

Association between Childhood Trauma and Suicidal Behavior in the General Population

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This study aimed to investigate the associations between various types of childhood trauma and suicidal behavior in the general population in South Korea. This mental health survey included a total of 1,490 general citizens living in a metropolitan South Korean city who completed a questionnaire that assessed respondents' histories of childhood trauma before the age of 12 years, including bullying victimization, emotional abuse, sexual abuse, and physical abuse, as well as suicidal behavior, including current suicidal ideation and histories of suicide planning and attempts. The following psychiatric scales were administered: Hospital Anxiety and Depression Scale (HADS), Rosenberg Self-Esteem Scale (R-SES), Connor-Davidson Resilience Scale (CD-RISC), Perceived Stress Scale (PSS), and visual analogue scale of EuroQol 5D (EQ-5D). Participants who experienced any childhood trauma had significantly higher HADS and PSS scores, and significantly lower EQ-5D scores. Additionally, participants with any type of childhood trauma were significantly more likely to have current suicidal ideation and histories of planned and attempted suicide. Multivariate analyses adjusted for confounding variables indicated that bullying victimization and sexual abuse were associated significantly with all types of suicidal behavior. Physical abuse was associated significantly with histories of suicide planning and attempts. The present findings showed that any type of childhood trauma was associated with higher levels of suicidality, anxiety, depression, and perceived stress, as well as lower health-related quality of life, in the general population. In particular, associations between childhood trauma and suicidality were identified after adjustment for confounding variables.

Key Words: *Sexual Child Abuse; Bullying; Depression; Attempted Suicide*

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INTRODUCTION

Exposure to trauma, such as physical and emotional violence and sexual abuse, disrupts the normal stages of childhood development and continuously impacts mental health in adulthood. For example, the likelihood of experiencing childhood-onset psychiatric disorders such as post-traumatic stress disorder, adjustment disorder, separation anxiety disorder, eating disorder, dissociative disorder, substance abuse, anxiety disorder, or depression may increase after exposure to traumatic stress during childhood.¹ Furthermore, childhood adversity often leads to chronic

developmental disturbances, such as increased vulnerability to future life stress and physical health problems.^{2,3}

The likelihood of experiencing adulthood pathologies may be increased following childhood adversity because severe early stress and maltreatment can induce a cascade of events that potentially influence normal brain development. For example, childhood abuse affects neurogenesis, synaptic overproduction and pruning, and myelination during specific sensitive periods,⁴ and may also induce hyperactivity in the hypothalamic-pituitary-adrenal (HPA) axis and result in smaller hippocampal volumes.⁵ Furthermore, childhood adversity is associated with increased ex-

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posure to negative life events in adulthood and heightened emotional reactivity to stress.⁶

Childhood trauma is a strong and independent risk factor for suicidal behavior. However, most of the studies that have investigated this association were conducted in Western countries and in specific populations. In a previous study in Korea, parental death before age 12 years and suspension of school due to financial strain during adolescence were associated with adulthood suicidal behavior in the general population.⁷ However, that study did not investigate traumatic events that occurred outside the family, including physical and sexual abuse. In another study in Korea, significant associations between childhood adversity and suicidality were observed in a clinical population with depressive disorder.⁸ However, the ability to generalize this association to the general Korean population is limited.

Suicide rates in Korea are remarkably high. According to statistics reported in 2019, the suicide rate in Korea was not only the highest among Organisation for Economic Co-operation and Development countries but was more than twice the average of these countries.⁹ Thus, the development of suicide prevention strategies and the performance of additional research to identify suicide risks in the general Korean population are necessary. The present study aimed to investigate the associations between different types of childhood adversity and suicidal behavior in the general Korean population.

MATERIALS AND METHODS

1. Participants

The present study was conducted as one component of a mental health survey of the general population in South Korea. A total of 1,490 citizens living in the metropolitan city of Gwangju completed survey questionnaires in 2016 and 2018. The institutional review boards of Chonnam National University Hospital approved this study (no. TMP 2017294).

