

The Differentiating Effect of Family Socioeconomic Status on College Students' Healthy Lifestyles: The Mediating Role of Health Literacy

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Received: 10 March 2026 / Accepted: 5 April 2026 / Published online: 7 April 2026

Abstract

To investigate the influence pathway of family socioeconomic status (SES) on college students' healthy lifestyles and to examine the mediating mechanism of health literacy in this relationship. A convenience sampling method was used to recruit 1,050 college students from 9 universities in central and western China as research subjects; A cross-sectional survey was conducted using standardized scales, including the Family Socioeconomic Status Scale, the Health Literacy Rapid Assessment Questionnaire (HLRAQ), and the Health-Promoting Lifestyle Scale II (HPLP-II); Stratified stepwise regression analysis was used, and based on Hayes' (2017) Process macro Model 4, the bias-corrected Bootstrap method (repeated sampling 5,000 times) was performed in SPSS22.0 to test the mediating effect and confidence intervals of health literacy. Pearson correlation analysis revealed varying associations between dimensions of family SES, healthy lifestyle, and health literacy, with differences in both direction and magnitude: Family economic status was significantly positively correlated with both healthy lifestyle ($r = 0.091$, $p < 0.05$) and health literacy ($r = 0.088$, $p < 0.05$); Family social status was significantly negatively correlated with healthy lifestyle ($r = -0.113$, $p < 0.05$) and health literacy ($r = -0.065$, $p < 0.05$). Health literacy was strongly positively correlated with a healthy lifestyle ($r = 0.259$, $p < 0.001$). The mediating effect test further indicated that health literacy played a partial mediating role between family economic status and healthy lifestyle, with an indirect effect $\beta=0.022$ (SE=0.0028, 95% CI [0.006, 0.041]), accounting for 24.18% of the total effect; It also played a partial mediating role between family social status and healthy lifestyle, with an indirect effect $\beta=-0.016$ (SE=0.0082, 95% CI [-0.0330, -0.0005]), accounting for 14.58% of the total effect. The family SES is not a single construct, and its economic dimension and social dimension have independent effects on the healthy lifestyle of college students in opposite directions and with different intensities; Health literacy is a key psychological mediating variable that links family

background to individual health behavior. This study systematically reveals for the first time the differentiated pathways of SES multi-dimensionality in the formation of health behaviors, providing high-quality empirical evidence and theoretical support for universities to implement stratified, classified, targeted and precise health literacy improvement and health behavior intervention.

Keywords: Healthy Lifestyle; Family Socioeconomic Status; Health Literacy; College Students; Mediation

1. Introduction

A healthy lifestyle encompasses a constellation of health-promoting behaviors—including balanced nutrition, regular physical activity, sufficient and restorative sleep, stress management, and avoidance of harmful substances—that individuals adopt to maintain and enhance their physical, mental, and social well-being (Walker et al., 1987). As emphasized by the World Health Organization (WHO), approximately 60% of the global burden of non-communicable diseases (NCDs) is attributable to modifiable behavioral and lifestyle factors. Sustained engagement in such behaviors has been consistently associated with reduced risk of chronic conditions (e.g., cardiovascular disease, type 2 diabetes, and certain cancers), increased life expectancy, and improved health-related quality of life. The college years represent a critical developmental window: a transitional phase from adolescence to emerging adulthood characterized by growing autonomy and heightened neuroplasticity—making it a pivotal period for the acquisition, reinforcement, and long-term consolidation of health behaviors (Chen, 2007). Yet, this formative stage is frequently accompanied by competing psychosocial demands—including academic workload, identity exploration, peer relationship dynamics, and vocational uncertainty—which may undermine consistent adherence to healthy practices. Consequently, evidence-informed interventions that foster scientifically grounded, sustainable lifestyle habits among college students constitute an essential strategic priority for advancing the Healthy China Initiative and strengthening population-level health resilience.

The family, as a primary microsystem shaping adolescent development, constitutes a critical social determinant of health disparities among college students across socioeconomic strata (David et al., 2018). Families with higher socioeconomic status (SES) typically prioritize health promotion and possess greater material and cultural capital—enabling access to preventive services (e.g., routine health screenings), nutrient-dense diets, structured physical activity opportunities, restorative leisure, and consistent health-related modeling. Consequently, they are better positioned to provide instrumental support, normative reinforcement, and cognitive scaffolding that foster the internalization of sustainable health behaviors in their children (Conner et al., 2013). In contrast, families with lower SES often contend with structural constraints—including financial insecurity, time poverty, and limited access to health information and quality care—that impede their capacity to deliver comprehensive health education or model health-protective practices. Empirical evidence further indicates that such contextual limitations correlate with elevated prevalence of health-risk behaviors within low-SES households (Roshchina, 2016).

