

Psychosocial Factors Predict Healthy Lifestyle Behaviors among University Students with Differences by Sex and Age

Wanich Suksatan

wanich.suksatan@slu.edu

Saint Louis University

Hisako Matsuo

Saint Louis University

Tanyathorn Hauwadhanasuk

Saint Louis University

Gurusai Sujitha Peramsetty

Saint Louis University

Research Article

Keywords: Health Behavior, Health Knowledge, Attitudes, Practice, Social Support, Students' Attitudes

Posted Date: May 14th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-9411028/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Additional Declarations: No competing interests reported.

Abstract

Background

Healthy lifestyle behaviors play an essential role in preventing chronic diseases among university students, yet the psychosocial factors that shape these behaviors may differ across demographic groups. This study examined whether health awareness, self-esteem, and social support predicted healthy lifestyle behaviors among university students and explored whether these associations varied by sex and age.

Methods

A cross-sectional secondary data analysis was conducted using survey data from 1,169 undergraduate students in China. Validated instruments measured health awareness, healthy lifestyle behaviors, self-esteem, and social support. Multiple regression analyses were performed separately for males and females, and for younger (18–20 years) and older (21–23 years) students. Group differences were assessed using independent-samples t-tests.

Results

Self-esteem and social support were the strongest predictors of healthy lifestyle behaviors across all groups, although their relative influence varied slightly by sex and age. Among males and younger students, self-esteem demonstrated the largest effect, whereas social support was more influential among females and older students. Health awareness showed smaller but statistically significant associations. The models explained a moderate proportion of variance in healthy lifestyle behaviors (adjusted $R^2 \approx 0.29$ – 0.30).

Conclusion

Psychosocial factors, particularly self-esteem and social support, play a central role in shaping healthy lifestyle behaviors among university students. These findings highlight the importance of interventions that enhance psychological well-being and strengthen social support systems within university settings.

1. Background

Healthy lifestyle behaviors, including balanced nutrition, regular physical activity, adequate sleep, and stress management, are essential for preventing chronic noncommunicable diseases and supporting long-term physical and mental well-being among university students. Yet, unhealthy lifestyle patterns remain common during the university years, a period often characterized by academic pressure, irregular schedules, and major developmental transitions [1]. These challenges may lead to inadequate dietary

habits, low physical activity, and increased stress, which can have lasting effects on health trajectories into adulthood [2].

Psychosocial factors play a central role in shaping students' health behaviors. Health awareness, defined as individuals' knowledge of and attention to personal health, has been positively linked to healthier dietary and exercise habits [3, 4]. Self-esteem, reflecting one's sense of self-worth, is another determinant associated with positive health behaviors; students with higher self-esteem often demonstrate healthier eating patterns and lower engagement in risky behaviors such as disordered eating [5, 6]. Social support, including emotional and practical assistance from family, peers, and significant others, has also been shown to promote healthier behaviors, with strong evidence that supportive networks encourage better diet, higher physical activity, and improved well-being [7, 8].

Despite growing evidence, less is known about whether these psychosocial predictors operate similarly across demographic groups. Prior research suggests potential sex differences in lifestyle habits; for example, females often exhibit healthier eating patterns, while males tend to engage in more physical activity [9]. Age-related variation may also occur as students transition from early to later university years [10]. However, findings remain inconsistent, and few studies have examined how sex and age may influence the relative importance of health awareness, self-esteem, and social support, particularly within the Chinese higher education context.

Given these gaps, further investigation is needed to understand how these psychosocial factors predict healthy lifestyle behaviors among university students and whether these relationships differ across demographic subgroups. This study is guided by Social Cognitive Theory (SCT), which posits that health behaviors are shaped through reciprocal interactions between personal factors, behavior, and the social environment [11]. Within this framework, health awareness reflects cognitive influences on behavior, self-esteem represents intrapersonal motivational factors, and social support captures environmental reinforcement. Applying SCT provides a coherent theoretical basis for examining how these psychosocial factors jointly shape students' health behaviors and whether these relationships differ by sex and age.

2. Objectives

The objective of this study was to examine the extent to which health awareness, self-esteem, and social support predict healthy lifestyle behaviors among university students and to determine whether these associations differ by sex and age group. Specifically, the study aimed to evaluate the independent contributions of these psychosocial factors and to compare their predictive strength between male and female students and between younger (18–20 years) and older (21–23 years) students.

