

Body Image and Self-Esteem as Serial Mediators Linking Physical Activity to Depression Among College Students

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Objective

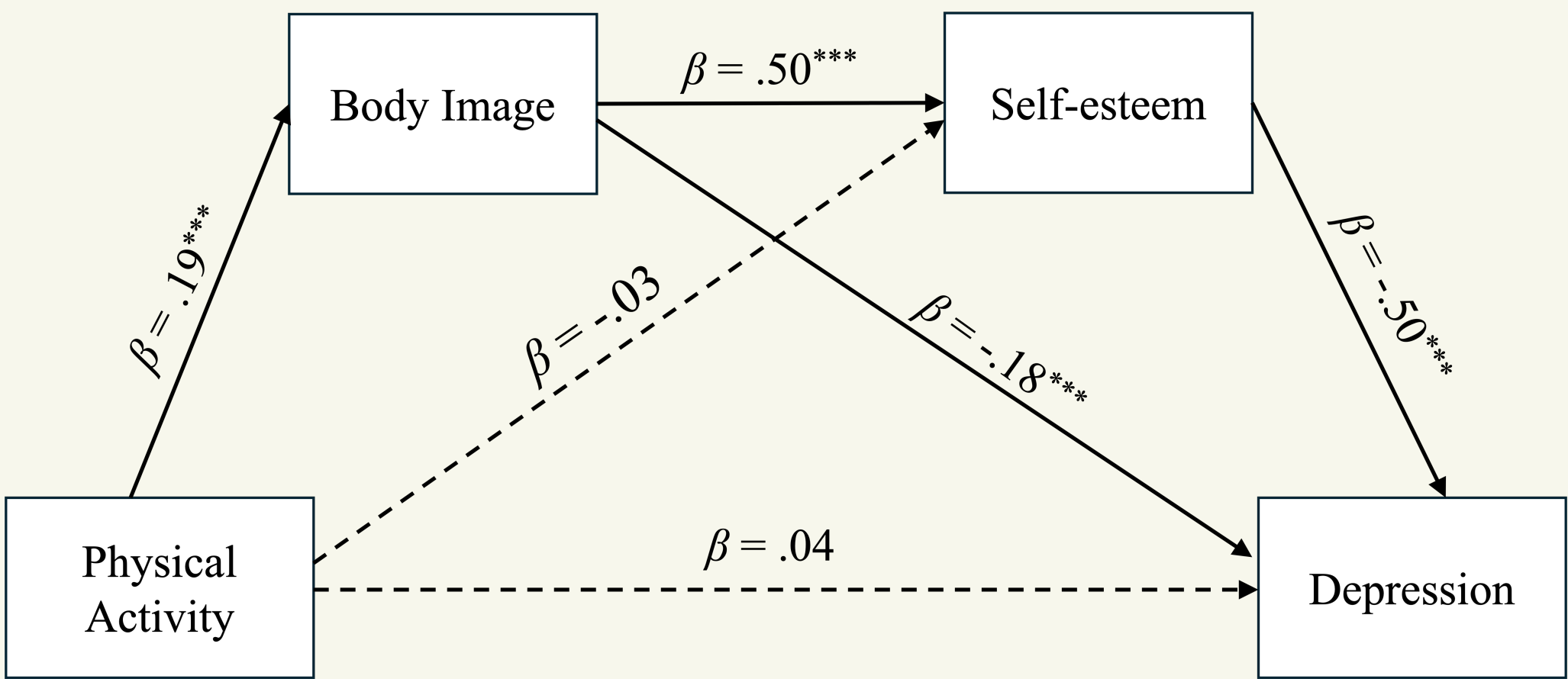
College students often experience academic, interpersonal, and identity-related stressors that may increase depressive symptoms. Although physical activity has been linked to better mental health, its direct association with depression remains unclear. This study examined whether body image and self-esteem serially mediate the relationship between physical activity and depression among college students, and whether these psychological mechanisms differ by gender.

Method

A cross-sectional survey was conducted with 659 college students. Participants completed the International Physical Activity Questionnaire-Short Form Taiwan version (IPAQ-SF), the Multidimensional Body-Self Relations Questionnaire (MBSRQ), the Rosenberg Self-Esteem Scale (RSES), and the Beck Depression Inventory-II (BDI-II). Data were analyzed using descriptive statistics, correlation analysis, and multiple regression analysis. Mediation effects were examined using PROCESS macro Models 4 and 6 for SPSS (Hayes, 2017). Partial least squares structural equation modeling (PLS-SEM) was further used to examine gender differences through multi-group analysis.

Result

A total of 659 valid responses were analyzed, with a mean age of 21.25 years (*SD* = 1.83). Body image (*r* = -.42) and self-esteem (*r* = -.59) were negatively associated with depression, while physical activity showed no significant association (*r* = -.03). The total effect and direct effect of physical activity on depression were also not significant (*p* > .05). Serial mediation analysis showed that body image significantly mediated the relationship between physical activity and depression, $\beta = -.03$, 95% CI [-.06, -.02]. The indirect effect through self-esteem alone was not significant, $\beta = .01$, 95% CI [-.03, .05].



Result

However, the serial pathway from physical activity to body image, self-esteem, and depression was significant, $\beta = -.05$, 95% CI [-.07, -.03]. Furthermore, the path from physical activity to self-esteem differed significantly by gender. This path was significant among females but not among males.

Serial Mediating Effects of body image and self-esteem between physical activity and depression

	β	Bootstrap 95% CI
Indirect effect		
PA → BI → DEP	- 0.03	[-.06, -.02]
PA → SE → DEP	0.01	[-.03, .05]
Serial mediation		
PA → BI → SE → DEP	-0.05	[-.07, -.03]

Note. PA = physical activity; BI = body image; SE = self-esteem; DEP = depression. CI = confidence interval. Significant indirect effects are indicated by 95% CIs that do not include zero.

Discussion

This study shows that physical activity was not directly associated with depressive symptoms, but was indirectly related to depression through body image and self-esteem. Higher physical activity was linked to more positive body image, which was further associated with higher self-esteem and lower depressive symptoms. This finding supports previous research suggesting that body image and self-esteem are key mechanisms connecting physical activity and mental health (Liu & Liu, 2025; Shang et al., 2021). Gender-based analysis further showed that the path from physical activity to self-esteem was significant for females but not for males, suggesting that this psychological process may vary by gender. These findings indicate that campus mental health programs should promote physical activity while also strengthening positive body image and self-esteem.

References

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Disclosure of conflict of interest
name of first author:Nai Chen Yeh
I have no COI with regard to the presentation.