

Article

The Relationship Between Parental Academic Achievement Pressure, Physical Activity, Self-Esteem, and Body Image Among South Korean Adolescents

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Abstract: The purpose of this study is to analyze the effects of parental academic achievement pressure and physical activity on body image mediated by self-esteem. By examining a total of 1328 South Korean adolescents, this study yielded the following results. First, parental academic achievement pressure negatively affects self-esteem directly. Second, physical activity positively affects self-esteem directly. Third, self-esteem positively influences body image directly. Fourth, parental academic achievement pressure has a negative indirect effect on body image through the mediation of self-esteem. Fifth, physical activity has a positive indirect effect on body image through the mediation of self-esteem. These findings underscore the importance of appropriate physical activity, especially for adolescents under significant academic pressure. Physical activity can directly enhance self-esteem, which in turn improves body image. This study highlights the role of physical activity in mitigating the negative impact of parental academic achievement pressure on body image through self-esteem.

Keywords: academic achievement pressure; physical activity; self-esteem; body image



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1. Introduction

1.1. Need for This Study

Body image is widely recognized as a key factor influencing psychological well-being, particularly among adolescents [1]. Satisfaction with one's body image can positively impact both self-satisfaction and overall life satisfaction [1]. Conversely, adolescents with a negative body image are more likely to experience heightened feelings of depression [2]. A poor body image can also impede the development of interpersonal skills and positive peer relationships [3]. Notably, previous studies have consistently identified self-esteem as a significant factor in enhancing body image [3–8].

Self-esteem refers to an individual's positive or negative self-assessment, reflecting the degree of respect and value one places on oneself [9–11]. It plays a critical role in maintaining healthy interpersonal relationships, influencing achievement, and affecting various aspects of life, including emotions, behavior, and cognition [9–12]. Adolescents with high self-esteem tend to act confidently, think positively, and value themselves [13]. During adolescence, a period marked by significant changes and emotional fluctuations, well-developed self-esteem can help individuals adapt to challenges and promote healthy development [13]. Adolescence is a crucial period for self-esteem formation, significantly influencing cognitive development. Low self-esteem during this stage can lead to a distorted self-image, maladaptive behaviors, and self-rejection, contributing to heightened negative emotions such as depression and despair, which may eventually lead to suicidal thoughts [6,14]. Recent studies from 2023 to 2024 have found that parental academic achievement pressure can negatively affect self-esteem [15–17], whereas physical activity has been shown to positively influence self-esteem [18–21].

Parental academic achievement pressure refers to the psychological burden children experience when they perceive their parents' educational expectations exceed their own perceived abilities [22]. While moderate achievement pressure can have positive effects, such as improved academic performance, increased motivation, and a positive attitude toward education, excessive pressure can lead to negative outcomes [23]. These negative effects include lower self-esteem, higher failure rates, and mental health issues such as depression, anxiety, and even substance abuse [24]. Parental pressure for academic success can heighten students' fear of negative evaluation, further impacting their self-esteem [25]. Studies by Han and Park [15] and Min [16] indicate that parental academic achievement pressure negatively affects the self-esteem of both middle and elementary school students.

In contrast to parental academic pressure, physical activity has a positive relationship with self-esteem [18–21]. The importance of physical activity, particularly during adolescence, is well-documented, as engaging in sports during this period increases the likelihood of maintaining an active lifestyle into adulthood [26,27]. Numerous studies have established the profound positive impact of physical activity on mental health and psychological well-being [18–21], with participation in physical activity shown to significantly enhance self-esteem [18–21]. For example, an eight-week aerobic exercise program led to a significant increase in self-esteem among college students [18]. Likewise, a 12-week aerobic exercise regimen produced similar improvements in self-esteem among high school students [19]. Additionally, other studies [20,21] have shown that higher levels of physical activity boost self-esteem in adults aged from 20 to 60.

Given the importance of body image in adolescent development, this study seeks to explore the collective influence of self-esteem, parental academic pressure, and physical activity on adolescents' body image. While previous research has examined these factors individually, a comprehensive model examining their combined effects is still lacking. This study aims to address this gap by testing the direct and indirect effects of these variables on body image in adolescents.

