



Associations of optimism and pessimism with physical activity, quality of life, and life satisfaction in university students: A cross-sectional study

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ABSTRACT

Background: Optimism and pessimism are psychological constructs that may be associated with individuals' physical and psychological well-being. This study aimed to examine the associations of optimism and pessimism with physical activity, quality of life, and life satisfaction in university students.

Methods: This cross-sectional study included 406 university students aged 18–25 years who completed an online survey assessing optimism and pessimism, physical activity, quality of life, and life satisfaction. Associations between optimism and pessimism and the study outcomes were examined using correlation analyses and multiple linear regression models adjusted for age, sex, and body mass index. Physical activity analyses were based on participants with valid and scoreable IPAQ-LF data ($n = 318$).

Results: Optimism was positively associated with life satisfaction and several quality-of-life domains, whereas pessimism showed negative associations with these outcomes. These associations largely remained significant after adjustment for age, sex, and body mass index. Pessimism was additionally associated with lower physical activity.

Conclusion: Optimism and pessimism were differentially associated with physical activity, life satisfaction, and quality of life, with pessimism showing broader negative associations across these outcomes. These findings highlight the importance of considering optimism and pessimism as distinct psychological constructs in university students.

1. Introduction

Psychological well-being is widely recognized as a fundamental psychosocial determinant shaping individuals' quality of life, life satisfaction, and overall health perception (Scheier & Carver, 1992). Within this framework, optimism and pessimism represent relatively stable cognitive dispositions that reflect individuals' generalized expectations about the future and play a central role in shaping coping strategies, health-related behaviors, and subjective well-being (Akshay, 2013). Optimism is typically characterized by positive outcome expectancies, problem-focused coping, and psychological resilience, whereas pessimism is associated with negative expectations, avoidant coping styles, and increased psychological burden (Akshay, 2013; Ryff & Singer, 2008).

Accumulating evidence indicates that these cognitive tendencies are

not only closely linked to mental health outcomes but are also associated with broader, multidimensional health indicators such as quality of life and life satisfaction (Daşkıran et al., 2024; Rezaei & Khosroshahi, 2018). Previous research has consistently demonstrated positive associations between optimism and quality of life as well as psychological well-being, while pessimism has been shown to exhibit negative associations with these outcomes (Çalışkan & Uzunkol, 2018; Karaçam & Pulur, 2016). Seminal work by Scheier and Carver highlighted that optimism is systematically related to both subjective and objective health indicators (Scheier & Carver, 1992). Subsequent studies have reported that optimistic individuals tend to exhibit higher quality of life particularly in domains related to mental health, vitality, and social functioning, whereas pessimism has been associated with lower energy levels and more negative health perceptions (Avşaroğlu & Koç, 2019; Delhey et al., 2002). Similarly, studies conducted among university students have

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documented strong positive relationships between optimism and life satisfaction, alongside inverse associations between pessimism and life satisfaction (Çalışkan & Uzunkol, 2018; Tuzgöl Dost, 2007). Several mechanisms have been proposed to explain these associations. Individuals with higher levels of optimism tend to adopt more adaptive coping strategies, exhibit lower stress reactivity, and demonstrate more favorable neuroendocrine and psychophysiological responses to stressful situations. In contrast, pessimism has been associated with maladaptive coping, heightened stress responses, and negative health perceptions. These mechanisms may primarily influence subjective evaluations of health and well-being rather than directly affecting health-related behaviors such as physical activity (Carver et al., 2010).

Despite this growing body of literature, evidence regarding the relationship between optimism, pessimism, and physical activity levels remains limited and inconclusive. Although regular physical activity is well established as a key contributor to psychological well-being, quality of life, and life satisfaction, the role of cognitive dispositions such as optimism and pessimism in shaping engagement in physical activity is not yet clearly understood (Ölçücü et al., 2015; Yıldırım et al., 2015). While some studies suggest that optimistic individuals are more likely to adopt and maintain physically active lifestyles, other investigations report weak or non-significant associations. Methodological limitations, including reliance on self-reported physical activity measures, heterogeneous samples, and the frequent treatment of optimism and pessimism as opposite ends of a single continuum rather than distinct constructs, may partly account for these inconsistencies (Işık et al., 2014; Yıldırım et al., 2015). Moreover, only a limited number of studies have simultaneously examined physical activity, quality of life, and life satisfaction within a single analytical framework, and existing findings remain insufficient and controversial (Daşkıran et al., 2024; Işık et al., 2014; Tuzgöl Dost, 2007).