3. Methods

Design and Setting

This study utilized a cross-sectional design and analyzed secondary data originally collected from a university in Guangdong Province, China. The dataset was accessed through the Inter-university Consortium for Political and Social Research (ICPSR) and included undergraduate students who completed an online survey assessing health awareness, lifestyle behaviors, self-esteem, and social support [12].

Sample and Sampling Technique

The original data collection used simple random sampling [12]. A complete list of enrolled students was obtained from the university, and a computer-generated random number table was used to select potential participants. Invitation emails were sent between March 23 and April 12, 2024, and included study details, confidentiality assurances, and an online consent form. Only students who provided informed consent were able to proceed to the survey. Of the 1,297 students who accessed the questionnaire, 1,169 met the inclusion criteria after data screening for completeness and response validity.

Research Instruments

Health Awareness was measured using the Health Awareness Scale (HAS), a six-item instrument rated on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). Higher scores represent greater awareness of personal health status and engagement with health-related information. In the original dataset, internal consistency was excellent (Cronbach's $\alpha = 0.991$) [13].

Healthy Lifestyle Behaviors scale was assessed using the Diet and Healthy Lifestyle Scale (DEVS), a 14-item instrument with three response options per item (1 = low frequency/intake to 3 = high frequency/intake). Scores reflect the extent to which students engage in various healthy habits. Cronbach's α for this scale was 0.932 in the original study [14].

Self-Esteem was measured using the Rosenberg Self-Esteem Scale (RSES), which contains 10 items scored from 1 (strongly disagree) to 4 (strongly agree). Higher scores indicate greater global self-worth. Reliability in the dataset was high (Cronbach's $\alpha = 0.996$) [15].

Social Support was assessed using the Oslo Social Support Scale (OSSS-3), consisting of three items assessing number of close contacts, interest shown by others, and perceived practical support. Scores range across 4- and 5-point Likert-type options, with higher totals indicating stronger perceived support. The original dataset demonstrated strong internal consistency (Cronbach's $\alpha = 0.981$) [15].

Data Screening and Preparation

All data underwent quality screening to remove inconsistent, incomplete, or patterned responses in the original dataset. For the present analysis, variables were assessed for missing values, normality, and outliers, with no additional exclusions required. Demographic variables were recoded for analysis, with

sex coded as male = 0 and female = 1, and age group categorized as 18–20 years = 0 and 21–23 years = 1.

Statistical Analysis

All analyses were performed using SPSS Version 28. Descriptive statistics were used to summarize participant characteristics and key study variables, and independent-samples t-tests were conducted to assess group differences by sex and age. To examine whether health awareness, self-esteem, and social support predicted healthy lifestyle behaviors, and to determine whether these associations differed across demographic groups, hierarchical multiple regression models were conducted separately for males and females, as well as for younger (18–20 years) and older (21–23 years) students. For each model, standardized beta coefficients (β), confidence intervals, R^2 , adjusted R^2 , F-statistics, and p-values were reported, and effect sizes were interpreted using established guidelines. All statistical tests were two-tailed with a significance level of $p < .05$.

4. Results

Participant Characteristics and Gender Comparisons

A total of 1,169 university students participated in the study, comprising 554 males (47.4%) and 615 females (52.6%). The mean age of the sample was 20.56 years ($SD = 1.73$), ranging from 18 to 23 years. Descriptive statistics and gender differences for the study variables, including health awareness, healthy lifestyle behaviors, self-esteem, and social support, are presented in Table 1. Comparisons by age group, students aged 18–20 years ($n = 573$) and 21–23 years ($n = 596$) did not differ significantly in health awareness, healthy lifestyle behaviors, or self-esteem. A marginal difference was observed in social support ($t(1,164.73) = -1.80$, $p = .073$), with older students reporting slightly higher levels of support.