2. Suicidal behavior and childhood trauma

The primary study variables, assessed using survey responses, were suicidal behaviors, including current suicidal ideation over the past year and the lifetime histories of suicide planning and attempts. Childhood trauma was evaluated using six questionnaires that assessed childhood adversity before the age of 12 years.⁸ The types of childhood trauma included bullying victimization, violence by parents, emotional abuse, sexual violence, sexual harassment, and severe physical assault. Sexual violence and sexual harassment were classified together as sexual abuse, and violence by parents and severe physical assault were classified together as physical abuse. Thus, experiences of childhood trauma were represented by four variables in the present study.

3. Sociodemographic and clinical characteristics

The present study involved the assessment of a variety of sociodemographic characteristics, including age, sex, length of education (<12 and ≥12 years), health care insurance status (Medicare and Medicaid), and religiosity.

4. Psychiatric scales

Anxiety and depressive symptoms were measured using the Hospital Anxiety and Depression Scale (HADS), on which higher scores indicate more severe anxiety and depressive symptoms. Although this scale was originally developed to screen for anxiety and depression in physically ill patients, its reliability and validity for the assessment of symptoms of these conditions in the general population have been verified.¹⁰ Subjective stress severity was assessed using the Perceived Stress Scale (PSS), on which higher scores indicate more severe levels of perceived stress.¹¹ Resilience was assessed with the Korean version of the Connor-Davidson Resilience Scale (CD-RISC), which measures strength, endurance, optimism, sense of control, and spirituality. Higher CD-RISC scores indicate better resilience.¹² Rosenberg's Self-Esteem Scale (R-SES) was administered to evaluate self-esteem; higher scores indicate greater self-esteem.¹³ Health-related quality of life (HRQoL) was assessed using the visual analogue scale of the EuroQol 5D (EQ-5D), on which higher scores indicate a better quality of life.¹⁴

5. Statistical analysis

Respondents' sociodemographic characteristics, clinical scale scores, and suicidal behaviors were compared independently according to the presence of the four types of childhood adversity using chi-squared and *t* tests. To identify independent associations between childhood adversity and suicidal behaviors, logistic regression analyses were performed with covariates that were significant in the univariate analyses. All statistical analyses were performed using the Statistical Package for the Social Sciences (version 25.0; IBM Corporation, Armonk, NY, USA), and two-tailed *p* values <0.05 were considered to indicate statistical significance.

RESULTS

Table 1 displays the sociodemographic characteristics of the participants according to histories of childhood adversity. The mean age of the 1,490 participants was 42.9±14.2 years. A total of 332 (22.3%) reported more than one type of childhood adversity. Physical abuse was the most common type of adversity (10.8%), followed by bullying (9.3%), sexual abuse (7.2%), and emotional abuse (6.4%). Participants who experienced bullying or sexual abuse during childhood were significantly younger than those who did not report such experiences. Women were more likely to report experiences of bullying, sexual abuse, and emotional abuse, whereas men were more likely to report experiences of physical abuse. Additionally, participants who experi-

TABLE 1. Comparisons of sociodemographic characteristics according to childhood adversity history

	N (%)	Age, years mean (SD)	Sex, female N (%)	Education, >12 years N (%)	Medicare, yes N (%)	Religion, yes N (%)
Total	1490 (100)	42.9 (14.2)	786 (53.1)	933 (64.0)	91 (6.5)	868 (59.5)
Bullying						
Yes	136 (9.3)	34.0 (13.2)	85 (62.5)	83 (61.5)	17 (13.2)	86 (63.2)
No	1327 (90.7)	43.6 (14.0)	688 (52.2)	847 (64.8)	72 (5.7)	771 (59.0)
p-value		<0.001	0.024	0.451	0.004	0.360
Sexual abuse						
Yes	105 (7.2)	38.4 (12.7)	92 (87.6)	79 (75.2)	8 (7.8)	66 (62.9)
No	1355 (92.8)	43.0 (14.2)	680 (50.5)	850 (63.7)	82 (6.4)	788 (59.1)
p-value		0.001	<0.001	0.019	0.530	0.472
Physical abuse						
Yes	158 (10.8)	43.1 (14.1)	65 (41.4)	84 (54.9)	20 (13.2)	91 (58.0)
No	1302 (89.2)	43.0 (14.7)	708 (54.7)	843 (65.6)	68 (5.5)	763 (59.5)
p-value		0.656	0.002	0.012	0.001	0.731
Emotional abuse						
Yes	96 (6.4)	41.8 (14.8)	62 (64.6)	52 (54.7)	11 (12.1)	60 (62.5)
No	1367 (93.4)	42.7 (14.1)	713 (52.5)	876 (65.0)	79 (6.1)	798 (59.3)
p-value		0.536	0.026	0.046	0.042	0.591

