

Effect of Childhood Adversity and Positive Psychological Resources on Stress Response—Comparison Between Depressed and Nondepressed Young Adults

ABSTRACT

Objective: The purpose of this study was to explore the relationship between stress response, childhood adversity, and positive psychological resources in young adults, to investigate the mediation effect of positive psychological resources, and to compare the moderated mediation effects between depressed and non-depressed groups.

Methods: A total of 360 young adults (165 outpatients diagnosed with depression and 195 non-depressed participants) were recruited. Data were collected using the Adverse Childhood Events questionnaire, Positive Resources Test, and Stress Response Inventory. Models 4 and 14 of the PROCESS macro were used to test the mediating and moderated mediating effects.

Results: In both groups, the stress response was negatively correlated with positive psychological resources and positively correlated with childhood adversity. Positive psychological resources mediated childhood adversity and depression. In the depression group, positive resources had a moderated mediation effect on the relationship between childhood adversity, positive psychological resources, and stress response.

Conclusion: The findings suggest the importance of enhancing positive psychological resources, especially in patient groups, to help overcome childhood adversity and cope with stress more effectively.

Keywords: Positive psychology, child adverse events, stress response, depression, young adults

Introduction

Psychological stress can be defined as a negative emotional experience followed by anticipated physiological and behavioral changes that aim to adapt, either by changing the circumstances to modify the stressor or tolerating its consequences.¹ Young Korean adults experience extremely high levels of stress.² According to a national survey conducted in 2020, 28.6% of Korean adults reported that their lives were very stressful or highly stressful, and 10.5% reported depression.³ Their primary sources of stress may be the factors such as relentless competition, parenting strain, performance-related pressure, lack of free time, and interpersonal relationships.^{2,4,5} Such persistently high levels of stress can lead to negative psychological impacts on a person, including helplessness, insomnia, loneliness, and the onset or worsening of anxiety and depression.^{6,7} Response to stress can be described as physical, psychological, and behavioral reactions to such stressors, which can help identify the early signs of emotional problems. Therefore, adequate and timely interventions for the stress response are essential to help cope with stress and prevent mental disorders at an early stage.

One of the most commonly reported causes of maladaptation to stress is exposure to adverse events during early childhood.⁸ That is, children subjected to early negative experiences may



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remain vulnerable to increasingly stressful circumstances throughout adolescence and adulthood, such as decreased support in social interactions.⁹ Such continuity of stress is likely to be anchored in structural contexts that are generally persistent, such as financial instability or family conflict, which increase the risk of subsequent exposure to stress. By perceiving and responding to stress in ways that intensify stressful conditions, the detrimental effects of early adversity may result in traumatic behaviors and failure to cope with stress, which can lead to depression.¹⁰⁻¹² Therefore, it is important to examine coping strategies in young adults with depression due to their relatively high prevalence of childhood adversity and maladaptive stress responses.

Among those who experienced childhood adversity, not all report hardships in coping with stress; therefore, it is necessary to discover their coping pathways. The effective use of positive psychological resources has been reported to decrease stress responses in patients suffering from depression.¹³ Positive psychology resources are brief cognitive and behavioral interventions that aim to restructure thoughts, feelings, and behaviors toward states of positive well-being.^{14,15} Individual psychological resources, such as self-control, self-compassion, and resilience, may help mitigate high stress.¹⁶ Positive psychological resources can be particularly effective at reducing stress among patients because they are easily accessible and learned, and because nurturing and sustaining these resources is primarily due to individual discretion rather than social experiences.¹⁷

Although positive psychological principles are known to be effective in decreasing stress and depression,¹⁸ individual access to these resources remains a challenge. In addition, such applications must be supported by an adequate understanding of positive psychology and its relationship with childhood adversity and stress responses. Therefore, the purpose of this study was to investigate the mediation effect of positive psychological resources and to compare the mediation effects between the depressed and non-depressed groups. The hypothesis of our study is as follows: (1) positive psychological resources will mediate childhood adversity and stress response and (2) the mediating effect of positive psychological resources will be different between the depressed group and the non-depressed group.

