before and in college were differentially associated with HRQOL in different domains. These findings underscore the importance of developing school policies and health education initiatives to prevent school bullying and ameliorate its short-term and long-term effects on HRQOL.

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WHAT'S KNOWN ON THIS SUBJECT: American Public Health Association reported >3.2 million students in the United States are bullied each year; 160 000 students skip school every day for fear of bullying. Little is known about whether bullying affects health-related quality of life (HRQOL) among college students.

WHAT THIS STUDY ADDS: Different types of bullying experiences affected different domains of HRQOL. Precollege bullying had long-term effects on HRQOL. Verbal/relational bullying-victimization experiences, mediated via depression, affected psychological HRQOL. Findings inform preventive and clinical practice to ameliorate the impact of bullying.

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Mr Chen contributed to the conception of the ideas, design of the study, collection, analysis, and interpretation of the data, and writing and revision of the manuscript; and Dr Huang conceptualized the research framework, supervised the study, and contributed to the conception of the ideas, design of the study, analysis and interpretation of the data, and writing, editing, and revision of the manuscript. Drs Chen and Huang contributed equally to this article.

www.pediatrics.org/cgi/doi/10.1542/peds.2014-1798

DOI: 10.1542/peds.2014-1798

Accepted for publication Oct 22, 2014

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To date, bullying has remained an unresolved serious issue on campuses. Owing to its broad impact, concerns have been echoed among educators, psychiatrists, and mental health professionals worldwide, calling for more efforts.^{1,2} According to a World Health Organization (WHO) collaborative cross-national survey encompassing 39 countries and regions, 9% to 13% of young people aged 11 to 15 years reported being bullied in the past couple of months.³ In addition, a recently published book on bullying prevention by the American Public Health Association reported that >3.2 million students in the United States are bullied each year and 160 000 students skip school every day for fear of bullying, indicating the enormities of bullying in youths.⁴ By contrast, there is a relative paucity of literature on school bullying in Taiwan. One study found that 9.9% of fourth to sixth graders had been bullied in the past 2 months in 2007, and 3 years later the rate rose to 16.1%.⁵

Although the terms and meanings of bullying may vary slightly across cultures,⁶ the definitions of bullying adopted in previous research usually include 3 core elements as coined by Dan Olweus: repeated hurtful actions occurring between individuals of the same age group and with a power imbalance.^{7,8} The roles of bullying can be classified into bullies and victims.⁹ As for types of bullying, 4 distinct categories¹⁰ are commonly used: (1) physical: bullying through physical contact (eg, hitting, kicking, or shoving around); (2) verbal: bullying via verbal expressions (eg, teasing in a hurtful way, calling mean names about appearance or social status); (3) relational: bullying through social means (eg, socially excluding others, or spreading rumors); and (4) cyber: bullying through electronic channels (eg, sending hurtful messages or pictures via the Internet or cell phones).¹⁰

Although these categories are mutually exclusive, various types of bullying can occur simultaneously.

In addition to its rampant occurrence, bullying has caused great concerns because of its associated negative health consequences, including both physical and psychological symptoms, such as poor appetites, physical injuries, headaches, depressive symptoms, and anxiety.^{11–13} High school students with previous bullying-victimization experiences had been found more likely to remain depressed.¹⁴ Further, studies also have shown that exposure to bullying at school can have long-term health effects in adulthood, including escalated risks of depression, suicidal ideation or attempts, and anxiety disorder.^{15–18}

Alternatively, instead of examining specific health problems, some studies focused on the health impact of bullying in a more comprehensive and systematic fashion.^{19,20} In this line of investigation, the concept of health-related quality of life (HRQOL) was commonly used to evaluate health of individuals in a holistic approach,²¹ and measures of HRQOL have been developed and increasingly used to assess perceived health status in health research.²² For example, Australian researchers found worsened physical and psychological HRQOL among adults with past experiences of bullying victimization.²³

In sum, school bullying may have both acute and long-term health effects. Although bullying in college appeared to be less prevalent (eg, <7% in the United States²⁴) than in primary and secondary schools, precollege bullying experiences may still have residual effects on college students' health. However, little is known about whether and what aspects of their HRQOL may be affected. Among the first to explore this topic, the current study aimed to describe school bullying experiences and to examine various types,

roles, and periods of occurrence of bullying in relation to HRQOL among college students in Taiwan. It was hoped that this study could raise awareness of bullying-related health issues and provide empirical evidence to inform school policies and health education initiatives that may help ameliorate the impact of bullying in youths.

