



# Effects of short-video use on undergraduates' weight-loss intention: a regulatory mediation model

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## Abstract

This research intends to explore the effects of short video use on college students' weight loss intentions, and its intrinsic mechanism of action, based on the responses of 1268 students from three universities in southwest China to questionnaires with the instruments of a sports participation scale, body image scale, self-esteem scale and weight loss intention scale. The findings are listed as follows: 1) Short video use can significantly and positively predict weight loss intention; 2) Body image mediates the relationship between short video usage and weight loss intentions; 3) Self-esteem plays a regulatory effect as the direct path between short video use and weight loss intention as well as partial mediation effect of body image. The direct effect of short video use on weight loss intentions and the mediating effect of body image gradually increased with the decrease of self-esteem. The results of the study suggest that short video use can affect the weight loss intentions of college students through either a direct or indirect path created by the mediating role of body image. Meanwhile, the influence of self-esteem on weight loss intention can't be ignored, which is another key factor that affects college students' weight loss intentions beyond short video use and body image.

**Keywords** Short video use · Body image · Self-esteem · Weight loss intention

## Introduction

Swift, vivid, and streamlined short videos on social media platforms fill an important proportion of the daily life of contemporary college students, as those popular videos are a convenient way to dawdle away dull moments. In recent years the aesthetic concept built up and transmitted via short videos on social media has been stirring up a new aesthetic craze. Under this trend, the aesthetic orientation of youths has converged with the media orientation. Additionally, undergraduates demonstrate weak identification ability and behavior control power while remaining extremely sensitive to new things, and they are likely to internalize the “slim figure” and “perfect stature” advertised by short videos on social media, resulting in their weight loss intentions (Andreassen & Pallesen, 2014; Zhang et al., 2019; Yang et al., 2021; Liang et al., 2020).

Weight loss intention indicates various motivations for weight loss derived from dissatisfaction with their statures (Huang & Ye, 2014). Some scholars explored the psychological activities of undergraduates through the mass media and found that the mass media normally shaped the “ideal statures” of the male and the female. Undergraduates living

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in this environment of sexual objectification will spontaneously accept such “edification,” and then change their thoughts through the process of internalization by looking at one’s own body from an objectified perspective which was extremely prone to cause self-objectification, further leading to the generation of a weight loss intention (Liang et al., 2020; Yang et al., 2020; Ouyang et al., 2021; Shi et al., 2020). Some scholars also believed that (Tiggemann & Slater, 2013; Tichon & Shapiro, 2003; Chen et al., 2016) the probability of the users’ dieting behaviors, unhealthy eating behaviors (e.g. skipping breakfast and having energy drinks), and eating disorder symptoms would rise with the increase of the service duration of social networking sites. Meanwhile, some scholars (Wick & Harriger, 2018; Chang et al., 2013; Anschutz et al., 2008; Holland & Tiggemann, 2016) considered that the internalization of media’s “ideal image” was one of the causes of restrictive eating behaviors. The users with higher internalization of media’s “ideal image” tended to adopt extreme weight loss methods, such as restrictive diet and other unhealthy weight control behaviors, to meet stylish aesthetics. This study, based on the above analysis, proposes the hypothesis No. 1 that short video use will significantly and positively predict an individual’s weight loss intentions.

The tripartite influence model proposed by Thompson et al. (2000) held that social-cultural factors (i.e. parents, peers, and mass media) are the initial influencing sources leading an individual to have a negative body image and restrictive eating behaviors. Body image is the image formed by individuals regarding their statures, is the person’s objective cognition and subjective evaluation of their physical features, and it is composed of multiple dimensions involving appearance, body shape, physical ability, and health, while the self-perception degree will affect the emotions and health behaviors including the weight control, personal social adaptation, psychological stress, self-development and interpersonal relations (Wang et al., 2017; Shi et al., 2020). Another argument is whether short video use will have negative impacts on body image. According to relevant studies, as ideal appearance information is presented, the media will have undergraduates internalize the ideal beauty standards being promoted and perceive such ideal physical states as real, universal and recognized under excessive exposure to the media pictures of slim female models or muscular male models (Galioto & Crowther, 2013; Hawkins et al., 2004; Qin, 2009), and excessive exposure to the media’s “ideal image” will lead to the decline of physical satisfaction (Zhang, 2018; McLean et al., 2016; Loeber et al., 2016). Meanwhile, the mass media is normally considered to be an important factor causing the imbalance of individual body image because it is so difficult to achieve the statures of models, stars, and artists shown in the media. When the gap between the real physical self and the ideal physical

