

# Body Image and Negative Emotions in Chinese Deaf and Hard-of-Hearing College Students: The Mediating Role of Core Self-Evaluation and the Moderating Role of Self-Compassion

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**Purpose:** Because hearing impairment as an invisible disability is not considered to have serious body image problems, the impact of body image on negative emotions of deaf or hard-of-hearing (DHH) college students has been relatively neglected. The present study aimed to explore the impact of body image on negative emotions as well as the mediating role of core self-evaluation and the moderating role of self-compassion by using a sample of DHH college students.

**Materials and Methods:** A sample of 357 Chinese DHH students completed the measures of body image, core self-evaluation, self-compassion, depression, and anxiety. Correlations and line regression analyses were used to explore the relationships among the above variables. The mediating role of core self-evaluation and the moderating role of self-compassion were examined using the Hayes' Proces.

**Results:** The results showed that body image not only directly affects negative emotions but also indirectly impacts negative emotions through core self-evaluation. Moreover, self-compassion Moderated the effects of core self-evaluation on negative emotions.

**Conclusion:** Body image is an important influencing factor of negative emotions in DHH college students. Increasing positive body image, improving core self-evaluation, and cultivating self-compassion can be effective in reducing negative emotions in DHH college students.

**Keywords:** body image, depression, anxiety, core self-evaluation, self-compassion, DHH college students

## Introduction

With the improvement and development of education for people with disabilities in China, more and more people with disabilities are entering universities for higher education.<sup>1</sup> College students with disabilities have also gradually changed from the role of needing to be taken care of to the role of contributing to the construction of the country. However, DHH college students, as an important part of college students with disabilities, are vulnerable to being more affected by negative emotions due to their hearing impairments and difficulties in adapting to the college life environment.<sup>2,3</sup> Negative emotions can have many negative consequences, as these negative emotions may reduce the quality of life<sup>4</sup> and increase the incidence of mental illness.<sup>5</sup> Not only that, if more and more DHH college students are affected by negative emotions, the prevalence of mental illness will increase, which will not only lead to higher medical costs but also be detrimental to the construction and development of society. Therefore, exploring the influencing factors and mechanisms of negative emotions in DHH college students is of great significance in improving the quality of life and mental health of DHH college students, and even promoting social development.

The cognitive theory of emotion holds that emotions arise from evaluations of stimuli or of things.<sup>6</sup> In general, negative emotions are generated when the stimulus or thing is evaluated as being harmful to oneself. As an important concept of self-evaluation and perception of one's own body, body image has a deep and lasting impact on the negative emotions of DHH college students. Due to physical deficiencies, DHH college students' true experience of the outside world and themselves can be easily biased by other factors, including their perception of their appearance. Some studies found that DHH college students are prone to body image disorder, that is, to view their bodies in a negative way, which leads to increased dissatisfaction with their bodies.<sup>7</sup> Once the individual has a negative evaluation of their own body, then they are prone to negative emotions. Many cross-sectional studies suggested that individuals who are not satisfied with their body image are at high risk of depression and anxiety in specific populations, such as adolescents,<sup>8,9</sup> young adults,<sup>10,11</sup> specific disease population.<sup>12,13</sup> Similarly, some longitudinal research also discovered that dissatisfaction with body image predicted depression<sup>14</sup> and anxiety.<sup>15</sup> In summary, although research on the relationship between body image and negative emotions in DHH college students is limited, it is reasonable to propose Hypothesis 1: Body image is closely associated with negative emotions in DHH college students.

Importantly, body image, as a part of physical self-concept, may influence negative emotions through higher-level self-concepts, such as core self-evaluation. In other words, core self-evaluation may mediate the relationship between body image and negative emotions in DHH college students. As a kind of higher-level self-concept, core self-evaluation refers to one's basic evaluation of self-worth and ability, which is composed of four characteristics: self-esteem, locus of control, generalized self-efficacy, and emotional stability (low neuroticism).<sup>16</sup> The multidimensional hierarchical self-concept perspective proposed that lower-level self-concept affects higher-level self-concept.<sup>17</sup> In other words, body image could influence core self-evaluation. Based on this perspective, some cross-sectional studies found that body image was closely linked with self-esteem, general self-efficacy,<sup>18</sup> locus of control,<sup>19</sup> and neuroticism.<sup>20</sup> More directly, Liu<sup>21</sup> suggested that body image was significantly associated with core self-evaluation in junior school students. Moreover, previous longitudinal studies also discovered that individuals with positive body image could predict subsequent high levels of self-esteem.<sup>22</sup>