Therefore, the present study aimed to examine the associations of optimism and pessimism levels with physical activity, quality of life, and life satisfaction among university students. Distinct from prior research, this study conceptualizes optimism and pessimism as independent cognitive dispositions, evaluates quality of life across all subdomains, and is conducted in a large sample of young adults. Based on the existing literature, it was hypothesized that higher levels of optimism would be positively associated with quality of life and life satisfaction, whereas higher levels of pessimism would be negatively associated with these outcomes. Additionally, it was hypothesized that the associations between optimism, pessimism, and physical activity levels would be limited. By addressing these aims, this study seeks to clarify the role of cognitive dispositions in health-related subjective outcomes during young adulthood and to contribute to the existing literature.

2. Materials and methods

2.1. Study design

This study was designed as a cross-sectional, descriptive investigation aimed at examining the associations between optimism and pessimism levels and physical activity, quality of life, and life satisfaction among university students aged 18–25 years. A quantitative research approach was employed, and data were collected using an online survey methodology. This study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the Ethics Committee of Mudanya University (Decision No: 2025-1, Date: 24.04.2025). Electronic informed consent was obtained from all participants prior to data collection.

The target population consisted of students enrolled at private universities located in Bursa, Türkiye. Sample size estimation was performed using G*Power version 3.1 software, based on the effect size (0.32) reported in the study by Daşkıran et al. (2024). With a statistical power of 95% and a Type I error rate of 0.05, the minimum required sample size was calculated as 100 participants (Daşkıran et al., 2024). In

addition, according to the sampling recommendations proposed by Uzgören (2012), a minimum of 384 participants is required to represent a population of approximately 100,000 individuals at a 5% confidence level. Accordingly, the inclusion of 406 eligible and voluntarily participating university students during the study period indicated that the sample size was statistically adequate and representative of the target population (Uzgören, 2012).

Participants were eligible for inclusion if they were between 18 and 25 years of age, were registered university students, and provided voluntary consent to participate. Individuals were excluded if they were actively engaged in competitive sports, had orthopedic or neurological conditions limiting physical activity, were using antidepressant medications, were pregnant, had a diagnosis of malignancy, had chronic diseases, or were using regular medications. Additionally, participants who did not complete the questionnaires were excluded from the analysis.

2.2. Data collection instruments

Data collection was terminated once the predetermined sample size was reached. Four measurement instruments with established validity and reliability were used in this study. All data were collected online via Google Forms. No clinical examinations or laboratory assessments were conducted.

Sociodemographic Information Form: A sociodemographic questionnaire developed by the researchers was used to collect information on age, sex, height, weight, body mass index (BMI), educational status, parental education levels, marital status, and monthly income.

International Physical Activity Questionnaire (IPAQ): Physical activity levels were assessed using the long form of the International Physical Activity Questionnaire (IPAQ), originally developed by Craig et al. (2003) and validated for the Turkish population by Öztürk (2005). The IPAQ-LF captures physical activity performed at different intensities across occupational, transportation, domestic, and leisure-related contexts. Responses were converted to MET-min/week to obtain an overall estimate of physical activity. Based on the scoring criteria used in this study, participants were categorized according to their total activity level as <600, 600–3000, or ≥ 3000 MET-min/week (Öztürk, 2005; Schuch et al., 2018). IPAQ-LF data were scored according to the recommended scoring and data-cleaning procedures. Continuous physical activity scores were calculated as MET value $\times$ minutes/day $\times$ days/week. Activity bouts lasting less than 10 min were not included in the calculation. Responses with missing or non-interpretable frequency or duration information were considered non-scoreable, and cases with a total reported activity duration exceeding 960 min/day were excluded from IPAQ-LF analyses in accordance with the data-cleaning procedure. Following re-evaluation and cleaning of the participant-level IPAQ-LF data, valid and scoreable physical activity data were available for 318 of the 406 participants. Therefore, analyses involving IPAQ-LF were conducted using these available cases, whereas analyses of the other study outcomes retained the full analytical sample ($n = 406$).