self generated under the effect of the media is significant, it will lead to the reduction of physical self-satisfaction, further causing negative body images (Ruhl et al., 2011; Smeets et al., 2010; Renet et al., 2018; Benton & Karazsia, 2015; Vandenbosch & Eggermont, 2012; Tiggemann & Slater, 2014). Therefore, short video use will deepen the internal pressure of users from the media and undergraduates are more vulnerable to the internal pressure of media. The longer they use it, the more negative their body image will be, and a series of related psychological disorders will be derived (Harrison, 2010; Sharp et al., 2014; Wei et al., 2017). Further studies (Gillen, 2015; Andrew et al., 2016; Yu et al., 2012; Laporta et al., 2016; Choi & Choi, 2016; Ching & Xu, 2019) have also shown that a decline in physical satisfaction will produce diversified motivations to lose weight, and some even utilize certain unhealthy weight loss methods (e.g. excessive diet control, excessive exercise, taking weight loss drugs, liposuction, etc....) to correct the negative body image. Relevant studies (Sun et al., 2017; Hsin & Hung, 2008) report that there is a strong correlation between an individual’s satisfaction with their body image and the degree of intention for weight loss, i.e. the more positive the body image, the lower the degree of intention for weight loss; On the contrary, those who are dissatisfied with their body image or hold a negative body image will promote weight loss intentions and behaviors. Furthermore, some studies (Zhang, 2018; Chisuwa & O’Dea, 2010; Karazsia et al., 2017; Neumark et al., 2006; McLean et al., 2016) found that excessive short video use will not only lead to negative body image, but the users with negative body image will have higher weight loss intention than those with normal body images and are more likely to choose unhealthy weight control strategies, causing physical and psychological harm to the users in the long run. The conclusion is that short video use seems proven to affect the weight loss intentions through body image, therefore the hypothesis No. 2 is proposed in this study, that body image plays an intermediary role between short video use and weight loss intentions.

The predictive effects of short video use and body image on weight loss intentions are not constant in all cases, instead may vary with individual characteristics. Self-esteem is a holistic yet specific attitude toward oneself, being either positive or negative (Hülya et al., 2006). Self-esteem can well reflect an individual’s weight loss intentions. People with low self-esteem tend to have body image disorders, depression, and anxiety so their intentions to lose weight increase (Margaret et al., 2017; Kamody et al., 2018; Peng et al., 2017). Previous studies show that college students with low self-esteem tend to manifest higher weight loss intention (Ni & Shao, 2019; Li & Du, 2016), as they spend more time on social media. and also spend more time examining their bodies and comparing with others (Vogel et al., 2014; Shen, 2018; Ding et al.,

2017) as compared to those with high self-esteem (Ehrenberg et al., 2008). Meanwhile, some studies also point out that students with low self-esteem tend to encounter stronger weight loss intention (Arroyo et al., 2014; Yang & Xu, 2016), as they are more inclined to internalize ideal body types after longer exposure to social media (Hobza & Rochlen, 2009), compared with those who have high self-esteem. Hence, this research proposes the hypothesis No. 3: Self-esteem acts as a mediator between short video use and weight loss intentions.

Relevant studies (Tiggemann & Zaccardo, 2015; Zhang et al., 2015; Kamody et al., 2018; Ouyang et al., 2020) reported that self-esteem, an important factor influencing undergraduates' body image, has a positive predictive effect on weight loss intentions, indicating that undergraduates with higher self-esteem are more confident and positive about themselves and are more likely to have a higher sense of physical value, positive emotions and positive body image, while those with lower self-esteem are more likely to have lower or even no self-confidence and self-denial, and then a lower sense of body value and extreme depression will emerge, thereby generating negative body image. Shu (2012) and then Klomsten et al. (2004) unanimously believed that body shape is the most powerful indicator to predict overall self-esteem, which would also negatively affect weight loss intention. Yigiter (2014) also found that young people were increasingly dissatisfied with physical stature due to the decline of self-esteem, promoting an increase in weight loss intentions. This seems to imply that undergraduates with low self-esteem are more prone to have a negative body image and thus have a desire to alter their body image to match modern aesthetics and that their weight loss intentions are higher than those of undergraduates with high self-esteem. Therefore, this study proposes the hypothesis No. 4: Self-esteem plays a regulatory role between body image and weight loss intention.

To sum up, this study constructs a regulated mediation model as shown in Fig. 1 to explore the relation mechanism between short video use and weight loss intention and its boundary conditions, i.e. the mediating role of body image and the regulatory role of self-esteem.