Additionally, core self-evaluation has been shown to impact negative emotions. Specifically, low levels of core self-evaluation can lead to negative emotions such as depression and anxiety.<sup>23,24</sup> In contrast, individuals with high levels of core self-evaluation may generate more positive emotions and less negative emotions.<sup>25</sup> Cognitive schema provides an explanation from the perspective of automatic processing. Individuals with high levels of core self-evaluation develop a positive self-schema, which leads to sensitivity to positive information and thus generates positive emotion. Conversely, individuals with low levels of core self-evaluations would have processing bias to negative information and develop negative emotions.<sup>26,27</sup> Differently, self-verification theory offers an alternative explanation from the view of active processing, namely that people actively seek information that is consistent with their self-concept. Individuals with positive core self-evaluations seek positive information and tend to interpret neutral information more positively.<sup>27,28</sup> However, individuals with negative core self-evaluations seek out negative information and interpret neutral information as more negative.<sup>27,28</sup> In line with the literature reviewed above, we propose Hypothesis 2: Core self-evaluation mediates the effects of body image on negative emotions in DHH college students.

However, some researchers suggested that the effects of body image and core self-evaluation related variables on negative emotions were not always stable.<sup>9,29</sup> Based on the emotional coping theory, self-compassion, as a positive emotion regulation strategy and emotional arousal state, in which individuals understand and accept their failures, weakness, and disappointment with an open and tolerant attitude,<sup>30</sup> could moderate the influence of external and internal stress on negative emotions.<sup>31</sup> Specifically, when individuals are faced with such pressures as self-defects, low levels of self-value, and failure, self-compassion will make them calmly accept and objectively look at the emotions generated by the pressure, and try to weaken the negative emotions and even promote the negative emotions to transform into positive emotions. For example, Sick and colleagues found that there was a stronger effect of body shame on depression in females with low levels of self-compassion than those with high levels of self-compassion.<sup>29</sup> Callow, Moffitt, Neumann<sup>32</sup> also discovered that self-compassion, as an effective emotion regulation strategy, could reduce the adverse effects of external shame on depression and anxiety in Australian university students. Recently, Zhang et al (2024) also showed that self-compassion could buffer the effects of contingent self-esteem on negative emotions by using the experimental

method of self-compassion training in Chinese college students.<sup>33</sup> In light of the above argument, for DHH college students, physical deficiencies can lead to body image disorder and low levels of core self-evaluation, making them suffer from self-threat which can be regarded as internal stress. Self-compassion, as a positive emotion regulation strategy, may also play a moderating role in the effect of body image and core self-evaluation on negative emotions in DHH college students. Therefore, we propose Hypothesis 3: Self-compassion moderates the patterns of relationship between body image, negative emotions, and core self-evaluation.

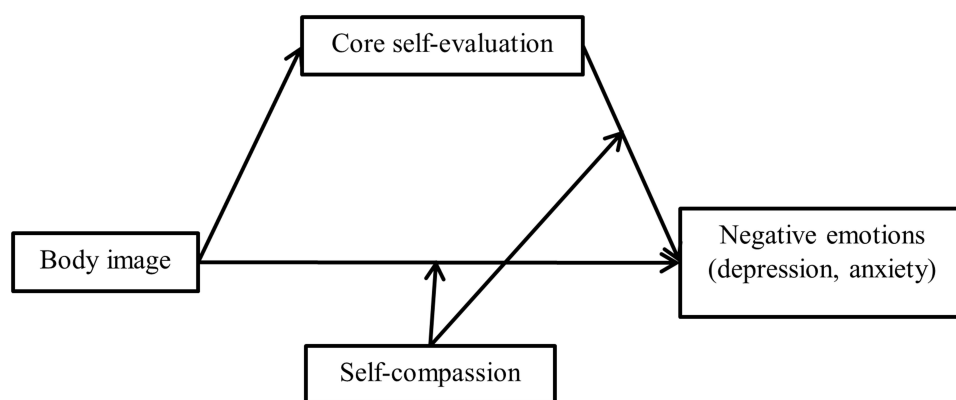
Drawing on the literature reviewed above, although previous studies paid attention to the relationship between body image and negative emotions among various populations such as adolescents, young and older adults, and people with specific diseases or physical disabilities, few studies focused on these relationships in the population of DHH college students. Previous researchers believed that, unlike physical disabilities, hearing impairment, as an invisible disability, is considered to have less severe body image problems.<sup>34</sup> So, the impact of body image on negative emotions among DHH individuals has been relatively overlooked. Moreover, it is unclear that the mediating mechanism (ie, how body image relates to negative emotions through core self-evaluation) and moderating mechanism (ie, when body image will have a greater effect on negative emotions) underlying the relationship between body image and negative emotion in DHH college students. To fill these gaps, the current study integrated body image, core self-evaluation, negative emotions, and self-compassion into a model to systematically explore the impact of body image on negative emotions as well as the mediating role of core self-evaluation and the moderating role of self-compassion by using a sample of DHH college students. It is worth noting that depression and anxiety are considered to be the most common negative emotions. Depression and anxiety as indicators of negative emotions are involved in the present study. Thus, we proposed the following hypotheses, and the model is shown in Figure 1.

