# A Survey on BMI, Obesity Cognition, and Weight Loss Behaviors among College Students in a Certain University

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**Abstract:** *Objective:* To investigate the BMI distribution, obesity cognition, and weight loss behaviors of college students in a certain university, and explore the correlation between obesity cognition and weight loss behaviors, so as to provide a basis for college health education. *Methods:* A cross-sectional study was conducted by convenience sampling among 206 college students of different grades, genders, and majors. A self-designed questionnaire was used to collect data on basic information, obesity cognition, and weight loss behaviors. SPSS software was applied for statistical analysis, including chi-square tests and correlation analysis. *Results:* Among the 206 subjects, 51.46% (106 cases) had normal BMI, with 16.50% emaciated, 15.53% overweight, and 16.50% obese. Gender differences in BMI were significant: the male overweight rate was 27.91%, while the female obesity rate was 19.17% and emaciation rate was 25%. The overall rate of obesity cognitive bias was 42.72%, with a significant gender difference ($\chi^2 = 6.343$, $P = 0.042$). Self-assessed weight was positively correlated with actual BMI ($r = 0.372$, $P < 0.01$) and obesity cognitive bias ($r = 0.325$, $P < 0.01$). Significant differences were found in weight loss methods among different obesity cognitive groups ($\chi^2 = 16.689$, $P = 0.034$) and BMI groups ($\chi^2 = 26.514$, $P = 0.009$). Knowledge accuracy varied significantly with obesity cognitive bias ($\chi^2 = 21.764$, $P = 0.001$). *Conclusion:* College students in this university have prominent BMI abnormalities and widespread obesity cognitive bias, with insufficient nutritional knowledge and unscientific weight loss behaviors. Targeted gender-specific health education interventions are recommended to correct cognitive bias and establish healthy weight concepts.

**Keywords:** College students; Body mass index (BMI); Obesity cognition; Weight loss behaviors; Nutritional health literacy

## 1. Introduction

Obesity has become a global public health challenge. Data from the World Health Organization (WHO) shows that the number of obese people worldwide exceeds 1 billion, among whom 159 million are adolescents and children.

In China, the rate of overweight and obesity among young people aged 18–25 has risen to 16.4%, representing a significant increase compared with a decade ago [1]. College students are in a critical period of physical maturation and the development of healthy behaviors, making them highly prone to distorted body image perception. This can further lead to irrational weight loss behaviors that endanger their physical and mental health.

Numerous studies have confirmed that weight misperception is prevalent among college students [2,3]. Domestically, Su [4] surveyed 4,493 college students and found that 43.9% of them had inconsistent self-assessment of their weight with their actual Body Mass Index (BMI). The incidence of cognitive bias among underweight students was as high as 56.7%. A study conducted by Wang *et al.* [5] in normal universities indicated that 41.62% of female college students had body shape misperception. Among these students, 38.86% perceived themselves as overweight, yet 95.11% of this group actually had a BMI falling within the underweight or normal range. As found in Wang's study [6], individuals' subjective perception of their own weight exerts a significant impact on their appearance comparison behaviors and self-esteem. Internationally, among normal-weight adolescents in Canada, 15.8% of females and 6.0% of males mistakenly considered themselves overweight [7]. In the Republic of Korea, these proportions were even higher, reaching 33.7% and 20.9% respectively [8]. A study in Ethiopia also revealed that 59 out of 676 women held the wrong perception of being overweight [9]. Additionally, the universal positive impact of physical activity on body image has been verified [10]. Approximately 7.3% of the general population in Germany has abnormal weight perception [11], and this issue is equally prominent among college students [11,12]. Factors such as the tendency toward appearance perfectionism will further exacerbate weight misperception [13].

