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The impact of body-shaping intention and fitness behavior on quality of life

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Abstract

Weight loss and body shaping have become prevalent trends in Taiwan; having an ideal body shape is a goal pursued and desired by most young people. Therefore, we conducted a study focused on how college students who are dissatisfied with their body shape can improve their quality of life (QOL) through body-shaping intention (BSI) and fitness behavior (FB). We employed purposive sampling and conducted a questionnaire-based survey in universities in the northern, central, southern, and eastern regions of Taiwan (n=518). First, we adopted the structural equation modeling (SEM) framework to examine hypothesized relationships between the research variables (BSI, FB, QOL). Subsequently, confirmatory factor analysis was conducted to test the structural validity of the questionnaire. Finally, AMOS was used to evaluate the SEM. The SEM analysis revealed that BSI had a positive impact on QOL ($\beta = .369$, $t = 5.293$, $p < .001$); BSI positively influenced FB ($\beta = .543$, $t = 7.964$, $p < .001$); and FB positively affected QOL ($\beta = .192$, $t = 4.186$, $p < .001$). BSI not only motivates individuals to engage in FB to improve their health and appearance but also significantly enhances their QOL by improving aspects such as their physical health, psychological state, and social support. These results are beneficial for educational institutions to re-evaluate their health promotion strategies for students. They underscore the importance of continuously enhancing school fitness and weight loss programs, providing significant insights for relevant policies and practices.

Keywords: Health promotion, structural equation modeling, weight-loss programs.

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1. Introduction

Based on a survey conducted by Taiwan's Ministry of Health and Welfare from 2017 to 2020, 34.8% of Taiwanese university students (ages 19–24) fall into the overweight or obese category according to their body mass index (BMI) [1]. Body image is a multifaceted construct that includes body perception and attitudes, particularly self-evaluation of physical appearance [2, 3]. Most individuals' body image primarily centers around their weight and body shape; those with a higher

body fat percentage tend to be less satisfied with their body image [4]. This dissatisfaction can directly harm self-esteem [5]. Previous studies have also indicated that a negative body image is significantly associated with higher levels of anxiety and depressive symptoms [6], and those with a higher BMI exhibit more pronounced depressive symptoms [7]. Being in good shape enhances not only self-esteem but also psychological well-being and quality of life (QOL) [8]. Therefore, the aim of this study was to determine whether and how body-shaping intention (BSI) and fitness behavior (FB) improve the QOL of Taiwanese university students who are dissatisfied with their body shape.

BSI refers to an individual's motivation and goals in pursuing an ideal body shape, typically including exercise, diet management, and fitness plans to achieve muscle sculpting, fat reduction, or a specific body form [9]. Previous research has indicated a negative correlation between adolescents' BMI and their body image, with leaner individuals having a better body image. Among these, female adolescents exhibit significantly higher dissatisfaction with their bodies and stronger weight-loss intentions than male adolescents [9, 10]. Additionally, studies have shown a significant positive relationship between body-image satisfaction and the level of participation in fitness activities [11]. This implies that individuals who are more satisfied with their physique are more likely to engage in fitness exercises to maintain their physical appearance. Therefore, BSI and FB are evidently closely related.

FB refers to specific actions and habits related to an individual's participation in exercise or physical activities. An FB is a planned, organized, and repetitive physical activity aimed at promoting or maintaining health and fitness [12, 13]. Previous research indicates that dissatisfaction with one's body shape can stimulate more proactive behaviors [11]. Weight loss and muscle gain are major motivations for engaging in fitness activities. Some individuals initially start exercising owing to appearance concerns, but over time, their motivation may shift toward physiological and psychological well-being [14]. Achieving an ideal body shape requires sustained effort and commitment, with regular exercise and a healthy lifestyle being key aspects in reaching this goal [15]. Fitness activities and adequate nutrition are critical factors in a healthy lifestyle [16]. Specifically, the combination of a healthy diet and regular exercise can effectively maintain and improve health and promote physical and mental well-being [17].

QOL is an open-ended concept that changes with societal development [18]. Its definition varies depending on cultural, social, and personal values. According to the World Health Organization, QOL is a comprehensive indicator reflecting an individual's well-being and satisfaction in the physical, psychological, social, and environmental domains. When adolescents perceive themselves as overweight and feel pressured to lose weight, they are reportedly more likely to identify with extrinsic exercise goals related to weight [19]. In particular, a stronger motivation to engage in fitness activities is associated with a higher degree of life satisfaction [20]. Overall, an individual's subjective well-being is often measured as a part of life satisfaction, and exercise and physical training are important factors in the improvement of QOL [14, 18].