## Materials and Methods

### Participants and Procedure

This cross-sectional study recruited 361 DHH college students from two universities in Henan and Sichuan provinces, China. After removing invalid questionnaires with missing data for the whole scale, 357 valid questionnaires remained. The sample consisted of DHH 267 students from a university in Henan Province and DHH 90 students from a university in Sichuan Province. Participants' ages ranged from 18 to 27 ( $M_{\text{age}} = 21.23$ ,  $SD_{\text{age}} = 1.67$ ). Of the participants, there were 152 males ( $M_{\text{age}} = 21.22$ ,  $SD_{\text{age}} = 1.67$ ) and 205 females ( $M_{\text{age}} = 21.23$ ,  $SD_{\text{age}} = 1.66$ ). See Table 1 for the detailed demographic information.

DHH college students were invited to complete the questionnaire in batches, with each batch comprising approximately 20 students. To ensure comprehension, we first invited teachers who have rich experience in teaching Chinese to DHH college students to adapt the questionnaire to reduce the difficult vocabulary. Additionally, during the survey, we invited three teachers who could understand and accurately express the content of the questionnaire in sign language to assist DHH college students in filling out the questionnaire. Students were encouraged to raise their hands to seek help



**Figure 1** The proposed hypothesis model of this study.

**Table 1** The Demographic Information of DHH College Students in This Study (N = 357)

Variables	Category	N(%) / M(SD)
Gender	Male	152 (42.58%)
	Female	205 (57.42%)
Region	Henan Province	267 (74.79%)
	Sichuan Province	90 (25.21%)
Pre-lingual Hearing Loss	Yes	194 (54.34%)
	No	150 (42.02%)
	Missing	13 (3.64%)
Hearing Aids	Yes	115 (32.21%)
	No	242 (67.79%)
Age		21.23 (1.67)
BMI		21.93 (4.28)

**Abbreviation:** BMI, body mass index.

from sign language teachers if they had any questions during the questionnaire filling process. As a token of appreciation, each participant received a gift or an equivalent cash value upon completing the questionnaire. The study was approved by the ethics committee of the corresponding author's university.

## Measures

### Negative Emotion

Two dimensions from the Depression Anxiety Stress Scale (DASS) were used to assess two negative emotions, depression and anxiety. This scale was originally developed by Lovibond, Lovibond<sup>35</sup> and revised by Gong et al.<sup>36</sup> The original DASS scale included 21 items on three dimensions (ie, depression, anxiety, and stress). Because this study was interested in negative emotions, the depression and anxiety dimensions of this scale were selected for measurement. There were 7 items on this scale to assess depression (eg, I am feeling blue and depressed) and 7 items to assess anxiety (eg, I am scared for no reason). Items were scored on a 4-Likert point scale, with 1 = never and 4 = always. Higher average scores indicated higher levels of depression/anxiety. In this study, the Cronbach's alpha coefficient for depression and anxiety were respectively 0.85 and 0.83.

### Body Image

Body image was measured using the Body Image Concern Inventory (BICI) designed by Littleton et al.<sup>37</sup> This scale consists of 19 items (eg, I am dissatisfied with certain aspects of my appearance). The participants responded on a 5-point scale, with 1 = definitely false and 5 = definitely true. A higher average score indicated a higher dissatisfaction with body image. In this study, the Cronbach's alpha coefficient for this scale was 0.90.