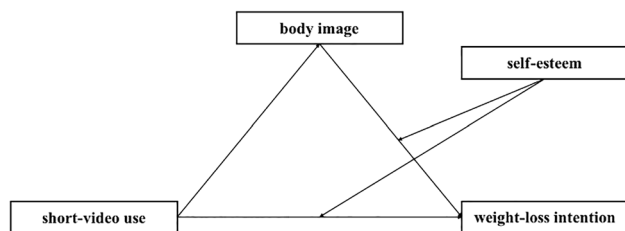


Fig. 1 Regulated mediation model

## Methods

### Participants

Undergraduates from three universities in southwest China were the respondents. Firstly, undergraduates were grouped by major and grade, 500 undergraduates were admitted from each university by random sampling and 125 paper questionnaires were distributed to each grade. With the aid of public physical education teachers and support tutors, the selected subjects were investigated anonymously after being approved by the ethics committee, and those completing questionnaires were volunteers. A total of 1500 questionnaires were distributed and 1268 valid questionnaires were collected, with an effective rate of 84.5%. There were 51 questionnaires excluded due to missing or incomplete answers, 74 questionnaires excluded due to negligent completion, and 107 questionnaires were excluded due to a failure to return them on time, thus a total of 232 questionnaires excluded.

Basic information of the sample group is shown as follows (listed in Table 1): Gender (692 males and 576 females), average age:  $20.79 \pm 3.43$  years, height:  $179.11 \pm 9.12$  cm, weight:  $70.91 \pm 14.66$  kg; BMI:  $23.17 \pm 4.01$ . There were 354 freshmen, 319 sophomores, 301 junior students, and 294 senior students. BMI indicates the value converted by the body mass index (BMI) formula:  $BMI = \text{Weight (kg)} \div \text{height (m}^2\text{)}$ . As per the physical fitness BMI standard from the Ministry of Education for undergraduates (Chen et al., 2019), BMI was divided into three groups. The sample size for light weight group ( $BMI < 20 \text{ kg/m}^2$ ) was 301, the sample size for normal weight group ( $BMI = 20 \text{ kg/m}^2 - 25 \text{ kg/m}^2$ ) was 698, and the sample size for over weight group ( $BMI > 25 \text{ kg/m}^2$ ) was 269.

### Measures

This study is descriptive, using a structured questionnaire as the research instrument, and the required data was obtained through the questionnaire survey. A two-phase questionnaire was adopted to secure meticulous and effective research. Procedures: First, work out an initial questionnaire based on the research objective and reference to a large amount of research literature. Second, conduct a small-sample survey of 200 people. Through normal distribution verification, reliability analysis, and exploratory factor analysis, eliminate some question items with less contribution, and then by means of structural model verification, settle on the final draft of the questionnaire.

The questionnaire was divided into five parts:

**Table 1** Basic information of the sample group ( $N=1268$ )

Variable	Mean $\pm$ SD	Variables	Category	n	%
Age (years)	20.79 $\pm$ 3.43	Gender	Male	692	54.57%
Height (cm)	179.11 $\pm$ 9.12		Female	576	45.43%
Weight (kg)	70.91 $\pm$ 14.66	Grade	Freshman	354	27.92%
BMI (kg/m <sup>2</sup> )	23.17 $\pm$ 4.01		Sophomore	319	25.16%
			Junior	301	23.74%
			Senior	294	23.19%
		BMI	Light Weight Group	301	23.74%
			Normal Weight Group	698	55.05%
			Overweight Group	269	21.21%

*BMI* body mass index. BMI=body weight (kg)/height (m). Lightweight BMI < 20 kg/m<sup>2</sup>, normal BMI: 20–25 kg/m<sup>2</sup>, overweight BMI > 25 kg/m<sup>2</sup> (BMI grouping per the Ministry of Education of China criteria for college students)