2. Literature Review

2.1. BSI and QOL

Previous research has indicated that a higher BSI leads to increased participation in physical activities, which can promote physical health by enhancing muscle strength, improving cardiovascular function, and controlling weight, thereby reducing the risk of chronic diseases and improving overall health-related QOL [11]. Furthermore, body-shaping behaviors may enhance an individual's body esteem and self-confidence owing to the pursuit of an ideal body image [21] while also helping to reduce anxiety and depressive symptoms [6, 22]. Finally, Peráčková and Peráček [17] and Gillison et al. [18] argue that healthy social relationships contribute to an individual's adherence to regular exercise and improve their enjoyment of and satisfaction with their life via social support. Active participation in fitness activities can provide opportunities for social interaction, strengthen an individual's social support networks, and enhance their social QOL. In summary, BSI can improve health and well-being through multiple facets and may have a positive impact on an individual's QOL. Therefore, for this study, hypothesis H1 was that BSI has a positive effect on QOL.

2.2. BSI and FB

In recent years, the theory of planned behavior has been successfully applied in empirical research across various fields [23, 24]. Behavioral intention refers to an individual's propensity to engage in a specific behavior and is primarily used to predict behavioral performance; thus, it is considered a precursor to behavior Huang et al. [23]. Wang et al. [24]. found that a higher BMI in participants was often associated with a higher BSI, which, in turn, increased their engagement in fitness activities. Additionally, Wang et al. [24] and Feng et al. [25] found that health-oriented dietary intentions of obese individuals had a significant impact on healthy eating behaviors. Furthermore, Feng et al. [25] and Mahmoudi et al. [26] discovered that individuals who were more dissatisfied with their body shape tended to exhibit stronger dietary restraint and exercise behaviors. In summary, BSIs have multifaceted effects on FB. It not only enhances motivation and goal setting but also promotes self-discipline and a diversity of FBs, while increasing a sense of achievement and social support, which aids in achieving long-term fitness goals and improving overall health [21]. Therefore, hypothesis H2 was that BSI positively affects FB.

2.3. FB and QOL

Mahmoudi et al. [26] and Hao et al. [27] reported that regular aerobic exercise and strength training yield optimal improvements in overall physical health and QOL. Hao et al. [27] and Breda et al. [28] also pointed out that adults' activity positively influences their QOL. Specifically, individuals who actively engage in exercise report significantly higher satisfaction with their QOL than those who do not exercise [18]. Additionally, exercise helps the body to manage and release stress, alleviates depressive symptoms, and reduces stress symptoms and QOL [8, 29]. Regular exercise and attention to body

shaping evidently reduce anxiety and depressive symptoms, improving mood and overall mental health [7, 27]. Finally, participating in group exercises or fitness classes can enhance social interactions and relationships, which contribute to increased life satisfaction and well-being, Zullig and White [30]. Zullig and White [30] also confirmed that fitness activities can improve well-being and promote physical health. Moreover, Hair et al. [31] discovered that men and women who engage in vigorous physical activities experience a significant increase in life satisfaction. Therefore, hypothesis H3 was that FB positively affects QOL.

3. Materials and Methods

3.1. Participants

This survey-based study had a cross-sectional design. We targeted university students in four regions of Taiwan: northern, central, southern, and eastern Taiwan. Participants were required to have more than a year of experience on FB. Purposive sampling was employed, with a total of 625 questionnaires distributed and 518 valid responses collected. Among the respondents, 298 were male (57.5%) and 220 were female (42.5%). The population distribution was as follows: northern region, 172; central region, 170; southern region, 111; and eastern region, 65. The age distribution of respondents was 18–24 years (500 participants, 96.5%), 25–34 years (16 participants, 3.1%), and 35–44 years (2 participants, 0.4%).

