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Research Article

Moderated Mediation Effect of Self-esteem on the Relationship Between Parenting Stress and Depression According to Employment Status in Married Women: A Longitudinal Study Utilizing Data from Panel Study on Korean Children

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SUMMARY

Purpose: This study was to examine the moderated mediation effect of self-esteem on the relationship between parenting stress and depression among married women with children using longitudinal data from the 3rd to 6th Panel Studies on Korean.

Methods: The data from the Panel Study of Korean Children (Korea Institute of Child Care and Education) was collected as part of a longitudinal inquiry of babies born in 2008, their parents and their community environments. Only the data collected from the married women over the age of 20 who participated in the maternal survey was used for this study.

Results: The initial level of married women's parenting stress affects the initial level and the rate of change in self-esteem; the initial level of self-esteem, the initial level and rate of change in depression; and the initial level of parenting stress, the initial level of depression. However, the impact of the rate of change in parenting stress on that of self-esteem was significant only in employed women while the impact of the rate of change in self-esteem on that of depression was significant only in unemployed women.

Conclusion: It is necessary to manage parenting stress among married women through various programs and education that increase self-esteem in order to reduce their level of depression.

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Introduction

The World Health Organization has identified depression as one of the more common diseases afflicting humankind, and predicts that it will be the most common disease for all age groups by 2020 [1]. According to the Epidemiological Survey of Psychiatric Illnesses in Korea, conducted by the Ministry of Health and Welfare in 2011, the 1-year prevalence rate of depression is 3.1% and its lifelong prevalence is 6.7%, with women having twice the lifelong prevalence than that of men [2]. Women aged 20–40 years have a high incidence of depression; among married women, it negatively

affects their individual mental health and the mental health of their families, which require proactive management [3]. Furthermore, depression among married women with children affects their children's emotional and behavioral development; therefore, it is important to implement early preventive education and treatment.

Multiple factors, including physiological, psychological, social and cultural factors, affect depression in married women. The probability of experiencing depression increases in women through the processes of childbirth and menstruation, and the level of depression rises with the physical changes that follow menopause and various types of stress in everyday life [4]. Among married women with children, or, specifically, women who assume a maternal role, the stress associated with child rearing is directly related to depression; hence, parenting stress is an important factor influencing depression, which must not be overlooked [5].

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Parenting stress refers to the daily stress, where parents experience the burden of their roles cognitively and emotionally after difficulties with child-rearing activities have accumulated [6]. In Korea, the woman's role as the person primarily responsible for child rearing is emphasized, and compared to men, women experience a higher level of parenting stress. When mothers experience higher levels of parenting stress, the incidence of verbal abuse, physical abuse and children's self-esteem decline and developmental disabilities increase [7]. As the entry of women into public affairs increases, their fatigue from job stress, childcare, and housework exacerbates their child-rearing stress; consequently, depression among married women in Korean society will become worse according to experts' predictions [8].

According to the stress-vulnerability model [9] and the stress-resistance model [10], the degree of depression differs by individual even when the stressor is identical. Furthermore, people suffering from severe levels of depression have different cognitive characteristics from people with mild levels of depression. This theoretical basis implies that researchers must examine cognitive variables that induce or buffer depression by their interactions with stress, and it highlights the role of self-esteem as an important cognitive variable in the relationship between stress and depression [6]. Human beings assess themselves and the work they do as valuable and important when their self-esteem is high; they also believe the work they do will increase in value in the future when they perform new tasks. Therefore, people with high self-esteem have a lower probability of experiencing symptoms of emotional dysphoria, such as self-denial, self-contempt, anxiety and depression [11]. A study [12] on married Korean women found that although the various types of stress experienced by women induced depression, self-esteem acted as a buffer against stress to produce an effect that lowered their degree of depression. A study [11] of American adults and another study [13] of married American women found that self-esteem decreased depression among the married women and had a mediating effect on the relationship between stress and depression.

However, the levels of parenting stress, self-esteem, and depression are factors that continuously change, depending on the time and situation, and their manifestation is diverse among individuals. Despite the limitation of cross-sectional studies in evaluating the relationship between these factors, most studies on parenting stress and depression among married women are cross-sectional. Furthermore, married women who hold jobs and are full-time housewives have been found to differ in their levels of stress and depression experienced in daily life [14].