TABLE 2. Comparisons of psychiatric measures and suicidality according to childhood adversity history

	HADS Mean (SD)	PSS Mean (SD)	CDRS Mean (SD)	R-SES Mean (SD)	EQ-5D Mean (SD)	Suicide idea N (%)	Suicide plan N (%)	Suicide attempt N (%)
Total	10.2 (6.3)	17.2 (4.7)	65.6 (14.9)	28.9 (4.3)	73.2 (15.3)	103 (7.0)	131 (8.9)	71 (4.8)
Bullying								
Yes (n=136)	12.9 (7.0)	19.7 (4.9)	61.5 (16.2)	26.9 (5.1)	68.4 (16.4)	30 (22.1)	42 (31.3)	24 (17.9)
No (n=1327)	9.9 (6.1)	17.0 (4.6)	66.1 (14.7)	29.2 (4.3)	73.8 (15.1)	73 (5.5)	89 (6.7)	47 (3.6)
p-value	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sexual abuse								
Yes (n=105)	13.8 (6.6)	19.2 (5.7)	63.2 (15.5)	28.6 (5.2)	70.1 (16.4)	26 (24.8)	30 (28.6)	19 (18.1)
No (n=1355)	9.9 (6.2)	17.1 (4.6)	65.9 (14.9)	29.0 (4.3)	73.5 (15.2)	77 (5.7)	101 (7.5)	52 (3.9)
p-value	<0.001	<0.001	0.093	0.321	0.035	<0.001	<0.001	<0.001
Physical abuse								
Yes (n=158)	12.7 (6.3)	18.7 (5.1)	62.0 (15.7)	27.6 (4.6)	0.8 (0.1)	26 (16.5)	39 (24.8)	26 (16.6)
No (n=1302)	9.8 (6.2)	17.0 (4.6)	66.1 (14.8)	29.2 (4.3)	0.9 (0.1)	76 (5.8)	91 (7.0)	44 (3.4)
p-value	<0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001
Emotional abuse								
Yes (n=96)	14.6 (7.3)	20.2 (4.7)	57.4 (15.7)	26.3 (5.2)	64.8 (18.8)	19 (19.8)	34 (35.8)	15 (15.8)
No (n=1367)	9.9 (6.1)	17 (4.6)	66.1 (14.7)	29.2 (4.3)	73.9 (14.8)	84 (6.2)	97 (7.1)	56 (4.1)
p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

CDRS: Connor-Davidson Resilience Scale, EQ-5D: EuroQol 5D, HADS: Hospital Anxiety and Depression scale, PSS: Perceived Stress Scale, R-SES: Rosenberg's Self-Esteem Scale.

enced bullying, physical abuse, or emotional abuse were more likely to have Medicaid insurance, which represents poor economic status.

Table 2 shows the comparisons of psychiatric measure scores and suicidal behaviors according to histories of childhood adversity. Participants who experienced any type of childhood adversity had significantly higher HADS and PSS scores and lower EQ-5D scores, whereas participants with histories of bullying, physical abuse, or emotional abuse, but not sexual abuse, had significantly lower CD-

RISC and R-SES scores. Participants who experienced any type of childhood adversity were more likely to have current suicidal ideation over the past year and lifetime histories of suicide planning and attempts.