3.2. Statistical Analysis

In this study, we used SPSS for descriptive statistics and correlation analysis, and AMOS for structural equation modeling. The aim of the structural equation model was to examine the composite reliability (CR), average variance extracted (AVE), convergent validity, and discriminant validity of the measurement tools and to test the theoretical relationships between latent variables via path analysis. The criteria to assess convergent validity are as follows: the standardized factor loading (FL) of questionnaire items should be greater than .50, the CR of each factor should be greater than .60, and the AVE should be greater than .50. To assess discriminant validity, the correlation coefficient between two different factors must be less than the square root of the AVE (SROAVE) [32].

3.3. Instruments

The scales used in this study were the Body Shape Intention Scale (BSIS), Fitness Behavior Scale (FBS), and Quality of Life Scale (QOLS). All items on the scales were rated using a 5-point Likert scale. The internal consistency reliability of the tools was assessed based on the criteria recommended by Bien [33]: a Cronbach's α value greater than .7 indicated acceptable internal consistency reliability.

BSI was defined as the individual's motivational tendency to pursue their ideal body appearance. The BSIS was developed based on the research topic and with reference to Yu and Cheng [34] and Lin et al. [35]. We subjected it to exploratory factor analysis (EFA), which resulted in the extraction of three factors (Kaiser–Meyer–Olkin [KMO] value = .810, $p < .001$), with a cumulative explained variance of 77.50%. The three dimensions were as follows: willingness to continue (e.g., "I expect to continue managing my body shape in the future"), sharing (e.g., "I would recommend body-shaping activities to others"), and cognition (e.g., "Body shaping is very important to me"). The results of confirmatory factor analysis indicated that the three factors had acceptable model-fit indices (χ^2/degrees of freedom [df] = 4.527, goodness of fit index [GFI] = .956, standardized root mean square residual [SRMR] = .047, adjusted goodness of fit index [AGFI] = .917, non-normed fit index [NNFI] = .923, Normed Fit Index [NFI] = .935, and Comparative Fit Index [CFI] = .949). Convergent validity (item FL values ranged from .50 to .87; CR values for each factor ranged from .740 to .817; AVE values ranged from .51 to .60) and discriminant validity (SROAVE values ranged from .713 to .730, larger than the correlation coefficients between dimensions) were confirmed. Cronbach's α for the overall scale was .818, and those for the three subscales were .713 (willingness to continue), .818 (sharing), and .752 (cognition), indicating good reliability.

FB was defined as the specific behaviors and habits of an individual participating in physical exercise or physical activities. The FBS was developed based on the research topic [26, 36]. The scale was subjected to EFA, which resulted in the extraction of three factors (KMO = .943, $p < .001$), with a cumulative explained variance of 80.77%. The three dimensions were as follows: "dietary management" (e.g., "I avoid consuming high-calorie foods at every meal"), "physical activity" (e.g., "I engage in intense exercise three times a week"), and "routine" (e.g., "I schedule regular times for fitness activities"). Results of confirmatory factor analysis indicated that these three factors had acceptable model-fit indices (χ^2/df = 3.944, GFI = .954, SRMR = .025, AGFI = .915, NNFI = .970, NFI = .973, and CFI = .980). For convergent validity, item FL values ranged from .79 to .88; CR values ranged from .87 to .90; and AVE values ranged from .68 to .74. For discriminant validity, the SROAVE values ranged from .827 to .860, greater than the correlation coefficients between dimensions. Cronbach's α for the overall scale was .940, and those for the three subscales were .891 (dietary management), .868 (physical activity), and .857 (routine), indicating good reliability.

QOL was defined as the degree to which an individual feels satisfied with their physical, psychological, and social relationships in the environment in which they live. The QOLS was based on the Chinese version of the "World Health Organization Quality of Life Questionnaire" [37] and adapted to suit the research objectives. The scale was subjected to EFA, which yielded three factors (KMO = .874, $p < .001$), with a cumulative explained variance of 75.10%. The three factors were as follows: "physical health" (e.g., "Am I satisfied with my sleep quality?"), "psychological health" (e.g., "Am I satisfied with my overall life?"), and "social relationships" (e.g., "Am I satisfied with the support I receive from friends?"). Results of confirmatory factor analysis indicated that these three factors had acceptable model-fit indices (χ^2/df = 2.735, GFI = .974, SRMR = .036, AGFI = .951, NNFI = .962, NFI = .961, and CFI = .975). Convergent validity (item FL values ranged from .56 to .82; CR values ranged from .74 to .80; AVE values ranged from .51 to .54) and discriminant validity (SROAVE values

ranged from .707 to .736, greater than the correlation coefficients between dimensions) were confirmed. Cronbach's α for the overall scale was .856, and those for the three factors were .768 (physical health), .741 (psychological health), and .723 (social relationships), indicating good reliability.