Optimism–Pessimism Scale for Adolescents: Optimism and pessimism levels were measured using the Optimism–Pessimism Scale (OPS) for Adolescents developed by Çalışkan and Uzunkol (2018). The instrument contains 16 items divided equally between optimism and pessimism and uses a 5-point response format. The original validation study reported internal consistency coefficients of 0.86 and 0.82 for the optimism and pessimism subscales, respectively (Çalışkan & Uzunkol, 2018). Each subscale is scored separately, with increasing scores reflecting higher levels of the corresponding disposition. The two subscales are interpreted independently rather than as opposite ends of a single continuum. The internal consistency

of the Optimism–Pessimism Scale was evaluated in the present sample using Cronbach's alpha. The optimism and pessimism subscales demonstrated excellent and good internal consistency, with Cronbach's α coefficients of 0.900 and 0.877, respectively.

Quality of Life Scale (SF-36): Health-related quality of life was evaluated using the SF-36, which provides scores across eight dimensions: physical functioning, role limitations due to physical problems, bodily pain, general health, vitality, social functioning, role limitations due to emotional problems, and mental health. Scores for each dimension range from 0 to 100, with higher scores representing more favorable health-related quality of life (Koçyigit et al., 1999).

Satisfaction with Life Scale: Life satisfaction was evaluated using the Satisfaction with Life Scale developed by Diener et al. (1985) and adapted into Turkish by Dağlı and Baysal (2016). The scale consists of five items rated on a 5-point Likert scale, with higher total scores reflecting greater life satisfaction. The reported Cronbach's alpha coefficient for the Turkish version is 0.88 (Dağlı & Baysal, 2016; Diener et al., 1985).

2.3. Data collection procedure

Data collection was conducted between April and June 2025, following ethical approval obtained on 24 April 2025. Participants were recruited through an online survey link and completed all questionnaires according to standardized instructions. A total of 427 responses were received during the data collection period. Of these, 12 participants were excluded due to incomplete questionnaire responses, while 9 participants were excluded because they met predefined exclusion criteria: three participants had a chronic disease, one was pregnant, and five reported antidepressant medication use. Consequently, the final analytical sample consisted of 406 university students. To enhance data quality, the survey was configured to allow only one response per participant. All measurements were obtained using validated self-report instruments. Given the cross-sectional design of the study, findings were interpreted at an associative level rather than implying causality.

2.4. Statistical analysis

Statistical analyses were performed using SPSS version 25.0 (IBM Corp., Armonk, NY, USA). Continuous variables were presented as mean $\pm$ standard deviation, and categorical variables were expressed as frequencies and percentages. Normality of data distribution was assessed using the Kolmogorov–Smirnov and Shapiro–Wilk tests. As the variables did not meet normality assumptions, non-parametric statistical methods were applied. Associations between variables were examined using Spearman's rank correlation analysis, with correlation coefficients interpreted as weak (0.00–0.29), moderate (0.30–0.64), or strong (≥ 0.65) (Ural & Kiliç, 2013). Differences between categorical variables were analyzed using the chi-square test. Additionally, multiple linear regression analyses were performed to examine the independent associations of optimism and pessimism with physical activity, life satisfaction, and each SF-36 subdomain. Separate regression models were constructed for each outcome variable, with optimism and pessimism entered simultaneously as independent variables while adjusting for age, sex, and body mass index. Standardized regression coefficients (β), unstandardized regression coefficients (B), standard errors (SE), model R^2 , adjusted R^2 , F statistics, and corresponding p -values were reported.

Assumptions of multiple linear regression were evaluated using residual diagnostics. Residual normality, homoscedasticity, linearity, multicollinearity, and influential observations were assessed. Multicollinearity was evaluated using variance inflation factors (VIFs), and influential observations were assessed using Cook's distance. VIF values were below 1.5 across all models, indicating no evidence of problematic multicollinearity, and no observations had a Cook's distance greater than 1. Linearity diagnostics did not indicate substantial violations.

Residual normality was not fully satisfied for some outcomes, and evidence of heteroscedasticity was observed for the bodily pain model. Therefore, HC3 heteroscedasticity-robust standard errors were additionally examined as a sensitivity analysis.

3. Results

In this study, the associations between optimism and pessimism levels and life satisfaction, quality of life subdomains, and physical activity levels were examined. In line with the research objectives, only the relationships among these variables are presented in the Results section.

Descriptive characteristics of the participants, including socio-demographic information, anthropometric measurements, and scale scores, are presented in Table 1. The study sample consisted primarily of young adult university students, with a higher proportion of female participants. Participants' age, height, body weight, and body mass index values demonstrated a wide range of distribution within the sample.