Methods

Setting and Sample

All participants were between 18 and 45 years of age and comprised outpatients with depressive disorders and a general population sample. We consecutively recruited outpatients who visited the mood

clinic at Jeju National University Hospital in a city in Korea, between October 2017 and September 2018, and met the DSM-5 criteria for depressive disorders. Diagnoses were made by a well-trained psychiatrist (JYE). The exclusion criteria included lifetime diagnoses of other psychiatric disorders (e.g., psychotic disorders), depressive disorder secondary to organic etiology and/or severe physical illness, and epilepsy and/or other organic brain disorders. A total of 165 outpatients who met the study criteria consented to participate in the depressed group. The clinical diagnoses of the depressed group at recruitment included major depressive disorder ($n=99$, 60.0%), persistent depressive disorder ($n=34$, 20.6%), and depressive disorder not otherwise specified (NOS) ($n=32$, 19.4%). The mean duration related to depression illness was 1.9 (± 1.8) years. During the 1-year study period, volunteers for the non-depressed group have recruited through information flyers advertisements in communities and hospitals in a city in Korea. Individuals with a history of current or previous psychiatric or severe physical illnesses were excluded. While 210 young adults were initially willing to participate in the study, 15 candidates declined to complete it; hence, all 195 volunteers were enrolled in the non-depressed group.

This study was approved by the Institutional Review Board of Jeju University Hospital (JEJUNUH 2017-06-015-003). All subjects provided informed consent for their participation in this study after the procedure was fully explained to them. For the sample size of the PROCESS macro as a logistic regression path analysis model, Vittinghoff and McCulloch (2007) suggested that a minimum of 10 cases per predictor variable is adequate.¹⁹ Accordingly, given that there were 5 parameters in the model, a sample size of 50 in each group was considered necessary for sufficient analysis.

Measures

Stress Response: Stress response was measured using the Stress Response Inventory (SRI), developed by Ko et al.²⁰ which was developed to measure stress responses in the general Korean population. The SRI consists of 39 items rated on a 5-Likert scale and includes 7 symptom subscales: tension, aggression, somatization, anger, depression, fatigue, and frustration. The scores ranged from 0 to 156, with higher scores indicating higher levels of stress. The reliability of this study was 0.98.

Childhood Adversity: The Adverse Childhood Experiences (ACEs) questionnaire was used to assess childhood adversity.²¹ This questionnaire consists of 10 items, including ACEs on emotional abuse, physical abuse, emotional neglect, physical neglect, parental separation or divorce, mothers treated violently, substance abuse in the household, mental illness in the household, and incarcerated household members. The responses were collected as yes/no responses, and the number of yes responses was summed. The scores ranged from 0 to 10. The ACE questionnaire has been validated in the Korean population (Cronbach's $\alpha=0.92$), and in this study, it was 0.81.

Positive Psychological Resources: Positive psychological resources were assessed using the Positive Resources Test (POREST), developed by Huh et al.²² The POREST was developed to measure individuals' positive psychological resources in clinical settings and is measured on a 5-point Likert scale with 23 items. It consists of 4 domains: optimism, purpose and hope, self-control, and support and caregiving. In this study, Cronbach's α was 0.95.

MAIN POINTS

- Positive psychological resources had a mediating effect on the relationship between childhood adversity and stress response.
- The moderated mediation effect among childhood adversity, positive psychological resources, and stress response was significant in depressed group.
- Promoting positive psychological resources can help to overcome and cope with stress more effectively among depressive patients with childhood adversity.