The relationship among parenting stress, self-esteem, and depression of married women requires an examination suited to the participants' characteristics, comparing their employment status and investigating the changes in each factor over time. Hence, this study compared an employed group and an unemployed group of married women with children using longitudinal data from the third to sixth panel studies on Korean children, and examined the relationship among parenting stress, self-esteem, and depression by group to establish basic knowledge for the purpose of reducing depression among married women. Details of the stipulated purpose are as follows: (a) identify the women's general characteristics; (b) check the developmental trajectories of the women's parenting stress, self-esteem and depression; (c) check the longitudinal relationships among the developmental trajectories of the women's parenting stress, self-esteem and depression; (d) check the moderated mediation effect of self-esteem on the relationship between parenting stress and depression according to employment status; (e) check the direct and indirect effects of employment status in longitudinal relationships among parenting stress, self-esteem and depression.

Methods

Study design

This study used a longitudinal descriptive research design to examine the relationship among the longitudinal developmental trajectories of the parenting stress, self-esteem, and depression of married women.

Setting and sample

The data from the Panel Study of Korean Children (Korea Institute of Child Care and Education) was collected as part of a longitudinal inquiry of babies born in 2008, their parents and their community environments. Only the data collected from the married women over the age of 20 who participated in the maternal survey was used for this study. The study recruited participants for comparisons between those who were employed and unemployed, and ultimately selected participants without changes in their employment status (resignation, parental leave, re-employment) during the corresponding survey period; women with employed status totaled 328 and women with unemployed status totaled 625.

Ethical consideration

The study underwent examination (KU IRB 2016-103) by Kosin University's Institutional Review Board, and was approved.

Measurement

Parenting stress

The tool used to measure parenting stress consisted of 11 questions from the instrument developed by Kim and Kang [15] that was revised to fit the purpose of the panel study on Korean Children. Each question is rated on a 5-point scale: from *strongly disagree* (1 point), *mildly disagree* (2 points), *neutral* (3 points), *mildly agree* (4 points), to *strongly agree* (5 points). A higher score indicates a higher level of stress related to parenting. The reliability of the tool in Kim and Kang's study [15], as measured by Cronbach α , was .86, and Cronbach α was .86 for the third panel study on Korean children used in this study, .87 for the fourth panel, and .88 for the fifth panel and the sixth panel.

Self-esteem

The instrument used to measure self-esteem consisted of 10 questions (rated on a 5-point scale) from the Rosenberg Self-esteem Scale [16], which were translated and revised to fit the panel study on Korean children. A higher score indicates a higher level of self-esteem. A preliminary study targeting Korean women [17] in 2007 reported a reliability of .82, as measured by Cronbach α , whereas Cronbach α for the third panel study on Korean children that was used in this study was of .86, and .88 for the fourth, fifth, and sixth panel studies.

Depression

The instrument used to measure depression consisted of 6 questions from the tool developed by Kessler and colleagues [18], which was translated and revised to fit the purpose of the panel study on Korean children. Each question includes a 5-point scale: from *none of the time* (1 point), *a little of the time* (2 points), *some of the time* (3 points), *most of the time* (4 points), to *all of the time* (5 points). A higher score indicates a higher degree of depression. The reliability of the tool in Kessler's study [18], as measured by Cronbach α was .89. Cronbach α for the third and fourth panel studies on

Korean children used in this study was .91, followed by .92 for the fifth and sixth panel studies.

Data collection

A research plan was submitted through the homepage (<http://panel.kicce.re.kr>) of the panel study on Korean children, which was managed by the Korean Institute of Child Care and Education. After a deliberation process, the data used in this study were obtained, which excluded sensitive data that could disclose personal information. Panel Study of Korean Children conducted by the Korea Institute of Child Care and Education was conducted with all families, excluding those that were not included in the subjects of the survey of samples and refused to participate in the survey, among the families of newborns born between April 2008 and July 2008 at the sample medical institutions with more than 500 annual deliveries of newborns as of 2006. In total, 2,562 families were recruited as preliminary samples that had the intention to participate. Of these, 2,150 families of newborns were extracted as the final samples. To the samples of the panel of Korean children, stratified multistage sampling was applied. Stage 1 selected medical institutions where newborns are delivered; Stage 2 extracted the families of newborns who were born in the selected medical institutions as the preliminary samples; and Stage 3 constructed families that intended to participate in the panel of the families in the preliminary samples as samples. This study selected individuals who participated in all panel surveys from the third through the sixth. As a result of checking the maintenance rate of samples for their validity, it turned out that the maintenance rate of all samples of 2008 was 83.8% in the third panel survey (2010), 81.6% in the fourth panel survey (2011), 79.2% in the fifth panel survey (2012), and 77.3% in the sixth panel survey (2013).

Data analysis

The procedures to analyze the data are as follows: In order to investigate the general characteristics of the participants, the study analyzed frequencies and descriptive statistics using SPSS WIN 18.0 (SPSS Korea Data Solution, Seoul, South Korea). After verifying the validity of the study's instruments, their reliability coefficients (Cronbach α) were calculated. Measures of skewness and kurtosis, which satisfied the absolute values of < 3 and < 10 , respectively, were obtained to verify the normality of the data, for the purpose of using the full information maximum likelihood method to handle missing values in the analysis of data [19].