Despite its theoretical and practical significance, the mediating pathways through which familial SES influences college students' healthy lifestyle adoption remain underexplored—particularly the interplay among material conditions, psychological cognition (e.g., health literacy), and behavioral enactment. To address this gap, the present study adopts a tripartite conceptual framework—grounded in the socioecological model—to examine how family SES shapes college students' healthy lifestyles indirectly, via individual-level health literacy. By elucidating this mechanism, the research aims to generate actionable, evidence-based insights for designing targeted health promotion curricula and campus-wide wellness initiatives in higher education institutions.

2. Theory and Hypotheses Development

(1) Family socioeconomic status and healthy lifestyle

Family socioeconomic status (SES) is defined as the position a family holds within society, which is determined by the social resources that the family possesses or can exercise control over. As a comprehensive measure of family resources, it is usually composed mainly of family income, parents' educational attainment and parents' occupation (Bradley & Corwyn, 2002). Studies have shown that families with higher SES levels usually have more resources, knowledge and social capital, and can provide a healthier living environment and behavioral pattern for their children. Using large-scale cohort data analysis, Zhang et al. (2021), through an analysis of large-scale cohort data, found that individuals with lower socioeconomic status (SES) exhibit a higher risk of all-cause mortality relative to those with higher SES, and that a healthy lifestyle serves as a significant mediator in this association. Similar conclusions were also verified in the group of college students, with studies indicating that young people with low SES faced more problems such as resource scarcity, environmental stress, and insufficient social support during their growth, and were more likely to develop irregular schedules and unhealthy eating habits (Pampel et al., 2010). Based on this, the study puts forward Hypothesis 1:

H1: Family socioeconomic status has a significant predictive effect on the healthy lifestyle of college students.

(2) Mediating health literacy

In the research on the influencing factors of a healthy lifestyle, health literacy is an important variable proposed by the research community in the 21st century. Health literacy refers to an individual's ability to acquire, understand, evaluate and apply health information in order to make beneficial health decisions (Sørensen et al., 2012). Health literacy is not only an important prerequisite for a healthy lifestyle, but is also considered a key mediating mechanism for explaining the transmission of social inequality in the health domain (Nutbeam, 2008).

On the one hand, family socioeconomic status has a significant impact on health literacy. Studies have shown that families with high SES typically have more abundant health information resources, higher levels of parental health awareness, and better educational investment, which can effectively enhance children's health knowledge reserves and information processing

capabilities (Stormacq et al., 2019). Empirical research shows that household income is positively correlated with health literacy and is one of the main factors influencing individual health literacy (Hu et al., 2019; Liu et al., 2019; Zeng et al., 2019); In terms of parental education, some studies suggest that the educational attainment of fathers is one of the main factors influencing health literacy (Hu et al., 2019; Li et al., 2017), while others suggest that the educational attainment of mothers is the main factor influencing children's health literacy (Li et al., 2017). However, whether it is the father or the mother, their educational attainment has a significant positive impact on an individual's health literacy. As this study puts forward Hypothesis 2:

H2: Family socioeconomic status has a significant predictive effect on health literacy among college students

On the other hand, health literacy is an important determinant of a healthy lifestyle. Individuals with higher health literacy are better able to understand the necessity of a healthy lifestyle, acquire scientific health knowledge, and take the initiative to adopt a healthy lifestyle in their daily lives (Suka et al., 2015). A large number of empirical studies have confirmed that health literacy is significantly positively correlated with healthy lifestyles and significantly negatively correlated with health-risk behaviors such as suicide and self-harm (Wang et al., 2020). Residents with health literacy scored significantly higher on health-promoting lifestyles than those without (Chen et al., 2020), while lack of health literacy or moderate to low levels of health literacy were risk factors for health-risk behaviors among adolescents (Li et al., 2019), and the detection rate of picky eating or selective eating was also the highest (Han Xiaosheng, 2018). Therefore, this study presents research hypothesis 3:

H3: Health literacy of college students has a significant predictive effect on their healthy lifestyle.