Statistical Analysis

Data were analyzed using Statistical Package for Social Sciences version 25.0 (IBM SPSS Corp.; Armonk, NY, USA), and the models were analyzed using the mediation, moderation, and conditional process analysis (PROCESS macro) developed by Hayes.²³ First, categorical variables of the general characteristics were presented with *n* (%) values. The study variables were presented as median (interquartile range) and mean (standard deviation). Second, spearman's rank correlation coefficient was performed to examine the relationships with the non-normally distributed variable (childhood adversity). Pearson's correlation coefficient analysis was conducted to examine the relationship between normally distributed variables (stress response and positive psychological resources). Third, the multiple linear regression analysis was performed to examine the influence of independent variables on the stress response. The assumptions related to the linear regression model (linearity, normality, homoscedasticity, and multicollinearity) were examined and met. A *P*-value of less than .05 was considered statistically significant. Fourth, PROCESS macro Model 4 was used to examine whether positive psychological resources mediated the relationship between stress response and childhood adversity. Fifth, PROCESS macro Model 14 was used to verify the moderating effect of depression among those relationships. In this PROCESS macro approach, effects are assessed with a bias-corrected bootstrap confidence interval (CI). A 95% bias-corrected bootstrap CI with 5000 resamples was used to test the indirect effects. If the upper and lower bounds of the bias-corrected 95% CI did not include zero, the mediating or moderating effect was considered significant.

Results

General Characteristics of the Study Participants

Table 1 presents the descriptive characteristics of the participants. As seen from the table, the depressed and non-depressed groups were homogenous in terms of age, gender, and education. In the depressed group, their mean age was 27 (SD=7.7) years, 42.8% of the participants were female, and 21.8% had a bachelor's degree or higher. In the non-depressed group, their mean age was 27 (SD=7.7) years, 42.6% of the participants were female, and 22.6% had a bachelor's degree or higher. The family income was distributed as follows: 53.3% ≥3 million Korean won per month in depressed group, and 55.4% ≥3 million Korean won per month in non-depressed group.

Only 25% of participants experienced more than one adversity event during childhood. Their mean scores for positive psychological resources and stress response were 75.32 (SD=17.67) and 45.39 (SD=38.63), respectively. In the sub-domain of the positive psychological resources, their mean scores for optimism, purpose and hope, self-control, and support and caregiving were 3.34 (SD=0.86), 3.19 (SD=0.88), 3.00 (SD=0.85), and 3.56 (SD=0.85), respectively.

Correlations Among Study Variables

The relationship among stress response, childhood adversity, and positive psychological resources is described in Table 2. Childhood adversity was negatively correlated with positive psychological resources ($r = -0.36$, $P < .001$) and positively correlated with stress response ($r = 0.44$, $P < .001$). Further, the positive psychological resources were negatively correlated with stress response ($r = -0.60$, $P < .001$).

Table 1. General Characteristics of the Study Participants

	Total (n = 360) n (%) / Mean (SD)	Depressed Group (n = 165) n (%) / Mean (SD)	Non- Depressed Group (n = 195) n (%) / Mean (SD)
Gender			
Male	207 (57.5)	95 (57.2)	112 (57.4)
Female	153 (42.5)	70 (42.8)	83 (42.6)
Marital status			
Married	270 (75.0)	136 (82.4)	134 (68.7)
Unmarried	90 (25.0)	29 (17.6)	61 (31.3)
Education			
≤High school	280 (77.8)	129 (78.2)	151 (77.4)
≥Bachelor's degree	80 (22.2)	36 (21.8)	44 (22.6)
Employment			
Yes	108 (30.0)	31 (18.8)	77 (39.5)
No	252 (70.0)	134 (81.2)	118 (60.5)
Family income (won/month)			
<3 million	164 (45.6)	77 (46.7)	87 (44.6)
≥3 million	196 (54.4)	88 (53.3)	108 (55.4)
Childhood adversity ^a	0 (0-1)	1 (0-3)	0 (0-0)
Positive psychological resources	75.32 (17.67)	65.35 (16.27)	79.25 (14.42)
Stress response	45.39 (38.63)	73.32 (34.07)	20.48 (21.60)

SD, Standard deviation; ^amedian (interquartile range).