4. Results

4.1. Model-Fit Analysis

The overall model-fit indices for this study were evaluated. The χ^2/df was 3.381, which is less than 5 [38]. The AGFI was .938, greater than .8 [39], the GFI was .967, also greater than .8 [40], the CFI was .972, exceeding .9 [41], and the SRMR was .042, which is less than .08 [42], all of which met the evaluation criteria. Additionally, the NNFI was .959, greater than .9 [43], and the NFI was .962, also exceeding .9 [43], both of which met the evaluation standards. In summary, these assessments indicate that the overall model fit of this study was within an acceptable range.

4.2. Path Analysis

The structural model was evaluated to assess the hypotheses in the conceptual framework, including the relationships among BSI, FB, and QOL (see Figure 1). The standardized path coefficient (β) was employed to determine the extent to which the data supported the hypothesized relationships (Figure 1 and Table 1). Hypothesis H1 was supported (β = .369, t = 5.293, p < .001), demonstrating a positive impact of BSI on QOL among university students. Hypothesis H2 was also supported (β = .543, t = 7.964, p < .001), showing a positive impact of BSI on FB. Finally, hypothesis H3 was supported (β = .192, t = 4.186, p < .001), demonstrating a positive impact of FB on QOL. The results of this study show that BSI not only motivates individuals to engage in FB to improve their health and appearance but also significantly enhances QOL by improving aspects such as physical, psychological, and social support.

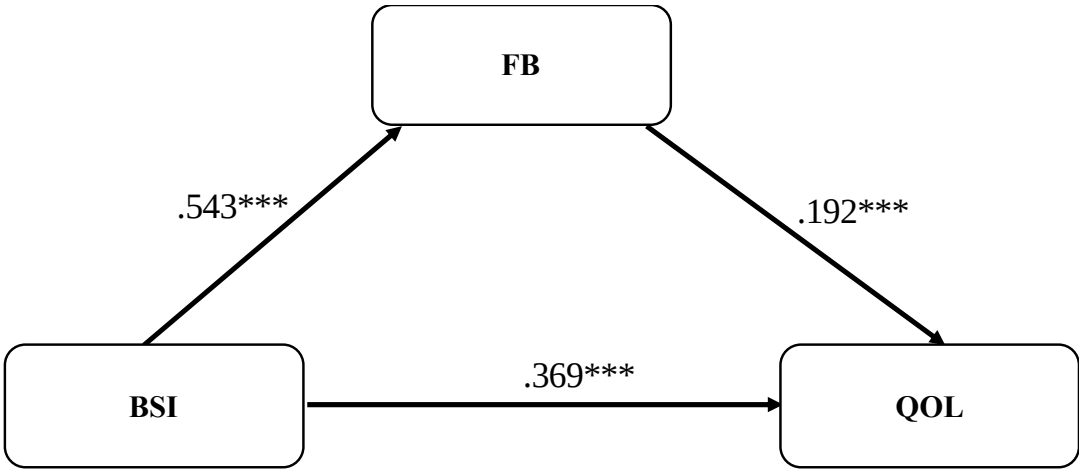

Figure 1.
Structural equation model describing the relationship between BSI, FB, and QOL, and the value of each arrow represents the standardized path coefficient. ***Indicates statistical significance at the p < .001 level.

Table 1.
Path-analysis results.

Path	β	S.E.	t	p value	Decision
H1: BSI→QOL	0.369	0.070	5.293	***	Supported
H2: BSI→FB	0.543	0.068	7.964	***	Supported
H3: FB→QOL	0.192	0.046	4.186	***	Supported

5. Discussion

5.1. BSI Positively Affects QOL

The results of this study indicated that BSI has a positive impact on QOL. This indicates that BSI encourages individuals with poorer body image to be more willing and active in participating in fitness activities, thereby helping them to improve their physical strength, body shape, and self-esteem [21], further enhancing their overall health and QOL. Additionally, for individuals engaged in body shaping, BSI may be associated with other health-behavioral changes, such as healthier eating habits and regular routines, which contribute to an improved overall QOL [25, 44]. Furthermore, participation in fitness activities and exercise classes often increases social interactions and helps individuals to build relationships with others, which also has a positive effect on QOL. However, although BSI has a positive impact on QOL, a balance must be maintained, and BSI must be moderated. Excessive anxiety or overemphasis on body shaping may have negative effects (e.g., behaviors that lead to anorexia and the use of drugs for weight loss) [45-49], which is a concern that educational institutions should address in the future.