METHODS

Sample

Survey data were collected from college students aged 18 years or older from 2 large comprehensive universities in Taiwan. A random sample was drawn by using the proportional stratified cluster sampling method. To reflect the diversity of academic disciplines within university, discipline-based colleges were used as strata for stratified sampling. To reach the estimated sample size according to the proportions of the colleges, 1 to 2 departmental required courses (ie, clusters) within each college were randomly selected, and all students enrolled in the sampled courses were invited to participate in this study. We also assessed the potential clustering effect by calculating the intraclass correlation coefficients for the HRQOL measures across sampled clusters; they were all <0.05, indicating a relatively small clustering effect.^{25,26} A total of 1452 responses were received with a response rate of 84.2%. After removing 13 students who accidentally skipped 1 or more pages of the questionnaire, the final sample included 1439 students, with more women (58.4%) than men, and 98.4% aged 18 to 24 years and 1.6% older than 24 (mean 20.51, SD 1.82). Approximately half (50.5%) attended a private university, with slightly more juniors (30.2%) than seniors (24.0%), sophomores (23.0%), and freshmen (22.8%).

Measures

HRQOL

Developed in diverse cultural settings for international comparisons, the

WHO Quality of Life assessment (WHOQOL) is one of the most widely used HRQOL instruments.^{27,28} In this study, HRQOL was measured by the short version of WHOQOL (WHOQOL-BREF) Taiwan version, which has been demonstrated to have good psychometric properties.²⁹ It consists of 26 items (including 2 items of cultural relevance to Taiwan), to evaluate HRQOL in 4 domains: physical health (7 items; eg, "How satisfied are you with your sleep?"), psychological (6 items; eg, "How much do you enjoy life?"), social relationships (4 items; eg, "How satisfied are you with your personal relationships?"), and environment (9 items; eg, "How satisfied are you with your transport?"). Each item was rated from 1 to 5, with a higher score indicating better HRQOL. Following WHOQOL-BREF Taiwan version instructions, the mean score of items within each domain was multiplied by 4 to create the domain score, ranging from 4 to 20, with internal consistency (Cronbach's α) between 0.70 and 0.77 and test-retest reliability (correlation coefficient) between 0.76 and 0.80.²⁹

Bullying Experiences

Bullying-related questions were based on the definition of school bullying by Olweus,⁸ as follows: "We say a student is BEING BULLIED when another student, or a group of students, say or do nasty and unpleasant things to him or her. It is also bullying when a student is teased repeatedly in a way he or she doesn't like. But it is NOT BULLYING when two students of about the same strength quarrel or fight."^{8,23} In addition to this statement, definitions and examples of the 4 types of bullying (physical, verbal, relational, and cyber), as described previously, were also provided to the participants on the questionnaire. For each type of bullying, the time periods of occurrence included the following: never, precollege, in-college (ie, while enrolled as a college student), and in both

periods (ie, both before and in college). The survey also inquired about 2 roles of bullying (bullies and victims).

These bullying-related questions were validated in consultation with experts and also pilot-tested among 30 college students, including a test-retest reliability assessment (average correlation coefficient of items = 0.832). In addition, as summary indicators of the overall bullying experiences, a bullying perpetration index (BPI) and a bullying victimization index (BVI) were created to indicate the total number of 4 types of bullying perpetration and victimization ever experienced, respectively, ranging from 0 (never) to 4.