- 1) Personal background: The content included gender, grade, height, weight, and other basic information about the subject. BMI was calculated based on the weight and height of the undergraduate.
- 2) Short video use intensity scale: The scale was based on a social network site use intensity scale (Ellison et al., 2007). Ding et al. (2016) and Hu et al. (2021) adapted the social network site use intensity scale based on the use characteristics of short videos, and six items were thus acquired after two items were deleted. The subjects were scored by using the five-point Likert interval scale (5 = Strongly agree; 1 = Strongly disagree) to reflect the degree of short video integration in their individual life and emotional dependence on short videos. The higher score indicated the higher intensity of individual short video use. The overall Cronbach's  $\alpha$  value of short video use intensity scale was 0.78, highly supporting the reliability of the scale. The verification results of the scale measurement model are shown as follows:  $X^2/DF=2.943$ , the parameter values of CFI (comparative fit index), TLI (Tucker–Lewis index), RMSEA (root mean square error of approximation), SRMR (standardized root mean square residual) were 0.931, 0.919, 0.070 and 0.061 successively, all of which met acceptable standards, indicating that the model fit with the survey data and the scale exhibited satisfactory structural validity. It was concluded that the short video use intensity scale was reliable and valid.
- 3) Body image scale: Multidirectional Body-self Relations Questionnaire (MBSRQ) compiled and created by Cash et al. (1990), included seven dimensions, namely the health evaluation, weight concern, appearance evaluation, physical fitness evaluation, appearance adaptation, physical ability adaptation, and disease concern. The scale had 37 items in total and was compiled by using the five-point Likert scale. The options were “extremely consistent, relatively consistent, uncertain, less consistent, and extremely inconsistent”, and they were respectively calculated as 5, 4, 3, 2, and 1 point(s). The higher the score was, the more positive the body image. Cronbach's  $\alpha$  values of overall and dimensions of the body image scale were greater than 0.70 (0.81 ~ 0.94), highly supporting the reliability of the scale. The verification results of the measurement model of the scale are:  $X^2/DF=2.429$ , and the parameter values of CFI, TLI, RMSEA, and SRMR are 0.936, 0.925, 0.066 and 0.055 respectively, which all met the acceptable standards, indicating that the model fit with the survey data and the scale showed satisfactory structural validity. Therefore, the body image scale delivered good reliability and validity.
- 4) Self-esteem scale: This scale was the translated and revised version of the self-esteem scale compiled by Tian (2006), and the revised scale was divided into 10 questions. 4-point scoring ranged from “completely inconsistent” (1 point) to “completely consistent” (4 points) was adopted, where questions 2, 5, 6, 8, and 9 were reverse questions, and reverse scoring was adopted for reverse questions. The higher the score was, the more positive the self-esteem. Overall Cronbach's  $\alpha$  of the self-esteem scale was valued at 0.88, highly demonstrating that the scale was of great reliability (see Table 2). The verification results of the scale measurement model are:  $X^2/DF=1.602$ , and the parameters including CFI, TLI, RMSEA, and SRMR were valued at 0.946, 0.935, 0.058, and 0.051 respectively, all of which met the acceptable standards, indicating that the model fit with the survey data and the scale showed satisfactory structural validity. Therefore, the self-esteem scale was found to have good reliability and validity.
- 5) Weight loss intention scale: The weight loss motivation subscale was adapted from the eating disorder inventory (EDI) compiled by Gamer et al. (1983), with an additional item from the author (“I am will-

**Table 2** Descriptive statistics and correlation between variables ( $N=1268$ )

	$M \pm SD$	1	2	3	4	5	6	7
1. gender	–	1.00						
2. grade	–	0.04	1.00					
3. BMI	$23.17 \pm 4.01$	–0.01	–0.04	1.00				
4. short video use	$3.37 \pm 0.96$	0.03	0.05	0.01	1			
5. body image	$2.48 \pm 0.72$	0.03	0.02	–0.02	–0.42**	1		
6. self-esteem	$3.36 \pm 0.48$	0.02	0.02	–0.03	–0.35**	0.20**	1	
7. weight loss intention	$2.11 \pm 0.87$	0.01	0.03	0.05	0.28**	–0.33**	–0.26**	1

\* $p < 0.05$ ; \*\* $p < 0.01$

ing to lose weight”), totaling 6 questions. The subject expressed his/her weight loss intention by scoring with a five-point Likert interval scale (5 = Strongly agree; 1 = Strongly disagree). The higher the score was, the stronger the weight loss intention. The overall Cronbach’s  $\alpha$  of the weight loss intention scale was valued at 0.91, highly supporting that the scale was of great reliability (see Table 2). The verification results of the scale measurement model satisfied  $X^2/DF = 1.351$ , and the parameters of CFI, TLI, RMSEA, and SRMR were valued at 0.948, 0.942, 0.044, and 0.038 respectively, all of which met the acceptable standards, indicating that the model fit with the survey data and the scale showed satisfactory structural validity. Therefore, the weight loss intention scale was found to have satisfactory reliability and validity.

## Statistical analysis

Data obtained in this study was analyzed using SPSS19.0 and AMOS21.0 software packages. The statistical methods included descriptive statistics, Kolmogorov–Smirnov test, reliability analysis, exploratory factor analysis, Harman single factor test, correlation analysis, structural equation model, Bootstrap analysis, etc. The significance level of all variables was set as  $\alpha = 0.05$ .