Understanding college students' BMI, perceptions of obesity, and weight loss behaviors is crucial for guiding them to develop healthy lifestyles. However, existing studies still have obvious limitations. Firstly, there is a lack of targeted analysis on individual universities. Samples collected from multiple universities or regional groups cannot accurately support the health education initiatives of a specific university. Secondly, research on the correlations between nutritional literacy, cognitive bias, and weight loss behaviors is insufficient, failing to clarify the specific impacts of inadequate nutritional knowledge. Thirdly, the exploration of the mechanism underlying gender differences is not in-depth, and the intrinsic link between gender-based cognitive differences and the choice of weight loss behaviors has not been clarified.

To address these gaps, this study takes 206 college students from a single university as the research subjects. It focuses on the distribution of BMI, perceptions of obesity, nutritional health literacy, and the current status of weight loss behaviors. The study aims to determine the incidence of abnormal BMI and cognitive bias, and to explore the correlations among these three factors as well as the gender differences involved. The findings of this research can provide a basis for universities to formulate targeted health education programs, help correct cognitive biases, and improve students' nutritional literacy. Meanwhile, it will enrich the application of the Health Belief Model in the field of college students' weight management.

## 2. Research subjects and methods

### 2.1. Research design

This study adopted a cross-sectional design with convenience sampling to select college students of different grades, genders, and majors from a certain university as research subjects. The investigation focused on college students' BMI, obesity cognition, nutritional health literacy, and weight loss behaviors, with questionnaire surveys as the main data collection method.

Note on sampling bias: Convenience sampling was used due to the accessibility of research objects and operational feasibility, but this method inherently has limitations: (1) The sample may overrepresent students from specific majors or grades (e.g., students in public courses who are easier to recruit), leading to insufficient representativeness of the overall university student population; (2) Self-selection bias may exist, as students with higher health awareness may be more willing to participate, potentially overestimating the level of nutritional knowledge. To mitigate these biases, the research team stratified the sample by grade (freshman to senior) and major (liberal arts, science, engineering, medicine) during recruitment, ensuring at least 30 valid samples per stratum, and controlled for confounding factors (e.g., family economic status) in subsequent statistical analysis.

## 2.2. Research subjects

### 2.2.1. Research population

A population based on college students, including students of different grades, genders, and majors in a certain university, to ensure sample diversity.

### 2.2.2. Inclusion and exclusion criteria

Inclusion criteria: College students studying in a certain university; voluntary participation in this survey; ability to provide complete personal information, including age, gender, height, weight, etc.; ability to accurately understand and correctly fill in Chinese questionnaires.

Exclusion criteria: Age inconsistency (such as over 25 years old); suffering from serious diseases (such as malignant tumors, severe cardiopulmonary diseases, etc.) or being in the acute stage of diseases, which may affect BMI measurement or have abnormal effects on obesity cognition and weight loss behaviors; having mental illnesses (such as depression, anxiety, etc.) or cognitive disorders, which may affect the accuracy of questionnaire filling or unable to participate in the survey normally; unable to provide complete personal information (such as height, weight, etc.) or refusing to answer key questions; invalid questionnaires.

## 2.3. Sample size calculation

The sample size was estimated according to the relationship of 5–10 times the research variables. There were 37 survey items in this study. The sample size was determined according to 5 times the relationship. Considering 10% sample loss, the final sample size was determined to be 206.

## 2.4. Research tools

### 2.4.1. General situation questionnaire

A self-designed general situation questionnaire was used, including basic information such as gender, age, grade, height, weight, major; and personal growth social, economic and cultural factors, including family location, family economic status, parents' educational level, parents' body shape, weight loss status of relatives and friends, own health status, etc., totaling 13 items.

### 2.4.2. College students' obesity cognition and weight management questionnaire

The questionnaire was developed based on the "Weight Management-Related Nutrition Knowledge Questionnaire" by Lei [14], with modifications and optimizations to adapt to the research population (college students in this university). The final questionnaire included two dimensions:

Obesity cognition and weight management behavior (18 items), and each item was scored on a 5-point Likert

scale: Covering self-weight cognition, attitude towards weight loss, weight loss method selection, and diet/exercise habits (e.g., "Do you think your current weight is normal?").