### Core Self-Evaluation

Core self-evaluation was evaluated by the core self-evaluation scale designed by Judge et al.<sup>38</sup> and revised by Du et al.<sup>39</sup> This scale consists of 10 items. For example, I can successfully complete all tasks. Each item was rated on a 5-Likert point scale (1 = completely disagree, 5 = completely agree). The higher the average scores, the more positive of core self-evaluation. The Cronbach's alpha coefficient for this scale was 0.71 in this study.

### Self-Compassion

Self-compassion was measured using the self-compassion scale-short form (SCS-S) designed by Raes, Pommier, Neff, Van Gucht.<sup>40</sup> The SCS-S consists of 12 items and is divided into 6 dimensions (ie, self-kindness, mindfulness, common humanity, self-judgment, isolation, and over-identification). Each item (eg, I try to understand and accept the aspects of

my personality that I dislike) was scored on a 5-Likert point scale (1 = never, 5 = always). A higher average score indicated that higher level of self-compassion. The Cronbach's alpha for the scale was 0.69 in this study.

## Statistical Analyses

First, descriptive analyses and correlation analyses were conducted. Second, we conducted linear regression analysis to explore the effect of body image on negative emotions (ie, depression and anxiety). Third, we used Hayes' PROCESS macro model 4 to test the mediating role of core self-evaluation in the relationship between body image and negative emotions in DHH college students. PROCESS model 4 could test a mediating effect based on a bootstrapping method. In general, the indirect effect is statistically significant if the 95% bootstrap confidence interval (95% CI) does not include 0. Fourth, we also used Hayes' PROCESS macro model 15 to test the moderating effect of self-compassion on the relationship between body image, core self-evaluation, and negative emotions. The moderating effects were statistically significant if the standardized coefficients of the interaction terms were significant ( $p < 0.05$ ) or marginally significant ( $p < 0.10$ ). To further explore the moderating effect, a simple slope test was used to examine the relationship between body image, core self-evaluation, and negative emotions at different levels of self-compassion to illustrate the moderating effect in detail. Additionally, body mass index (BMI), gender (coded as a dummy variable: 0 = male, 1 = female), and age have been widely shown in previous studies to be significantly associated with body image, self-compassion, and negative emotions.<sup>8,41-45</sup> Gender is also closely related to core self-evaluation.<sup>46</sup> Therefore, we included BMI, age, and gender as covariates in the subsequent analyses.

## Results

### Preliminary Analyses

As shown in Table 2, body image was significantly positively correlated with negative emotions (ie, depression and anxiety) and significantly negatively correlated with core self-evaluation and self-compassion. Additionally, negative emotions were significantly negatively correlated with core self-evaluation and self-compassion. Core self-evaluation was significantly positively associated with self-compassion.

### The Relationship Between Body Image and Negative Emotions

We conducted linear regression analyses with body image as independent variable and negative emotions (ie, depression and anxiety) as dependent variables to test *Hypothesis 1*. The results suggested that body image was positively associated with depression ( $b = 0.39$ ,  $SE = 0.05$ ,  $t = 7.87$ ,  $p < 0.001$ ). Likewise, body image was also positively associated with anxiety ( $b = 0.42$ ,  $SE = 0.05$ ,  $t = 8.60$ ,  $p < 0.001$ ). These results supported *Hypothesis 1*, that is, DHH college students who were dissatisfied with their body image were more likely to have negative emotions (ie, depression and anxiety).

**Table 2** Descriptive Analyses and Correlation Analyses Between Variables (N = 357)

Variables	M	SD	1	2	3	4	5	6	7	8
1 Body image	2.74	0.69	–							
Negative emotion										
2 Depression	1.94	0.61	0.39**	–						
3 Anxiety	1.99	0.60	0.42**	0.80**	–					
4 Core self-evaluation	3.25	0.52	–0.39**	–0.60**	–0.53**	–				
5 Self-compassion	3.30	0.46	–0.38**	–0.50**	–0.40**	0.60**	–			
6 Age	21.23	1.66	0.07	0.16*	0.13*	–0.06	–0.02	–		
7 BMI	21.93	4.28	–0.06	–0.09	–0.08	0.07	0.11*	–0.01	–	
8 Gender			0.11*	–0.03	0.05	0.06	0.15**	–0.001	–0.18**	–

Notes: \* $p < 0.05$ ; \*\* $p < 0.01$ ; Gender was dummy coded as male = 0, female = 1.