To ensure the rigor of the research, before data analysis began, it was necessary to test the normal distribution of all variables in the pre-test and formal test. By using the Kolmogorov–Smirnov Test, it was determined that all the continuous variables in the pre-test and normal test conformed to a normal distribution (All the P values were significantly higher than 0.05).

Statistics obtained from questionnaires may lead to common method biases. This research uses Harman single factor test to test the possible common method biases (Zhou & Long, 2004). The results show that the characteristic roots of a total of 11 factors were greater than 1, among which the largest factor explained variance was 23.91%, far from the

critical standard of 40%. It can be seen that the research is less likely to be affected by common method biases, as data is within the acceptable range.

## Results

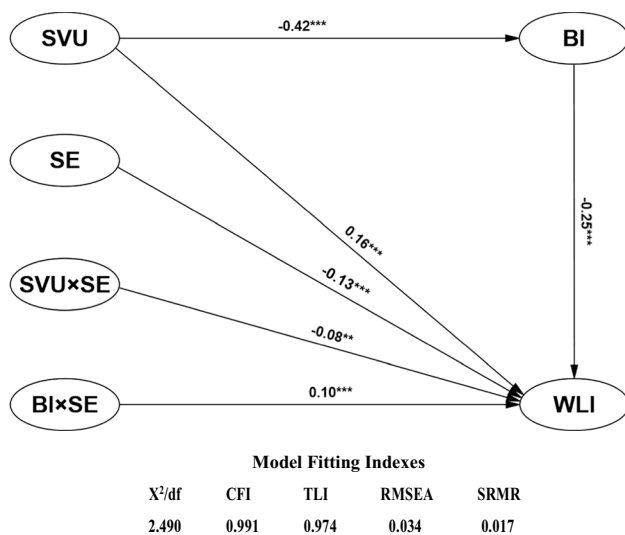
### Descriptive statistics and correlation analysis

Pearson correlation was used to analyze the correlation coefficients between short video use, body image, self-esteem, and weight loss intention (see Table 2). The results showed that short video use was positively correlated with weight loss intentions, but negatively correlated with body image and self-esteem; body image was positively correlated with self-esteem. Furthermore, it was found in the correlation analysis between demographic variables and research variables, that there was no significant correlation between gender, grade, BMI, and research variables, therefore, they were not controlled in the research hypothesis test. The above correlation analysis results provided the basis for testing subsequent assumptions (Fig. 2).

### Model validation analysis on short video use, body image, self-esteem, and weight loss intention of undergraduates

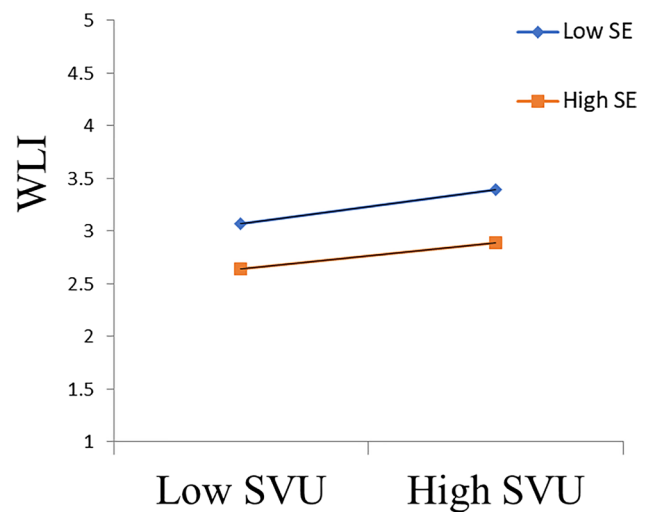
The intermediary role of body image and the regulatory role of self-esteem were tested to investigate the relations between short video use, body image, self-esteem, and weight loss intention. In this study, the indexes of the scale were packaged based on the question packaging strategy, as recommended by Wu and Wen (2011), and tested per the regulatory mediation procedure (Wen & Ye, 2014). The model fitting index was  $X^2/DF = 2.490$ , and the parameters of CFI, TLI, RMSEA, and SRMR were valued at 0.991, 0.974, 0.034, and 0.017 respectively, meeting the acceptable standards, and indicating that the model fit well.

