Received: 01 May 2025/ Revised: 26 June 2025/ Accepted: 04 July 2025

ORIGINAL ARTICLE

Journal of Hacettepe University
Physical Therapy and Rehabilitation

The Mediating Role of Physical Activity in the Relationship Between Social Anhedonia and Social Media Addiction in Young Adults

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ABSTRACT

Purpose: Addictive social media use is becoming increasingly common among young adults, leading to a shift in attention away from physical activities and towards a more sedentary lifestyle. In recent years, there has been increasing awareness that social anhedonia may play a critical role in the overuse of social media. The aim of this study is to examine the mediating role of physical activity in the relationship between social anhedonia and social media addiction.

Methods: A total of 218 college students (mean age= 21.39 ± 1.75) completed the questionnaires. Bergen Social Media Addiction Scale (BSMAS), Revised Social Anhedonia Scale (RSAS) and International Physical Activity Scale-Short Form (IPAQ-SF) used to assess social media addiction, social anhedonia, and level of physical activity respectively. Mediation analyses were conducted by using PROCESS macro in the SPSS software.

Results: BSMAS and RSAS scores were statistically significantly correlated ($r=0.242$ $p<0.001$). IPAQ-SF were also found to be statistically significantly associated with RSAS score ($r=-0.138$ $p=0.042$). When IPAQ-SF level is included in the significant relationship between RSAS and BSMAS scores, it was shown to play a mediating role.

Discussion: This study shows that physical activity mediates the relationship between social anhedonia and social media addiction in university students. This relationship highlights the potential preventive role of physical activity in mitigating social media addiction among individuals experiencing anhedonia. Future research could develop comprehensive intervention strategies that examine the effects of social programs aimed at increasing participation in physical activity on face-to-face communication and digital addiction.

Key Words: social anhedonia, social media addiction, physical activity, mediation

INTRODUCTION

With the spread of wireless technologies and smartphones, the way we communicate and disseminate information has changed and the internet has become a part of daily life. Internet users primarily use social media platforms for communication and interaction. These platforms facilitate the development of social networks by connecting users with one another (1,2).

Social media, which has become the primary means of communication, is predominantly used for non-academic purposes among university students. Excessive use of social media has been associated with significant mental health problems (3). Sleep disturbance, stress, depression, anxiety (4,5,6,7) impulsivity (8), low self-esteem, loneliness (3,7) are among the negative effects on today's youth.

Social media addiction is a type of behavioral addiction, broadly defined as compulsive engagement with social media platforms that significantly impairs functioning in various areas of life, such as interpersonal relationships, work, academic performance, and physical health (9). It involves unpleasant feelings when offline and an increased tolerance to the negative effects of being online. Beyond the harmful effects of excessive use, social media addiction has also been linked to poor problem-solving skills, reduced cognitive control, impaired memory, and certain neurological disorders (10). Although there is no clear consensus on the psychological risks and consequences of online

communication introduced by modern technology, a growing body of research highlights the compulsive and uncontrolled use of social networks as a cause of social media addiction (11,12).

Anhedonia refers to the inability to experience pleasure from activities that are typically enjoyable. Social anhedonia, specifically, denotes the reduced ability to find pleasure in social interactions and relationships (13). A limited number of recent studies have suggested that anhedonia may represent a personality trait and serve as a risk factor for internet addiction (14).

The importance of physical activity for a healthy life is indisputable. Research indicates that regular physical activity—particularly during periods of growth and adolescence—has beneficial effects on physical, mental, and metabolic health (15). However, increased time spent on social media reduces engagement in physical activity and promotes sedentary behavior (16). The rapid advancement of technology has significantly contributed to the decline in physical activity levels. Consequently, this decline has impaired both the prevention and recovery of cardiovascular diseases, which are among the leading causes of mortality worldwide (17). Brailovskaia et al. reported that mental health impairments such as daily stress increased Facebook use and physical activity mediated this relationship. They recommended further studies to examine the putative causal effect of physical activity on the use of a social media tool such as Facebook (18). Given the protective role of exercise against symptoms of depression and anxiety in adulthood, the increasing use of smartphones and social media may place some young people at risk of reduced physical activity, thereby increasing their vulnerability to depression and anxiety later in life (19).