Other Variables

Depression, a health condition associated with both bullying^{11,14} and HRQOL,^{30,31} was assessed by using the Chinese version of the Patient Health Questionnaire, whose validity and reliability had been examined^{32,33} and also validated in Taiwan³⁴ (Cronbach's α = 0.82 in this study). Patient Health Questionnaire scores >5 and >10 indicate mild and moderate to severe depression, respectively. Participants also were asked whether they had been diagnosed with any physical or mental disorders. Further, per the adolescent problem behavior framework,³⁵ the survey inquired whether they had participated in unprotected sex, heavy episodic drinking, and smoking in the past year. Certain characteristics associated with bullying victimization, including younger age, lower household economic status, learning difficulties, motor impairments,^{13,36,37} and other background characteristics, were accounted for in this study.

Procedure

Surveys were administered in sampled classes, each student's responses were anonymous and confidential, and voluntary completion of this survey

constituted the informed consent to participate. As incentives, each participant was offered a small gift and a chance to win a cash prize (worth ~US\$3.50) immediately after handing in the completed questionnaire, in addition to entry into a drawing for 2 movie tickets. All data were collected in March 2013. The study protocol was reviewed and approved by the Research Ethics Committee of the National Taiwan University.

Data Analysis

SPSS 20.0 (IBM SPSS Statistics, IBM Corporation, Chicago, IL) was used to perform all statistical analyses. Descriptive statistics were first examined, and then bivariate associations were evaluated by using analysis of variance (ANOVA). Finally, multivariate linear regression modeling was performed to investigate the associations between bullying experiences and 4 HRQOL domain scores. As recommended by the WHOQOL-BREF Taiwan version working group, the previously noted variables that are likely to affect people's HRQOL, including depression and adolescent problem behaviors, were controlled for in the analyses.

RESULTS

Roles and Types of Bullying Experiences

Tables 1 and 2 present bullying-perpetration and bullying-victimization experiences, respectively, by type and period of occurrence. For both bullying-perpetration and bullying-victimization experiences, the prevalence of cyber bullying (7.8% and 7.2%, respectively) was the lowest, whereas verbal bullying (36.9% and 33.9%, respectively) was most common. In general, more precollege than in-college bullying experiences were reported.

Bullying Experiences and HRQOL

Tables 1 and 2 also show the mean HRQOL scores in each domain across

TABLE 1 Domain Scores of WHOQOL-BREF, by Type of Bullying-Perpetration Experience and Period of Occurrence (n = 1439)

Type/Period	n (%)	Physical Health		Psychological		Social Relationships		Environment	
		Mean (SD)	P	Mean (SD)	P	Mean (SD)	P	Mean (SD)	P
Physical			.112		.400		.040		.273
Never	1243 (86.4)	12.53 (1.77)		13.17 (2.38)		13.59 (2.14)		14.10 (1.90)	
Precollege	181 (12.6)	12.21 (1.87)		13.00 (2.46)		13.19 (2.62)		13.80 (2.27)	
In-college	5 (0.3)	13.16 (0.89)		14.67 (3.06)		15.41 (3.59)		14.11 (2.16)	
In both periods	10 (0.7)	12.63 (1.58)		13.47 (2.20)		13.90 (2.81)		14.22 (2.81)	
Verbal			.384		.497		.314		.313
Never	908 (63.1)	12.54 (1.78)		13.18 (2.37)		13.59 (2.16)		14.11 (1.92)	
Precollege	368 (25.6)	12.36 (1.82)		13.10 (2.39)		13.39 (2.34)		14.02 (2.04)	
In-college	18 (1.3)	12.60 (1.86)		12.37 (2.84)		13.24 (2.27)		13.33 (1.89)	
In both periods	145 (10.1)	12.55 (1.67)		13.22 (2.51)		13.74 (2.26)		13.97 (2.03)	
Relational			.727		.984		.829		.596
Never	1099 (76.4)	12.47 (1.80)		13.16 (2.40)		13.54 (2.21)		14.03 (1.92)	
Precollege	284 (19.7)	12.55 (1.69)		13.13 (2.44)		13.52 (2.25)		14.20 (2.07)	
In-college	9 (0.6)	12.19 (1.37)		13.33 (1.05)		13.78 (1.43)		14.17 (1.45)	
In both periods	47 (3.3)	12.69 (1.97)		13.08 (2.26)		13.83 (2.56)		14.10 (2.43)	
Cyber			.644		.773		.654		.245
Never	1327 (92.2)	12.49 (1.79)		13.16 (2.41)		13.54 (2.20)		14.08 (1.94)	
Precollege	55 (3.8)	12.78 (1.70)		13.26 (2.43)		13.87 (2.57)		14.25 (2.24)	
In-college	31 (2.2)	12.35 (1.50)		12.88 (1.95)		13.58 (2.33)		13.62 (2.10)	
In both periods	26 (1.8)	12.49 (2.00)		12.79 (2.07)		13.24 (2.50)		13.52 (2.31)	