Table 1
Descriptive statistics of study variables by sex and age group

Variable	Group	n	Mean (SD)	Test statistic	p-value
Health Awareness	Male	554	20.19 (7.65)	t(1167) = - 0.05	.964
	Female	615	20.21 (7.77)		
	18–20 years	573	20.26 (7.62)	t(1167) = 0.25	.807
	21–23 years	596	20.15 (7.81)		
Healthy Lifestyles	Male	554	22.89 (7.08)	t(1167) = 0.18	.855
	Female	615	22.81 (6.95)		
	18–20 years	573	22.67 (7.00)	t(1167) = - 0.82	.412
	21–23 years	596	23.01 (7.05)		
Self-Esteem	Male	554	24.48 (10.95)	t(1167) = - 0.07	.948
	Female	615	24.52 (11.05)		
	18–20 years	573	23.72 (10.94)	t(1167) = - 0.64	.523
	21–23 years	596	24.30 (11.06)		
Social Support	Male	554	6.86 (3.86)	t(1148) = - 0.13	.898
	Female	615	6.84 (3.77)		
	18–20 years	573	6.62 (3.82)	t(1164.73) = - 1.80	.073
	21–23 years	596	7.02 (3.80)		
Note. Values are presented as mean (SD). Independent samples t-tests were conducted to compare groups.					

Pearson Correlations among key study Variables

Pearson correlation analysis showed that all variables were positively associated, with weak to moderate correlations. Healthy lifestyle behaviors were moderately correlated with social support ($r = 0.41$) and self-esteem ($r = 0.38$), whereas health awareness showed weaker associations with all variables ($r = 0.10$ – 0.21). Overall, psychosocial factors appeared to have stronger relationships with healthy lifestyle behaviors than health awareness. All correlations were below 0.80, indicating no multicollinearity concerns (see Fig. 1).

Multiple Regression Analyses

Multiple regression analyses indicated that self-esteem and social support were the strongest predictors of healthy lifestyle behaviors across all groups. Among males, self-esteem demonstrated the largest

effect ($\beta = 0.34$), followed closely by social support ($\beta = 0.33$), whereas among females, social support emerged as the most influential predictor ($\beta = 0.37$), with self-esteem also showing a strong association ($\beta = 0.31$). In contrast, health awareness demonstrated smaller but statistically significant effects ($\beta = 0.08$) (see Fig. 2).

Age-stratified analyses showed a similar pattern, with self-esteem being the strongest predictor among individuals aged 18–20 years ($\beta = 0.35$), while social support had the greatest influence among those aged 21–23 years ($\beta = 0.38$). Overall, the models explained a moderate proportion of variance in healthy lifestyle behaviors (Adjusted $R^2 \approx 0.29$ – 0.30), indicating consistent and robust effects of psychosocial factors across sex and age groups (see Fig. 3). Complete regression coefficients for gender and age groups are summarized in Table 2.

Table 2

Multiple regression models predicting healthy lifestyle behaviors by sex and age group (standardized coefficients with 95% confidence intervals)

Predictor	Male (n = 554)	Female (n = 615)	Aged 18–20 (n = 573)	Aged 21–23 (n = 596)
	β (95%CI)	β (95%CI)	β (95%CI)	β (95%CI)
Health Awareness	0.19*** (0.118, 0.259)	0.08* (0.013, 0.149)	0.18*** (0.111, 0.250)	0.09** (0.026, 0.163)
Self-esteem	0.34*** (0.274, 0.414)	0.31*** (0.246, 0.382)	0.35*** (0.285, 0.423)	0.30*** (0.234, 0.373)
Social Support	0.33*** (0.263, 0.404)	0.37*** (0.298, 0.435)	0.31*** (0.236, 0.376)	0.38*** (0.313, 0.450)
Adjusted R ²	0.30	0.26	0.30	0.29
F-statistic	81.7***	82.6***	84.0***	80.3***
Notes. Values are standardized regression coefficients (β) with 95% confidence intervals. The final model (Model 3) is presented.				
*p < .05, **p < .01, ***p < .001				

5. Discussion

This study identified health awareness, self-esteem, and social support as significant predictors of healthy lifestyle behaviors among Chinese university students. The strong influence of health awareness, reflected in students’ knowledge and attitudes about nutrition, exercise, and health risks, is consistent with international evidence showing that greater health consciousness predicts better dietary patterns and greater engagement in physical activity [2, 6]. Likewise, the association between self-esteem and healthy behaviors in our study aligns with prior work indicating that students with higher self-worth tend

to maintain balanced diets and regular physical activity, whereas lower self-esteem is linked to maladaptive behaviors such as disordered eating [16]. These findings reinforce the central role of psychological factors in shaping health-related behaviors during late adolescence and early adulthood.