Correlations between the variables were performed to test for multicollinearity of the variables, and a latent growth model was analyzed using AMOS 17.0 (SPSS Korea Data Solution) in order to estimate the changing aspects of parenting stress, self-esteem and depression, depending on temporal flow. With regard to the changes in parenting stress, self-esteem and depression that were contingent upon the passage of time, the significance of the initial value and change rate was confirmed in the unconditional model, and the most suitable model was ultimately selected by comparing the fit of the changeless model and the linear model. Model fit was assessed by the use of Chi-square, the normed fit index (NFI), relative fit index (RFI), incremental fit index (IFI), Tucker Lewis index (TLI), comparative fit index (CFI) and root mean square error of approximation (RMSEA).

To confirm the mutual relationship between the developmental trajectories of each variable, the study examined the influence of the factors on the initial score and changes in depression using a significance test on the path-coefficients of the conditional model. In order to check if there is a difference in the relationships between developmental trajectories of each variable

according to employment status, a multiple group analysis was conducted. An invariance test of the path coefficient was conducted, applying an invariance constraint to each path. Lastly, bootstrapping was carried out in order to check the direct and indirect effects among the variables. Ultimately, the bootstrapping was conducted to confirm the moderated mediating effect of self-esteem on the relationship between parenting stress and depression. This study conducted an analysis of data, applying the longitudinal weighted value suggested by the Korean children and youth panel survey.

Results

Differences by participants' and groups' general characteristics

The average age of the unemployed status women was 32.74 years; 242 participants had a college/graduate or higher level of education (25.4%) and 299 had no religious affiliation (31.4%), which were the highest percentages for each variable. Household income was on average, 3.3627 million won, and 370 participants (38.8%) received exemptions from the full amount of childcare expenditures, which accounted for the highest proportion of participants. The average parenting time during the week was 2,027.72 minutes and was 905.82 minutes during the weekend. The most common type of childcare service was daycare centers, which were used by 604 (63.4%) participants. The average age of the employed status women was 32.87 years; 159 participants (16.7%) had a college/graduate or higher level of education, and 135 (14.2%) were Christian, which were the highest percentages for both variables. The average parenting time during the week was 1,048.77 minutes and it was 900.72 minutes on weekends. The most common type of childcare service was daycare centers, which were used by 220 (23.1%) participants.

Correlations and changes in each factor by time

Changes in the average score for each factor, which reflected changes in the variables over time, revealed that both the unemployed and employed groups experienced a gradual decrease in parenting stress and depression and an increase in self-esteem with the passage of time. To verify the normality of the data for each factor, the skewness and kurtosis of the data were calculated, which revealed that none of the factors exceeded the absolute value of 3 for skewness and 10 for kurtosis, thereby satisfying the normality assumption. The correlation between the factors was significant at the .05 level (Table 1).

Latent growth model for each factor and fitness test

To verify whether the changes in each factor among the unemployed status participants were statistically significant and to find the optimum model for changing trends, the fitness of the changeless model and the linear model were tested. The linear model was found to be a good fit for parenting stress ($\chi^2 = 23.13$, $df = 8$, NFI = .96, RFI = .95, IFI = .97, TLI = .96, CFI = .97 and RMSEA = .05), self-esteem ($\chi^2 = 25.37$, $df = 8$, NFI = .97, RFI = .96, IFI = .97, TLI = .96, CFI = .97 and RMSEA = .05), and depression ($\chi^2 = 24.67$, $df = 8$, NFI = .97, RFI = .98, IFI = .97, TLI = .97, CFI = .98 and RMSEA = .03). In order to verify whether the changes in each factor among the employed status group were statistically significant and to find the optimum model for changing trends, the changeless model and the linear model were tested. The linear model was found to be a good fit for parenting stress ($\chi^2 = 24.35$, $df = 8$, NFI = .97, RFI = .97, IFI = .98, TLI = .97, CFI = .98 and RMSEA = .04), self-esteem ($\chi^2 = 23.31$, $df = 8$, NFI = .99, RFI = .99,

Table 1 Correlation of Variables (N = 953).