P values obtained from ANOVA. "In both periods" indicates both precollege and in-college.

various periods of occurrence, by type of bullying perpetration and victimization, respectively. Overall, the mean domain scores of HRQOL were 12.49 (physical health), 13.16 (psychological), 13.55 (social relationships), and 14.07 (environment). Of all types of bullying-perpetration experiences,

only physical bullying-perpetration experiences were significantly associated with HRQOL in the social relationships domain. However, physical, verbal, and relational bullying-victimization experiences were significantly associated with HRQOL in all domains except for physical bullying-victimization

experiences in the environment domain.

Multivariate Associations Between Bullying Experiences and HRQOL Domain Scores

After controlling for key background characteristics, health conditions, and health risk behaviors, specific types of

TABLE 2 Domain Scores of WHOQOL-BREF, by Type of Bullying-Victimization Experience and Period of Occurrence (n = 1439)

Type/Period	n (%)	Physical Health		Psychological		Social Relationships		Environment	
		Mean (SD)	P	Mean (SD)	P	Mean (SD)	P	Mean (SD)	P
Physical			.013		.038		< .001		.122
Never	1271 (88.3)	12.55 (1.78)		13.21 (2.38)		13.65 (2.16)		14.11 (1.92)	
Precollege	153 (10.6)	12.06 (1.81)		12.67 (2.45)		12.71 (2.51)		13.73 (2.22)	
In-college	10 (0.7)	12.47 (1.34)		12.67 (2.86)		13.96 (3.14)		13.73 (1.81)	
In both periods	5 (0.3)	13.03 (1.87)		14.13 (2.47)		14.20 (2.59)		14.07 (2.89)	
Verbal			.001		.002		< .001		.001
Never	951 (66.1)	12.61 (1.74)		13.31 (2.32)		13.77 (2.07)		14.18 (1.91)	
Precollege	334 (23.2)	12.31 (1.84)		12.91 (2.47)		13.20 (2.45)		14.00 (1.99)	
In-college	29 (2.0)	12.69 (1.76)		13.24 (2.60)		13.53 (2.31)		13.57 (1.92)	
In both periods	125 (8.7)	12.03 (1.86)		12.60 (2.58)		12.86 (2.44)		13.48 (2.19)	
Relational			.002		.001		< .001		.001
Never	1102 (76.6)	12.59 (1.76)		13.29 (2.37)		13.67 (2.13)		14.16 (1.92)	
Precollege	286 (19.9)	12.26 (1.81)		12.79 (2.40)		13.29 (2.40)		13.87 (2.02)	
In-college	20 (1.4)	11.89 (1.91)		12.43 (2.47)		12.60 (2.42)		13.11 (2.20)	
In both periods	31 (2.2)	11.79 (1.82)		12.15 (2.37)		12.45 (2.79)		13.15 (2.15)	
Cyber			.714		.053		.470		.205
Never	1335 (92.8)	12.50 (1.76)		13.20 (2.38)		13.58 (2.18)		14.09 (1.95)	
Precollege	53 (3.7)	12.56 (2.05)		12.59 (2.45)		13.24 (2.40)		13.80 (2.11)	
In-college	28 (1.9)	12.29 (1.95)		12.48 (2.83)		13.10 (3.01)		14.03 (1.94)	
In both periods	23 (1.6)	12.14 (2.17)		12.46 (2.19)		13.36 (2.85)		13.31 (2.37)	

P values obtained from ANOVA. "In both periods" indicates both precollege and in-college.

bullying experiences (Table 3) and bullying experience indices (Table 4) were found significantly associated with HRQOL in different domains. Also, mild and moderate to severe depression were both found to significantly affect HRQOL in all domains. The main results for each HRQOL domain are highlighted as follows in sequence.