1.2. Research Hypothesis and Research Model

Previous studies indicate several important relationships. First, parental academic achievement pressure has been shown to negatively affect self-esteem [15,16,25,28]. Second, physical activity has a positive impact on self-esteem [18–21]. Third, self-esteem plays a crucial role in positively influencing body image [3–8]. Additionally, the negative impact of parental academic achievement pressure on body image is mediated by its effect on self-esteem [15,16,25,28], suggesting that the pressure indirectly affects body image through diminished self-esteem. Similarly, physical activity enhances self-esteem, which in turn positively affects body image [3–8,18–21]. Based on these findings, we hypothesize that both parental academic achievement pressure and physical activity influence body image through the mediation of self-esteem. The research hypotheses and model (Figure 1) are outlined as follows:

Hypothesis 1 (RH1): *Parental academic achievement pressure will have a negative effect on self-esteem.*

Hypothesis 2 (RH2): *Physical activity will have a positive effect on self-esteem.*

Hypothesis 3 (RH3): *Self-esteem will have a positive effect on body image.*

Hypothesis 4 (RH4): *Parental academic achievement pressure will have a negative indirect effect on body image through the mediation of self-esteem.*

Hypothesis 5 (RH5): *Physical activity will have a positive indirect effect on body image through the mediation of self-esteem.*

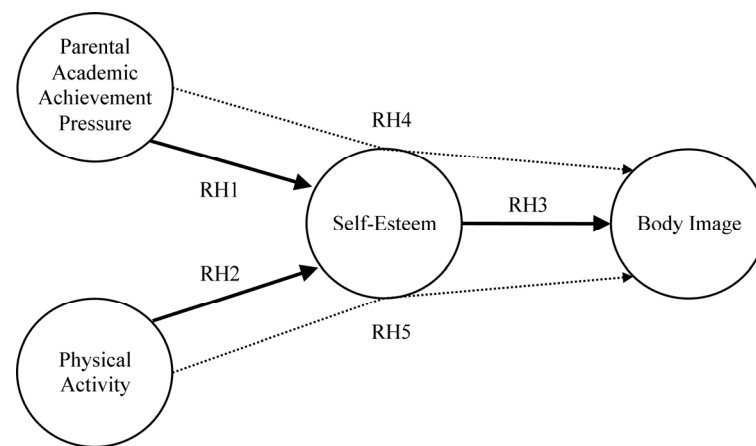


Figure 1. The proposed research model. Solid lines indicate a direct effect, while dotted lines represent an indirect effect.

2. Materials and Methods

2.1. Participants

This study utilizes raw data from the 2021 Korean Children’s Panel Survey, published by the Korea Institute of Child Care and Education, an affiliated research institute operating under the Office of the Prime Minister [29]. The Korean Children’s Panel Survey is an approved statistical survey under Article 18 of the Statistics Act of the Republic of Korea, with statistical approval number (No. 402002). The population of the Korean Children’s Panel survey consists of newborns born in 2008, who were 13 years old as of 2021. In Korea, 13 years of age corresponds to the first grade of middle school. The sample for the Korean Children’s Panel was selected through a two-stage process. First, a sampling frame was constructed using a list of medical institutions across the country that had a certain level of childbirth cases (at least 500 cases). These institutions were selected as the primary sampling units. Subsequently, to select the secondary sampling units, which were the households of newborns, the selected medical institutions were visited, and a list of newborn households was compiled from mothers who expressed their willingness to participate in the survey. The final panel was established by reconfirming participation from the households included in the preliminary sample list. A trained investigator visited the participants’ home to conduct interviews and questionnaire surveys using a tablet-assisted personal interview. The investigator also observed the household environment and conducted individual performance tests to assess the child’s development. This study analyzed data from 1328 male and female adolescents born in 2008 (Table 1), as included in the 2021 Korean Children’s Panel survey.

Table 1. Demographic information of the participants ($N = 1328$).

Type		N	%
Gender	Male	678	51.1
	Female	650	48.9
Age	13	1328	100.0

2.2. Instruments

In this study, we selected and analyzed only the research variables relevant to our study’s objectives from the 2021 Korean Children’s Panel survey. The variables used in this study include parental academic achievement pressure, physical activity level, self-esteem, and body image. Parental academic achievement pressure was assessed with a total of 15 items, using a 5-point scale ranging from (1) strongly disagree to (5) strongly agree. A higher score indicates a higher perceived pressure toward academic achievement from

parents. Example items include “My parents tell me that I need to study hard to become a great person”, “My parents dislike it when I go out with friends instead of studying”, “My parents scold me if my school grades drop even slightly”, and “My parents tell me that studying is the most important thing”. The physical activity level was assessed with a single item: “In the past 7 days, on how many days did you engage in physical activities (exercise)?” The response options range from (1) 0 to (6) 5 days or more. A higher score indicates a higher level of physical activity. Self-esteem was measured with a total of 5 items on a 4-point scale with the following options: (1) strongly disagree, (2) disagree, (3) agree, and (4) strongly agree. A higher score indicates a higher level of self-esteem. Example items include “I can do things as well as others”, “I have a lot of good qualities”, “I think I am a valuable person”. Body image was measured with a total of 3 items on a 4-point scale with the following options: (1) strongly disagree, (2) disagree, (3) agree, and (4) strongly agree. A higher score indicates a more positive perception of one’s body image. Example items include “I am satisfied with my appearance” and “I like the way I look in the mirror”.