Descriptive statistics for optimism and pessimism levels, life satisfaction, physical activity level, and the physical and mental subdomains of quality of life are presented in Table 2. Overall, participants demonstrated moderate to high levels of optimism and moderate levels of life satisfaction, whereas pessimism levels were relatively low. Examination of the SF-36 subdomains indicated generally moderate scores in role limitations due to physical problems, bodily pain, general health, vitality, social functioning, and mental health. Scores for the physical functioning subdomain exhibited a wider range of distribution across

Table 1
Sociodemographic data.

		n (%)	Min–max	Mean $\pm$ SD
Gender	Female	308 (75.9)	–	–
	Male	98 (24.1)	–	–
	Total	406 (100)	–	–
Age (years)	–	–	18–25	20.25 $\pm$ 2.27
Height (m)	–	–	1.47–1.94	1.67 $\pm$ 0.08
Weight (kg)	–	–	37.0–160.0	64.89 $\pm$ 15.29
BMI	–	–	14.45–62.5	22.94 $\pm$ 4.58
Education level	Associate	158 (38.9)		
	Bachelor's	237 (58.4)		
Mother's education level	Master's	11 (2.7)		
	Primary school	116 (28.6)		
	Middle school	75 (18.5)		
	High school	135 (33.3)		
	Bachelor's	68 (16.7)		
Father's education level	Master's	10 (2.5)		
	Doctorate (PhD)	2 (0.5)		
	Primary school	77 (19)		
	Middle school	61 (15)		
	High school	163 (40.1)		
Marital status	Bachelor's	96 (23.6)		
	Master's	7 (1.7)		
	Doctorate (PhD)	2 (0.5)		
	Married	89 (21.9)		
	Single	311 (76.6)		
	Divorced	6 (1.5)		

n: number of participants; %: percentage; Min: minimum; Max: maximum; SD: standard deviation; m: meters; kg: kilograms; BMI: body mass index.

Table 2

Descriptive statistics for optimism, pessimism, life satisfaction, and quality of life subdomains.

Instruments	Min–max	Mean $\pm$ SD
Optimism scale	9–40	31.42 $\pm$ 6.23
Pessimism scale	8–37	17.22 $\pm$ 6.56
Satisfaction with Life Scale	5–25	17.06 $\pm$ 3.93
Physical function – SF-36	0–100	90.43 $\pm$ 14.88
Role limitations due to physical problems – SF-36	0–100	67.79 $\pm$ 33.22
Bodily pain – SF-36	0–100	68.95 $\pm$ 18.64
General health – SF-36	9–96	60.96 $\pm$ 17.96
Vitality – SF-36	10–100	62.00 $\pm$ 18.18
Social functioning – SF-36	0–100	60.73 $\pm$ 22.87
Role limitations due to emotional problems – SF-36	0–100	62.97 $\pm$ 31.42
Mental health – SF-36	16–85	50.33 $\pm$ 11.80
IPAQ-LF	0–27,876	4126.95 $\pm$ 4291.24

Min: minimum; Max: maximum; SD: standard deviation; SF-36: Short Form 36; IPAQ-LF: International Physical Activity Questionnaire. Note. IPAQ-LF descriptive statistics were based on participants with valid and scoreable IPAQ-LF data ($n = 318$); other descriptive statistics were based on the full analytical sample ($n = 406$).

participants. Based on the results of the long form of the International Physical Activity Questionnaire, substantial interindividual variability in physical activity levels was observed among participants.

The associations between optimism and pessimism levels and physical activity, quality of life subdomains, and life satisfaction are presented in Table 3. The results indicated that optimism was positively associated with several quality of life subdomains, particularly general health perception, vitality, social functioning, and mental health. Optimism was also weakly but significantly positively associated with physical activity level, whereas no statistically significant association was observed with the physical functioning subdomain.

Analysis of pessimism levels revealed statistically significant negative associations with multiple quality of life subdomains, including role limitations due to physical problems, bodily pain, general health perception, vitality, social functioning, role limitations due to emotional problems, and mental health. Similarly, pessimism was negatively and significantly associated with life satisfaction. Pessimism was also weakly but significantly negatively associated with physical activity level, while no statistically significant association was found with the physical functioning subdomain.