According to an alternative perspective, in the absence of problematic social media use with addictive characteristics, excessive use may not negatively impact health (20). A study conducted in Canada found that individuals who used social media intensively were more likely to meet physical activity recommendations. The authors attributed this finding—which contrasts with much of the existing literature—to the possibility that individuals who do not use social media may be less inclined to engage in physical activity due to limited social interaction and inadequate peer support (16). The interactive nature of social media can offer opportunities to connect with peers, share problems, access support networks, and promote health-related behaviors (21). However, there is currently no consensus in the literature regarding the optimal amount or "dose" of social media use that supports physical activity, a key component of health behavior.

A review of the literature reveals studies suggesting that anhedonia may contribute to internet addiction. However, no studies to date have specifically examined the relationship between problematic social media use and social anhedonia, and the role of physical activity level in this relationship. The aim of this study is to investigate the extent to which social media use interferes with the pleasure derived from interpersonal relationships among young adults, and whether physical activity serves as a protective factor in this association. The hypothesis of the study was that physical activity level mediates the relationship between social anhedonia and social media addiction.

METHODS

Study Design

This cross-sectional study was conducted at the Kutahya Health Sciences University, Department of Physiotherapy and Rehabilitation. The study was approved by the Non-Interventional Clinical Research Ethics Committee of Kutahya Health Sciences University (2024/06-36). In the current study, the following model was designed to indicate the mediating role of physical activity in the effect of social anhedonia on social media addiction (Figure 1).

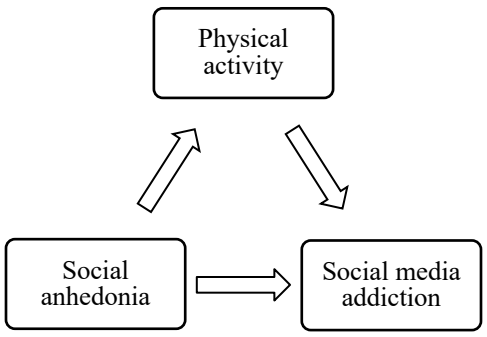

Figure 1. Research Model

Participants

Individuals aged 18–25 years, without any known chronic illnesses, who used social media and volunteered to participate were included in the study. Exclusion criteria included having orthopedic and/or neurological conditions that impaired walking, or having experienced lower extremity injuries—such as strains, sprains, or fractures—within the past six months.

Assessments

Demographic Characteristics: Demographic data including age (year), body mass index (BMI, kg/m2) and smoking and alcohol use habits were recorded.

Social media addiction: Bergen Social Media Addiction Scale was used. The scale consists of six items. Each item in the scale meets six basic addiction criteria: mental occupation, mood change, tolerance withdrawal, conflict, and failed quit attempt. The scale is answered on a five-point Likert-type scale ranging from "1" very rarely to "5" very often. The total score of the scale varies between 6-30. Higher total scores indicate greater risk of social media addiction. The Turkish adaptation was conducted by Demirci (22).

Social anhedonia: The Revised Social Anhedonia Scale (RSAS) was used to measure participants' levels of social anhedonia, which refers to a reduced ability to experience pleasure from interpersonal interactions. The scale consists of 40 questions answered as "Yes/No" evaluating individuals' attitudes and responses toward social engagement and enjoyment. Higher total scores reflect greater levels of social anhedonia. It was adapted into Turkish by Cihan et al. (23).

Physical activity level: The International Physical Activity Questionnaire–Short Form (IPAQ-SF) was used to assess participants' levels of physical activity over the past seven days. The questionnaire consists of seven items that capture the frequency (days per week) and duration (minutes per day) of vigorous-intensity activities, moderate-intensity activities, walking, and sedentary behavior. Based on participants' responses, metabolic equivalent task (MET) scores are calculated to categorize physical activity into three levels: low, moderate, and high. The Turkish adaptation of the scale was conducted by Sağlam et al. (24).

