Between body esteem and mental health among adolescents in China

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Article Info	ABSTRACT
	Numerous studies have highlighted the importance of body esteem and unconditional self acceptance (USA) in promoting mental health over actual body shape. This study aimed to examine the relationship between body esteem and mental health, and whether this is mediated by USA, and whether the mediation is moderated by actual body shape. The cross-sectional study included 189 adolescents from Ganzhou, China, to complete the body esteem scale (BES) and general health questionnaire (GHQ-28) to measure body esteem and general mental health, respectively. The bootstrap analysis, with 5,000 samples at a 95% confidence interval showed that the effect of body esteem on mental health was fully mediated by USA, and the significant mediation effect was observed only among individuals with moderate body mass index (BMI). These findings suggest that unconditional self-acceptance is an important protective factor against mental health issues, yet striving to have a moderate BMI with positive attitude helps with the entire process.

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1. INTRODUCTION

The prevalence of poor mental health among adolescents is a growing concern in many countries, as evidenced by various studies in the last five years, for instance, it was reported that the proportion of adolescents with mood disorders has risen from 13% in 1996 to 29.2% in 2015 in Malaysia [1], and in the United States, it was reported at 15.08% [2], [3]. From Japan, similar report showed the number of 17.0% [4]. A large sample study among Southeast Asian Nations, such as Laos, Philippines, Thailand, and Timor-Leste reported 9.0% of adolescents have developed suicide ideation in the year of 2015 [5]. Responding to the concern, numerous studies have been conducted to gain a deeper understanding of mental health issues, particularly among high-risk populations, such as young adults and adolescents. Studies have consistently shown that young individuals, such as adolescents, are highly susceptible to mental health issues [6]–[8]. Large numbers of current studies on mental health issues among young individuals, especially adolescents, boiled down to one factor, which is the individuals' evaluation of their own body. It has been reported that adolescents' evaluation towards themselves is significantly related to their mental health [9]. Body esteem, which pertains to adolescents' valuing of their physical appearance, has been established as a significant predictor of significant predictor of social anxiety, depression, and other mental health disturbances [10]. Moreover, adolescents tend to form their body esteem by comparing themselves to other individuals with ideal-looking appearance [11], [12]. Festinger's theory of social comparison [13] suggested that individuals tend to seek for validation by comparing oneself to others, especially when they were at young age, and among current

generation of adolescents, this physical social comparison was corroborated by the presence of social media [14]. This phenomenon of social comparison among adolescents has been reported to be linked with the development of their perceived standard for an ideal body image. This standard is subsequently utilized by adolescents to formulate their body esteem. Specifically, when adolescents perceive that their physical appearance deviates from their idealized body image benchmark, they are prone to develop lower levels of body esteem. Conversely, if they perceive their physical appearance to be closer to their idealized body image benchmark, they are more likely to experience higher levels of body esteem [15]. Furthermore, the actual body shape, represented by body mass index (BMI), might also interact with body esteem in contributing to the overall mental health [16], with trait social comparison as a significant mediator [17], in other words, adolescents with suboptimal BMI may still foster affirmative body image perceptions when they refrain from engaging in social comparisons regarding immutable physical attributes, such as genetic makeup, height, or skeletal structure.

Consistent with this notion, social comparison has been identified as the principal contributor to a distorted ideal body image, whereby individuals, especially adolescents, perceive themselves as flawed if they do not perceive themselves to be alike or relatively similar to individuals with ideal body mass index (BMI) as portrayed on various social media platforms [18]. This sense of imperfection obstructs their ability to accept themselves as they are, thereby adversely impacting their overall mental health. Additionally, upward social comparison significantly predicts the way adolescents evaluate themselves, including the way they evaluate their physical appearance. It is commonly acknowledged that social media platforms are populated with individuals who possess an ideal BMI. Nonetheless, as noted by Thompson *et al.* [19], individuals who perceive themselves as failing to meet their ideal BMI standard are subject to the adverse ramifications of engaging in upward social comparison. Moreover, the greater the disparity between their actual BMI and their perceived ideal BMI, the less inclined they are to accept themselves as they are. Contextually, non-ideal body shape should not be harmful to the adolescents' mental health as long as they develop positive body-esteem or believe that they have a positive physical appearance. It is reported that the negative body-esteem among young individuals often came from social comparison [20] or peers' behavior that make them more aware of their sub-ideal body image, such as body-shaming and verbal bullying [21]. Confirming that, another study in Malaysia reported that adolescents who are more likely compare themselves with their peers were less likely to be able to accept themselves unconditionally [22].