Abbreviation: BMI, body mass index.

**Table 3** Results of Mediation Analyses

Predictors	Model 1		Model 2			
	Core self-evaluation		Depression		Anxiety	
	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>
Body image	−0.39	−7.98***	0.18	3.99***	0.25	5.25***
Core self-evaluation			−0.52	−11.54***	−0.43	−9.03***
<i>R</i> <sup>2</sup>	0.15		0.38		0.33	
<i>F</i>	63.67***		109.13***		86.06***	

**Notes:** Model 1 represented the effect of body image on core self-evaluation; Model 2 represented the effects of body image and core self-evaluation on negative emotions (ie, depression and anxiety). The *b* value represents the standardized coefficients. \*\*\**p* < 0.001.

## The Mediating Role of Core Self-Evaluation

We used model 4 from Hayes' PROCESS macro to test the mediating role of core self-evaluation. The results are shown in Table 3. Specifically, body image was a significant negative predictor of core self-evaluation ( $b = -0.39$ ,  $SE = 0.05$ ,  $t = -7.98$ ,  $p < 0.001$ ). Moreover, core self-evaluation was a significant negative predictor of depression ( $b = -0.52$ ,  $SE = 0.05$ ,  $t = -11.54$ ,  $p < 0.001$ ) and anxiety ( $b = -0.43$ ,  $SE = 0.05$ ,  $t = -9.03$ ,  $p < 0.001$ ). Importantly, the effects of body image on depression ( $b = 0.18$ ,  $SE = 0.05$ ,  $t = 3.99$ ,  $p < 0.001$ ) and anxiety ( $b = 0.25$ ,  $SE = 0.05$ ,  $t = 5.25$ ,  $p < 0.001$ ) were still significant after core self-evaluation was taken into the regression.

The results of bootstrap methods showed that the indirect effect of body image on depression through core self-evaluation was significant (indirect effect = 0.20, 95% CI [0.14, 0.27]). The indirect effect of body image on anxiety by core self-evaluation was also significant (indirect effect = 0.17, 95% CI [0.12, 0.22]). The 95% CI did not include 0, indicating that core self-evaluation mediated the relationship between body image and negative emotions (ie, depression and anxiety) in DHH college students, which supported *Hypothesis 2*.

## The Moderating Role of Self-Compassion

We used the model 15 from Hayes' PROCESS macro to test the moderating effect of self-compassion on the path from core self-evaluation to negative emotions and the path from core self-evaluation to negative emotions. As shown in Table 4, the results revealed that core self-evaluation negatively predicted depression and anxiety. Importantly, the predictive effects of core self-evaluation on depression and anxiety were moderated by self-compassion ( $b = 0.09$ ,  $SE = 0.04$ ,  $t = 2.53$ ,  $p = 0.01$ ;

**Table 4** Results of Moderation Analyses

Predictors	Model 1		Model 2			
	Core Self-Evaluation		Depression		Anxiety	
	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>	<i>b</i>	<i>t</i>
Body image	−0.39	−7.98***	0.15	3.41***	0.24	4.93***
Core self-evaluation			−0.45	−8.42***	−0.40	−7.05***
Self-compassion			−0.20	−3.66***	−0.10	−1.77 <sup>+</sup>
Core self-evaluation × Self-compassion			0.09	2.53*	0.07	1.82 <sup>+</sup>
Body image × Self-compassion			0.03	0.66	0.01	0.32
<i>R</i> <sup>2</sup>	0.15		0.41		0.34	
<i>F</i>	63.67***		49.32***		35.86***	

**Notes:** Model 1 represented that the effect of body image on core self-evaluation; Model 2 represented the effects of body image, core self-evaluation, self-compassion, and core self-evaluation × self-compassion on negative emotions (ie, depression and anxiety). The *b* value represents the standardized coefficients. <sup>+</sup>*p* < 0.10; \**p* < 0.05; \*\*\**p* < 0.001.