The data results are shown in Fig. 1. Short video use was found to have a significant predictive effect with a 95% confidence interval of [0.12, 0.24] (excluding 0) on



**Fig. 2** Path analysis diagram and model fitting test for short video use, body image, self-esteem and weight loss intention. SVU, short video use; BI, body image; SE, self-esteem; WLI, weight loss intention. \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

the weight loss intention ( $\beta = 0.16, p < 0.001$ ) of undergraduates, indicating that short video use could significantly and positively predict weight loss intention, supporting Hypothesis No. 1. Short video use had a significant predictive effect on body image ( $\beta = -0.42, p < 0.001$ ) with a 95% confidence interval of  $[-0.45, -0.35]$ ; body image had a significant predictive effect on undergraduates' weight loss intention ( $\beta = -0.25, p < 0.001$ ) with a 95% confidence interval of  $[-0.31, -0.22]$ ; indirect effect size of short video use on undergraduates' weight loss intention through body image was 0.11 ( $P < 0.001$ ) with a 95% confidence interval of  $[0.09, 0.16]$  (excluding 0), indicating that body image played a partial intermediary role in the effects of short video use on undergraduates' weight loss intention, coinciding with Hypothesis No. 2. Self-esteem had a significant predictive effect on weight loss intention ( $\beta = -0.13, p < 0.001$ ) with a 95% confidence interval of  $[-0.19, -0.06]$ ; the interaction between self-esteem and body image delivered a significant predictive effect on undergraduates' weight loss intention ( $\beta = 0.10, p < 0.001$ ) with a 95% confidence interval of  $[0.06, 0.18]$  (excluding 0), indicating that self-esteem played a regulatory role in the relation between body image and weight loss intention of undergraduates. The interaction between self-esteem and short video use had a significant predictive effect on body image ( $\beta = -0.08, p < 0.01$ ) with a 95% confidence interval of  $[-0.14, -0.03]$  (excluding 0), indicating that self-esteem played a regulatory role in the relation between short video use and body image. To sum up, self-esteem regulates direct effect of short video usage  $\rightarrow$  weight loss intentions, and second half path of mediation process of



**Fig. 3** Graph for regulatory effect of self-esteem on relation between short video use and weight loss intention

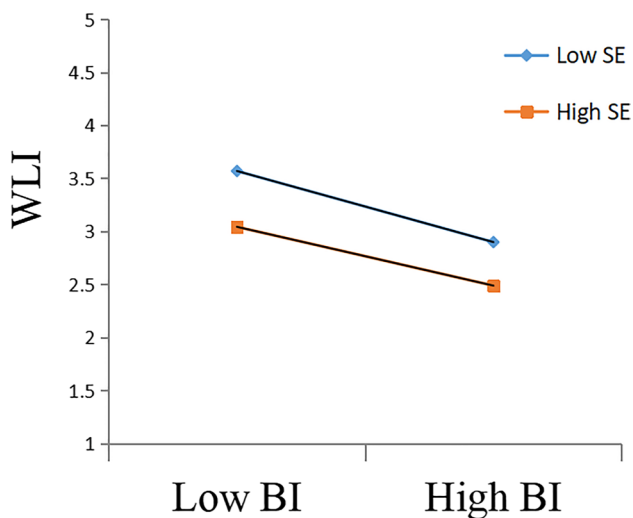
short video usage  $\rightarrow$  self-esteem  $\rightarrow$  weight loss intention, agreeing with Hypothesis No. 2 and No. 3.

To more clearly explain the essence of the interaction between self-esteem and short video use or self-esteem and body image, we divided self-esteem into high and low score groups with the average score plus or minus a standard deviation, conducted a simple slope test, and drew a simple effect assay plan. As shown in Fig. 3, when the self-esteem level was low, the short video use had a significant and negative prediction of weight loss intention,  $B_{simple} = -0.33$  and  $p < 0.001$ . When the self-esteem level was high, short video use had a negative prediction of weight loss intention,  $B_{simple} = -0.25$  and  $p < 0.001$ . The results showed that the predictive effect of short video use on weight loss intention would increase with the decrease in self-esteem. As shown in Fig. 4, when the self-esteem level was low, body image significantly and negatively predicted undergraduates' weight loss intention,  $B_{simple} = -0.67$  and  $P < 0.001$ . When the level of self-esteem was high, body image negatively predicted the undergraduates' weight loss intention,  $B_{simple} = -0.55$ , and  $p < 0.001$ . The results showed that the predictive effect of personal body image level on weight loss intention would increase with the decrease in self-esteem.