Table 3 shows the results of multiple logistic regression analyses of the associations between each type of childhood adversity and types of suicidal behavior after adjustment for age, sex, education, Medicaid insurance, other childhood traumas, and scores on the HADS, R-SES, CD-RISC, PSS, and EQ-5D. These multivariate analyses revealed

TABLE 3. Logistic regression analysis of the associations between each type of childhood adversity and types of suicidal behavior

	Suicide idea; recent 1 year		Suicide plan; life long		Suicide attempt; life long	
	OR (CI)	p-value	OR (CI)	p-value	OR (CI)	p-value
Bullying	2.5 (1.2-5.3)	0.012	3.1 (1.6-6.0)	0.001	5.2 (2.3-11.6)	<0.001
Sexual abuse	5.3 (2.5-11.2)	<0.001	3.0 (1.5-6.1)	0.003	3.2 (1.3-7.8)	0.010
Physical abuse	1.5 (0.7-3.0)	0.257	2.2 (1.2-4.0)	0.014	3.2 (1.5-6.6)	0.002
Emotional abuse	0.5 (0.2-1.2)	0.108	1.3 (0.6-2.9)	0.457	0.4 (0.2-1.2)	0.113
Nagelkerke R ²	0.304		0.287		0.290	
Hosmer & Lemeshow Test	$\chi^2=8.356$	p=0.399	$\chi^2=5.474$	p=0.706	$\chi^2=8.963$	p=0.345

Note: Adjusted for age, sex, education, medical insurance, childhood traumas, and HADS, R-SES, CD-RISC, PSS, and EQ-5D scores.

that bullying victimization and sexual abuse were associated significantly with all types of suicidal behavior. Physical abuse was associated significantly with histories of suicide planning and attempts. Emotional abuse was not significantly associated with any suicidal behavior after adjusting confounding variables.

DISCUSSION

The main result of the present study was that the experience of childhood adversity was associated independently with suicidal behavior in the general Korean population. Additionally, the present study showed that all types of childhood trauma were associated significantly with suicidal ideation over the past year and histories of planned and attempted suicides. After adjustment for demographic and clinical characteristics, most of these associations remained significant. In particular, individuals who experienced bullying victimization or sexual abuse were approximately two to three times (odds ratio, 2.5-5.3) more likely to have recent suicidal ideation. Furthermore, bullying victimization, physical abuse or sexual abuse were associated significantly with a lifetime history of suicide planning and attempts (odds ratio, 2.2-5.2). Taken together, the present findings demonstrate that the experience of childhood adversity is associated significantly with the risk of suicide in the general Korean population.

Recently, bullying in schools has become an important issue in Korea. The present study showed that participants who experienced bullying were from younger generations. According to a 2018 study that was the first investigation of school violence to include bullying, 70% of all bullying victims are elementary-school students.¹⁵ Furthermore, cross-sectional studies have found that high-school students who are victimized by bullying are more likely to have suicidal ideation.¹⁶ Similarly, a prospective study of middle-school students revealed associations between suicidality and bullying among victims and offenders.¹⁷ To our knowledge, however, the present study is the first to document an association between bullying experienced before the age of 12 years and lifelong suicidal behavior. These findings suggest that school mental-health programs should include interventions to prevent current and future sui-

cidality associated with bullying.

Several previous studies have revealed associations between childhood physical abuse and suicidal behavior. Historically, Korean culture features a patriarchal family system in which childhood physical abuse by parents as corporal punishment is permitted more than in Western countries. Recent meta-analyses have shown that individuals who experience spanking and physical abuse during childhood tend to express antisocial behaviors and aggressiveness,¹⁸ and lifetime aggression has been shown to be an important mediator of the relationship between childhood physical abuse and lifetime suicide attempts.¹⁹ Taken together, these findings of strong associations between childhood physical trauma and suicidal behaviors suggest the need for education about the negative impacts of physical abuse, including corporal punishment, during childhood in the context of the high suicidality rate in the general Korean adult population.

Many previous studies have documented associations between childhood sexual abuse and suicidal behaviors. In Korean patients with depressive disorder, childhood sexual abuse was found to be associated with current suicidal ideation and a history of past suicide attempts, but the significance of this association disappeared in adjusted multivariate analyses.⁸ The present finding of a significant association between histories of childhood sexual abuse and high suicidality in the general Korean population suggests the need for careful long-term clinical support for children victimized by sexual abuse.

A meta-analysis showed that emotional abuse has strong effect on suicidal behavior.²⁰ Similarly, emotional abuse in childhood is more associated with suicidal ideation and suicide attempts than is sexual or physical trauma.²¹ However, the significance of the relationships between emotional abuse and suicidal behavior disappeared after adjustment for other types of trauma and various correlates in that analysis. The limitations of the questionnaires used to identify emotional abuse must also be considered.