$b = 0.07$ ,  $SE = 0.04$ ,  $t = 1.82$ ,  $p = 0.07$ , respectively). Further, we used the simple slope tests to examine the predictive effects of core self-evaluation on depression and anxiety at high and low levels of self-compassion (ie, one standard deviation above and below the mean of self-compassion). The results showed that the predictive effects of core self-evaluation on depression and anxiety at high levels of self-compassion ( $b_{\text{simple}} = -0.35$ ,  $SE = 0.06$ ,  $t = -5.89$ ,  $p < 0.001$ ;  $b_{\text{simple}} = -0.32$ ,  $SE = 0.06$ ,  $t = -5.12$ ,  $p < 0.001$ , respectively) were lower than that at low levels of self-compassion ( $b_{\text{simple}} = -0.54$ ,  $SE = 0.07$ ,  $t = -7.77$ ,  $p < 0.001$ ;  $b_{\text{simple}} = -0.47$ ,  $SE = 0.07$ ,  $t = -6.34$ ,  $p < 0.001$ , respectively). However, the results also showed that self-compassion did not moderate the influences of body image on depression and anxiety ( $b = 0.02$ ,  $SE = 0.04$ ,  $t = 0.66$ ,  $p = 0.51$ ;  $b = 0.01$ ,  $SE = 0.04$ ,  $t = 0.32$ ,  $p = 0.74$ , respectively). The above results partially supported *Hypothesis 3*.

## Discussion

The current study aimed to explore the process that may help explain how body image influences negative emotions and whether the process varied depending upon different levels of self-compassion in DHH college students. The results suggested that DHH college students' body image can not only directly affect negative emotions, but also indirectly influence negative emotions through core self-evaluation. Moreover, our results also revealed that self-compassion moderated the effects of core self-evaluation on negative emotions. These findings enrich the understanding of the influence of body image on the negative emotions of DHH college students and its mechanism.

Firstly, this study revealed that body image was a significant predictor of depression and anxiety in DHH college students, indicating that DHH college students with dissatisfaction with their body image were more likely to suffer from negative emotions. This result was consistent with previous studies.<sup>8,9</sup> An extensive body of studies suggested that body image, as an important evaluation indicator of self-body, could influence the happiness,<sup>47</sup> life satisfaction,<sup>48</sup> self-esteem<sup>48</sup> and mental health (negative emotions)<sup>49</sup> of DHH individuals. Two possible views can explain the present results. For one thing, individuals with hearing impairments are prone to dissatisfaction with body image, which may impact their body self-concept,<sup>7</sup> resulting in negative emotions. For another, individuals who are dissatisfied with their body image may seek larger interpersonal distance and reduced social interaction,<sup>50</sup> thus affecting their social relationships and producing negative emotions. Therefore, the body image of DHH college students influences their negative emotions.

Secondly, the current study discovered that core self-evaluation played a mediating role in the relationships between body image and negative emotions in DHH college students, which was similar to the prior study. For example, the cross-sectional studies of Lu and colleagues<sup>48</sup> found that self-esteem mediated the relationship between perceived physical appearance and life satisfaction in DHH and hearing adolescents. Pehlivan et al<sup>13</sup> conducted a longitudinal study and discovered that body image could predict depression through self-esteem in endometriosis. Previous researchers proposed that body image, as a kind of low levels of self-concept, can affect high levels of self-concept such as core self-evaluation,<sup>22</sup> which in turn impacts individuals' negative emotions.<sup>23,24</sup> Individuals holding satisfactory body image tend to develop positive core self-evaluations, while conversely holding an unsatisfactory body image can lead to the development of negative core self-evaluations. Positive core self-evaluations further influence individuals to create processing biases for positive information, thus reducing negative emotions.<sup>27</sup> Similarly, negative core self-evaluations cause individuals to process negative information more, resulting in more negative emotions.<sup>27</sup>

Interestingly, our results showed that self-compassion moderated the effects of core self-evaluation on negative emotions but not the effects of body image on negative emotions. Previous studies found that individuals with high levels of self-compassion tend to hold more effective emotion regulation strategies. Based on the emotional coping theory, self-compassion leads individuals to face suffering with openness and tolerance, thus alleviating the negative emotions generated by the suffering. Importantly, self-compassion, as a subjective experience, was assumed to be a response to suffering.<sup>30</sup> If individuals experience some stressful events that might not trigger subjective distress, self-compassion will not respond.<sup>51</sup> Core self-evaluation, as a high-level self-concept, is an evaluation of self-worth and competence. If individuals' core self-evaluation is low, it represents their aversion and devaluation of the self, which is perceived as great suffering. Therefore, self-compassion will mitigate the effects of core self-evaluation on negative emotions. Recently, Zhang et al<sup>33</sup> also found that self-compassion played a moderating role in the relationship between contingent self-esteem on negative emotions.