## Discussion

### Effects of short video use on undergraduates' weight loss intentions

This research finds that the frequency of short video use has a significant positive predictive effect on college students' weight loss intention, showing that with the increase in short



**Fig. 4** Graph for regulatory role of self-esteem on relation between body image and weight loss intention

video use, weight loss intention will also increase, and vice versa. The concept of “slim body” and “perfect body” vigorously hailed by short videos throughout social media has gradually stimulated the internalization of this concept. The increased exposure to social-cultural pressure, from family, peers, media, and other factors, has also played a huge part in emphasizing the ideology of a “slim body” (Yang et al., 2021; Liang et al., 2020). Therefore, college students who don’t meet the criteria set by the media are prone to take unreasonable methods for weight loss (including dieting, taking weight loss products, excessive exercise, etc...) to attain their intended degree of weight loss. However, these methods may also contain a certain degree of physical and psychological harm to college students (Kvardova et al., 2020; Marks et al., 2020; Xu et al., 2010; Rodgers et al., 2011). In addition, some scholars believe that ideal image internalization is one cause of restrictive eating behaviors, and manifests a significant positive predictive effect on such behaviors as well (Alleva et al., 2016; Fardouly et al., 2020). Therefore, a positive predictive effect exists between the frequency of short video use and the degree of weight loss intention, where the former serves as an important factor for the latter, which also supports Hypothesis No. 1.

### Intermediary role of body image

This study discovers that short video usage shows a significant negative predictive effect on body image, indicating that the higher the use of short videos, the more negative the body image of college students, and vice versa. This result also verifies the findings from Karsay et al. (2021) and Dian et al. (2019), that is, short video use may lead to an individual’s dissatisfaction with their body, which in turn leads

to a decrease in college students’ body image. At the same time, studies have also confirmed (Fardouly & Rapee, 2019; Song & Zhu, 2019) that people who use less social media are better than those who use more social media in terms of body image. This research also shows that body image exerts a significant negative predictive effect on weight loss intention, indicating that the more negative the individual’s body image, the higher the weight loss intention, and vice versa. Some scholars believe that (Cao et al., 2014; Sun et al., 2013) college students are prone to a cognitive deviation between actual body mass and ideal body mass, generally assuming that the former is heavier than the latter. Such that, they tend to focus more on a good-looking appearance and slim body, therefore, resulting in reduced body image, risen obesity anxiety, and intensified weight loss intention. Meanwhile, Hsin and Hung (2008), Shi et al. (2020), Sun et al. (2017), and other scholars agreed that body image can better predict the weight loss intentions of college students. The lower the satisfaction, the higher the intention. It also proves that short video use can lead indirectly and positively predict weight loss intention through the intermediary effect of body image. This shows that excessive use of short videos will reduce college students’ body satisfaction, resulting in negative body image. Thus, their weight loss intention rises, as they search for changes in body image. This result accurately matches the findings of Wang et al. (2016), Jiotsa et al. (2021), and Yao et al. (2018). Short video use will eventually trigger eating dysfunction and eating disorders due to negative body image formed in the process of more exposure to an ideal image on social media.

In conclusion (and referring to the Bootstrap mediating effect test program), Hypothesis No. 2 that body image plays an intermediary role between short video use and weight loss intentions is tenable. Reducing the use of short videos can better improve the body image of college students, and a positive body image can play an important role in inhibiting their weight loss intentions. Therefore, reducing the use of short videos can not only directly lower their weight loss intentions but also have an indirect impact on such intentions by improving their positive body image.

### Regulatory effect of self-esteem

This study discovers that self-esteem regulates the relationship between short video use and weight loss intention. Essentially, short video use delivers a more significant but reverse predictive effect on the weight loss intention of students with low self-esteem compared to those with high self-esteem. Some studies suggest that self-esteem is an important factor that moderates college students’ intention to lose weight. Students with high self-esteem show more confidence regarding their physical appearance, leading to less weight loss intention, and vice