The importance of social support observed in this study also mirrors patterns reported across countries and cultural settings. Adolescents and university students who receive consistent encouragement, emotional support, or modeling from family and peers are more likely to engage in physical activity and consume fruits and vegetables [1, 17]. Similarly, research involving international undergraduates found that friend support plays a critical role in motivating participation in physical activity [7]. A recent systematic review further confirms that social support enhances young adults' health behaviors and well-being by providing emotional resources, accountability, and motivation [8]. Collectively, these findings demonstrate that health awareness, self-esteem, and social support operate as universal psychosocial determinants of healthy lifestyles, and our study extends this body of evidence to the Chinese higher education context.

Notably, we found no significant differences in overall healthy lifestyle scores between male and female students, nor between younger (18–20) and older (21–23) students. This contrasts with international findings that often report gender-based differences—for example, female students typically demonstrate healthier eating patterns, while males participate more frequently in physical activity [9]. The absence of sex differences in our sample may indicate a convergence in lifestyle behaviors among young Chinese adults, possibly influenced by shared campus environments, access to similar resources, and comparable academic demands. Likewise, the lack of age-group differences within a relatively narrow developmental period suggests that undergraduate students, regardless of their year in university, tend to exhibit similar lifestyle habits. These findings are consistent with a Spanish study reporting uniformly poor dietary patterns and high sedentary behavior across university students of different ages [10].

However, subtle variations emerged in the predictive strength of key psychosocial determinants. Social support demonstrated a somewhat stronger positive influence on healthy lifestyle behaviors among female students and those in the older subgroup. This pattern aligns with evidence that women may benefit more from interpersonal support when engaging in health-promoting behaviors [18]. Female students often describe encouragement from peers and family as a primary motivator for exercising and maintaining healthy eating habits, whereas male students may be more influenced by individual goals, competitiveness, or self-directed interests [10]. Future cross-cultural research should investigate these moderating effects in greater depth to inform tailored and more effective health promotion strategies.

The findings of this study highlight the critical need for nurses and health educators to integrate psychosocial assessment, specifically health awareness, self-esteem, and social support, into routine practice when working with university populations. Nursing professionals can play a pivotal role by developing targeted interventions such as wellness counseling, health education workshops, peer-support initiatives, and programs that build confidence and coping skills. Collaboration among universities, families, and community organizations can further strengthen supportive networks and

extend health-promoting resources beyond the campus. Collectively, these multilevel, nurse-led strategies can create a supportive ecosystem that empowers students to adopt, strengthen, and sustain healthy lifestyle behaviors.

This study has several limitations. First, its cross-sectional design limits causal inference, and bidirectional relationships between psychosocial factors and health behaviors cannot be ruled out. Second, reliance on self-reported measures may introduce recall and social desirability bias, despite the use of validated instruments. Third, the sample was drawn from a single province in China, which may limit generalizability to students in other regions or countries with different cultural norms, socioeconomic conditions, or university environments. Finally, although key psychosocial predictors were included, other potentially relevant factors, such as stress, self-efficacy, family socioeconomic status, or academic workload, were not assessed and may contribute to lifestyle behaviors.

Conclusion

This study demonstrates that health awareness, self-esteem, and social support are key psychosocial determinants of healthy lifestyle behaviors among Chinese university students. The multiple regression findings show that each factor uniquely contributes to healthier behaviors, with self-esteem and social support emerging as the most consistent predictors across groups, underscoring the importance of psychosocial and environmental factors in promoting healthy lifestyles among university students. Together, the results highlight the importance of fostering health knowledge, psychological well-being, and supportive social environments in university settings. Strengthening these areas may enhance students' ability to adopt and sustain healthy lifestyles during a critical period of transition into adulthood. Future research should explore these relationships longitudinally and evaluate tailored interventions that address the specific needs of diverse student populations.

Declarations

Clinical Trial Number

Not Applicable

Author Contributions

Conceptualization, W.S., H.M., and T.H.; methodology, W.S. and H.M.; soft-ware, W.S. and H.M.; validation, W.S. and H.M.; formal analysis, W.S.; writing—original draft preparation, W.S.; writing—review and editing, W.S., H.M., T.H., and G.S.P.; supervision, H.M. All authors have read and agreed to the published version of the manuscript.