Different from core self-evaluation, body image is a low level of self-concept that may not threaten self-value and capacity. In other words, dissatisfaction with body image may not be a distressing experience for DHH college students. Moreover, the DHH college students recruited for this study were enrolled in specialized education departments or programs within mainstream universities, meaning that their primary social interactions were also with other DHH students. In this environment, DHH college students may exhibit fewer differences from their DHH peers in terms of physical integrity, an aspect of body image that they highly prioritize. Research has shown that stronger cultural adaptation to either Deaf or hearing culture predicts a more positive body image.<sup>52</sup> Additionally, studies have found that DHH adolescents in special education schools had high levels of body satisfaction.<sup>48,53</sup> Similarly, for DHH college students in self-contained classrooms, body image may not trigger subjective suffering. Thus, self-compassion did not moderate the relationship between body image and negative emotions in DHH college students.

## Implications and Limitations

The present study has both important theoretical and practical implications. Theoretically, to the authors' knowledge, this study is the first attempt to examine core self-evaluation and self-compassion in the relationship between body image and negative emotions using a sample of DHH college students. These results emphasized the important effect of body image on negative emotions in DHH college students, which broadened the understanding of the influencing factors of negative emotions in DHH college students. Furthermore, this study showed that core self-evaluation is an important mediator and self-compassion is a vital moderator in the relationship between body image and negative emotions in DHH college students, which enhanced the understanding of how and when body image impacts negative emotions in DHH college students. Practically, these findings provide valuable insight for eliminating negative emotions of DHH college students. Firstly, the results of the effect of body image on negative emotion enlighten us that we should cultivate positive body image of DHH college students. Although hearing loss cannot be fully recovered, hearing impaired college students can improve other aspects of their body image through physical exercise and healthy eating habits, such as facial appearance and well-proportioned body. Secondly, the mediating role of core self-evaluation suggests that DHH college students can develop positive core self-evaluation by improving self-esteem and self-efficacy, developing emotional stability, and increasing their sense of control. Thirdly, the moderating role of self-compassion inspires that we should cultivate the capacity of self-compassion of DHH college students.

Several limitations of this study should be noted. Firstly, we recruited participants from self-contained classrooms for DHH students in college, which limited the generalization of results to other samples of DHH college students educated in mainstream classes. Previous studies suggested that DHH college students studying in self-contained classrooms may have less negative impact on body image than DHH college students studying in mainstream classes.<sup>48,53</sup> Thus, future studies could investigate the relationship between body image and negative emotions in DHH college students studying in mainstream classes and explore the difference between DHH college students studying in mainstream classes and self-contained classrooms in the effect of body image on negative emotions. Secondly, this study was a cross-sectional study which cannot reveal the causal relationship between body image and negative emotions in DHH college students. Extant research showed the complex longitudinal relationship between low levels of self-concept and high levels of self-concept. However, this study only discovered the association between low levels of self-concept (body image) and high levels of self-concept (core self-evaluation). Future studies could use longitudinal design or experiment methods to explore the causal relationship between body image, core self-evaluation, and negative emotions in DHH college students.

## Conclusion

This study explored the important role of body image in the negative emotions of Chinese DHH college students and revealed the mediating role of core self-evaluation and the moderating role of self-compassion in this process. The results indicated that body image not only directly affects negative emotions but also indirectly influences the development of negative emotions through core self-evaluation. These findings highlight that body image is a key factor influencing negative emotions in DHH college students. More importantly, body image affects individuals' negative emotions through core self-evaluation. Moreover, self-compassion can mitigate the impact of core self-evaluation on negative emotions, further proving the importance of an individual's emotional regulation ability in emotional management.



## Data Sharing Statement

The dataset analyzed during the current study is available from the corresponding author upon reasonable request.

## Ethics Approval and Informed Consent

This study conformed to the Declaration of Helsinki and was approved by the Ethics Committee of Tibet University (ZDYXLL2024003). All participants signed an informed consent form before starting the questionnaire, could withdraw from the questionnaire at any time.

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## Disclosure

The authors declare no conflicts of interest in this work.

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