Based on the above analysis, health literacy may become the key mediating variable of family SES influencing college students' healthy lifestyles. Although studies have explored the relationship between family SES and health literacy, and between health literacy and healthy lifestyle, there are still limited studies that test all three in the same mediating model. Therefore, Hypothesis 4 is proposed in this study:

H4: Health literacy plays a mediating role between family socioeconomic status and healthy lifestyles of college students.

3. Methods

3.1. Participants

The subjects were college students from nine universities in the central and western parts of Mainland China. Using a convenience sampling method, electronic questionnaires were distributed to students in their classes by counselors and instructors. Participation was voluntary and based on informed consent. A total of 1,300 questionnaires were retrieved, and 1,050 were valid, with a valid questionnaire rate of 80.8%. Among the samples, 579 were male, accounting for 55.1%; 471 women, 44.9%; 564 freshmen, 53.7%; 195 sophomores, 18.6%; 213 juniors,

20.3%; 80 seniors and above, 7.6; 127 in liberal arts, 12.1%; 175 in science, 16.7; 489 in engineering, 46.6%; 158 in medicine, 15.0%; Others 101, 9.6%. The sample demonstrated a reasonable demographic distribution, providing a reliable basis for research inference.

3.2. Measures

3.2.1. Family Socioeconomic Status Scale

Family socioeconomic status is mainly assessed by collecting information on parents' education, occupation, and income. The scoring method refers to the Kuppaswamy evaluation method and Li Qiang (2002) multi-division assignment standard, dividing education, income and occupation into seven levels: 21 is the top level, 18-20 is the upper level, 15-17 is the upper-middle level, 12-14 is the middle-middle level, 9-11 is the lower-middle level, 6-8 is the lower level, and 3-5 is the lowest level. Among them, the income assignment criteria are based on the 2020 Blue Book China Class Income Classification (Li et al., 2020), with the income level of middle-class families as the median and divided into seven grades. The assignment criteria are shown in Table 1.

Table 1. Assignment of Family Socioeconomic Status

Education	Household income (ten thousand yuan)	Occupation	Score
Illiterate or literate very little	3 Below	Temporary worker, unemployed	1
Primary school graduate	3 ~ 8	Manual workers	2
Junior high school graduation	8 to 15	Skilled workers	3
High school graduate	15 ~ 30	General office workers	4
Graduated from a secondary technical school or vocational school	30 ~ 100	General managers and general professional and technical personnel	5
College or university degree	100 ~ 500	Middle managers and general professionals	6
Master's degree and above	More than 500	Senior executives and senior professionals	7

3.2.2. Health Literacy Questionnaire

Health literacy tool selection: The Rapid Assessment Questionnaire of Urban Public Health Literacy by Zhuang (2014). The questionnaire is currently the shortest health literacy assessment tool in China. It consists of 20 questions, including 8 questions on health knowledge, 8 questions on healthy lifestyle and behavior, and 4 questions on health skills. Each question is worth 5 points, and each correct answer is worth 5 points, out of 100 points. The criteria for defining health

literacy use 60% and 75% as cut-off values to divide health literacy levels into three grades: below 60 is low health literacy, above 75 is high health literacy, and 60 to 74 is marginal cost health literacy. The Cronbach's α coefficients for each dimension of the scale were 0.87, 0.78, and 0.90 respectively.

3.2.3. Health-promoting Lifestyle Scale

The Healthy Lifestyle Scale is based on the second edition of the Healthy Lifestyle Scale developed by Walker et al. (1996) and revised by Wu Mingcang (2014). It consists of 29 questions and is based on the preliminary research through item analysis and exploratory factor analysis. Two items, "I practice relaxation and meditation every day," and "I resolve disputes with others through discussion and inclusion," were removed, and 27 items, six dimensions, were retained: interpersonal relationship (4), health responsibility (6), stress management (4), nutritional behavior (3), physical activity (4), and mental growth (6). Using the Likert five-point scoring system, "strongly disagree" for 1 point, "disagree" for 2 points, "uncertain" for 3 points, "agree" for 4 points, "strongly agree" for 5 points, with a total score of 27 to 135 points, the higher the score, the better the healthy lifestyle. The Cronbach's α coefficient of the scale is 0.965, and the Cronbach's α coefficient of each dimension is between 0.737 and 0.891.

3.3. Data Analysis

Descriptive statistics, consistency reliability analysis and correlation analysis of the study data were performed using SPSS 22.0 software, and mediating effect analysis was conducted using the Process 3.3 plugin.

