

Scrolling and Self: How Self-Esteem and Physical Activity Shape the Effects of Instagram Use on Eating Behavior in University Students

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INTRODUCTION

The use of Social Networking Sites (SNS) has been continuously increasing in recent years [1], contributing to the rise of significant behavioral and psychological issues, especially when SNS are used as a coping mechanism for stress and loneliness among young people. One of the most widely used SNS today is Instagram, and several studies indicate that excessive use of this platform may be associated with decreased cognitive functioning in young adults, as well as behavioral and sleep disorders [2].

In addition, the Instagram platform's focus on food imagery, fitness content, and body aesthetics often perpetuates unattainable beauty standards, potentially triggering disordered eating patterns or body dissatisfaction [3,4].

Moreover, the study by Romero-Rodriguez et al. [5], found that while problematic smartphone use negatively influences self-esteem, the intensity of Instagram use itself was not a direct predictor of self-esteem among university students. This suggests a nuanced relationship between SNS engagement and self-perception, warranting further exploration.

AIMS

This study aimed to explore the relationships between problematic social media use (PSMU), self-esteem, physical activity (PA), and eating behaviors, using a moderated-mediation model. In this study, we tested a moderated-mediation model of how explained variables may be interrelated. The model's starting point is the well-established link between PSMU and self-esteem, and PSMU and eating behaviour, with the hypothesis that higher PSMU is associated with higher levels of problematic affects and behaviors. We then

hypothesized that participants who have higher self-esteem will show better eating habits despite higher levels of PSMU (mediation analysis). Finally, we supposed that physical activity and sedentary levels could moderate the relationship between PSMU and self-esteem (moderation analysis), with a protective role of PA.

METHODS

A cross-sectional study was conducted with 1237 university students (74.4% females, mean age = 22.7 ± 5.5 years). Participants completed an online survey assessing Instagram use, enrolled in 13 different academic programs (e.g., languages, art, biology, pharmacy, sport science). The students completed an online questionnaire composed of four sections about: physical activity (International Physical Activity Questionnaire, IPAQ) [6]; Instagram usage (Social Media Use Questionnaire, SMUQ) [7]; self-esteem (Rosenberg Self-Esteem Scale) [8]; eating behaviors (Dutch Eating Behavior Questionnaire, DEBQ) [9].

A chi-square test was used to test the gender differences in the distribution of participants in the three PA categories (low, moderate, high). Non-parametric Spearman's correlations were then computed between Instagram use (minutes per day, reasons for use), SMUQ subscales (Withdrawal and Compulsion), PA (MET/min/week), sitting time (hours/day), self-esteem and eating behaviors (emotional eating, restrained eating, external eating). A multiple linear regression was then performed to test the effect of Instagram time (minutes per day) and motives of use on the two SMUQ subscales (Withdrawal and Compulsion). Finally, a moderated-mediation analysis [10] was conducted to examine the relationships between PSMU and Eating behaviors, considering PA and

sitting time, and self-esteem, as potential moderators and mediator, respectively.

RESULTS

In our sample, females reported higher levels of PSMU and more problematic eating behaviors than males, who in turn exhibited significantly higher levels of physical activity ($p < 0.001$). Regarding Instagram use, females reported significantly higher daily usage ($p < 0.001$), number of followers ($p < 0.01$), following ($p < 0.01$), and higher scores for all reasons for Instagram use, except for self-promotion, where responses were similar to males.

Two multiple linear regression analyses (one for each subscale of SMUQ) were used to investigate which of the motives for use or usage time were more influential on the problematic use. Considering Withdrawal as the dependent variable, the overall regression was statistically significant ($R^2_{adj} = 0.222$, $F(6,1165) = 56.71$, $p < 0.001$). All the independent variables were significant predictors of Withdrawal, with the exception of the use for Documenting.

The correlation analysis showed that the PSMU (both Withdrawal and Compulsion) was significantly positively correlated to the daily usage time, and to all the three typologies of eating behaviors (restrained, emotional, and external eating).

PSMU was positively correlated with restrained, emotional, and external eating behaviors and negatively correlated with PA and self-esteem. Self-esteem mediated the relationship between PSMU and eating behaviors, with higher self-esteem associated with healthier eating patterns. Sitting time moderated the relationship between PSMU and self-esteem, reinforcing the negative effects of excessive Instagram use. Gender differences were observed, with females reporting higher levels of PSMU, problematic eating behaviors and lower PA levels compared to males. This study highlights the complex interplay between PSMU, self-esteem, PA, and eating behaviors in university students.

CONCLUSION

These findings highlight the importance of addressing PSMU's impact on self-esteem and eating behaviors in young adults. PA emerged as a beneficial factor for self-esteem, but its inability to moderate the PSMU–self-esteem relationship suggests that targeted interventions should consider psychological components alongside lifestyle modifications mainly directed at reducing sedentary and sitting time. Promoting regular PA could serve as an effective strategy to enhance self-esteem and counteract the harmful effects of excessive Instagram use. Health education programs emphasizing digital literacy, self-esteem enhancement, and balanced SNS engagement may help mitigate PSMU's adverse effects. Future research should explore longitudinal relationships and intervention strategies to promote healthier social media habits and psychological well-being among university students.

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