Physical Health Domain

Cyber bullying victimization before college was significantly associated with higher HRQOL in college (β 0.060). Neither BPI nor BVI was significantly associated with HRQOL.

Psychological Domain

None of the bullying experiences was significantly associated with HRQOL. However, those with a BPI of 3 (β 0.062) reported significantly higher psychological HRQOL.

Social Relationships Domain

College students with verbal (β 0.130) and relational (β 0.072) bullying-perpetration experiences in both periods showed significantly higher HRQOL, whereas those with verbal (β -0.086) and relational (β -0.056) bullying-victimization experiences in both periods reported significantly lower HRQOL. Those with a BPI of 3 (β 0.066) reported significantly higher HRQOL, whereas those with a BVI of 1 (β -0.074), 2 (β -0.063), and 3 (β -0.055) all reported significantly lower HRQOL.

Environment Domain

Last, those with cyber bullying-victimization experiences in college (β 0.068) and those with a BPI of 2 (β 0.062) and 3 (β 0.066) reported significantly higher HRQOL in the environment domain.

DISCUSSION

This study, to our knowledge, was among the first to empirically examine the associations of various types of school bullying experiences in different periods in life with

TABLE 3 Multiple Linear Regression Models for Bullying Experiences Associated With Domain Scores of WHOQOL-BREF

Variable	Physical Health	Psychological	Social Relationships	Environment
	β	β	β	β
Verbal: bullying perpetration				
Never (ref)				
Precollege	-0.016	0.023	0.038	0.003
In-college	0.020	-0.019	-0.010	-0.028
In both periods	0.056	0.054	0.130***	0.044
Relational: bullying perpetration				
Never (ref)				
Precollege	0.037	0.009	-0.006	0.047
In-college	0.013	0.034	0.016	0.015
In both periods	0.052	0.037	0.072**	0.052
Verbal: bullying victimization				
Never (ref)				
Precollege	-0.013	0.005	-0.042	0.011
In-college	-0.001	0.012	-0.012	-0.040
In both periods	-0.048	-0.043	-0.086**	-0.053
Relational: bullying victimization				
Never (ref)				
Precollege	-0.041	-0.044	-0.040	-0.043
In-college	0.014	-0.001	-0.017	-0.008
In both periods	-0.026	-0.021	-0.056*	-0.042
Cyber: bullying victimization				
Never (ref)				
Precollege	0.060*	-0.012	0.010	0.019
In-college	0.041	0.013	0.028	0.068*
In both periods	0.014	-0.009	0.047	0.018
Severity of depression				
None (ref)				
Mild	-0.301***	-0.323***	-0.243***	-0.228***
Moderate to severe	-0.413***	-0.469***	-0.320***	-0.306***
F	7.858**	10.757**	8.679**	5.570**
R ²	0.231	0.291	0.249	0.176
Adjusted R ²	0.201	0.264	0.220	0.144

β = standardized regression coefficient. "In both periods" indicates both precollege and in-college.

Bullying experiences that were significantly associated with HRQOL are presented in the table, but all these models also adjusted for physical and cyber bullying-perpetration experiences and physical bullying-victimization experiences; all 4 models controlled for gender, year in university, type of university, grade point average, region of origin, monthly disposable income, having a stable relationship, having a religion, sexual orientation, long-term difficulty with activities of daily living, diagnosed physical and mental disorder (excluding depression), past-year smoking, past-year unprotected sex, and past-year heavy episodic drinking.

* $P < .05$; ** $P \leq .01$; *** $P \leq .001$.

HRQOL in various domains among college students in Taiwan. Even after taking into account the aforementioned background characteristics, health conditions, and health risk behaviors, this study found significant independent associations between different types of bullying experiences and HRQOL in different domains.