Common method bias test: This study collected data using the self-reporting method, and there may be common method bias. To control this bias, the study took preventive measures such as voluntary participation, anonymous surveys, and random distribution of three variable items, and tested the data using the Harman univariate test. The results showed that a total of 15 factors were extracted, and the variance variation explained by the first factor was 33.3%, below the critical value of 40%, indicating that there was no serious common method bias problem in this study.

4. Results

In analyzing the study results, it was found that family socioeconomic status (SES) exhibited a non-significant negative correlation. During the testing process, no positive correlation was observed between parents' educational attainment, occupation, and income—this contradicts the a priori assumption of the scale, which posits that educational attainment, occupation, and income are positively correlated. Specifically, people with a high level of education do not necessarily have a high economic income, and people with a high occupational assignment do not necessarily have a high income. According to regression analysis, economic income better represents the socioeconomic status of a family, and this result is more in line with the current development situation in central and western China (Zhou, 2018). Therefore, in the results analysis, this study divided family socioeconomic status into two dimensions: family social status and family economic status.

4.1. Correlations Between Socioeconomic Status of College Students' Families, Health Literacy, and Health-Promoting Lifestyles

Pearson product-difference correlation analysis was adopted, and the results are shown in Table 2. Family economic status is significantly positively correlated with a healthy lifestyle ($r = 0.091$, $p < 0.05$), and significantly positively correlated with health literacy ($r = 0.088$, $p < 0.05$). Family social status was significantly negatively correlated with both healthy lifestyle ($r = -0.113$, $p < 0.05$) and health literacy ($r = -0.065$, $p < 0.05$); Health literacy was significantly positively correlated with a healthy lifestyle ($r = 0.259$, $p < 0.05$), if 1, 2, 3 were verified.

Table 2. Correlation coefficients of Family socioeconomic status, health literacy and healthy lifestyle

Variables	Family economic status	Family social status	Health literacy	Healthy lifestyle
Family Economic status	1			
Family social position	0.903**	1		
Health literacy	0.088*	-0.065*	1	
Healthy lifestyle	0.091*	-0.113*	0.259*	1

Note: * $p < .05$

4.2. A mediating Test of Health Literacy

(1) The mediating effect of health literacy between family economic status and healthy lifestyle

To examine the mediating role of health literacy in the relationship between family economic status and healthy lifestyle of college students, stepwise regression analysis was used in this study, and the results are shown in Table 3.

In the first step of the regression model, family economic status was the independent variable and healthy lifestyle was the dependent variable. The results showed that family economic status had a significant positive predictive effect on the healthy lifestyle of college students ($\beta = 0.091$, $t = 2.973$, $p < 0.05$), with model explanatory power of 0.8% ($R^2 = 0.008$, $F = 8.842$, $p < 0.05$), indicating that the higher the family economic status, the level of healthy lifestyle among college students was higher.

In the second-step regression model, family economic status was designated as the independent variable and health literacy as the dependent variable. Results demonstrated that family economic status exerted a significant positive predictive effect on health literacy ($\beta = 0.088$, $t = 2.846$, $p < 0.05$). The model accounted for 0.8% of the variance ($R^2 = 0.008$, $F = 8.099$, $p < 0.05$), indicating that students from families with higher economic status exhibit a higher level of health literacy.

In the third-step regression model, both family economic status and health literacy were included as independent variables, with a healthy lifestyle as the dependent variable. The results

showed that health literacy had a significant positive predictive effect on healthy lifestyle ($\beta = 0.252, t = 8.447, p < 0.05$), while the direct predictive effect of family economic status on healthy lifestyle was weakened. It still reached a significant level ($\beta = 0.069, t = 2.320, p < 0.05$). The explanatory power of the model increased significantly to 7.2% ($R^2 = 0.072, \Delta R^2 = 0.070, F = 40.392, p < 0.05$). The results suggest that health literacy plays a partial mediating role between family economic status and the healthy lifestyle of college students.