Ethical Considerations

The original study protocol received approval from the Ethics Committee of Guangdong Business and Technology University (Approval No. 2024GS006). All responses were anonymous, and participants were

informed about voluntary participation, confidentiality, and the right to withdraw at any time.

Consent to Participate

Informed consent was obtained from all participants included in the original study.

Consent to Publish

Not applicable.

Conflict of Interest

The authors declare that there is no conflict of interest.

Funding Statement

This research did not receive any grants from public, commercial, or nonprofit funding agencies.

Data Availability

The dataset analyzed in this study is publicly available through the Inter-university Consortium for Political and Social Research (ICPSR) at <https://doi.org/10.3886/E207741V1>.

References

1. Zhang Z, Abdullah H, Ghazali AHA, D'Silva JL, Ismail IA, Huang Z. The influence of health awareness on university students' healthy lifestyles: The chain mediating role of self-esteem and social support. *PLOS ONE*. 2024;19(10):e0311886. doi: 10.1371/journal.pone.0311886.
2. Benjanirat T, Ounprasertsuk J, Kawe S, Sillabutra J. Mental Health Status, Related Knowledge, and Its Influencing Factors Among First-Year University Students: A Cross-sectional Study in Thailand. *Journal of Nursing and Midwifery Sciences*. 2025;12(12):e163995. doi: 10.5812/jnms-160956.
3. Wu Y, Wang S, Shi M, Wang X, Liu H, Guo S, et al. Awareness of nutrition and health knowledge and its influencing factors among Wuhan residents. *Front Public Health*. 2022;10:987755. doi: 10.3389/fpubh.2022.987755.
4. Li H, Shi L, Xing YL. The mediating role of health awareness in the relationship between health information behavior and health outcomes among the older adults. *Front Public Health*. 2025;13:1492472. doi: 10.3389/fpubh.2025.1492472.
5. Li H, Hao F. The influence of physical activity on the mental health of high school students: the chain mediating effects of social support and self-esteem. *Sci Rep*. 2025;15(1):27537. doi: 10.1038/s41598-025-11952-5.
6. Cella S, Cipriano A, Aprea C, Cotrufo P. Self-Esteem and Binge Eating among Adolescent Boys and Girls: The Role of Body Disinvestment. *Int J Environ Res Public Health*. 2021;18(14). doi: 10.3390/ijerph18147496.

7. Lisboa T, Silva WRD, Silva DAS, Felden É PG, Pelegrini A, Lopes JJD, et al. Social support from family and friends for physical activity in adolescence: analysis with structural equation modeling. *Cad Saude Publica*. 2021;37(1):e00196819. doi: 10.1590/0102-311x00196819.
8. Ruihua L, Hassan NC, Qiuxia Z, Sha O, Jingyi D. A systematic review on the impact of social support on college students' wellbeing and mental health. *PLOS ONE*. 2025;20(7):e0325212. doi: 10.1371/journal.pone.0325212.
9. Lonati E, Cazzaniga E, Adorni R, Zanatta F, Belingheri M, Colleoni M, et al. Health-Related Lifestyles among University Students: Focusing on Eating Habits and Physical Activity. *International Journal of Environmental Research and Public Health*. 2024;21(5):626. doi: 10.3390/ijerph21050626.
10. García-Pérez L, Villodres GC, Muros JJ. Differences in healthy lifestyle habits in university students as a function of academic area. *J Public Health (Oxf)*. 2023;45(2):513-22. doi: 10.1093/pubmed/fdac120.
11. Bandura A. Health promotion from the perspective of social cognitive theory. *Understanding and changing health behaviour*. Psychology Press; 2013. p. 299-339.
12. Zhang Z: The Influence of Health Awareness on University Students' Healthy Lifestyles in Guangdong. <https://doi.org/10.3886/E207741V1> (2024). Accessed November 10, 2025.
13. Michaelidou N, Hassan LM. The role of health consciousness, food safety concern and ethical identity on attitudes and intentions towards organic food. *International Journal of Consumer Studies*. 2008;32(2):163-70. doi: 10.1111/j.1470-6431.2007.00619.x.
14. Calizaya-Milla YE, Saintila J, Morales-García WC, Ruiz Mamani PG, Huancahuire-Vega S. Evidence of Validity and Factorial Invariance of a Diet and Healthy Lifestyle Scale (DEVS) in University Students. *Sustainability*. 2022;14(19):12273. doi: 10.3390/su141912273.
15. Rosenberg M, Rosenberg M. *Society and the Adolescent Self-Image*. Princeton: Princeton University Press; 2015.
16. Hazzard VM, Telke SE, Simone M, Anderson LM, Larson NI, Neumark-Sztainer D. Intuitive eating longitudinally predicts better psychological health and lower use of disordered eating behaviors: findings from EAT 2010-2018. *Eat Weight Disord*. 2021;26(1):287-94. doi: 10.1007/s40519-020-00852-4.
17. Nabors L, Fiser-Gregory K, Olaniyan A, Stanton-Chapman T, Merianos A. College students' attitudes about ways family, friends, significant others and media affect their eating and exercise behaviors and weight perceptions. *J Am Coll Health*. 2024;72(4):1296-308. doi: 10.1080/07448481.2022.2076101.
18. Jimenez-Morcillo J, Clemente-Suárez VJ. Gender Differences in Body Satisfaction Perception: The Role of Nutritional Habits, Psychological Traits, and Physical Activity in a Strength-Training Population. *Nutrients*. 2024;16(1):104. doi: 10.3390/nu16010104.