Variables	M ± SD	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12
Unemployment status													
X1: Parenting stress 3rd	2.85 ± 0.62	1											
X2: Parenting stress 4th	2.84 ± 0.63	.70*	1										
X3: Parenting stress 5th	2.79 ± 0.64	.63*	.71*	1									
X4: Parenting stress 6th	2.72 ± 0.61	.62*	.67*	.68*	1								
X5: Self-esteem 3rd	3.57 ± 0.56	-.57*	-.48*	-.43*	-.45*	1							
X6: Self-esteem 4th	3.58 ± 0.54	-.47*	-.55*	-.47*	-.47*	.72*	1						
X7: Self-esteem 5th	3.60 ± 0.59	-.44*	-.46*	-.55*	-.46*	.68*	.72*	1					
X8: Self-esteem 6th	3.68 ± 0.49	-.42*	-.47*	-.43*	-.58*	.64*	.71*	.68*	1				
X9: Depression 3rd	2.00 ± 0.77	.54*	.44*	.42*	.42*	-.58*	-.45*	-.49*	-.40*	1			
X10: Depression 4th	1.99 ± 0.75	.45*	.54*	.50*	.45*	-.45*	-.59*	-.51*	-.39*	.58*	1		
X11: Depression 5th	1.98 ± 0.68	.40*	.46*	.59*	.49*	-.39*	-.41*	-.58*	-.44*	.56*	.58*	1	
X12: Depression 6th	1.96 ± 0.75	.38*	.44*	.44*	.58*	-.37*	-.43*	-.43*	-.56*	.43*	.52*	.59*	1
Employment status													
X1: Parenting stress 3rd	2.72 ± 0.62	1											
X2: Parenting stress 4th	2.66 ± 0.61	.68*	1										
X3: Parenting stress 5th	2.63 ± 0.66	.63*	.61*	1									
X4: Parenting stress 6th	2.51 ± 0.60	.58*	.59*	.66*	1								
X5: Self-esteem 3rd	3.78 ± 0.58	-.51*	-.40*	-.42*	-.40*	1							
X6: Self-esteem 4th	3.83 ± 0.55	-.43*	-.45*	-.32*	-.41*	.66*	1						
X7: Self-esteem 5th	3.84 ± 0.55	-.42*	-.38*	-.50*	-.49*	.64*	.67*	1					
X8: Self-esteem 6th	3.88 ± 0.50	-.35*	-.34*	-.37*	-.51*	.55*	.64*	.66*	1				
X9: Depression 3rd	1.92 ± 0.72	.49*	.48*	.39*	.36*	-.50*	-.34*	-.32*	-.28*	1			
X10: Depression 4th	1.84 ± 0.65	.35*	.35*	.32*	.35*	-.34*	-.44*	-.32*	-.32*	.52*	1		
X11: Depression 5th	1.83 ± 0.73	.29*	.29*	.45*	.38*	-.33*	-.31*	-.51*	-.30*	.45*	.50*	1	
X12: Depression 6th	1.82 ± 0.65	.28*	.28*	.34*	.51*	-.27*	-.31*	-.31*	-.43*	.41*	.41*	.49*	1

Note. *p < .001.

IFI = .99, TLI = .99, CFI = .99 and RMSEA = .04), and depression ($\chi^2 = 22.87$, $df = 8$, NFI = .98, RFI = .97, IFI = .98, TLI = .98, CFI = .99 and RMSEA = .03).

Estimating the developmental trajectory of each factor

The intercept mean score of the unemployed status participants was 2.81 ($p < .001$) for parenting stress, 3.64 ($p < .001$) for self-esteem, and 1.95 ($p < .001$) for depression, while the intercept variance was 0.27 ($p < .001$) for parenting stress, 0.25 ($p < .001$) for self-esteem, and 0.13 ($p < .001$) for depression. The slope mean score was -0.13 ($p < .001$) for parenting stress and -0.26 ($p < .001$) for depression, with an increase in the first year followed by a decrease in parenting stress and depression. The slope variance was 0.07 ($p < .001$) for parenting stress and 0.03 ($p < .001$) for depression, which confirmed individual differences in the change rate. The slope mean score was 0.07 ($p < .001$) for self-esteem, with an increase in the first year, which continued to increase as time passed. The slope variance was 0.03 ($p < .001$) for self-esteem, again confirming individual differences in the change rate.

The correlation between the intercept and slope score for each factor was -0.04 ($p < .001$) for parenting stress, -0.03 ($p < .001$) for self-esteem, and -0.04 ($p < .001$) for depression. The intercept mean score of the employed status participants was 2.81 ($p < .001$) for parenting stress, 3.64 ($p < .001$) for self-esteem, and 1.97 ($p < .001$) for depression, while the intercept variance was 0.28 ($p < .001$) for parenting stress, 0.26 ($p < .001$) for self-esteem, and 0.32 ($p < .001$) for depression. The slope mean score was -0.13 ($p < .001$) for parenting stress and -0.03 ($p < .001$) for depression. The slope variance was 0.04 ($p < .001$) for parenting stress and 0.13 ($p < .001$) for depression. The slope mean score was 0.90 ($p < .001$) for self-esteem. The slope variance was 0.03 ($p < .001$) for self-esteem, again confirming individual differences in the change rate. The correlation between the intercept and slope score for each factor was -0.03 ($p < .001$) for parenting stress, -0.03 ($p < .001$) for self-esteem, and -0.06 ($p < .001$) for depression (Table 2).