Physical Health and Environment Domains: Cyber Bullying-Victimization Experiences and Possible Lifestyle-Altering Effect

Interestingly, students with cyber bullying-victimization experiences

before college reported significantly higher HRQOL in physical health. It is possible that they might have changed the pattern of, or reduced, their Internet use in response to such victimization experiences, and instead, they might have devoted more time to other activities that turned out to enhance their physical health. By contrast, cyber bullying victims in college reported significantly higher HRQOL in environment, suggesting that they might find solace in their environment outside the cyberspace (eg, dining out, visiting places).

TABLE 4 Multiple Linear Regression Models for Bullying Experience Indices Associated With Domain Scores of WHOQOL-BREF

Variable	Physical Health	Psychological	Social Relationships	Environment
	β	β	β	β
Bullying Perpetration Index				
Never (ref)				
1	0.051	0.031	0.039	0.041
2	0.035	0.045	0.049	0.062*
3	0.039	0.062*	0.066*	0.066*
4	0.021	-0.003	0.043	0.040
Bullying Victimization Index				
Never (ref)				
1	-0.054	-0.032	-0.074**	-0.021
2	-0.044	-0.037	-0.063*	-0.057
3	0.025	-0.041	-0.055*	-0.027
4	-0.046	-0.004	-0.011	0.002
Severity of depression				
None (ref)				
Mild	-0.304***	-0.323***	-0.246***	-0.232***
Moderate to severe	-0.413***	-0.468***	-0.317***	-0.294***
F	11.343***	15.887***	11.793***	7.932***
R ²	0.222	0.285	0.229	0.166
Adjusted R ²	0.202	0.267	0.210	0.145

β = standardized regression coefficient. All 4 models controlled for gender, year in university, type of university, grade point average, region of origin, monthly disposable income, having a stable relationship, having a religion, sexual orientation, long-term difficulty with activities of daily living, diagnosed physical and mental disorder (excluding depression), past-year smoking, past-year unprotected sex, and past-year heavy episodic drinking. * $P < .05$; ** $P \leq .01$; *** $P \leq .001$.

Consequently, they might develop a better understanding and a greater appreciation of their environment, resulting in higher HRQOL in the environment domain. It remains unclear whether cyber bullying victimization has a lifestyle-altering effect, as noted previously. Cohort research is needed to illuminate possible life-course changes after cyber bullying-victimization experiences in different periods in life.

Psychological Domain: Bullying, Depression, and Mediating Effect on HRQOL

Consistent with previous research,^{30,31} this study found that depression had the strongest effect on HRQOL in each domain. However, unlike a previous Australian study in adults²³ using the Short Form Health Survey in which earlier bullying-victimization experiences significantly affected psychological HRQOL, this study did not find such a significant association. Other than differences in the study population and measures used, it is worth noting

that our study controlled for depression, a mental disorder that commonly occurs after bullying-victimization experiences.^{11,13,14} Hence, it is likely that such experiences lead to depression, and depression decreases psychological HRQOL.

To explore this relationship, depression was removed from the regression models. Such ancillary analyses revealed that verbal bullying-victimization experiences in both periods ($\beta -0.097$) and relational bullying-victimization experiences before college ($\beta -0.079$) were significantly associated with lower HRQOL in the psychological domain. In addition, those with a BVI of 2 ($\beta -0.107$) and 3 ($\beta -0.089$) also exhibited significantly lower psychological HRQOL. These suggest that some of the psychological effects of bullying-victimization experiences on HRQOL may have been mediated through depression. This possible mediating effect of depression on the relationships between bullying-victimization experiences and HRQOL requires future longitudinal

investigations to ascertain their temporal relations and causal mechanisms.