Childhood adversity can disrupt the early development of the central nervous system, and negatively affect the functioning of the prefrontal cortex and hippocampus later in life.²² These biological changes induced by toxic stress can have severe adverse influences on judgement and emo-

tional regulation. Thus, individuals who experienced traumatic events during childhood are more likely to exhibit problems with emotional and behavioral self-regulation later in life, and to attempt suicide.²³ In addition, adults who experienced childhood trauma have higher levels of stress perception, anxiety, and depression.^{2,3} It can be inferred that childhood trauma victims have high stress perception due to abnormalities in the HPA axis caused by trauma-induced dysregulation of the early neurobiological stress response.²⁴ In biological terms, dysregulation of the HPA axis plays a major role in the pathology of depression. For example, stress-induced hypercortisolemia results in the downregulation of glucocorticoid receptors, which, in turn, alters the cortisol negative feedback loop and results in heightened corticotropin-releasing hormone and adrenocorticotrophic hormone levels. This vicious cycle increases cortisol levels and ultimately results in hippocampal atrophy and a reduced nerve regeneration rate. The HPA axis and glucocorticoid hormones are also involved in the development of anxiety and fear after exposure to stress.²⁵

In terms of cognition, early maladaptive schemas formulated by traumatic experiences could aggravate ambivalence regarding emotional expressiveness and induce the use of negative coping styles, which could exacerbate depressive symptoms in adults.²⁶ Similarly, a recent study conducted in Korea showed that rumination mediates the influence of childhood trauma on the development of depression and anxiety in non-clinical adults.²⁷

Except for sexual abuse, childhood adversities are associated with lesser resilience, self-esteem, and HRQoL. Resilience is a defense mechanism that individuals can develop against adversities. For example, a study targeting a community population with no major depressive disorder in the past 12 months showed that many childhood trauma victims have longitudinal psychological damage, and that resilience may be a protective factor against this process.²⁸ In other words, individuals with high levels of resilience are more likely to be mentally healthy despite their childhood traumas, whereas those with less resilience are more likely to develop major depressive disorder after childhood trauma. However, whether resilience is a temperamental ability that is applicable against trauma or the result of an adaptive process according to specific types of adversity remains unclear.

In general, previous studies have revealed strong positive correlations between childhood maltreatment and low self-esteem. A systematic review revealed similar patterns of this correlation in the East Asia and Pacific regions.²⁹ For example, Asian populations including those in Korea, tend to consider traditional values to be very important because they embody family hierarchy, shame, and Confucian principles. The present results suggest that Korean individuals who are maltreated search for the causes in themselves and, due to internalization, have lower levels of self-esteem and resilience. Similarly, HRQoL is a multi-dimensional concept that incorporates physical, mental, emotional, and social functioning domains. A systematic

review identified robust and consistent evidence of an inverse relationship between childhood maltreatment and current HRQoL in adults,³⁰ which is comparable to the present results.

The present study has several limitations that should be considered when interpreting the results. First, childhood adversities and suicidality were assessed using a checklist; thus, recall bias may have been present due to the participants' current mental states. Second, the severities of the suicidal behaviors and childhood traumas were not assessed; quantitative measures could have been employed. Finally, the causality of relationships between childhood adversity and mental health issues in adulthood could not be examined due to the cross-sectional design of the study, which involved measurement of the variables at a single timepoint. Nonetheless, considering the limited amount of previous studies investigating associations between various childhood adversities and adulthood suicidal behavior in the general Korean population, this study has important clinical implications. The present study provides clinical evidence that the identification of childhood adversity is very important for the appropriate management of suicide risk and mental health difficulties in the general population.

In conclusion, the present study demonstrated that various types of childhood adversity, including bullying, sexual abuse, and physical abuse were associated with suicidal behavior in a general population of Korean adults. Additionally, these findings showed that mental health and HRQoL were related to the experience of childhood trauma, suggesting the need to prevent childhood adversity in Korean society to reduce suicidality and mental health issues in the general adult population.

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CONFLICT OF INTEREST STATEMENT

None declared.

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