Figures

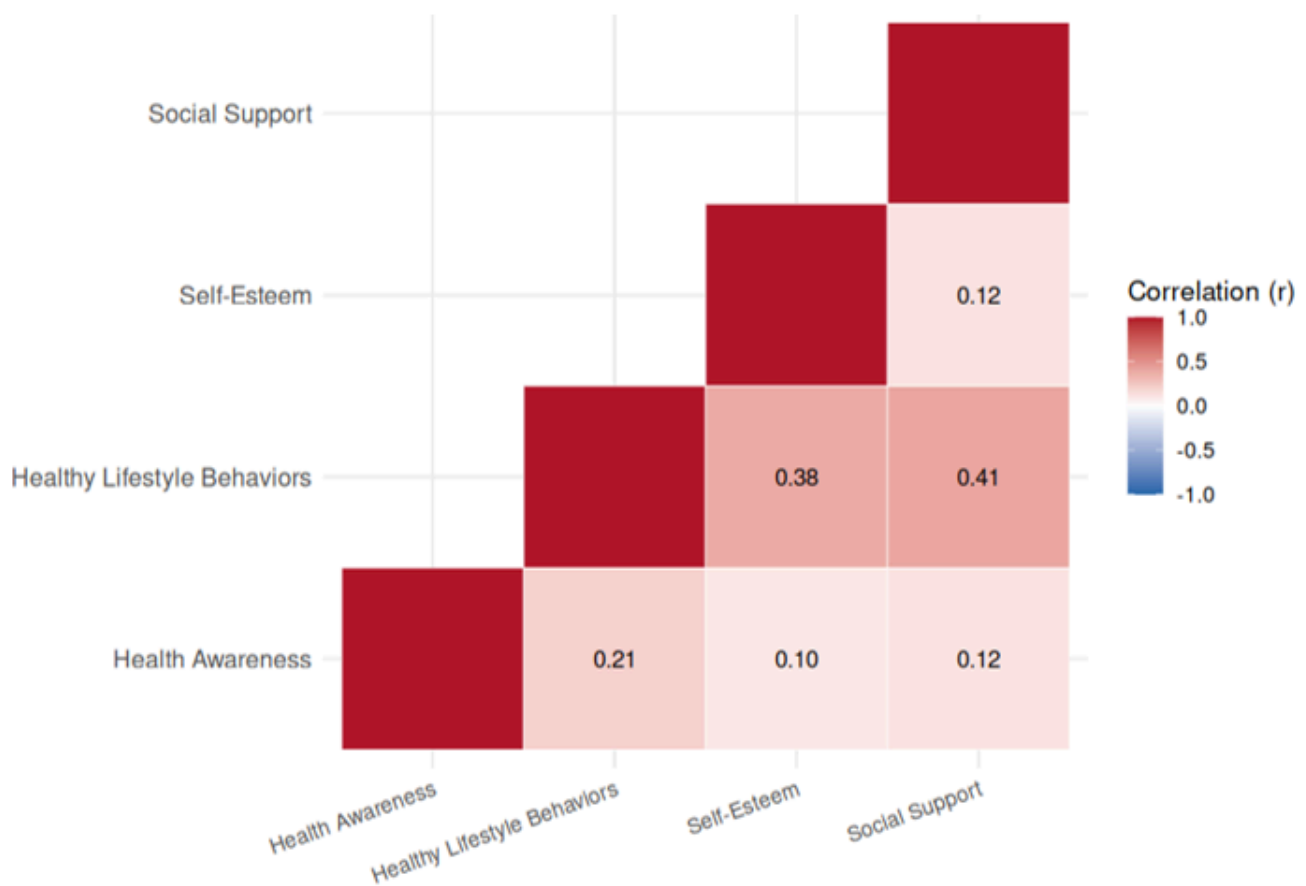


Figure 1

Pearson correlation matrix among study variables. Color intensity represents the strength and direction of correlations. All variables were significantly correlated ($p < .05$), with no evidence of multicollinearity.