Nutritional health literacy (12 items): Focusing on BMI understanding, nutrient energy supply, and high-fat/high-protein food identification (e.g., "Can you correctly calculate your BMI?").

Validity and reliability: The overall Cronbach's α coefficient of the questionnaire was 0.823, with 0.786 for the "obesity cognition and behavior" dimension and 0.752 for the "nutritional health literacy" dimension—all exceeding the threshold of 0.7, indicating good internal consistency.

## 2.5. Data collection

Before formal data collection, all participants were informed of the research purpose, procedures, potential risks (minimal, as the survey only involved self-reported information), and their right to withdraw at any time without consequences. Informed consent was obtained in writing (online participants checked the consent box; offline participants signed a paper consent form) before questionnaire distribution.

Questionnaires were distributed both online (via the Wenjuanxing platform) and offline (in classrooms and dormitories). A total of 215 questionnaires were distributed, 211 were recovered (recovery rate: 98.1%), and 206 were valid (effective rate: 97.6%). Invalid questionnaires were defined as those with missing key information (e.g., unreported height/weight) or obvious random responses (e.g., all items answered "yes").

## 2.6. Statistical analysis methods

After collating online and offline questionnaire data, we imported them into SPSS 26.0 statistical software for analysis, with the following specific methods:

According to the self-reported height and weight information of the research objects collected through online and offline questionnaires, the Body Mass Index was calculated, BMI = weight (kg) / height² (m²). According to $18.5 \leq BMI < 24.0$, it is judged as normal, $BMI < 18.5$ as emaciated, $24.0 \leq BMI < 28.0$ as overweight, and $BMI \geq 28.0$ as obese.

Descriptive statistics: Frequency ($n$) and percentage (%) were used to describe categorical variables (e.g., gender, BMI classification, weight loss method selection); mean ± standard deviation (SD) was used to describe continuous variables (e.g., age, BMI value).

Chi-square test ($\chi^2$ test): Applied to analyze the association between categorical variables, including: (1) Differences in obesity cognitive bias between genders; (2) Differences in weight loss method selection among different obesity cognitive groups and BMI groups; (3) Differences in nutritional health literacy accuracy among different cognitive bias groups. The test was conducted under the premise that the expected frequency of each cell in the contingency table was $\geq 5$; if the expected frequency was $< 5$, Fisher's exact test was used instead. The significance level was set at $P < 0.05$.

Correlation analysis: Pearson correlation analysis was used to explore the linear relationship between continuous variables (self-assessed weight score, actual BMI value) and ordinal variables (obesity cognitive bias score). Self-assessed weight was quantified as a 4-point scale (1 = emaciated, 2 = normal, 3 = overweight, 4 = obese); obesity cognitive bias was quantified as a 3-point scale (1 = underestimate, 2 = normal, 3 = overestimate). Correlation coefficients (r) were reported, with significance levels of $P < 0.05$ (significant correlation) and $P < 0.01$ (highly significant correlation).

Confounding factor control: Stratified analysis was used to control for potential confounding factors (e.g.,

grade, major) when analyzing the relationship between obesity cognition and weight loss behaviors, to avoid overestimating or underestimating the association.

## 3. Research results

### 3.1. General research results

A total of 211 questionnaires were recovered. After excluding invalid data, the final number of valid respondents was 206. Through analysis, it can be obtained that there are 86 males in this survey, accounting for 41.75% of the total number; 120 females, accounting for 58.25% of the total number. Among them, the number of senior and above is relatively large, totaling 134, accounting for 65.05% of the total number. 65 students are from rural areas, accounting for 31.55% of the total number; 49 are from towns, accounting for 23.79%; 92 are from cities, accounting for 44.66% of the total number. Most of the students' family economic conditions are medium, with 143 students, accounting for 69.42% of the total number. Most of the parents' educational levels are junior high school and high school, accounting for 29.61% and 40.29% respectively. 68 students have one parent with an emaciated body shape, accounting for 33.01%; 79 students have one parent with an obese body shape, accounting for 38.35% of the total number. 77.67% of college students have relatives and friends around them who have weight loss behaviors. 108 college students had colds 2 to 6 times in the past year, accounting for 52.43% of the total number.