2.3. Data Analysis

For descriptive statistics, Cronbach’s alpha and correlations were calculated using SPSS Version 20.0. Following Anderson and Gerbing’s recommendation [30], a two-step approach was applied to structural equation modeling (SEM). Initially, a confirmatory factor analysis (CFA) was conducted to evaluate the psychometric properties of the measurement model. In the subsequent step, SEM was used to explore the relationships among variables with the AMOS Version 20.0. To evaluate the overall model fit [31], the following indices were employed: chi-square (χ^2), chi-square/degrees of freedom (χ^2/df) (<5.0), comparative fit index (CFI) (>0.90), root mean square error of approximation (RMSEA) (<0.08), and the standardized root mean square residual (SRMR) (<0.08). The reliability of the constructs and their corresponding indicators was assessed using Cronbach’s alpha [32]. Convergent validity was determined through construct reliability (CR) with a threshold of 0.70 and average variance extracted (AVE) with a cutoff of 0.50 [32]. Discriminant validity was verified following the guidelines of Lichtenstein, Netemeyer, and Burton [33], ensuring that the AVE for all latent variables exceeded their respective squared correlations. The indirect effect of parental academic achievement pressure and physical activity on body image mediated by self-esteem were examined using a bootstrapping method with 5000 bootstrap samples and a 95% confidence interval [34].

3. Results

3.1. Correlations

To examine the relationships between the factors, a correlation analysis was conducted. The results of the correlation analysis and the squared values of the correlations are summarized in Table 2.

Table 2. Correlation coefficient and corresponding squared correlation coefficient.

Variables	1	2	3	4
1. Parental academic achievement pressure	1			
2. Self-esteem	−0.137 ** (0.018)	1		
3. Body-image	−0.147 ** (0.021)	0.594 ** (0.352)	1	
4. Physical activity	−0.103 ** (0.010)	0.112 ** (0.012)	0.064 * (0.004)	1

** = $p < 0.01$, * = $p < 0.05$. The number in the parentheses is the squared correlation coefficient.

3.2. Confirmatory Factor Analysis

The analysis of the fit of the measurement model revealed the following results: [$\chi^2 = 2040.581$, $\chi^2/\text{df} = 8.261$, $p < 0.001$], CFI = 0.90, SRMR = 0.046, and RMSEA = 0.07. These results indicate that the model meets the general criteria for acceptable fit indices [31]. In terms of reliability, all factors showed acceptable reliability with Cronbach’s alpha values

exceeding 0.70 [32]. Regarding convergent validity, all factors met the appropriate criteria with composite reliability (CR) values above 0.70 and average variance extracted (AVE) values above 0.50 [32]. For discriminant validity, the AVE for each factor was greater than the squared correlations of all corresponding factors, confirming discriminant validity [33] (Table 3). The squared values of the correlations are summarized in Table 2 for reference. Meanwhile, the factor analysis of physical activity levels, composed of a single item, was conducted through the following procedures. It is necessary to set the error variance when a measurement variable is used as a single indicator in confirmatory factor analysis (CFA) conducted with AMOS. The error variance needs to be calculated and entered manually by the researcher. The formula for calculating the error variance is as follows: Error Variance = $(1 - \alpha)\sigma^2$. As a reliability analysis using the SPSS statistics program could not be conducted, an estimated value of 0.7 was used. The variance in physical activity is 2.867. Therefore, the error variance in the physical activity is $(1 - 0.7)2.86 = 0.858$.

Table 3. Detailed description of variables.