Multigroup analysis of latent growth model of parenting stress, self-esteem, and depression

The results of a multiple group analysis conducted to check if there are differences among the women's parenting stress, self-esteem and depression in the relationship between developmental trajectories according to employment status are as follows: The study verified χ^2 difference between the constrained model and the free model of the factor loading between groups by using confirmatory factor analysis after separating the two groups in order to verify the measurement invariance of the groups before verifying the difference between the groups. The results show $\chi^2 = 1,108.59$, $df = 349$ for the free model and $\chi^2 = 1,653.60$ for the constrained model, indicating no significant difference ($\Delta\chi^2/df = 545.01/349 = 1.56$) between the groups as the χ^2 difference is 545.01 when the degree of freedom for both the free model and fixed model increases by 349 (standard of χ^2 difference: $\Delta\chi^2(1) > 3.84$). As a result of a verification of multivariate latent growth models based on the latent growth model of each variable, the goodness of fit of models turned out as follows: $\chi^2 = 438.19$, $df = 164$, NFI = .97, RFI = .94, IFI = .97, TLI = .98, CFI = .96 and RMSEA = .02.

Since the research model's goodness of fit was verified, an invariance test of the measurement models was conducted for a multiple group analysis. Model 1 was the homogeneity of shape with the following values: $\chi^2 = 496.72$, $df = 191$, TLI = .92, CFI = .91 and RMSEA = .04; Model 2 was the homogeneity of intercept factors with the following values: $\chi^2 = 537.65$, $df = 194$, TLI = .92, CFI = .92 and RMSEA = .04; Model 3 was the homogeneity of slope factor with the following values: $\chi^2 = 537.74$, $df = 205$, TLI = .94, CFI = .92 and RMSEA = .05; and Model 4 was the homogeneity of path invariance with the following values: $\chi^2 = 537.48$, $df = 217$, TLI = .93, CFI = .92 and RMSEA = .05. Thus, the metric invariance was secured. As a result of a verification of path coefficient for each group, six of the nine hypotheses were statistically significant in the unemployed group while six hypotheses, too, were statistically significant in the employed group (Table 3, and Figures 1 and 2). As

Table 2 Trajectories of Variables.

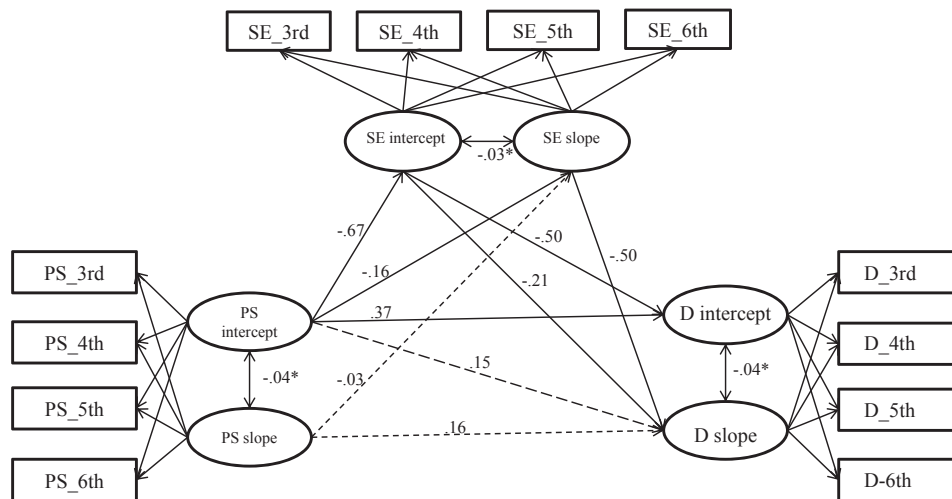
Variables		M (SE)	Variance (SE)
Unemployment status	Parenting stress intercept	2.81 (0.02)*	.27 (0.01)*
	Parenting stress slope	-0.13 (0.01)*	.07 (0.01)*
	Parenting stress intercept-slope correlation	-.04*	
	Self-esteem intercept	3.64 (0.02)*	.25 (0.02)*
	Self-esteem slope	0.07 (0.01)*	.03 (0.01)*
	Self-esteem intercept-slope correlation	-.03*	
	Depression intercept	1.95 (0.02)*	.13 (0.02)*
	Depression slope	-0.26 (0.02)*	.03 (0.02)*
	Depression intercept-slope correlation	-.04*	
	Employment status	Parenting stress intercept	2.81 (0.02)*
Parenting stress slope		-0.13 (0.01)*	.04 (0.01)*
Parenting stress intercept-slope correlation		-.03*	
Self-esteem intercept		3.64 (0.02)*	.26 (0.02)*
Self-esteem slope		0.90 (0.01)*	.03 (0.01)*
Self-esteem intercept-slope correlation		-.03*	
Depression intercept		1.97 (0.02)*	.32 (0.02)*
Depression slope		-0.03 (0.02)*	.13 (0.03)*
Depression intercept-slope correlation		-.06*	