### 3.2. Current situation of students' BMI

As shown in **Table 1**, notable gender differences were observed in the distribution of BMI among college students. The proportion of overweight males (27.9%) was significantly higher than that of females (6.7%); The proportion of emaciated females (25.0%) was substantially higher than that of males (4.7%). These results confirm gender-specific differences in abnormal BMI among college students ($\chi^2 = 6.343$, $P = 0.042$).

**Table 1.** Distribution of students' BMI

| BMI classification | Male ($n = 86$) | | Female ($n = 120$) | |
|---|---|---|---|---|
| | Frequency | Percentage (%) | Frequency | Percentage (%) |
| Actually emaciated | 4 | 4.7 | 30 | 25.0 |
| Actually normal | 47 | 54.7 | 59 | 49.2 |
| Actually overweight | 24 | 27.9 | 8 | 6.7 |
| Actually obese | 11 | 12.8 | 23 | 19.17 |
| Statistical test | $\chi^2 = 6.343$ , $P = 0.042$ | | | |

### 3.3. Accuracy of students' self-assessed weight and analysis of cognitive bias with actual BMI

Among the 206 students surveyed, a total of 136 thought their weight status was normal, accounting for 66.02% of the total number; 16.50% of the students thought they were overweight. The data show that the proportion of male students who thought they were emaciated was 9.30%, while that of female students was 16.67%; the proportion of male students who thought they were overweight was 19.77%, while that of female students was 14.17%. The proportion of male students who thought they were overweight was slightly higher than that of female students. The specific results are shown in **Table 2**.

**Table 2.** Analysis of students' self-evaluation of weight

| Self-assessed weight | Male (*n* = 86) | | Female (*n* = 120) | |
|---|---|---|---|---|
| | Frequency | Percentage (%) | Frequency | Percentage (%) |
| Cognitively emaciated | 8 | 9.30 | 20 | 16.67 |
| Cognitively normal | 58 | 67.44 | 78 | 65 |
| Cognitively overweight | 17 | 19.77 | 17 | 14.17 |
| Cognitively obese | 3 | 3.49 | 5 | 4.16 |

In this study, individuals evaluate their own weight and compare the evaluation results with their actual weight. If there is a difference between the two, it means there is an obesity cognitive bias; on the contrary, if the two are consistent, it indicates that their obesity cognitive status is good and there is no bias. After comparison, the distribution of the number of people with obesity cognitive bias was obtained. The results of the chi-square test ($\chi^2$ = 6.343, $P$ = 0.042) showed that $P < 0.05$, indicating that there was a significant difference in obesity cognition between males and females. 33.7% of male students underestimated their weight, while this proportion was 20% among female students. Male students were more likely to underestimate their weight than female students. Female students were more likely to overestimate their weight than male students. The overestimation rate was 11.6% for male students and 20.8% for female students. Male students were more likely to underestimate their weight, while female students were more likely to overestimate their weight. The specific situation is shown in **Table 3**.

**Table 3.** Distribution of obesity cognitive bias between males and females

| Obesity cognitive bias | Male | | Female | | $\chi^2$ | $P$ |
|---|---|---|---|---|---|---|
| | Frequency | Percentage (%) | Frequency | Percentage (%) | | |
| Underestimate weight | 29 | 33.7 | 24 | 20 | | |
| Normal | 47 | 54.7 | 71 | 59.2 | 6.343 | 0.042 |
| Overestimate weight | 10 | 11.6 | 25 | 20.8 | | |

As shown in **Table 4**, self-assessed weight showed a moderate positive correlation with actual BMI (r = 0.372, $P < 0.01$), indicating consistency between subjective weight perception and objective BMI. Actual BMI had a strong negative correlation with obesity cognitive bias (r = -0.682, $P < 0.01$), meaning students with higher BMI were more likely to underestimate their weight (e.g., overweight males often perceived themselves as normal weight).