Influence of Independent Variables on Stress Response

The regression model was statistically significant ($F = 30.10$, $P < .001$) and explained 41% of the variance in stress response. While controlling for general characteristics (age, gender, marital status, education level, employment status, and family income), childhood adversity (unstandardized estimate (β) = 4.45, $P < .001$) and positive psychological resources ($\beta = -1.05$, $P < .001$) significantly influence on stress response. Among general characteristics of the participants, the family income only impacted on stress response ($\beta = -7.44$, $P = 0.024$). Therefore, all the models were controlled for family income while conducting mediation analysis.

Testing for Mediation Effects of Positive Psychological Resources

The PROCESS macro model (Model 3) was used to examine whether positive psychological resources mediated the association between childhood adversity and stress response and to verify the indirect effects of mediation (Table 3). We performed bootstrapping at a 95% CI with 5000 bootstrap samples and calculated the CI of the lower

Table 2. Correlations Among Study Variables

	Childhood Adversity	Positive Psychological Resources	Stress Response
Childhood adversity	1	—	—
Positive psychological resources	-0.36 [†] ($< .001$)	1	—
Stress response	0.44 [†] ($< .001$)	-0.60 ^{††} ($< .001$)	1

[†]Spearman's rank correlation coefficient; ^{††}Pearson correlation coefficient.

Table 3. Mediating Effects of Positive Psychological Resources on the Relationship Between Childhood Adversity and Stress Response

	β	SE	<i>t</i>	<i>P</i>	LLCI	ULCI
Childhood adversity → Positive psychological resources	-3.17	0.50	-6.32	< .001	-4.16	-2.18
Childhood adversity → Stress response	4.38	0.96	4.58	< .001	2.50	6.27
Positive psychological resources → Stress response	-1.17	0.10	-11.50	< .001	-1.37	-0.97
Total effect	8.10	1.08			5.99	10.22
Direct effect	4.38	0.96			2.50	6.27
Indirect effect	3.72	0.68			2.47	5.18

Controlling for family income; β , unstandardized estimates; LLCI, lower 95% confidence interval; SE, standard error; ULCI, upper 95% confidence interval.

(LLCI) and upper bounds (ULCI). The models were controlled for family income.

The direct effects of childhood adversity on stress response ($\beta = 4.38$, 95% CI = 2.50, 6.27) were significant. The indirect effects of childhood adversity on stress response through positive psychological resources ($\beta = 3.72$, 95% CI = 2.47, 5.18) were also significant. These results indicate that positive psychological resources mediated the relationship between childhood adversity and stress response.

Testing for the Moderated Mediation Effect of Depression on the Pathway

To further investigate the difference between the 2 groups, the moderated mediation model was performed based on the mediation model using Model 14 of the PROCESS macro (Table 4). Depression had a moderating effect on the pathway between positive psychological resources and stress response ($\beta = -0.97$, $P < .001$). The

interaction term for positive psychological resources and depression was positively related to the stress response.

Childhood adversity had no direct effect on stress response ($\beta = 0.95$, 95% CI = -0.39, 2.28). The conditional indirect effect of positive psychological resources on stress response confirmed that, in the depressed group, there was a significant moderating effect on the indirect relationship between childhood adversity and stress response ($\beta = 2.96$, 95% CI = 1.85, 4.24). In contrast, in the non-depressed group, there was no significant relationship between childhood adversity and stress responses ($\beta = 0.01$, 95% CI = -0.15, 0.13). The final moderated mediation model is illustrated in Figure 1.