Note. SE = standard error.
*p < .001.

Table 3 Result of Latent Growth Model on Parenting Stress, Self-esteem and Depression.

Independent variables		Dependent variables	β	B	SE	CR	p
Unemployment status	Parenting stress intercept	→ Self-esteem intercept	-.67	-0.63	0.03	-20.98	< .001
	Parenting stress intercept	→ Self-esteem slope	-.16	-0.28	0.01	-2.55	.011
	Parenting stress slope	→ Self-esteem slope	-.03	-0.07	0.04	-0.45	.650
	Parenting stress intercept	→ Depression intercept	.37	0.42	0.05	8.23	< .001
	Parenting stress intercept	→ Depression slope	.15	0.16	0.03	0.59	.553
	Parenting stress slope	→ Depression slope	.16	0.17	0.01	0.48	.639
	Self-esteem intercept	→ Depression intercept	-.50	-0.61	0.06	-11.50	< .001
	Self-esteem intercept	→ Depression slope	-.21	-0.16	0.02	-2.35	.019
	Self-esteem slope	→ Depression slope	-.50	-0.52	0.16	-9.49	< .001
	Employment status	Parenting stress intercept	→ Self-esteem intercept	-.66	-0.61	0.05	-10.67
Parenting stress intercept		→ Self-esteem slope	-.20	-0.14	0.02	-1.988	.047
Parenting stress slope		→ Self-esteem slope	-.88	-0.87	0.13	-7.05	< .001
Parenting stress intercept		→ Depression intercept	.41	0.46	0.09	4.77	< .001
Parenting stress intercept		→ Depression slope	.11	0.12	0.02	0.39	.669
Parenting stress slope		→ Depression slope	.11	0.13	0.01	0.32	.749
Self-esteem intercept		→ Depression intercept	-.44	-0.54	0.01	-5.19	< .001
Self-esteem intercept		→ Depression slope	-.38	-0.12	0.04	-2.63	.008
Self-esteem slope		→ Depression slope	-.16	-0.17	0.05	-0.28	.782

Note. CR = critical ratio; SE = standard error.



* D=Depression; PS: Parenting stress; SE=Self-esteem —————> significant - - - - -> nonsignificant

Figure 1. Result of latent growth model on unemployment status.

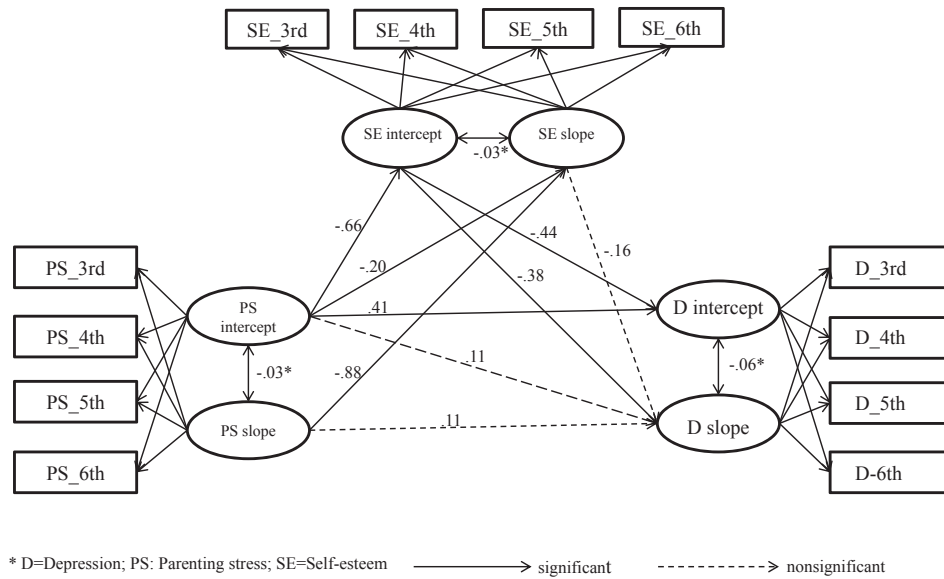


Figure 2. Result of latent growth model on employment status.