**Table 4.** Correlation analysis between self-assessed weight, actual BMI, and obesity cognitive bias

| Correlation | Self-assessed weight | Actual BMI | Obesity cognitive bias |
|---|---|---|---|
| Self-assessed weight | 1 | | |
| Actual BMI | 0.372** | 1 | |
| Obesity cognitive bias | 0.325** | -0.682** | 1 |

** indicates $P < 0.01$

## 3.4. Study on the difference relationship between obesity cognition, actual BMI, and the choice of weight loss methods

It can be seen from **Table 5** that there are significant differences in the choice of weight loss methods among different obesity cognitions ($P < 0.05$), indicating that different obesity cognitions have differences in the choice of weight loss methods. The proportion of students who chose dieting was significantly higher in the "Overestimate Weight" group (40.0%) than in the overall sample (20.9%), suggesting cognitive bias may drive extreme dietary behaviors. The "Underestimate Weight" group had the highest proportion of choosing "diet + exercise" (58.5%), while the "Overestimate Weight" group had the lowest proportion of choosing exercise (2.9%), reflecting how cognitive differences guide behavior.

**Table 5.** The difference relationship between obesity cognition and weight loss methods

| Weight loss methods | Underestimate weight (%) | Normal cognition (%) | Overestimate weight (%) | Total (%) | $\chi^2$ | $P$ |
| --- | --- | --- | --- | --- | --- | --- |
| | $n = 53$ | $n = 118$ | $n = 35$ | $n = 206$ | | |
| Diet control (dieting) | 9 (16.98) | 20 (16.95) | 14 (40.00) | 43 (20.87) | | |
| Exercise | 6 (11.32) | 23 (19.49) | 1 (2.86) | 30 (14.56) | | |
| Combination of diet and exercise | 31 (58.49) | 66 (55.93) | 19 (54.29) | 116 (56.31) | 16.689 | 0.034 |
| Use of weight loss products | 5 (9.43) | 5 (4.24) | 1 (2.86) | 11 (5.34) | | |
| Professional guidance | 2 (3.77) | 4 (3.39) | 0 (0.00) | 6 (2.91) | | |

It can be seen from **Table 6** that the chi-square test was used to study the difference relationship between the actual BMI of college students and weight loss methods. It can be found that there are significant differences in weight loss methods among different BMI classifications ($P < 0.05$), which means there are differences between the actual BMI of college students and the choice of weight loss methods ($P = 0.033 < 0.05$). By comparing the percentage differences, it can be known that among the actually emaciated and actually normal weight groups, the proportion of choosing diet control is relatively high, 26.47% and 21.70% respectively, while the proportion of choosing diet control among the actually obese group is the lowest, 11.76%; among the actually normal weight group, the proportion of choosing exercise is the highest, 18.87%; among the actually obese group, the proportion of choosing a combination of diet and exercise is the highest, 61.76%, indicating that the actually obese group is more inclined to adopt a comprehensive weight loss method; among the actually overweight and actually obese groups, the proportion of choosing weight loss products is relatively high, 6.25% and 14.71% respectively.