Statistical Analysis

SPSS 20.0 software was used for statistical analyses in the study. Categorical variables (gender and smoking use) were presented as n (%), and continuous variables (age, BMI, and all scale scores) were presented as mean ± SD. As variables were not normally distributed, Spearman correlation test analysis was used to examine the relationships among the scales. In the correlation analysis, correlation coefficient (ρ [rho]) 0.00-0.19 was considered as no relationship or insignificantly weak relationship, 0.20-0.39 as weak relationship, 0.40-0.69 as moderate relationship, 0.70-0.89 as strong relationship, 0.90-1.00 as very strong relationship (25). To examine whether physical activity mediated the relationship between social anhedonia and social media addiction, a mediation analysis was conducted with the SPSS PROCESS macro, version 3.4 (model 4), developed by Preacher and Hayes. Additionally, the 95% confidence interval (CI) of mediating effects was estimated by 5000 samples to test the mediating role of physical activity between social anhedonia and social media addiction. A priori power analysis using G-Power (A GPower 3.1.9 package program) demonstrated a minimum sample size of 215 with a medium effect size and power of 95% according to two predictors. Statistical significance level was set at $p<0.05$ (26).

RESULTS

A total of 248 university students were included in our study. After exclusion of participants with missing data, the study was completed with 218 subjects. The sociodemographic characteristics of the 218 participants and the scores of the scales used are shown in Table 1.

The correlations of the scale scores of the participants are shown in Table 2. There was a statistically significant positive correlation between the total score of the BSMAS and the total score of the RSAS ($r=0.242$ $p<0.001$). In addition, there was a statistically significant negative correlation between the total score of the RSAS and IPAQ ($r=-0.138$ $p=0.042$).

Table 1. Sociodemographic characteristics of the participants and scores of the scales used

	Participants N = 218
Characteristics	**Mean ± SD**
Age (years)	21.39 (± 1.75)
Gender (%)	
Female	144 (66.06 %)
Male	74 (33.94 %)
BMI (kg/m^2)	22.73 (± 3.42)
Smoking	63 (28.89 %)
	Scores of the Scales
BSMAS	17.65 (± 4.51)
RSAS	12 (± 6.27)
IPAQ	1665.95 (± 1151.83)

SD=Standart deviation, BMI: Body Mass Index, BSMAS: Bergen Social Media Addiction Scale, RSAS: Revised Social Anhedonia Scale, IPAQ: International Physical Activity Questionnaire

Table 2. Correlation Results of Participants' Scale Scores (n=218)

		1	**2**	**3**
1- BSMAS	r	1		
	p			
2- RSAS	r	0.242**	1	
	p	**<0.001**		
3- IPAQ	r	-0.203**	-0.138*	1
	p	**0.003**	**0.042**	

** Correlation is significant at 0.05 level (Spearman correlation test), ** Correlation is significant at 0.01 level (Spearman correlation test),* BSMAS: Bergen Social Media Addiction Scale, RSAS: Revised Social Anhedonia Scale, IPAQ: International Physical Activity Questionnaire.

Mediating Variable Analysis

Using the V4.2 Macro plug-in in the SPSS 25.0 program, the mediating effect of the IPAQ score on the relationship between the RSAS total score and the BSMAS total score was examined using the Bootstrap method (Model 4). The mediating effect of the IPAQ score on the relationship between the RSAS score and the BSMAS score was determined according to the confidence intervals obtained with the Bootstrap technique. Bootstrap method and 5.000 resampling were selected in the present analyses. In the mediation analyses using the Bootstrap method, it was seen that there should not be zero (0) between the values in the 95% confidence interval (CI) to support the research hypothesis.

According to the results of the analysis, the RSAS score negatively and significantly predicted the IPAQ score (path a; b =-28.84, t =-2.3, p =0.021, CI [-52.81, -4.81]). Second, the IPAQ score negatively and significantly predicted the BSMAS scores (b path; b =-0.0006, t =-2.2484, p=0.026, CI [-0.0011, -0.0001]). The total effect of IPAQ score on the BSMAS score was significant (path c; b =0.18, t =3.7532, p<0.001, CI [0.08, 0.27]). The direct relationship between the RSAS score and the mediating variable IPAQ did not lose significance when the mediator IPAQ was simultaneously included in the equation (c' path; b =0.1587, t =3.3815, p<0.001, CI [0.0662,0.2512]) (Figure 2).