The connection between body esteem and general mental health has been vastly studied in various context, and most of the studies reported the involvement of many other factors, such as general self-esteem [10], the sense of mattering [23], ability to accept oneself unconditionally [24], and body satisfaction [25], [26]. Among adolescents, it was reported that seeing their own selfies in social media would trigger them to evaluate their own physical appearance and be involved in social comparison that affected their well-being and body esteem [27], which in turn, lowered their defense against further mental health issues [11]. The involvement of social media in the relationship among body esteem, unconditional self acceptance (USA) and mental health was emphasized during the coronavirus desease (COVID-19) outbreak, where most individuals were locked down and develop higher reliance on social media platforms for daily social interactions [28], and the social media usage predicted higher frequency of social comparison among younger individuals [29]. Social comparison among youth through social media was also intensified by certain personality traits, such as perfectionism, which lowered their sense of mattering and increased their depression levels [30]. For instance, adolescents with perfectionism traits may be negatively impacted by seeing their own selfies on social media, as it may trigger them to evaluate their physical appearance and engage in social comparison, leading to decreased body esteem and inability to accept themselves as they are [27]. This, in turn, may weaken their ability to cope with future mental health issues [11]. The role of social media in the relationship between body esteem, USA, and mental health was particularly highlighted during the COVID-19 pandemic, when many individuals were confined to their homes and relied heavily on social media for daily interactions [28]. Social media usage was found to predict increased frequency of social comparison among younger individuals [29]. Which can be further intensified by certain personality traits, such as perfectionism, leading to decreased sense of mattering and increased levels of depression [31].

Popov [24] was particularly interesting as it denied the significance of the body esteem in predicting one's general mental health; Popov suggested that the way body esteem, either positive or negative, would not significantly predict their mental health as long as it does not affect their USA. It can be concluded that when individuals evaluate their body as positive, they would likely be able to accept themselves unconditionally and eventually be protected from various kinds of mental health problems.

While most of the aforementioned studies appeared to support the mediation hypothesis, it is also important to investigate the role of the actual body shape, or in the context of this study, represented by the BMI in forming the body esteem and USA, as well as maintaining one's positive mental health. First of all, both perceived and actual body image of an individual might interact in predicting their USA as the social feedback based on their actual BMI might confirm their positive or negative body esteem [9]. Second, the

interaction of the actual BMI and USA might also give different impact toward the overall mental health condition [32], as social feedback toward adolescents with ideal BMI might corroborate with their USA and reinforce its contribution on general mental health. The aforementioned past studies led us to form the following hypothetical moderated mediation model illustrated in Figure 1.
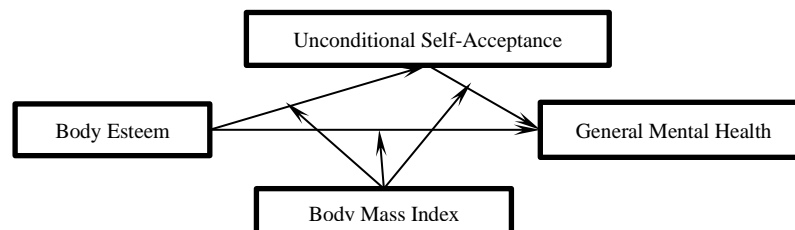

Figure 1. The hypothetical moderated mediation model

2. METHOD

2.1. Participants

Prior studies in the fields of psychology and psychiatry have revealed that sample sizes in studies are often inadequate, leading to insufficient reliability and reproducibility of evidence. To address this issue, a sufficient sample size is necessary to ensure consistency and stability of instruments such as questionnaires. In this cross-sectional survey study, sample size prediction was based on the results of the G*Power sample size calculator with a medium effect size of 0.15, power 0.8 and alpha value of 0.05. A minimum sample size of 87 adolescents from Ganzhou, China was suggested, but to obtained higher validity, 189 participatns were recruited. It is important to note that the study was conducted in Ganzhou, China as well.

2.2. Measurements

Body esteem was measured by body esteem scale (BES) by Tylka and Subich [33]. It is a scale used to assess an individual's subjective evaluation of their physical appearance, body image, and overall body satisfaction. It is a self-report questionnaire consisting of a series of items that examine attitudes and beliefs about various aspects of the body, such as weight, shape, and attractiveness. It consists of 35 items that are rated on a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree". The items are grouped into three subscales namely: i) appearance evaluation: this subscale measures an individual's overall satisfaction with their physical appearance, including their weight, shape, and attractiveness; ii) appearance orientation: this subscale measures the extent to which an individual's mood and self-worth are influenced by their physical appearance; and iii) body areas satisfaction: this subscale measures an individual's satisfaction with specific areas of their body, such as their stomach, thighs, and hips. The total score on BES is calculated by summing the scores on all the items. Higher scores indicate greater body esteem or satisfaction with one's body, while lower scores indicate lower levels of body esteem or dissatisfaction with one's body.