Table 3. shows the results of the sequential examination of the mediating effect of health literacy between family economic status and healthy lifestyle

Independent variables	Dependent variable	Standardized β	t	R^2	ΔR^2	F
Step 1 Family economic status	Healthy lifestyle	0.091	2.973*	0.008	0.007	8.842*
Step 2 Family economic status	Health literacy	0.088	2.846*	0.008	0.007	8.099*
Step 3 Family economic status	Healthy lifestyle	0.069	2.320*	0.072	0.070	40.392*
Health literacy		0.252	8.447*			

Note: * $p < .05$

To further verify the significance of the mediating effect, the Process macro (Model 4) developed by Hayes (2017) was used for the mediating effect test. The Bootstrap method was used for repeated sampling 5,000 times to calculate the 95% deviation corrected confidence interval. The results showed that the direct effect of family economic status on healthy lifestyle was $\beta=0.069$ ($p < 0.05$), the indirect effect through health literacy was $\beta=0.022$ ($SE = 0.0028, 95\% CI [0.006, 0.041]$), and the confidence interval did not include 0. The mediating effect of health literacy was significant. The mediating effect accounted for 24.18% of the total effect. The mediating effect model is shown in Figure 1.

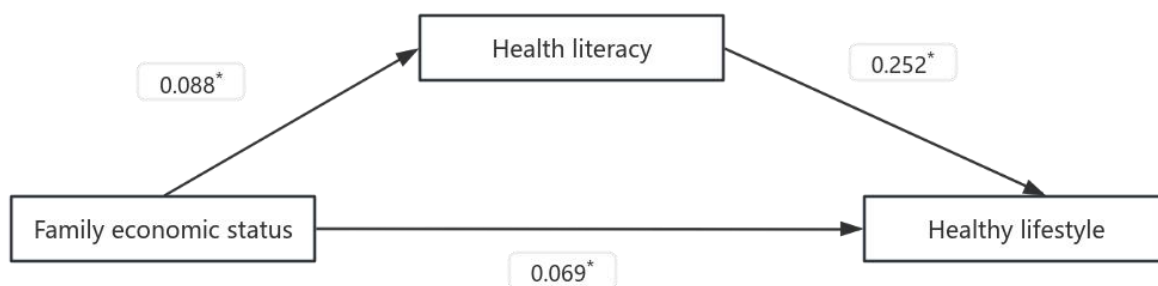


Figure 1. Diagram of the mediating effect of health literacy between family economic status and healthy lifestyle

(2) The mediating effect of health literacy between family social status and healthy lifestyle

Stepwise regression analysis was used to examine the mediating effect of health literacy between family social status and healthy lifestyle of college students, and the results are shown in Table 4.

The first step was to conduct a regression analysis with healthy lifestyle as the dependent variable and family social status as the independent variable. The results showed that the regression coefficient of family social status on healthy lifestyle was significant ($c = -0.113$, $t = -3.672$, $p < 0.05$), indicating that family social status had a significant negative predictive effect on healthy lifestyle among college students, and family social status could explain 1.3% of the variation in healthy lifestyle.

In the second step, a regression analysis was performed with health literacy as the dependent variable and family social status as the independent variable. Results revealed that the regression coefficient of family social status on health literacy was statistically significant ($a = -0.065$, $t = -2.123$, $p < 0.05$), indicating that family social status exerted a significant negative predictive effect on health literacy and accounted for 0.4% of the variance in health literacy.

In the third step, both family social status and health literacy were included as independent variables, and a healthy lifestyle was used as the dependent variable for regression analysis. The results showed that the regression coefficient of health literacy on healthy lifestyle was significant ($b = 0.252$, $t = 8.474$, $p < 0.05$), while the direct effect of family social status on healthy lifestyle remained significant ($c' = -0.096$, $t = -3.231$, $p < 0.05$).

Table 4. shows the results of the sequential examination of the mediating effect of health literacy between family social status and healthy lifestyle

Independent variables	Dependent variable	Standardized β	t	R^2	ΔR^2	F
Step 1 Family social status	Healthy lifestyle	-0.113	-3.672*	0.013	0.012	13.484*
Step 2 Family social status	Health literacy	-0.065	-2.123*	0.004	0.003	4.509*
Step 3 Family social status	Healthy lifestyle	-0.096	-3.231*	0.076	0.074	43.102*
Health literacy		0.252	8.474*			

Note: * $p < .05$

The mediating effect test was conducted using the Process macro (Model 4) developed by Hayes (2017), and the Bootstrap method was used for repeated sampling 5,000 times to calculate the 95% deviation corrected confidence interval. The results showed that the direct effect of family social status on healthy lifestyle was $\beta = -0.096$ ($p < 0.05$), the indirect effect through health

literacy was $\beta=0.016$ (SE = 0.0082, 95% CI [-0.0330, -0.0005]), and the confidence interval did not include 0. The mediating effect of health literacy was significant. The mediating effect accounted for 14.58% of the total effect. The mediating effect model is shown in Figure 2. To sum up, Hypothesis 4 is validated.