Overall, the findings demonstrated that subjective well-being indicators, such as mental health and life satisfaction, were positively

Table 3

Association of optimism and pessimism levels with physical activity, quality of life, and life satisfaction.

Instruments	Optimism scale		Pessimism scale	
	r	p	r	p
Physical function – SF-36	–0.047	0.345	0.074	0.139
Role limitations due to physical problems – SF-36	0.277	<0.001*	–0.287	<0.001*
Bodily pain – SF-36	0.062	0.210	–0.191	<0.001*
General health – SF-36	0.467	<0.001*	–0.494	<0.001*
Vitality – SF-36	0.572	<0.001*	–0.582	<0.001*
Social functioning – SF-36	0.337	<0.001*	–0.469	<0.001*
Role limitations due to emotional problems – SF-36	0.139	0.005	–0.266	<0.001*
Mental health – SF-36	0.195	<0.001*	–0.304	<0.001*
Satisfaction with Life Scale	0.541	<0.001*	–0.384	<0.001*
IPAQ-LF	0.137	0.014*	–0.172	0.002*

r: correlation coefficient; IPAQ-LF: International Physical Activity Questionnaire, SF-36: Short Form 36. Note: IPAQ-LF correlations were based on 318 participants with valid and scoreable physical activity data; all other correlations were based on the available full sample ($n = 406$).

* Spearman correlation analysis $p < 0.05$.

associated with optimism and negatively associated with pessimism. Physical activity demonstrated weaker but statistically significant associations in the same direction, with higher activity levels associated with greater optimism and lower pessimism.

The results of the multiple linear regression analyses are presented in Table 4. Separate regression models were constructed for physical activity, life satisfaction, and each SF-36 subdomain to examine the independent associations of optimism and pessimism with these outcomes after adjustment for age, sex, and body mass index. All ten regression models were statistically significant. Pessimism was independently and negatively associated with physical activity, life satisfaction, role limitations due to physical problems, bodily pain, general health, vitality, social functioning, role limitations due to emotional problems, and mental health. In contrast, optimism was independently and positively associated with life satisfaction, role limitations due to physical problems, general health, vitality, and social functioning. Neither optimism nor pessimism was independently associated with physical functioning after adjustment for the covariates.

The regression analyses further demonstrated that optimism and pessimism exhibited distinct association patterns. Higher pessimism was independently associated with less favorable outcomes across multiple subjective health domains, whereas the associations of optimism were more selective and primarily involved life satisfaction and subjective aspects of health-related quality of life. Pessimism was also weakly and inversely associated with physical activity, whereas optimism was not independently associated with physical activity. Neither optimism nor pessimism was independently associated with physical functioning.

Regression diagnostics indicated no evidence of problematic multicollinearity, with VIF values below 1.5 across all models. No observations had a Cook's distance greater than 1, and no substantial violations of linearity were identified. Residual normality was not fully satisfied for some outcomes, and heteroscedasticity was detected for the bodily pain model. Sensitivity analyses using HC3 heteroscedasticity-robust standard errors yielded a pattern of findings consistent with the conventional regression analyses.

4. Discussion

The present study examined the associations of optimism and pessimism with physical activity, health-related quality of life, and life satisfaction among university students. Overall, both the correlation and adjusted regression analyses indicated that optimism and pessimism were particularly associated with life satisfaction and several subjective and psychosocial dimensions of quality of life. However, the two constructs showed distinct association patterns. Pessimism demonstrated broader negative associations across the study outcomes and was also modestly and inversely associated with physical activity after adjustment for age, sex, and body mass index. In contrast, optimism showed more selective positive associations with life satisfaction and several quality-of-life domains and was not independently associated with physical activity in the adjusted model. Neither optimism nor pessimism was independently associated with physical functioning. Taken together, these findings suggest that optimism and pessimism may represent related but distinct psychological dispositions with different patterns of association with subjective well-being and health-related behaviors.

An important finding of the present study was the asymmetric pattern observed for optimism and pessimism in the adjusted analyses. Higher pessimism was independently associated with lower life satisfaction and less favorable scores across a broad range of health-related quality-of-life domains, including role limitations due to physical problems, bodily pain, general health, vitality, social functioning, role limitations due to emotional problems, and mental health. In contrast, optimism was independently associated with life satisfaction, role limitations due to physical problems, general health, vitality, and social functioning, but not with bodily pain, emotional role limitations, or

Table 4

Multiple linear regression analyses examining the associations of optimism and pessimism with physical activity, life satisfaction, and health-related quality of life.