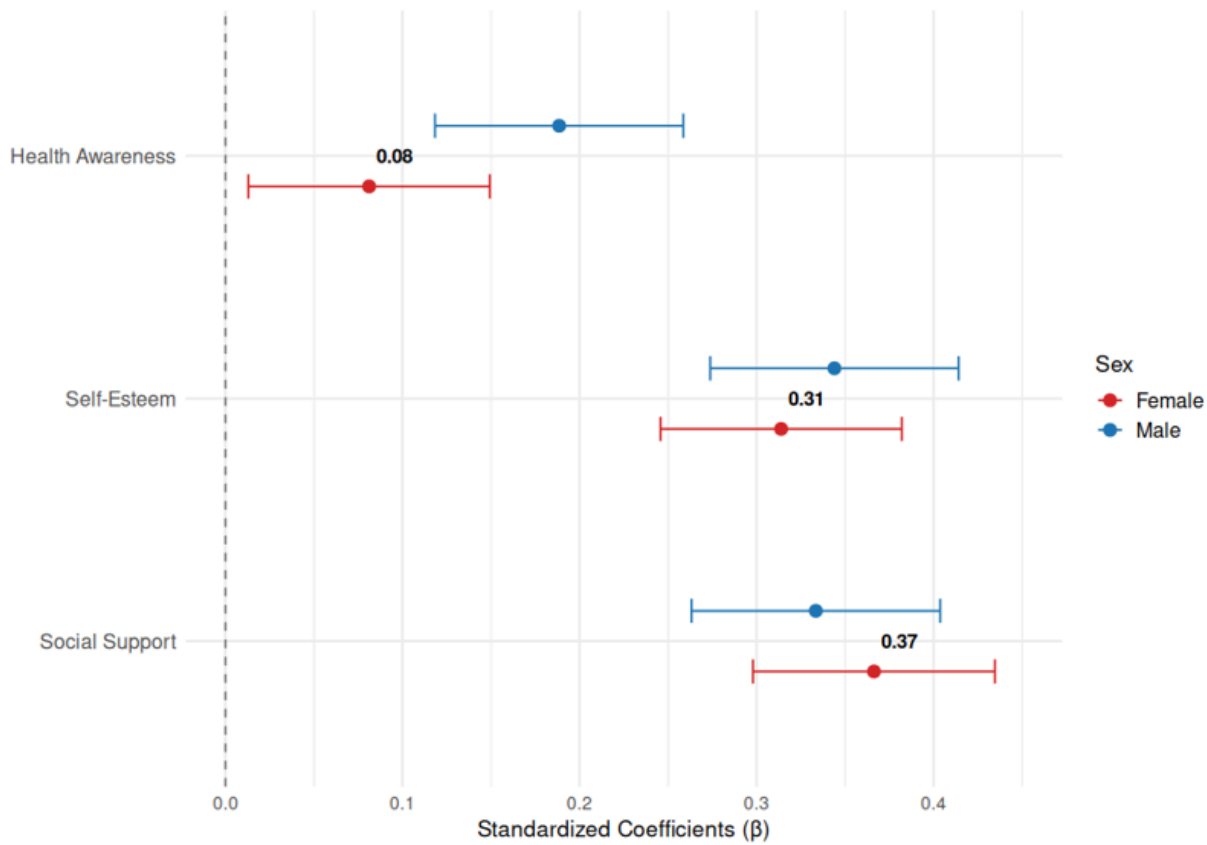


Figure 2

Sex differences in predictors of healthy lifestyle behaviors. Points represent standardized regression coefficients (β), and error bars indicate 95% confidence intervals.