5.2. BSI Positively Affects FB

This study revealed that when individuals' exercise goals or intentions are focused on body shaping, they are more likely to engage in regular physical activity and exhibit a higher commitment to the sustainability and intensity of their workouts.

BSI may motivate individuals to set specific exercise plans and actively seek out and use resources to achieve their goals. Specifically, several positive effects of BSIs were discovered. First, they contribute to increased exercise frequency and sustainability, as such goals typically involve regular physical activity [26]. Second, with a clear BSI, individuals are often more willing to invest time and energy in exercise [26] and are more likely to seek professional guidance or participate in fitness classes. BSI may also be associated with the adoption of other health behaviors, such as healthy eating and sufficient sleep [28], that support the achievement of body-shaping goals. In summary, this research highlights the significant explanatory power of BSIs on individuals' FB. It not only enhances motivation and goal setting but also promotes self-discipline and diversification of FB, while increasing feelings of achievement and social support, ultimately aiding individuals in reaching long-term fitness goals and improving overall health.

5.3. FB Positively Affects QOL

The findings of this study echo those of Peráčková and Peráček [17] and Gillison et al. [18], indicating that individuals who actively engage in exercise have a significantly better QOL. It also highlights that FB can be considered an important factor influencing QOL. Essentially, regular participation in fitness activities offers various benefits in terms of QOL. For example, exercise helps the body to handle and release stress, alleviates depressive symptoms, and reduces stress-related symptoms [8, 50, 51]. As physical activity increases, health-related QOL improves significantly [47]. Additionally, university students participating in group exercises or fitness classes can increase their social opportunities, expand their social circles, and enhance their interpersonal relationships, which also contributes to an improved QOL [52]. Overall, regular fitness exercises can significantly enhance physical health, psychological well-being, and social welfare, thereby improving QOL [52]. A high QOL can also increase a person's resources and motivation, promoting continued FB. Understanding and strengthening this relationship is crucial to enhance the overall well-being and QOL of individuals seeking to shape their bodies.

6. Conclusion

This study revealed that BSI positively affects QOL and FB, and that FB positively affects QOL. These observations indicate that BSI not only motivates individuals to engage in FB to improve their health and appearance but also significantly enhances their QOL by improving their physical health, psychological state, and social support. These results will help educational institutions reassess their health promotion strategies for students and emphasize the importance of continuously strengthening school fitness and weight loss programs, providing important insights for related policies and practices.

6.1. Implications

Previous research suggested that having a good body shape not only enhances self-esteem but also helps reduce anxiety and depression, significantly impacting personal psychological well-being and QOL [8, 50, 51]. The findings of this study indicate a close interrelationship among BSI, FB, and QOL. It confirms that BSI can motivate FB, contributing to improvements in both physical and mental health, and subsequently enhancing the QOL of university students. Therefore, we recommend that educational institutions provide fitness facilities and related resources on campus, offer exercise courses and professional guidance, and create opportunities for students to engage in fitness activities. Regular assessments of students' obesity levels and weight-loss consultations should be offered along with achievable fitness goals to enhance BSI. Establishing fitness clubs or organizations, conducting health and body-shaping seminars, and providing community activities can help disseminate knowledge about weight loss and fitness, raising students' health promotion awareness. In summary, these strategies may promote BSI and FB, as well as improve students' QOL.

6.2. Limitations and Recommendations

This study was primarily focused on university students in Taiwan, which may limit the generalizability of the research results to different age groups and broader populations. Additionally, as the study had a cross-sectional design, we made observations at a specific point in time and did not capture participants' longitudinal progression. Therefore, we recommend that future research employ a longitudinal method to examine whether the relationships between variables remain stable over time. Finally, we suggest that researchers conduct individual interviews regarding BSI and FB factors among university students and perform qualitative analysis to explore the nuances affecting QOL in greater depth.

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