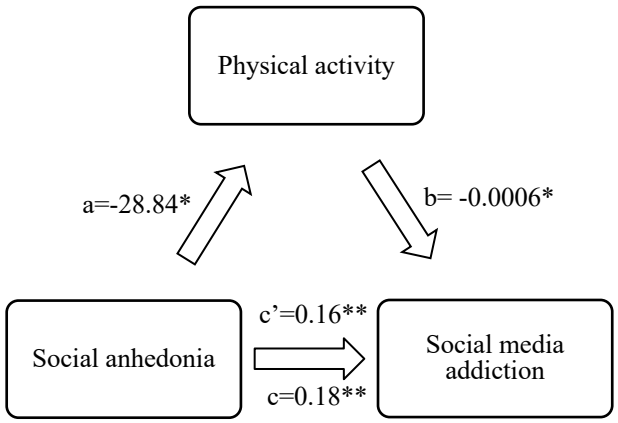

Figure 2. The mediating role of physical activity in the relationship between anhedonia and social media addiction.
*Indirect effect=% 95 CI [*0.0000, 0.0403]
(*p<0.05, **p<0.001, unstandardized regression coefficients used)

Based on these findings, the entire model was significant and explained 28.8 % of the total variance. The indirect effect of the RSAS score on the BSMAS score was significant. Therefore, physical activity significantly mediated the relationship between social anhedonia and social media addiction.

DISCUSSION

This study aims to investigate whether physical activity mediates the relationship between social anhedonia and social media addiction. Based on the findings of the current study, physical activity appears to be associated with both social anhedonia and social media addiction. Furthermore, physical activity was found to mediate the relationship between these two variables. According to the results, physical activity accounted for 28.8% of the association between social anhedonia and social media addiction.

Mediation Model

Observational studies reveal a complex link between depressive symptoms and physical activity. Since depression involves various intermediate phenotypes (e.g., mood, anhedonia, appetite), examining these specific features may offer deeper insight into the association with low physical activity. Anhedonia, a depressive phenotype, may be negatively associated with physical activity for various reasons (27). Physical activity acutely increases dopaminergic activity in the striatum. Given that treatments enhancing dopamine sensitivity can improve responsiveness to rewards, it is possible that physical activity may temporarily reduce anhedonia. However, it should also be noted that individuals with anhedonia may be less likely to participate in physical activity. Studies suggest that as they experience reduced pleasure from most non-pharmacological rewards, their motivation to engage in physical activity is likely diminished (28, 29, 30). Leventhal highlighted the link between anhedonia and neural activity, suggesting that individuals may experience a diminished capacity for pleasure that also impairs their motivation to engage in physical activity. It has been proposed that individuals with high levels of anhedonia may struggle to find enjoyment in exercise, which can lead to reduced participation in physical activity and potentially create a vicious cycle (31). In the current study, a negative correlation was observed between anhedonia and physical activity. Consistent with the literature and the proposed research model, individuals with social anhedonia were found to be physically inactive.

The rapid growth of social media has introduced a new form of interpersonal interaction, making the use of social media platforms one of the most common social behaviors today. A substantial body of literature suggests that increased social media use may negatively impact physical activity levels, particularly among adolescents and young adults (32). A significant negative association was found between social media addiction and physical activity levels among adolescent girls, indicating that higher levels of addiction are associated with lower physical activity (33). Similarly, Huang et al. reported that online activities reduce the time available for physical activity, and that excessive internet use is associated with decreased physical activity (34). In contrast, a smaller number of studies have found no significant relationship between physical activity and social media addiction. Yılmaz et al. found no statistically significant relationship between participants' physical activity levels and social media addiction (35). Similarly, Hurer et al. reported that physical activity among physiotherapy and rehabilitation students during the COVID-19 pandemic was not significantly affected by social media addiction (36). In the present study, however, a negative correlation was observed between social media addiction and physical activity. This finding, consistent with many studies in the literature, suggests that increased screen time and social media use may contribute to a major health concern—physical inactivity among young adults.