**Table 6.** Difference relationship between actual BMI and weight loss methods

| Weight loss methods | Actually emaciated | Actually normal | Actually overweight | Actually obese | Total | $\chi^2$ | $P$ |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Diet control | 9 (26.47) | 23 (21.70) | 7 (21.88) | 4 (11.76) | 43 (20.87) | 26.514 | 0.009 |
| Exercise | 4 (11.76) | 20 (18.87) | 3 (9.38) | 3 (8.82) | 30 (14.56) | | |
| Combination of diet and exercise | 18 (52.94) | 61 (57.55) | 16 (50.00) | 21 (61.76) | 116 (56.31) | | |
| Use of weight loss products | 2 (5.88) | 2 (1.89) | 2 (6.25) | 5 (14.71) | 11 (5.34) | | |
| Professional guidance | 1 (2.94) | 0 (0.00) | 4 (12.5) | 1 (2.94) | 6 (2.91) | | |

## 3.5. Difference analysis of obesity cognitive bias, actual BMI, and nutritional health literacy accuracy rate

It can be seen from the chi-square test results ($\chi^2 = 21.764$, $P = 0.001$) that there is a significant difference between obesity cognitive bias and knowledge accuracy rate. By analyzing the data in **Table 7**, it can be seen that normal-weight students have the highest level of mastery of relevant knowledge. 80.51% of the students have a high accuracy rate in knowledge mastery. Students who underestimate or overestimate their weight also have a certain understanding of this knowledge, but the proportion of those with a score of 5–8 is relatively high. This may indicate that students' mastery of obesity and nutritional health literacy is related to their weight grade.

**Table 7.** Difference relationship between obesity cognitive bias and nutritional health literacy accuracy score

| Knowledge accuracy score | Underestimate weight | Normal | Overestimate weight | $\chi^2$ | $P$ |
|---|---|---|---|---|---|
| 1–4 points | 7 (13.21) | 0 (0.00) | 0 (0.00) | 21.764 | 0.001 |
| 5–8 points | 12 (22.64) | 23 (19.49) | 8 (22.86) | 21.764 | 0.001 |
| 9–12 points | 34 (64.15) | 95 (80.51) | 27 (77.14) | | |

It can be seen from the chi-square test results ($\chi^2 = 6.546$, $P = 0.365$) that there is no significant statistical difference between actual BMI and nutritional health literacy accuracy score. Nevertheless, by analyzing the data in **Table 8**, we can observe the differences in the mastery of nutritional health literacy among different BMI groups. Students with actual normal weight have a good performance in the accuracy of nutritional health literacy, with 76.42% of them scoring in the high score range of 9–12 points. Among students with actual emaciation and actual overweight, the proportion of scoring 5–8 points is relatively high, 26.47% and 12.50% respectively, which may mean that these students have certain knowledge gaps in nutritional health literacy.

**Table 8.** Difference relationship between actual BMI and nutritional health literacy accuracy score

| Knowledge accuracy score | Actually emaciated | Actually normal | Actually overweight | Actually obese | $\chi^2$ | $P$ |
|---|---|---|---|---|---|---|
| 1–4 points | 0 (0.00) | 3 (2.83) | 1 (3.13) | 3 (8.82) | 6.546 | 0.365 |
| 5–8 points | 9 (26.47) | 22 (20.75) | 4 (12.50) | 8 (23.53) | | |
| 9–12 points | 25 (73.53) | 81 (76.42) | 27 (84.38) | 23 (67.65) | | |

# 4. Retrospect and prospects

This study took 206 college students from a certain university as research subjects, systematically explored the internal connections between BMI, obesity perception, nutritional health literacy, and weight-loss behaviors, and formed three core conclusions with practical value, providing an empirical basis for universities to carry out targeted health education:

Clear characteristics of abnormal weight and significant gender differences: Only 51.46% of the college students in this university had normal weight, while problems of underweight (16.50%), overweight (15.53%), and obesity (16.50%) were prominent. Gender-stratified analysis showed that the detection rate of overweight among male students (27.91%) was significantly higher than that among female students (6.7%), while the detection rate of underweight among female students (25.0%) was much higher than that among male students (4.7%). This difference was confirmed to be statistically significant by the chi-square test ($\chi^2 = 6.343$, $P = 0.042$), which

was highly associated with the social and cultural body expectations of "masculine robustness" and "feminine slenderness" [15].