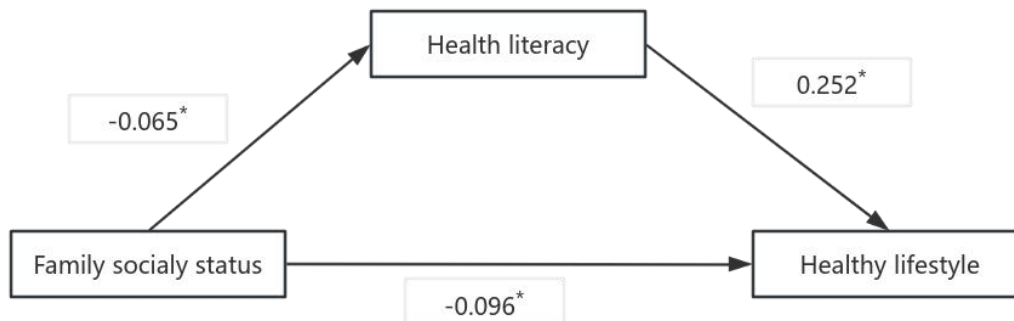


Figure 2. Map of the mediating effect of health literacy between family social status and healthy lifestyle

5. Discussion

5.1. The Relationship Between Family Socioeconomic Status, Health Literacy and Healthy Lifestyle

(1) The relationship between family socioeconomic status and health literacy

This study found that family economic status was significantly positively correlated with health literacy among college students, whereas family social status was significantly negatively correlated with health literacy. This finding reveals the heterogeneity in the effects of different dimensions of family socioeconomic status on health literacy.

The economic status of a family reflects the material resources at its disposal. Families with higher incomes are more likely to invest in quality educational resources, access to health information, and a health-promoting environment for their children, thereby providing favorable conditions for their health literacy development (Zhang et al., 2022). This result is in line with the family investment theory that family economic capital, through resource transformation, directly affects the accumulation of children's human capital (including health literacy). However, the seemingly contradictory result of a negative correlation between family social status and health literacy is worthy of further exploration. Families where parents have a higher professional status or a better educational attainment tend to be accompanied by a more intense work pace, higher work pressure and longer working hours. In the context of social transformation in contemporary China, such families may focus their limited time and energy highly on their children's academic achievements, objectively squeezing the space for the cultivation of health literacy. In addition, the notion of a "health-academic trade-off" that may exist within high social status families may also weaken the emphasis on the transmission of health knowledge and the formation of healthy habits. This result suggests that in health interventions, high social status should not be simply equated with high health literacy. Attention should be paid to the different paths of impact of

different family resource dimensions on health literacy.

In terms of effect size, the correlation coefficients between each dimension of family socioeconomic status and health literacy are at a relatively weak level. This finding is consistent with previous studies that after entering college, an individual's health literacy is more shaped by proximal factors such as peer influence, campus environment, and media exposure (Nutbeam & Lloyd, 2021). Family, as a remote factor, has relatively limited direct influence.

(2) The relationship between family socioeconomic status and healthy lifestyle

The findings show a significant positive correlation between family economic status and healthy lifestyle among college students, while a significant negative correlation between family social status and healthy lifestyle. This result is highly consistent with the previous discovery pattern of health literacy, further confirming the differentiated effects of different dimensions of family resources on health-related behaviors.

Families with higher economic income are able to provide their children with better health resources (such as quality food, exercise facilities, medical services), thereby promoting the formation of healthy lifestyles (Pampel et al., 2010). This resource-oriented approach reflects the direct shaping effect of family economic capital on healthy behavior.

It is notable that family social status is negatively correlated with a healthy lifestyle. This result may reflect a particular phenomenon in current Chinese society that families where parents have high professional status and good education are often in high-intensity, highly competitive professional environments. This "high status - high pressure" state of existence may be passed on to children through two mechanisms. First, parents are too busy with work pressure to demonstrate and supervise health, weakening the role of families as role models in the formation of healthy lifestyles. The second is that parents define success as academic and career achievements, which imperceptibly leads to children's neglect of healthy lifestyles. Theoretically, this can be seen as a "status inconsistency" or "resource-stress paradox," suggesting the need to distinguish different dimensions of family status in the study of healthy lifestyles and avoid simplifying it to a single class indicator.