Outcome	Predictor	B	SE	β	p	Model R ²	Adjusted R ²	F (df)	Model p
Physical activity	Optimism	-18.480	46.078	-0.026	0.689	0.067	0.052	4.49 (5.312)	<0.001*
	Pessimism	-87.593	42.465	-0.135	0.040*				
	Age	68.142	114.644	0.035	0.553				
	Sex	-2079.216	636.799	-0.193	0.001*				
	BMI	47.305	55.188	0.051	0.392				
Life satisfaction	Optimism	0.301	0.031	0.478	< 0.001*	0.328	0.319	38.99 (5.400)	<0.001*
	Pessimism	-0.083	0.029	-0.138	0.005*				
	Age	-0.135	0.075	-0.078	0.074				
	Sex	0.869	0.404	0.095	0.032*				
	BMI	-0.021	0.038	-0.024	0.587				
Physical function (SF-36)	Optimism	-0.022	0.139	-0.009	0.876	0.028	0.016	2.30 (5.400)	0.044*
	Pessimism	0.132	0.133	0.058	0.320				
	Age	0.142	0.344	0.022	0.681				
	Sex	3.868	1.838	0.111	0.036*				
	BMI	0.443	0.173	0.137	0.011*				
Role limitations due to physical problems (SF-36)	Optimism	0.910	0.298	0.171	0.002*	0.105	0.094	9.40 (5.400)	<0.001*
	Pessimism	-0.986	0.285	-0.195	< 0.001*				
	Age	-0.203	0.736	-0.014	0.783				
	Sex	-2.953	3.936	-0.038	0.454				
	BMI	-0.114	0.370	-0.016	0.759				
Bodily pain (SF-36)	Optimism	-0.184	0.173	-0.062	0.287	0.047	0.035	3.90 (5.400)	0.002*
	Pessimism	-0.642	0.165	-0.226	< 0.001*				
	Age	-0.183	0.426	-0.022	0.668				
	Sex	-2.739	2.280	-0.063	0.230				
	BMI	0.223	0.214	0.055	0.300				
General health (SF-36)	Optimism	0.833	0.142	0.289	< 0.001*	0.308	0.299	35.63 (5.400)	<0.001*
	Pessimism	-0.937	0.135	-0.342	< 0.001*				
	Age	-0.301	0.350	-0.038	0.390				
	Sex	1.828	1.872	0.044	0.329				
	BMI	-0.117	0.176	-0.030	0.507				
Vitality (SF-36)	Optimism	1.048	0.129	0.360	< 0.001*	0.440	0.432	62.73 (5.400)	<0.001*
	Pessimism	-1.090	0.123	-0.393	< 0.001*				
	Age	-0.157	0.319	-0.020	0.623				
	Sex	-2.022	1.705	-0.048	0.236				
	BMI	0.177	0.160	0.045	0.271				
Social functioning (SF-36)	Optimism	0.423	0.189	0.115	0.026*	0.239	0.230	25.136 (5.400)	<0.001*
	Pessimism	-1.449	0.181	-0.416	< 0.001*				
	Age	-0.733	0.467	-0.073	0.118				
	Sex	-2.191	2.499	-0.041	0.381				
	BMI	0.322	0.235	0.065	0.171				
Role limitations due to emotional problems (SF-36)	Optimism	-0.026	0.286	-0.005	0.928	0.083	0.071	7.21 (5.400)	<0.001*
	Pessimism	-1.273	0.273	-0.266	< 0.001*				
	Age	1.188	0.705	0.086	0.093				
	Sex	0.865	3.770	0.012	0.819				
	BMI	0.355	0.354	0.052	0.317				
Mental health (SF-36)	Optimism	0.105	0.106	0.056	0.320	0.112	0.101	10.09 (5.400)	<0.001*
	Pessimism	-0.508	0.101	-0.282	< 0.001*				
	Age	-0.161	0.260	-0.031	0.537				
	Sex	3.532	1.394	0.128	0.012*				
	BMI	0.044	0.131	0.017	0.735				

p < 0.05; B = unstandardized regression coefficient; SE = standard error; β = standardized regression coefficient; R² = coefficient of determination; Adjusted R² = adjusted coefficient of determination; F = F statistic; df = degrees of freedom; SF-36 = Short Form-36 Health Survey; BMI: body mass index.