2.2.1. Unconditional self acceptance (USA)

The USA was measured by using the scale of unconditional self acceptance [33]. The USA is a self-report questionnaire consisting of 12 items that assess an individual's level of self-acceptance, regardless of their successes, failures, or perceived flaws. The items are rated on a 5-point Likert scale, ranging from "strongly agree" to "strongly disagree". Higher scores in the USA indicate greater levels of unconditional self-acceptance, while lower scores indicate lower levels of self-acceptance. The USA is commonly used in research and clinical settings to assess the effectiveness of cognitive-behavioral interventions aimed at improving self-acceptance and reducing psychological distress [34].

2.2.2. General mental health

The general mental health was measured by using the health questionnaire (GHQ) [35]. It is a self-report questionnaire that is used to assess an individual's level of psychological distress or mental health problems. It consists of 28 items that are designed to measure four dimensions of mental health namely, somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression. It is a widely used screening tool in both research and clinical settings. It is often used to identify individuals who may be at risk for developing mental health problems, as well as to monitor changes in mental health over time. The GHQ is a self-administered measure, meaning that individuals complete the questionnaire themselves, and it typically takes about 5-10 minutes to complete. The items are rated on a 4-point Likert scale, ranging from "better than usual"

to "much worse than usual". Higher scores on the GHQ indicate higher levels of psychological distress or mental health problems.

2.2.3. BMI
The BMI was calculated by dividing a person's weight in kilograms by their height in meters squared (BMI=kg/m²). The World Health Organization (WHO) defines BMI ranges: i) Underweight: BMI below 18.5 kg/m², ii) Normal weight: BMI between 18.5 and 24.9 kg/m², iii) Overweight: BMI between 25 and 29.9 kg/m², and iv) Obesity: BMI of 30 kg/m² or higher.

2.3. Data collection procedure
Data was collected after the ethical clearance was issued by the Department of Research and Postgraduate Studies, Faculty of Social Science and Liberal Arts, UCSI University (no. 4108/RPG/FOSSLA/2021). The consent form was signed by the participants and/ their consenting guardians, each part of the form was back translated to mandarin and compiled to a digital form to be distributed online. Content validity was tested by a panel of expert from a public university in China and University of Cyberjaya, Malaysia.

2.4. Data analysis
The collected data was analyzed with bootstrapping method with 5,000 samples and 95% confidence interval. This method was chosen as bootstrapping method does not require assumption tests as in multiple regression and Sobel test, and at the same time, less likely to produce human errors such as in any structural equation model technique [36]. The analysis was conducted by employing the model 59 of PROCESS macro 4 for SPSS.

3. RESULTS AND DISCUSSION
3.1. Conditional direct effect of body esteem on general mental health, moderated by BMI
The conditional (moderated) direct contribution of body esteem on general mental health is depicted in Table 1. As depicted in Table 1, body esteem significantly and negatively predicts general mental health when the BMI is moderate and high. When the BMI is moderate, one point increase of body esteem predicts 0.86 points reduction of GHQ score, which means that the mental health is increased by 0.86 points, and when the BMI is higher, one point increase of body esteem predicts 0.11 points decrease of GHQ score, which means that the mental health is increased by 0.11 points.

Table 1. Conditional direct effect of X on Y (X=BES, Y=GHQ, W=BMI)

BMI	Effect	Se	t	P	LLCI	ULCI
16.952	-.072	.048	-1.502	.135	.135	.023
19.287	-.086	.035	-.015	.015*	-.156	-.017
22.213	-.105	.041	-.012	.012*	-.187	-.024

3.2. Moderated mediation hypothesis testing
The conditional indirect contribution of body esteem on general mental health mediated by USA is depicted in Table 2, while the indirect contribution of body esteem on general mental through USA is depicted in Table 2. Each of the effect and significance is depicted in low, moderate, and high BMI levels. As depicted in Table 2, USA significantly mediated the association between body esteem and general mental health when the BMI is moderate, as there is no zero score between the lower limit of bootstrap confidence interval and upper limit confidence interval. And it was a partial mediation as the direct effect of body esteem and general mental health is also significant when the BMI is at the moderate level. On the other hand, the USA did not perform any significant mediation role when the BMI was either low or high. The indirect effect is negative to the GHQ score, which means that mental health will increase by 0.39 points when the BMI is at the moderate level and the body esteem is increased by 1 point.