Variable		<i>M</i>	<i>S.D.</i>	<i>SRW</i>	α	<i>CR</i>	<i>AVE</i>
Parental academic achievement pressure	Item1	3.35	1.08	0.55	0.94	0.94	0.51
	Item2	2.40	1.12	0.67			
	Item3	2.11	1.02	0.76			
	Item4	2.32	1.15	0.80			
	Item5	2.25	1.13	0.79			
	Item6	2.47	1.15	0.78			
	Item7	2.34	1.14	0.79			
	Item8	2.50	1.14	0.80			
	Item9	2.15	1.06	0.70			
	Item10	1.74	0.98	0.61			
	Item11	3.07	1.16	0.60			
	Item12	1.96	1.02	0.66			
	Item13	2.11	1.09	0.68			
	Item14	2.48	1.19	0.70			
	Item15	2.02	1.03	0.80			
Self-Esteem	Item1	3.09	0.66	0.81	0.86	0.86	0.55
	Item2	3.16	0.65	0.73			
	Item3	3.03	0.69	0.60			
	Item4	3.41	0.60	0.75			
	Item5	3.27	0.66	0.81			
Body image	Item1	2.94	0.64	0.52	0.74	0.77	0.55
	Item2	2.89	0.67	0.82			
	Item3	2.73	0.85	0.83			
Physical activity	Item1	3.47	1.69	0.54			

M = mean, *S.D.* = standard deviation, *SRW* = standardized regression weights, α = Cronbach's alpha, *CR* = construct reliability, *AVE* = average variance extracted.

3.3. Structural Equation Modeling

The analysis of the structural equation model revealed the following results: [$\chi^2 = 2041.346$, $\chi^2/\text{df} = 8.198$, $p < 0.001$], CFI = 0.95, SRMR = 0.04, and RMSEA = 0.07. These results suggest that the model fit can be considered acceptable [31]. Parental academic achievement pressure had a significant direct effect on self-esteem ($\beta = -0.156$, $p < 0.001$). Physical activity had a significant direct effect on self-esteem ($\beta = 0.119$, $p < 0.001$). Self-esteem had a significant direct effect on self-esteem ($\beta = 0.798$, $p < 0.001$). Parental achievement pressure had a significant indirect effect on self-esteem mediated by self-esteem ($\beta = -0.124$, $p < 0.01$). Physical activity had a significant indirect effect on self-esteem mediated by self-esteem ($\beta = 0.095$, $p < 0.01$). The results of the final structural equation modeling are presented in Figure 1 and Table 4.

Table 4. Results of the structural equation modeling.

Path of Direct Effect	β		
RH1: Parental achievement pressure \longrightarrow self-esteem	−0.156 ***		
RH2: Physical activity \longrightarrow self-esteem	0.119 ***		
RH3: Self-esteem \longrightarrow body image	0.798 ***		
Path of indirect effect	β	95% CI	
		LL	UL
RH4: Parental achievement pressure \longrightarrow self-esteem \longrightarrow body image	−0.124 **	−0.178	−0.073
RH5: Physical activity \longrightarrow self-esteem \longrightarrow body image	0.095 **	0.33	0.147

*** = $p < 0.001$, ** = $p < 0.01$, β = standardized regression weight, LL = lower limit, UL = upper limit.

4. Discussion

This study analyzed the effects of parental academic achievement pressure and physical activity on body image mediated by self-esteem. The following results were obtained through a structural equation modeling analysis. First, parental academic achievement pressure had a negative effect on self-esteem. This result supports prior studies [14–16,25]. Atmaca and Ozen [25] analyzed 499 high school students and found that parental expectations for academic success can lead to increased academic stress in students, which heightens their fear of negative evaluations at school. This fear, in turn, impacts students' self-esteem. The fear of being judged negatively serves as a partial mediator between parental pressure and self-esteem, and acts as a complete mediator between academic stress and self-esteem. Han and Park [15] conducted a longitudinal analysis on elementary school students. Their results revealed that parental achievement pressure during the 4th and 5th grades negatively influenced self-esteem and overall happiness levels in the 6th grade, which in turn adversely affected future outlook in the 1st grade of middle school. In other words, parental pressure for academic achievement was found to have a detrimental impact on self-esteem, and this negative effect persisted over time, extending to other important psychological factors during developmental stages, such as future outlook. According to Min [16], parental pressure for academic achievement was found to significantly reduce self-esteem in 6th grade elementary school students. Furthermore, this decreased self-esteem negatively impacted their school adjustment. Similarly, the study by Son and Chung [35] also found a negative correlation between parental pressure for academic achievement and self-esteem in upper-grade elementary school children. The results of this study and prior studies [15,16,25,35] suggest that high expectations and intense interest from parents regarding achievement may place psychological pressure on children, leading them to feel that their self-worth is evaluated based on academic ability and success. Consequently, this perception may cause children to view themselves as incompetent and worthless.