(3) The relationship between health literacy and a healthy lifestyle

There was a significant positive correlation between health literacy and healthy lifestyle among college students ($r=0.259$, $p<0.05$), but the correlation coefficient was small and it was a weak correlation. This result is consistent with previous studies (Suka et al., 2015), indicating that health literacy is a necessary but not sufficient condition for a healthy lifestyle.

From the perspective of the knowledge-belieft-action theory, health literacy mainly addresses the issue of health cognition, while the formation of a healthy lifestyle requires crossing the knowledge-action gap and is influenced by multiple mediating and moderating variables such as behavioral intention, self-efficacy, social support, and environmental factors (Bandura, 2004). Therefore, promoting a healthy lifestyle merely by enhancing health literacy may have limited effect. Future interventions should combine health literacy improvement with behavioral skills training and environmental support to form a multi-level promotion strategy.

5.2. Mediating Role of Health Literacy

Mediating effect analysis shows that health literacy plays a partial mediating role between family socioeconomic status and healthy lifestyle. In terms of dimensions, family economic status indirectly promotes healthy lifestyles by enhancing health literacy; family social status, on the other hand, has an indirect negative impact on healthy lifestyles by weakening health literacy.

This result reveals the dual-path mechanism by which family socioeconomic status affects healthy lifestyles. On the one hand, there are direct effects, such as family resources directly providing health conditions and family atmosphere directly influencing healthy habits; on the other hand, there is an indirect effect through the proximal individual factor of health literacy. Health literacy, as an intervenable individual factor, is an important intermediate link in the impact of family socioeconomic status on a healthy lifestyle, in line with the theoretical framework that distant factors act on health through proximal factors (Braveman & Gottlieb, 2014).

Notably, the direct effect remained significant after controlling for health literacy, indicating that the influence of family socioeconomic status on healthy lifestyles is not entirely transmitted through health literacy, and there are other mediating pathways that have not been included. Future studies could further explore multiple mediating mechanisms to more fully reveal the transmission chain between family background and healthy lifestyle.

Furthermore, the negative indirect effect of family social status on healthy lifestyles through health literacy is a finding worthy of continued attention. It suggests that improving the healthy lifestyle of children from high social status families cannot rely solely on traditional health literacy education. Attention should also be paid to their family stress environment and value adjustment to help them establish a more balanced cognitive framework between academic competition and healthy living.

6. Limitations and Future Research Directions

The main limitations of this study are as follows:

First, this study utilizes cross-sectional data. While the mediation model was constructed based on theoretical deduction, it cannot fully rule out the potential for reverse causality or the influence of third-variable confounders. Future research could employ longitudinal designs or natural experimental approaches to further validate the directionality of the mediating pathway.

Second, the counterintuitive finding that family social status is negatively correlated with health literacy and healthy lifestyle is worthy of further study. Further research could explore the psychological and social mechanisms behind it from perspectives such as family time allocation, parental stress transmission, and intergenerational cultural capital, providing a theoretical basis for targeted intervention.

Third, although the influence on some paths is significant, the overall explanatory power (R^2) of the model is relatively low. This result suggests that the healthy lifestyle of college students is

still affected by a large number of factors not included in the model. Future research should expand the theoretical framework to include variables such as campus health environment, peer influence, media exposure, and personal health motivation, in order to enhance the explanatory power and intervention guidance value of the model.

Author Contributions:

Conceptualization, C. X & P. L.; methodology, C. X & P. L.; investigation, C. X & P. L.; resources, C. X & P. L.; data curation, C. X & P. L.; writing—original draft preparation, C. X & P. L.; writing—review and editing, C. X & P. L.; visualization, C. X & P. L.; supervision, C. X & P. L. All authors have read and agreed to the published version of the manuscript.

Funding:

Not applicable.

Institutional Review Board Statement:

The study was conducted in accordance with the Declaration of Helsinki and was reviewed and approved by the Institutional Review Board of the Nanchang Institute of Technology.

Informed Consent Statement:

Written informed consent was obtained from all participants involved in the study. For participants under the age of 18, written informed consent was obtained from their parents or legal guardians, and informed assent was obtained from the adolescents themselves prior to participation.

Data Availability Statement:

The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding author(s).

Conflict of Interest:

The author declare no conflict of interest.

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