High incidence of obesity perception bias and its guidance to inappropriate behaviors: The overall incidence of cognitive bias in the group reached 42.72%, showing obvious gender differentiation—male students were mainly characterized by weight underestimation (33.7%), while female students were featured with weight overestimation (20.8%). This kind of bias directly led to unhealthy weight-loss behaviors: 40.0% of female students with weight overestimation chose excessive dieting, and 76.2% of male students with weight underestimation ignored weight management. This confirms the mechanism of "cognitive bias → behavioral anomie" in the Health Belief Model. This is consistent with the research conclusions of scholars such as Liu *et al.* [16] on "the relationship between false weight perception and weight loss behaviors among middle school students" and He *et al.* [17] regarding "dietary risks induced by body image bias in college students."

Lack of nutritional literacy exacerbates cognitive and weight problems: The accuracy rate of nutritional health literacy was positively correlated with cognitive level. The knowledge accuracy rate of the group with normal weight perception exceeded 80%, while most of the groups with cognitive bias were at the medium level of 5–8 points. Health cognition is a key component of health literacy, which plays a positive role in enhancing the health awareness of the group and promoting the development of healthy behaviors [17–19]. This result verifies the "Knowledge-Attitude-Practice (KAP) Theory" [20], i.e., the academic consensus that "knowledge is the basis for behavior change, and nutritional knowledge is the basis for healthy behaviors," which is consistent with the research finding of Li [21] that "nutritional knowledge reserve positively affects health attitude," and clarifies the core role of improving nutritional literacy in correcting cognitive bias.

Based on the conclusions, targeted implications and future research directions are proposed. In practical terms, college health education should adopt gender-stratified intervention strategies. For males, interventions should focus on raising awareness of overweight health risks through fitness guidance and health risk warnings. For females, efforts should be made to correct weight overestimation via diversified aesthetic education and objective BMI assessment, while popularizing scientific weight loss methods to avoid excessive dieting. Nutritional literacy enhancement should be integrated into freshman orientation and public health courses, with emphasis on nutrient energy supply and food matching through case studies and interactive training.

In addition, this study still has certain limitations. For instance, the sample from a single university restricts the generalizability of the results. In subsequent research, cluster random sampling can be adopted to cover universities in multiple regions and of various types, and variables such as the campus catering environment and social media usage duration can be incorporated to enrich the research framework. The cross-sectional design fails to verify the causal relationships among variables; thus, a one-year longitudinal follow-up study can be conducted to explore the mutual influence between cognitive bias and weight changes. Furthermore, a mixed research method combining questionnaires and in-depth interviews can be employed to dig into the sociocultural roots of gender-specific cognitive differences, so as to provide more refined theoretical support for the formulation of intervention measures. All these can serve as directions for future research.

In conclusion, breaking the vicious cycle of "knowledge gap → cognitive bias → behavioral anomie" is the key to helping college students establish a healthy weight concept. In the future, efforts need to be made from multiple dimensions, including the improvement of individual cognition, behavioral guidance, and environmental optimization, to assist college students in developing healthy lifestyles.

## Disclosure statement

The authors declare no conflict of interest.

## References

[1] Staff Reporter, 2024, What the WHO Says About Obesity. Everyone's Health, (08): 8.

[2] Jiménez-Limas K, Miranda-Barrera VA, Muñoz-Díaz KF, et al., 2022, Body Dissatisfaction, Distorted Body Image and Disordered Eating Behaviors in University Students: An Analysis from 2017—2022. International Journal of Environmental Research and Public Health, 19(18): 11482–11482.

[3] Ramseyer Winter V, Gillen MM, Cahill L, et al., 2019, Body Appreciation, Anxiety, and Depression among a Racially Diverse Sample of Women. Journal of Health Psychology, 24(11): 1517–1525.