versa (Christine et al., 2020; Selensky & Carels, 2021). From what we can see, college students with low self-esteem tend to manifest higher weight loss intentions than those with high self-esteem. Furthermore, college students with lower self-esteem are more susceptible to social values, social focus, and comments, especially during their excessive amount of time spent on social media (Ehrenberg et al., 2008). The excessive advocacy of the ideal body model by society will drag college students into an uncoordinated body expectation state, as they focus more on body shape. Such that, weight loss intention accumulates gradually, with growing negative emotions and low self-esteem (Christine et al., 2020; Koronczi et al., 2013; Klomsten et al., 2004; Korkmaz, 2014). This means excessive use of short video software will spur weight loss intention to a higher level, then subject to self-esteem. As self-esteem lessens, the positive predictive effect on weight loss intention by short video use grows stronger. The weight loss intention of low self-esteem students is boosted to the highest level by social media, supporting Hypothesis No. 3 to be true. This study also reveals that self-esteem moderates the relationship between body image and weight loss intention. To be more specific, body image exerts a more significant predictive effect on the weight loss intention of college students with low self-esteem as compared to those with high self-esteem. Research suggests that (Peng et al., 2017; Kamody et al., 2018; Selensky & Carels, 2021; Ouyang et al., 2020) self-esteem exercises a significant positive predictive effect on body image, revealing that college students with higher self-esteem tend to manifest more positive body image, and vice versa. At the same time, studies also state that (Margaret et al., 2017; Bruin et al., 2009; Gillen, 2015; Christine et al., 2020) self-esteem, as an emotional assessment of oneself, can also well underline weight loss intention. College students with lower self-esteem are inclined to show higher weight loss intention, as they struggle to build their body into better shapes, while painfully suffering from depression, anxiety, and negative body image, and vice versa. In other words, negative body image will arouse weight loss intention, while mediated by self-esteem. As self-esteem lessens, the reverse predictive effect on weight loss intention by body image grows stronger. The weight loss intention of low self-esteem students is boosted to the highest level by negative body image, proving Hypothesis No. 4 to be true.

In conclusion, the direct effect of short video use on weight loss intention and the second-half path of the mediating effect of body image will be regulated by self-esteem; both the direct effect of short video use and the mediating effect of body image on weight loss intention will gradually increase with the decrease in self-esteem.

## Research value and prospect

This research boasts both theoretical and practical values, as it reveals the effect of short video use on college students' weight loss intention and related inherent functional mechanisms. Theoretically, this research elaborates how short video use exerts influence on weight loss intention in both direct and indirect manner, through scrutiny of details of short video use, body image, self-esteem, and weight loss intention of contemporary college students, while building a solid theoretical basis. In addition, this research further reveals that short video use of different individuals with various levels of self-esteem manifests both a direct effect and mediating effect of body image on weight loss intention. Besides short video use and body image, it proves that self-esteem is another key factor influencing weight loss intention. Practically, the result can explain how body dissatisfaction, even negative body image, is triggered by the internalization of the "ideal body" hailed by social media, due to excessive short video use. Hidden health harms may find their way in, as college students attempt to achieve ideal body shape through restrictive diets and other unhealthy methods. At the same time, this research also mentions that the influence of self-esteem on weight loss intention can't be ignored. Given that lower self-esteem may arouse weight loss intention, it is particularly important to improve the self-esteem of college students and develop healthy and confident living habits. At the same time, this paper advocates for more publicity for positive body image on social media, and more emphasis on healthy and scientific weight loss means. Also, it is advised that schools and parents should also pay attention to the development of college students' self-esteem and pay attention to the mental health of college students.

## Conclusion and limitation

### Conclusion

Short video use can both positively predict undergraduates' weight loss intentions and can also do so through the intermediary role of body image. Furthermore, self-esteem is one of the vital factors to alleviate undergraduates' weight loss intention as it plays a regulatory role in the direct path between short video use and weight loss intention and the second half path of intermediary effect of body image. The direct effect of short video use on weight loss intention and the intermediary effect of body image are gradually enhanced as self-esteem decreases.



## Limitation

Certain limitations were also found in this study. Firstly, this study is a cross-sectional study- causal relations between variables fail to be determined. Longitudinal tracking research will be supported to be used in perspective research to explore clearer causal relations between variables, with the aim of further testing such regulatory intermediary model proposed in this study. Secondly, the research subjects of this study are undergraduates in southwest China, and a wider range of subjects are expected to be selected in prospective research to test the external validity of the findings. Finally, numerous factors influence undergraduates' weight loss intention, and the effects of short video use, body image, and self-esteem on weight loss intention are the only ones that are considered in this study. It is hoped that more external or psychological factors are supported to be used to explore the weight loss issue of undergraduates in the future, with the purpose to help them develop healthy and confident lifestyles.

**Author contributions** YO and JioL carried out the protocol and questionnaire survey. JT and JP recruited the students enrolled in Southwest of China. KW and JinL undertook the statistical analysis and graphical representation of the database. YO and JioL revised the draft. All authors designed this study, contributed to the article, and approved the final manuscript.

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**Data availability** The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

## Declarations

**Ethics statement** The studies involving human participants were reviewed and approved by the Ethics Committee of Southwest University Hospital. The patients/participants provided their written informed consent to participate in this study.

**Conflicts of interest** All authors declare no conflict of interest.

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