Discussion

Although it is known that many people with depression have difficulties coping with stress, and positive psychology interventions

Table 4. Moderated Mediation Effect of Depression in the Relationships Between Childhood Adversity, Positive Psychological Resources, and Stress Response

	β	SE	<i>t</i>	<i>P</i>	LLCI	ULCI
Childhood adversity → Positive psychological resources	-3.05	0.46	-6.61	< .001	-3.96	-2.14
Childhood adversity → Stress response	0.95	0.68	1.40	0.163	-0.39	2.28
Positive psychological resources → Stress response	-1.93	0.24	-8.08	< .001	-2.41	-1.46
Depression → Stress response	-61.73	2.78	-22.2	< .001	-67.21	-56.25
Positive psychological resources * Depression → Stress response	0.97	0.16	5.88	< .001	0.64	1.29
Direct effect (childhood adversity → stress response)	0.95	0.68			-3.96	2.28
Conditional indirect effect						
Depressed group	2.96	0.61			1.85	4.24
Non-depressed group	0.01	0.07			-0.15	0.13

Controlling for family income; β , unstandardized estimates; LLCI, lower 95% confidence interval; SE, standard error; ULCI, upper 95% confidence interval.

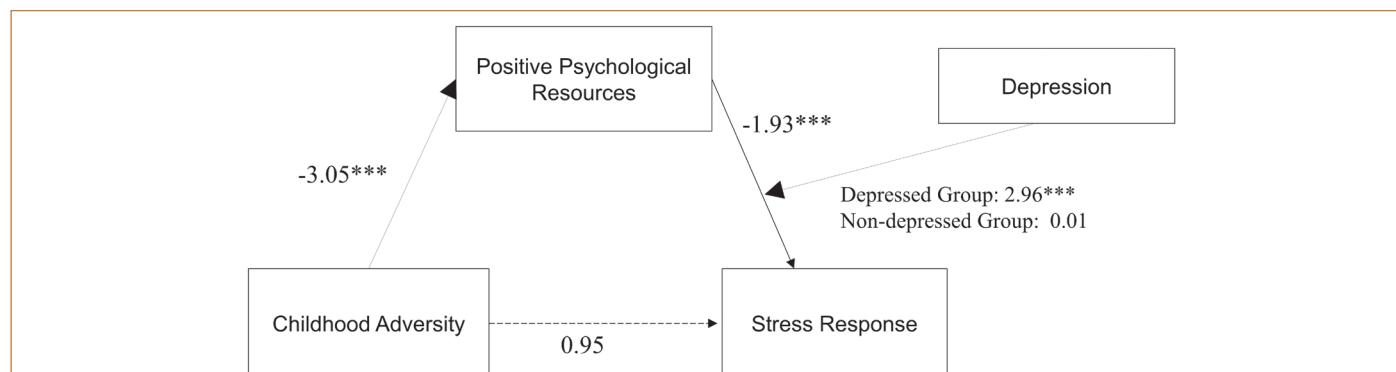


Figure 1. Moderated mediation effects of depression on the relationships between stress response, childhood adversity, and positive resource. Solid arrow: statistical significance ($***P < .001$); dotted arrow: no statistical significance.

are effective in reducing stress, their mechanisms and relationships for adequate application remain unclear. In this context, the current study aimed to extend research on the mediating role of positive psychological resources by comparing the interactions between childhood adversity and stress response in depressed and non-depressed young adults. In addition, the study further modified the model by testing the moderated mediation effects of depression on the relationship between childhood adversity, positive psychological resources, and stress responses.

In the present study, the level of stress response and childhood adversity experiences in the depressed group were higher than those in the non-depressed group. Patients with depression had lower levels of positive psychological resources, and the prevalence of childhood adversity was higher than that in the non-depressed young adults. This is similar to previous studies that reported that patients suffering from depression had higher actual stress levels, which were associated with childhood maltreatment.^{24,25}

The results of the current study showed that positive psychological resources had mediation effects on the relationship between childhood adversity and stress response. Positive psychological resources had a complete mediation effect on the study participants. The result of the study implies that individuals employ positive psychological resources to deal with stressful situations. This is consistent with the previous study which showed that the effects of adverse events in early life were buffered by psychological resources, such as emotional support and self-esteem.²⁶ However, more study is necessary to better understand the mechanism of adverse life events and provide insight into the effects of cumulative stress over the lifespan.