* Statistical significance.

mental health after adjustment. This differential pattern supports the conceptualization of optimism and pessimism as partially independent psychological constructs rather than simply opposite ends of a single continuum. It also suggests that the absence of optimism may not necessarily be equivalent to the presence of pessimism, particularly in relation to subjective health outcomes. This asymmetric pattern is consistent with more recent evidence suggesting that optimism and pessimism may show differential associations with health and well-being outcomes. Scheier et al. reported that the relative contributions of optimism and pessimism to physical health outcomes were not necessarily equivalent (Scheier et al., 2021), while Zou et al. similarly demonstrated differential associations of the two constructs with distinct dimensions of subjective well-being (Zou et al., 2022). Taken together, these findings indicate that the broader adverse association profile of pessimism cannot be inferred simply from the inverse pattern of optimism, underscoring the importance of evaluating the two constructs separately in health-related research.

The associations observed between optimism, pessimism, and health-related quality of life are generally consistent with previous literature. Rasmussen et al. reported in their meta-analytic review that optimism was systematically associated with physical health outcomes, although the strength of these associations varied according to the type of health outcome assessed (Rasmussen et al., 2009). More recent longitudinal evidence also supports associations between dispositional expectations and subjective well-being. In a large general-population sample followed over six years, Hinz et al. found associations of optimism and pessimism with life satisfaction and quality-of-life-related variables, with associations tending to be more pronounced for mental than for physical components of quality of life (Hinz et al., 2024). This pattern is broadly consistent with the present findings, in which the strongest associations were observed for subjective health perceptions and psychosocial domains rather than physical functioning. This pattern may reflect the stronger relevance of cognitive appraisal, coping style, emotional regulation, and stress response processes for subjective

evaluations of health and well-being. However, these mechanisms cannot be established from the present cross-sectional data and should be considered theoretical pathways proposed in previous research rather than mechanisms demonstrated by the current findings.

The findings regarding physical activity provide an additional perspective on the potentially distinct roles of optimism and pessimism. In the correlation analyses, higher optimism was weakly associated with greater physical activity, whereas higher pessimism was weakly associated with lower physical activity. After adjustment for age, sex, and body mass index, however, only the inverse association between pessimism and physical activity remained statistically significant. Optimism was no longer independently associated with physical activity. Although statistically significant, the adjusted association between pessimism and physical activity was modest ($\beta = -0.135$), indicating that the magnitude of this relationship should not be overstated.

The present findings can also be considered alongside longitudinal evidence concerning dispositional optimism, pessimism, and physical activity. Karhu et al. reported associations of higher optimism and lower pessimism with more favorable physical activity patterns over time (Karhu et al., 2025). The present study extends this perspective by showing that, within a cross-sectional sample of university students, pessimism retained a modest inverse association with physical activity even after adjustment for age, sex, and body mass index, whereas the corresponding association for optimism did not remain significant. Differences in study design, participant characteristics, follow-up duration, and physical activity assessment may contribute to variation across studies. In particular, the use of self-reported physical activity in the present study and the cross-sectional assessment of both psychological dispositions and activity behavior should be considered when interpreting these findings. Therefore, the present results should not be interpreted as evidence that pessimism leads to lower physical activity; rather, they indicate a modest independent association that warrants further investigation using longitudinal designs and objective measures of physical activity.

Beyond physical activity, the broader associations observed with subjective and psychosocial quality-of-life domains are consistent with the framework described by Conversano et al., who emphasized the relevance of optimism to coping, emotional regulation, psychological well-being, and health-related perceptions (Conversano et al., 2010). In the present study, optimism was positively associated with several dimensions of quality of life, whereas pessimism showed broader negative associations across these domains. Importantly, pessimism remained independently associated with mental health and emotional role limitations, whereas the corresponding adjusted associations for optimism were not statistically significant. This pattern further illustrates that optimism and pessimism may not contribute symmetrically to subjective well-being and supports their separate evaluation in research examining psychological dispositions and health-related outcomes.