a result of the homogeneity test of coefficients applying an invariance constraint for each path in order to check if there are differences in the relationships between developmental trajectories of parenting stress with self-esteem and depression, depending on employment status, it turned out that there was a statistically significant difference in Model 9 (Self-esteem intercept → Depression slope; Table 4). Self-esteem intercept affected depression slope in employment status. There was a greater effect of self-esteem intercept in the employed status. Lastly, as a result of checking the direct and indirect effects among variables, it turned out that the initial value of parenting stress had an indirect impact on the initial value and changes in depression by the medium of self-esteem in both the unemployed group and the employed group (Table 5).

Discussion

This study aimed to check the moderated mediating effect of self-esteem on the relationship between parenting stress and

depression, dividing married women into unemployed ones and employed ones through a longitudinal analysis.

First, the initial level of parenting stress for both the unemployed and employed women affected their self-esteem and changes in their self-esteem over time. However, it turned out that the rate of change in parenting stress affects the rate of change in self-esteem only in employed women. We found that there was a difference in this result between individuals. Despite the difficulty of finding accurate results for comparison due to the lack of studies targeting employed women that examined the longitudinal relationship among the three variables, the results of our study confirmed those of cross-sectional studies [6,20] on married women. The role of women has traditionally been emphasized in Korea. Recent changes in family structure and roles have resulted in increased maternal responsibility for child rearing and increased demands on parental roles such that, regardless of the employment status of women, parenting stress causes psychological changes in women experiencing maternal roles [21,22]. Low self-esteem due to stress is highly likely to progress to negative emotions and self-loathing tendencies [23]. Therefore, to maintain emotional stability in mothers, which is strongly related to the physical and emotional development of their growing children, proactive measures for resolving the initial stress of married women on parenting are necessary, as well as an individualized approach to managing parenting stress. This is because the study confirmed variations in parenting stress among the individual participants. Furthermore, the self-esteem of mothers changed along with the change of parenting stress over time. Thus, a long-term approach for managing the parenting stress of married women, as opposed to a short-term approach, should be implemented.

Second, only the initial level of parenting stress among both the unemployed and employed status women affected the initial level of depression, which was consistent with the results of a cross-sectional study on married women conducted in the United States [24]. Parenting stress is not a one-time event but an accumulation of experiences that are repeated daily; the repetition of parenting stress negatively changes the maternal experience of married women, causing depression by intimidating them, and leading to the development of skepticism about their parental abilities [6]. Depression in mothers affects their child-rearing behavior and the development of their children [7]. Therefore,

Table 4 Homogeneity Test of Coefficients Applying an Invariance Constraint for Each Path.

Model		χ^2	$\Delta\chi^2$	Δdf
Model 1	Unconstrained	496.92	—	—
Model 2	Parenting stress intercept → Self-esteem intercept	497.16	0.24	1
Model 3	Parenting stress intercept → Self-esteem slope	496.92	0.03	1
Model 4	Parenting stress slope → Self-esteem slope	496.91	0.01	1
Model 5	Parenting stress intercept → Depression intercept	496.91	0.01	1
Model 6	Parenting stress intercept → Depression slope	496.01	0.01	1
Model 7	Parenting stress slope → Depression slope	496.90	0.01	1
Model 8	Self-esteem intercept → Depression intercept	496.92	0.01	1
Model 9	Self-esteem intercept → Depression slope	541.08	44.16*	1
Model 10	Self-esteem slope → Depression slope	497.08	0.17	1

Note. * $p < .05$.

Table 5 Direct, Indirect and Total Effect of Variables.