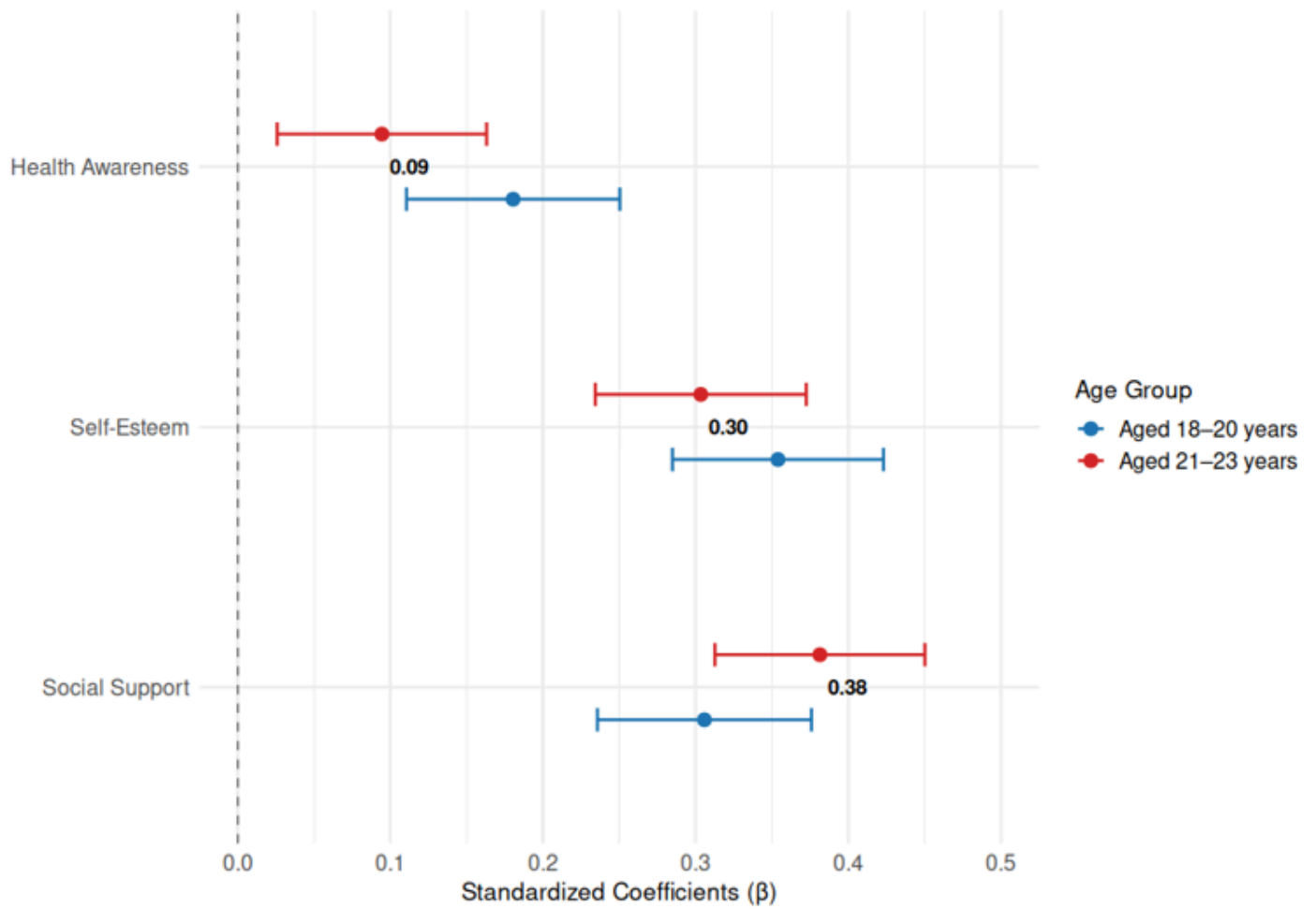


Figure 3

Age differences in predictors of healthy lifestyle behaviors. Points represent standardized regression coefficients (β), and error bars indicate 95% confidence intervals.