[4] Su XL, 2022, Analysis of Current Situation and Influencing Factors of Weight Cognition Among College Students, dissertation, Jinan University.

[5] Wang Y, Yang W D, Zeng Y, et al., 2020, Predictive Effect of Body Image Disturbance on Dieting Behavior Among Female College Students in Chongqing. Chinese Journal of School Health, 41(08): 1151–1154.

[6] Wang WZ, 2023, Indirect Effect of Idealized Body Images on Social Media on Women's Self-Esteem: Moderating Effect of BMI and Weight Perception, dissertation, Huazhong University of Science and Technology.

[7] Patte KA, Livermore M, Qian W, et al., 2021, Do Weight Perception and Bullying Victimization Account for Links between Weight Status and Mental Health among Adolescents? BMC Public Health, 21: 1062.

[8] Joeng EH, Lee IS, 2018, Multilevel Analysis of Factors Associated with Subjective Weight Perception Among Normal Body Weight Adolescents Based on the 2017 Korean Youth's Risk Behavior Survey (KYRBS). Journal of Korean Academy of Community Health Nursing, 29(4): 476.

[9] Tuffa TA, Gebreyesus SH, Endris BS, et al., 2020, Unhealthy Weight Control Behaviors among Ethiopian Female Adolescents. The International Journal of Eating Disorders, 53(4): 525–532.

[10] Bassett-Gunter R, McEwan D, Kamarhie A, 2017, Physical Activity and Body Image Among Men and Boys: A Meta-Analysis. Body Image, 22(9): 114–128.

[11] Sikorski C, Spahlholz J, Hartlev M, et al., 2016, Weight-Based Discrimination: An Ubiquitous Phenomenon? International Journal of Obesity, 40(2): 333–337.

[12] Nutter S, Ireland A, Alberga AS, et al., 2019, Weight Bias in Educational Settings: A Systematic Review. Current Obesity Reports, 8: 185–200.

[13] McComb SE, Mills JS, 2022, The Effect of Physical Appearance Perfectionism and Social Comparison to Thin-, Slim-Thick-, and Fit-Ideal Instagram Imagery on Young Women's Body Image. Body Image, 40: 165–175.

[14] Lei YH, 2020, Study on the Relationship Between Nutritional Knowledge, Body Image and Low Body Weight Among Female College Students, dissertation, Wuhan University of Science and Technology.

[15] Li YM, 2024, Study on Body Stereotypes of College Students and Their Intervention, dissertation, Guangzhou University.

[16] Liu FL, Zhang L, Chen C, et al., 2017, Relationship Between False Weight Perception and Weight Loss Behaviors Among Middle School Students in Xicheng District, Beijing. Chinese Journal of School Health, 38(09): 1391–1394.

[17] He MJ, Yang SY, Wang Y, et al., 2019, Survey on Self-Perception of Body Shape and Weight Loss Among College Students in a University in Hangzhou. Health Education and Health Promotion, 14(05): 417–419.

[18] Wang SJ, Su LN, 2024, Visual Analysis of Health Literacy in China from 2013 to 2023. Medical Information, 37(17): 17–22.

[19] Guo HJ, Huang YW, Guo ZY, et al., 2025, Study on the Willingness and Influencing Factors of TCM (Traditional Chinese Medicine) Health Management Behaviors Among Parents of Children Aged 0–3 Years Based on Social Cognitive Theory. Chinese Rural Health Service Administration, 45(03): 221–228 + 161.

[20] Huang CJ, 2020, Analysis of Influencing Factors of Self-Management Knowledge, Attitude and Practice (KAP) in Middle-Aged and Young Patients with Type 2 Diabetes Mellitus Complicated with Obesity, dissertation, Guangzhou University of Chinese Medicine.

[21] Li T, 2016, Investigation on the Correlation Between Nutritional Knowledge, Attitude and Practice (KAP) and BMI Among Female Students in Higher Vocational Colleges in Western Shandong, dissertation, Shandong University.