Additionally, depression moderated the mediation effects in the relationship between positive psychological resources and stress response. That is, the depressed group with high levels of positive psychological resources had low levels of stress response despite experiencing early childhood adversity. In other words, in patients who were diagnosed with depression in comparison to the non-depressed young adults, childhood adversity did not have a direct effect on the stress response, and positive psychological resources played a critical role in this relationship. These findings suggest that the mechanism of the recent stress response involves a more complicated process than that of the non-depressed group. Therefore, it is important to help nurture positive psychological resources while implementing stress management interventions in patients with depression.

Recent research has been conducted on the effectiveness of positive psychology interventions (PPIs) on depression and psychological symptoms.^{27,28} In recent years, the importance of positive psychological resources has emerged as a protective factor that affects the cause, severity, and prognosis of depression. However, little research has been conducted on reducing the stress response with PPI. Therefore, the implementation of positive psychological interventions to reduce stress responses, especially in patients suffering from depression, is necessary. In addition, for timely and adequate implementation, considering the complex dynamics of patients with depression is important to prevent consequent mental diseases as a result of the high levels of stress responses.

This study implies that individuals employ positive psychological resources to deal with stressful situations, which is consistent with other findings. Therefore, interventions to improve positive psychological resources in patients with depression are more critical in helping manage stress than in those who are not depressed. In particular, in the process of devising such programs, the sub-items of positive psychological resources such as optimism, purpose and hope, self-control, and social support should be taken into consideration. Among them, optimism is associated with a consistent tendency to believe that good things will happen rather than unpleasant things; those with higher levels of optimism experience less self-criticism and social withdrawal.^{29,30} Those with a sense of high purpose and hope are reported to have motivating and life-organizing goals,³¹ and those with a sense of high self-control may possess adaptive emotional control skills after experiencing negative life events owing to high self-regulation skills.³² It is also widely reported that social support is important for reducing stress and depression.³³ Therefore, there is a need for careful implementation of a program that can improve each subcategory evenly, and a follow-up study is needed to determine which subcategory of positive psychological resources increases stress efficiently in depressed patients.

Although this study addressed the importance of implementation for improving positive psychological resources among patients with depression by comparing group differences, it has several limitations. First, it used survey data from a specific area; therefore, generalizing the research results to the general population is difficult. In addition, as this was a cross-sectional study undertaken at a one-time point, it is inappropriate to propose any suggestion toward the causal between variables. Furthermore, there is a possibility of subjective bias among respondents because the survey was conducted using self-report questionnaires. To infer the causality among variables, potential influencing factors that may affect depression should be considered in subject selection and could have been obtained reports from third parties such as clinical interviews or physical examinations. Moreover, this study used the total score of the positive psychology scale, which is rated upon sub-domains, therefore there may be the risk of loss of power and degree of freedom. Thus, further studies focusing on the specified subtypes of positive psychological resources are recommended.

In conclusion, this study examined and compared the relationship between childhood adversity, positive psychological resources, and stress responses in both depressed and non-depressed young adults. The results showed that positive psychological resources fully mediated the relationships between childhood adversity and stress response among the patient group, and depression had a moderated mediation effect between positive psychological resources and stress response. Our findings suggest the importance of enhancing positive psychological resources, especially in the depressed group, to help overcome childhood adversity and cope with stress more effectively. The findings thus emphasize the need for a treatment that is prioritized to actively intervene, identify, and strengthen the patients' positive psychological resources, thereby regaining lower childhood stress thresholds and overcoming depression.

Ethics Committee Approval: This study was approved by Ethics Committee of Jeju National University Hospital (Approval No: JEJUNUH 2017-06-015-003).

Informed Consent: Written informed consent was obtained from the patients who agreed to take part in the study.

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Declaration of Interests: The authors have no conflict of interest to declare.

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