Social Relationships Domain: Multiplicative Versus Additive Effect of Verbal and Relational Bullying-Victimization Experiences

Verbal and relational bullying victimization may have detrimental effects on interpersonal confidence of the victims, thereby leading to social avoidance and even self-inflicted isolation. The victims also could be marginalized after being bullied. These consequences may jointly contribute to their decreased HRQOL in social relationships. Notably, the significant adverse effect of verbal bullying-victimization experiences in both periods ($\beta -0.086$), compared with only before college ($\beta -0.042$) and only in college ($\beta -0.012$), suggests a multiplicative, rather than additive, effect of verbal bullying victimization on HRQOL in this domain. By contrast, relational bullying-victimization experiences in both periods ($\beta -0.056$) exhibited an additive effect ($\beta -0.040$ for only before college; $\beta -0.017$ for only in college). Both findings also suggest a possible threshold of cumulative effect required for these 2 types of bullying-victimization experiences to affect HRQOL in social relationships. More research is warranted to corroborate these findings and further examine the possible moderating effect of verbal bullying victimization in different periods on HRQOL.

Social Relationships Domain: Verbal and Relational Bullying-Perpetration Experiences in Both Periods and Possible Reflection of Personality Traits

College students with verbal and relational bullying-perpetration experiences in both periods reported higher HRQOL in social relationships. Their repetitive and consistent bullying behavioral pattern in both periods may reflect their underlying aggressive personality traits^{38,39} in

combination with great verbal and interpersonal skills, which enable them to engage in verbal and relational bullying perpetration. On the other hand, their peers may attempt to appease them out of fear, which could in turn be misinterpreted by the bullies as signs of their popularity, or even centrality of their role in the social network, resulting in greater self-perceptions of their social relationships. Thus, future investigations into these interrelationships are needed to help inform bullying prevention initiatives to foster healthier social interactions on campus.

Limitations and Future Directions

Because this study was based on self-report, there is potential reporting bias, as most self-administered surveys might encounter. However, considering that validated measures were used for the main study variables, and that a pilot test, including a test-retest reliability assessment of the bullying-related questions, also was conducted to ensure clarity and appropriateness of the survey items, such bias is likely to be minimal and internal validity is enhanced. Also, the effects of social desirability were reduced given the anonymous nature of this survey.

Although this study used the proportional stratified cluster sampling method, future research based on a larger nationally representative sample is warranted to examine if our findings could be replicated.

Last, the cross-sectional nature of the survey design may constrain our ability to make causal inferences. However, because bullying experiences inquired in this study were either concurrent or preceding the survey, their temporal relationships with the current HRQOL were relatively clear. Nonetheless, the information about precollege bullying experiences was acquired retrospectively. Hence, future longitudinal research is still needed to confirm their causal relationships. Furthermore, the interrelationships of these school bullying experiences and their possible long-term effects on HRQOL could also be explored in later adulthood.

CONCLUSIONS

This study empirically examined the associations of various types of precollege and in-college bullying experiences with HRQOL in various domains among college students in Taiwan. Verbal, relational, and cyber bullying experiences were found

significantly associated with HRQOL in the physical health, social relationships, and environment domains. Considering the significant negative relationships of precollege and in-college bullying-victimization experiences with HRQOL among college students, it is reasonable to suggest that previous exposure to bullying victimization may have latent effects that could be triggered by future bullying-related traumatization. Therefore, whether their bullying-victimization experiences up until college might exacerbate over time into later adulthood remains unclear and requires further investigations. In addition, although no bullying experiences appeared to affect HRQOL in the psychological domain, the effects of bullying victimization on psychological HRQOL may be mediated and manifested through depression. In brief, although this study has provided empirical evidence of the significant associations between school bullying experiences and HRQOL among college students, future research is warranted to elucidate their causal mechanisms and to explore school policies and health education initiatives that may help ameliorate the impact of bullying among adolescents and youths.

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

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FINANCIAL DISCLOSURE: The authors have indicated they have no financial relationships relevant to this article to disclose.

FUNDING: Preparation of this manuscript was supported in part by grants MOST 103-2410-H-002-225-MY2, NSC 102-2410-H-002-220-, and NSC 100-2410-H-002-174-MY2 from the Ministry of Science and Technology, Taiwan (formerly, National Science Council) to Dr Huang.

POTENTIAL CONFLICT OF INTEREST: The authors have indicated they have no potential conflicts of interest to disclose.

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Pediatrics 2015;135;18

DOI: 10.1542/peds.2014-1798 originally published online December 22, 2014;

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The online version of this article, along with updated information and services, is located on the World Wide Web at:

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