Life satisfaction represented another outcome for which both psychological dispositions showed clear independent associations. Higher optimism was associated with greater life satisfaction, whereas higher pessimism was associated with lower life satisfaction, even after adjustment for age, sex, and body mass index. These findings are consistent with previous research examining the role of future-oriented cognitive expectations in subjective well-being. More specifically, Gavín-Chocano et al. examined optimism and pessimism in university students and found that a two-dimensional representation of the constructs was supported, with optimism positively and pessimism negatively related to life satisfaction. This finding is particularly relevant to the present study because it was observed in a comparable university-student population and supports the separate consideration of positive and negative future expectations when examining life satisfaction (Gavín-Chocano et al., 2023). Daşkıran et al. reported that optimism and pessimism may operate as mediating variables in the relationship between purpose in life and life satisfaction (Daşkıran et al., 2024). Although purpose in life and potential mediating pathways were not

assessed in the present study, our findings support an association between dispositional expectations and life satisfaction. The comparatively stronger standardized association observed for optimism than for pessimism in the adjusted life-satisfaction model may also suggest that positive and negative future expectations are not simply mirror images in their relationships with subjective well-being. Nevertheless, longitudinal and mediation-based studies are required to clarify the direction and mechanisms of these associations.

Several limitations of this study should be acknowledged. First, due to the cross-sectional design, causal inferences regarding the relationships between optimism, pessimism, physical activity, quality of life, and life satisfaction cannot be established. Second, data collection via a voluntary online survey may have introduced selection bias, potentially leading to an overrepresentation of individuals who were more willing or able to participate in health-related research. Third, the reliance on self-reported measurement instruments may have increased the risk of recall and social desirability bias. This issue is particularly relevant to physical activity assessment. Following the recommended IPAQ-LF scoring and data-cleaning procedures, valid and scoreable physical activity data were available for 318 of the 406 participants; therefore, analyses involving physical activity were based on this reduced subsample. Although this approach improves the interpretability of the IPAQ-LF estimates by excluding non-scoreable or implausible responses, the reduced number of available cases should be considered when interpreting and generalizing the physical activity findings. In addition, the data collection period spanning April to June may have influenced physical activity levels because of seasonal variation.

Furthermore, the sample was predominantly female (75.9%), which may limit the generalizability of the findings, particularly to male university students. Given the unequal sex distribution and the relatively smaller number of male participants, the present study was not designed to provide sufficiently balanced sex-specific comparisons. Future studies with more balanced samples should investigate whether the associations of optimism and pessimism with physical activity, quality of life, and life satisfaction differ by sex. Finally, although the regression models were adjusted for age, sex, and body mass index, residual confounding by unmeasured psychological, social, environmental, or lifestyle factors cannot be excluded.

Despite these limitations, the study has several strengths. The relatively large overall sample and the simultaneous evaluation of optimism and pessimism as separate dimensions enabled their independent association patterns to be examined across physical activity, life satisfaction, and all SF-36 subdomains. In addition, the use of adjusted regression models and sensitivity analyses with heteroscedasticity-robust standard errors strengthened the analytical evaluation of the observed associations. The application of recommended IPAQ-LF scoring and data-cleaning procedures also allowed physical activity analyses to be restricted to valid and scoreable observations. Collectively, these features provide a more nuanced understanding of how optimism and pessimism are differentially associated with subjective well-being, health-related quality of life, and physical activity in young adults.

5. Conclusion

The findings of this study indicate that optimism and pessimism are differentially associated with life satisfaction and multiple dimensions of quality of life, while pessimism also shows a modest inverse association with physical activity. These findings suggest that optimism and pessimism are meaningfully associated with subjective well-being and health-related outcomes; however, the cross-sectional design precludes conclusions regarding the direction or causality of these relationships. Evaluating the generalizability of these results across different populations is warranted. Future studies employing gender-balanced samples may help clarify potential sex-specific association patterns. As the present findings are specific to a young adult population, further research involving different age groups and clinical populations is

needed before broader generalizations can be made. Nevertheless, considering optimism and pessimism as distinct psychological constructs may provide a useful framework for future research examining subjective well-being and health-related outcomes.

CRedit authorship contribution statement

Gülay Yalçın: Writing – review & editing, Writing – original draft, Supervision, Methodology, Data curation, Conceptualization. **Server Erdoğan Gülcan:** Writing – original draft, Methodology, Data curation. **Dursun Boz:** Writing – review & editing, Supervision. **Nurten Küçükçakır:** Writing – review & editing, Validation, Formal analysis.

Ethical approval

This study was approved by the Ethics Committee of Mudanya University (Approval No: 2025-1, Date: 24 April 2025) and was conducted in accordance with the principles of the Declaration of Helsinki.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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