Second, physical activity had a positive effect on self-esteem. This result supports previous studies [18–21,36]. Gilani and Dashipour [18] analyzed a total of 84 college students (42 in the experimental group and 42 in the control group). The results indicated that aerobic exercise led to an increase in self-esteem only within the experimental group. Bicer [19] examined the effects of aerobic exercise training on mental health and self-esteem among patients with type 2 diabetes mellitus. Bicer [19] found that 12 weeks of aerobic exercise training significantly improved self-esteem and reduced anxiety and insomnia. This study suggests that physical activity can have positive psychological effects not only on the general population, but also on patients with medical conditions. Dąbrowska-Galas and Dąbrowska [20] conducted a study involving women aged 45–60 from Poland. The findings suggest that increased physical activity levels enhance self-esteem, which could help support women at higher risk of negative outcomes during menopause, leading to a less unpleasant and stressful menopausal experience. Zamani Sani et al. [21] indicated that physical activity directly increases self-esteem. Stafylidis [36] also found that physical activity positively affects the self-esteem of individuals with visual impairments. According to Frost and McKelvie [37], during young adulthood, engaging in exercise more frequently

and at moderate or higher intensity levels tends to result in positive changes in both self-esteem and body image. In a study [37] involving high school and university students, those who exercised for 15–60 min at least three times a week reported higher self-esteem compared to those who did not engage in regular physical activity [37]. In other words, when combining the results of this study with various previous studies [18–21,36], increases in self-esteem through physical activity is consistently observed across different age groups and physical conditions, including adolescents, college students, middle-aged individuals, diabetic patients, and those with visual impairments.

Third, self-esteem had a positive effect on body image. This result is consistent with the findings of previous studies. Pop's study [4] indicates that self-esteem and body dissatisfaction are in a significant negative correlation. Lee, Lee, and An [6] analyzed 167 college students and found that body-esteem and self-esteem exhibited a strong positive correlation. Individuals with lower self-esteem tend to engage in more frequent body comparisons with others and exhibit a greater tendency toward body dissatisfaction [8]. Kocur and Jach [7] conducted a study in Poland that analyzed a total of 450 students aged from 18 to 28, finding that self-esteem and body-esteem are positively correlated. Olchowska-Kotala [5] found a positive relationship between global self-esteem and both sexual attractiveness and physical condition. This suggests that women who perceive themselves as attractive and physically fit are more likely to have higher self-esteem. The participants of the study [5] was a total of 67 middle-aged women living in a Polish city. However, according to Davidson and McCabe [3], girls tended to report a more negative body image compared to boys. For this reason, there may be additional moderating variables, such as gender, that influence the relationship between self-esteem and body image.

Lastly, parental academic achievement pressure and physical activity both affected body image mediated by self-esteem. These results support the findings of previous studies [3–8,15–25]. The key contribution and distinct finding of this study is that parental academic achievement pressure negatively impacts adolescents' body image through the mediation of self-esteem. Additionally, physical activity was found to have a positive effect on adolescents' body image through the mediation of self-esteem. In other words, physical activity emerged as a significant factor that can mitigate the negative impact of parental academic achievement pressure on body image by enhancing self-esteem. The results of this study highlight that, for adolescents who are under significant academic achievement pressure, encouraging physical activity and enhancing self-esteem are essential for helping them develop a positive body image.

5. Conclusions

This study, by analyzing South Korean adolescents, identified a negative indirect effect of parental academic achievement pressure on body image mediated by self-esteem. Additionally, it found a positive indirect effect of physical activity on body image through the mediation of self-esteem. These findings underscore the importance of appropriate physical activity, especially for adolescents under significant academic pressure. This study highlights the role of physical activity in mitigating the negative impact of parental academic achievement pressure on body image through self-esteem. Based on the limitations of this study, I would like to make the following suggestions for future research. First, this study did not analyze the impact of gender on the relationships between the variables. Future studies need to include additional analyses considering gender, as this could yield more meaningful results. Second, this study focuses on Korean adolescents. Future research would examine a more diverse range of ethnic groups to provide a broader understanding of the relationships between parental academic achievement pressure, physical activity, self-esteem, and body image. Third, this study measures body image using only three items and physical activity with one item. Therefore, future research should adopt multidimensional scales to provide more detailed information for analysis. Lastly, this study did not include factors that reduce parental academic achievement pressure. It may be valuable to incorporate such factors into the research model proposed in this study.

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Informed Consent Statement: All procedures related to participant consent and other relevant aspects were conducted by the Korea Institute of Child Care and Education in accordance with the applicable laws of Republic of Korea.

Data Availability Statement: Restrictions apply to the availability of these data. Data were obtained from [the Korea Institute of Child Care and Education] and are available at [<https://panel.kicce.re.kr/pskc/index.do>] with the permission of [the Korea Institute of Child Care and Education (accessed on 23 October 2024)].

Conflicts of Interest: The authors declare no conflicts of interest.

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