Table 2. Conditional indirect effect of X on Y through M (X=BES, M-USA, Y=GHQ, W=BMI)

BMI	Effect	BootSE	BootLLCI	BootULCI
16.952	-.037	.024	-.087	.005
19.287	-.039	.017	-.077*	-.008
22.213	-.038	.025	-.099	.000

3.3. Post hoc analysis

While our test on the moderated mediation indicated that adolescents with moderate or 'ideal' BMI would have their USA mediates the effect of their body esteem on their general mental health, we are aware that the effect was not strong at -0.039, or in other words, barely 4% increment of mental health is predicted by an increase in body esteem, even after being mediated with the USA. To obtain further confirmation, we conducted further analysis on the 'appearance' part of the body esteem scale, as we would like to investigate whether the adolescents in China can accept themselves better when they think their physical appearance is good, and whether this acceptance can cover more changes in mental health improvement. The direct effect of the appearance element of body esteem on general mental health, moderated by the BMI is depicted in Table 3. The conditional indirect effect of the appearance element of body esteem on general mental health, mediated by the USA and moderated by BMI is depicted in Table 3.

Table 3 suggested that the appearance element of body esteem is not a significant predictor of general mental health at any level of BMI. This result implies that despite one believing that they have a positive physical appearance, they would not be mentally healthier, regardless of how they actually look. When the USA is included in the quotation as a mediator variable, the result is depicted in Table 4.

Table 3. Conditional direct effect of X on Y

BMI	Effect	Se	t	P	LLCI	ULCI
16.952	-.132	.093	-.316	.161	.316	.053
19.228	-.137	.073	-.280	.062	-.280	.007
22.213	.143	.087	-.314	.100	-.314	.028

X=BES appearance, Y=GHQ, W=BMI

Table 4. Conditional indirect effect of X on Y through M

BMI	Effect	BootSE	BootLLCI	BootULCI
16.952	-.088	.057	-.207	.013
19.228	-.091	.040	-.175*	-.022
22.213	-.083	.049	-.196*	-.007

X=BES appearance, M-USA, Y=GHQ, W=BMI

As can be seen in Table 4, the significant mediation of USA only occurs among individuals with moderate and high BMI (there is no zero score between the lower and upper limit of bootstrap confidence interval), which can be interpreted as the adolescents in China with an ideal or overweighted body tend to develop a more positive body esteem and can accept themselves better and scored lower mental health issues. The result can be interpreted as when the body esteem is reduced to only the adolescent's perception on their physical appearance, it would not significantly predict their mental health improvement without the mediation role of the USA. Additionally, it will only happen among adolescents with moderate and high BMI.

3.4. Discussion

Although the direct effect of body image on mental health was shown significant at the moderate and high levels of BMI, see Table 1, we did not consider that as the final result of this study, as we need to take into account the mediation role of the USA. It was shown that the USA partially mediated the link between the body esteem and the mental health when the BMI is at the moderate level, see Table 2. In other words, our results suggested that when Chinese adolescents with positive attitude toward their bodies, they would be able to accept themselves more, and thereby, would likely to be mentally healthier. Especially when they have an actual ideal body shape, not too heavy or too light.

Our post-hoc analysis suggested that when an adolescent in China believe that they look good, they would likely accept themselves better, and have better mental health levels, especially if they have ideal or overweighted bodies. When an individual is underweight (lower levels of BMI) their self-acceptance would not likely predict their general mental health, at any level of BMI.

The main finding of our study is slightly different from the previous study, such as reported by Rahim et al. [16] and Pop and Iorga [10], which reported that the link between body esteem and mental health is mediated by social comparison. Our finding moved a little bit ahead by indicating that it is the USA, instead of social comparison, that mediated the link. Despite our first finding indicating the importance of self-acceptance, our findings also suggested that it was not always the case. The mediation of the USA only occurs when the adolescents have an actual ideal BMI.

4.   CONCLUSION

The moderate mediation hypothesis was supported by our results, where the body esteem positively predicts mental health and partially mediated by the USA, in the condition of moderate BMI. The practical implication of this study lies in the finding that the actual BMI actually plays significant role in the maintenance of mental health of Chinese adolescents, where their parents and educators might want to enforce good diet and workout regime to achieve moderate BMI and be able to accept themselves better, with a hope that they would be protected from any mental health challenges. Additionally, our post-hoc analysis suggested that adolescents in China would be better in accepting themselves unconditionally and have better mental health when they have moderate BMI or higher BMI. This finding might not be in line with previous findings which reported that adolescents prefer to be underweight than overweight when they are not able to reach an ideal BMI.

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