Individuals experiencing social anhedonia may prefer solitude or digital interactions over face-to-face communication. They may be more inclined to engage in artificial social interactions on platforms such as social media, where they can control the social stimuli, they encounter and minimize real-life social stressors (37, 38). Additionally, the mechanistic links between social media addiction and social anhedonia may stem from shared neurophysiological underpinnings. Neuroimaging research has shown that individuals with social anhedonia exhibit lower neural responsiveness to social rewards, which may lead them to seek out more superficial and less emotionally fulfilling interactions on social media (39, 40). Moreover, social media use can be both a symptom and a contributing factor to existing psychological problems. Current research suggests that social anhedonia may lead to reduced social support and increased isolation, which in turn can trigger the development of addictive behaviors toward social media. Guillot et al. stated in their study that anhedonia may contribute to the development of internet-related addictive behaviors in the emerging adult population (41). Individuals experiencing anhedonia may tend to turn to the internet, which offers numerous rewards at minimal cost, to compensate for their hedonic deficits (42). This cyclical pattern creates a complex interaction in which social anhedonia contributes to social media addiction, and social media addiction, in turn, reinforces social anhedonia (43). In

the current study, a positive correlation was found between social anhedonia and social media addiction. From a clinical perspective, individuals with behavioral addictions are significantly less likely to derive enjoyment from activities outside the one to which they are addicted. Based on this understanding, the research model was constructed on the premise that anhedonia is a personality trait, and its presence may contribute to internet addiction in the current study.

The finding that physical activity partially mediates the relationship between social anhedonia and social media addiction has important theoretical and practical implications. The results suggest that individuals with high levels of social anhedonia may engage in less physical activity, which in turn may increase the risk of developing social media addiction. This indicates that individuals experiencing social anhedonia tend to reduce their physical activity, avoid social interactions, and turn to social media use instead. Interventions that promote physical activity may therefore be effective in reducing social media addiction, particularly among individuals with elevated social anhedonia.

This study has several limitations that should be taken into consideration when interpreting the findings. First, physical activity levels were measured using a self-report questionnaire, which may be subject to recall bias and social desirability effects. Objective methods such as accelerometers or pedometers could provide more accurate assessments. Second, although statistically significant correlations were found between the study variables, the strength of these correlations was relatively low, possibly due to the limited sample size. Third, the study sample consisted solely of university students from a single province, which limits the generalizability of the results to broader populations. Future studies should aim to include larger and more diverse samples and utilize objective measures of physical activity to improve the validity and applicability of the findings.

CONCLUSION

The unique contribution of this study is that it demonstrates that physical activity may moderate the relationship between social anhedonia and social media addiction. The findings suggest that individuals with high levels of social anhedonia engage in less physical activity, which increases their risk of social media addiction. The model accounted for 28.8% of the total variance. The mediating role of physical activity emerges as a significant component of this relationship. Therefore, interventions aimed at increasing physical activity may not only enhance physical health but also help reduce digital media use. Social programs that promote participation in physical activity can support face-to-face communication while also mitigating digital addiction. Future research could develop comprehensive intervention strategies by examining the effects of different types and intensities of physical activity on this relationship.

Acknowledgments

Author Contributions: Dilek KILIÇ took part in literature search, data collection, study design and writing. Rüya ÇAPAR took part in literature search, data collection and writing. Selda OĞUZ GÖKÇEN took part in statistical analysis and final editing of the article.

Financial Support: The study was supported by TÜBİTAK 2209-A University Students Research Projects Support Program.

Conflict of Interest: The authors state that there are no potential conflicts of interest concerning the research, writing, and/or publication of this article.

Ethical approval: The study was approved by the Non-Interventional Clinical Research Ethics Committee of Kutahya Health Sciences University (2024/06-36).

How to cite this article: Kilic D, Capar R, Oguz-Gokcen S, The Mediating Role of Physical Activity in the Relationship Between Social Anhedonia and Social Media Addiction in Young Adults. Journal of Hacettepe University Physical Therapy and Rehabilitation. 2025;3(3),109-116.

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