Independent variables			Dependent variables	Direct effect	Indirect effect	Total effect
Unemployment status	Parenting stress intercept	→	Self-esteem intercept	-.67 (< .001)		-.67 (< .001)
	Parenting stress intercept	→	Self-esteem slope	-.16 (.011)		-.16 (.011)
	Parenting stress slope	→	Self-esteem slope	-.03 (.650)		-.03 (.650)
	Parenting stress intercept	→	Depression intercept	.37 (< .001)	.38 (< .001)	.75 (< .001)
	Parenting stress intercept	→	Depression slope	.15 (.553)	.24 (< .001)	.39 (.048)
	Parenting stress slope	→	Depression slope	.16 (.639)	.03 (.123)	.15 (.401)
	Self-esteem intercept	→	Depression intercept	-.50 (< .001)		-.50 (< .001)
	Self-esteem intercept	→	Depression slope	-.21 (.019)		-.21 (.019)
	Self-esteem slope	→	Depression slope	-.50 (< .001)		-.50 (< .001)
	Employment status	Parenting stress intercept	→	Self-esteem intercept	-.66 (< .001)	
Parenting stress intercept		→	Self-esteem slope	-.20 (.047)		-.20 (.047)
Parenting stress slope		→	Self-esteem slope	-.88 (< .001)		-.88 (< .001)
Parenting stress intercept		→	Depression intercept	.41 (< .001)	.29 (< .001)	.70 (< .001)
Parenting stress intercept		→	Depression slope	.11 (.669)	.24 (.002)	.35 (.046)
Parenting stress slope		→	Depression slope	.11 (.749)	.14 (.140)	.18 (.310)
Self-esteem intercept		→	Depression intercept	-.44 (< .001)		-.44 (< .001)
Self-esteem intercept		→	Depression slope	-.38 (.008)		-.38 (.008)
Self-esteem slope		→	Depression slope	-.16 (.782)		-.16 (.782)

Note. CR = critical ratio; SE = standard error.

parenting stress among married women must be managed proactively, beginning in its initial stages. However, regardless of the employment status of the women in this study, the initial level and change of their parenting stress did not affect the change in depression over time. If these results are examined based on the Hovanitz [25] study (which reported different depression levels among individuals exposed to identical stressors), or the stress-vulnerability model [9] (which stated that depression occurred when individuals vulnerable to stress were exposed to it), the initial level of depression among the married women can be controlled by reducing their initial parenting stress. However, considering the short period for child rearing, it is necessary to respond with concern to the variables indicating a mediating effect between parenting stress and depression in order to decrease depression among married women.

Third, both the unemployed and employed status women in this study had a lower initial level of depression when their self-esteem was higher. The initial level of self-esteem affected changes in depression over time; changes in self-esteem affected levels of depression over time. However, it turned out that, for unemployed women, changes in self-esteem affect the level of depression. While for employed women, changes in self-esteem do not affect the level of depression. Since there are insufficient longitudinal analyses checking changes in married women's self-esteem and depression depending on employment status, it is difficult to compare them accurately. However, we assumed that continuous control of self-esteem had a significant impact on the reduction of unemployed women's depression. While in employed women, we assumed that intervention in the initial value of self-esteem was important for the reduction and changes in levels of depression. In addition, since, as a result of checking the difference in the path between groups in this study, there is a difference between the groups in the path in which the initial value of self-esteem affects the level of depression, it is necessary to approach the method of intervention of married women's depression depending on employment status in the clinic, too. We assumed that it was also important to determine the timing of applying education and programs that increased self-esteem.

A moderated mediating effect of self-esteem on the relationship between parenting stress and depression was found in both groups of married women. Ultimately, the study confirmed self-esteem as the parameter capable of controlling the initial level

and changes in depression, which supported the importance of self-esteem as a mediating factor of individual psychological changes resulting from stress, as presented in the cognitive aptitude-stress model [26], the psychosocial model of depression [27], and the stress-resistance model [10]. In particular, since we found that the initial value of self-esteem was a factor affecting the level of depression. At the same time, it differed depending on the employment status, an individual intervention according to the employment status should be planned for depression due to married women's parenting stress. We expected that parenting stress would have an effect on the reduction of depression by continuous control through various programs and education that increased self-esteem.

This study was significant in that it checked changes in depression over time by utilizing panel data of a 4-year survey, instead of a cross-sectional study. However, because the study was conducted with data corresponding only to 4 years and the degree of stress perceived by the parents differed depending on the growth stages of their children, a longitudinal study measuring various factors affecting depression by children's growth stage was needed.

Conclusion

This study was conducted to prepare basic data to reduce married women's depression, utilizing longitudinal data in the third through sixth Korean Children and Youth Panel Survey by understanding the relationships among the parenting stress, self-esteem and depression of married women with a child. We found that the initial level of married women's parenting stress affects the initial level and changes in self-esteem; the initial level of self-esteem, the initial level and changes in level of depression; and the initial level of parenting stress, and the initial level of depression. However, the impact of changes in parenting stress on that of self-esteem was significant only in employed women while the impact of changes in self-esteem on that of depression was significant only in unemployed women. Self-esteem was confirmed as having a moderated mediating effect on the relationship between parenting stress and depression. Thus, it is necessary to manage parenting stress among married women through various programs and education that increase self-esteem in order to reduce their level of depression. Furthermore, nursing planning and intervention for mother's

depression is necessary to control the level of parenting stress and self-esteem through a long-term approach rather than a short-term approach.

Conflict of interest

The authors declared no conflict of interest.

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