

Original Article

Psychological correlates of eating behavior in overweight/obese adolescents in Taiwan: Psychometric and correlation analysis of the Three-Factor Eating Questionnaire (TFEQ)-R21



Yu-Wen Lin ^a, Chung-Ying Lin ^b, Carol Strong ^c,
Chih-Hsiang Liu ^c, Yi-Ping Hsieh ^d, Yi-Ching Lin ^e,
Meng-Che Tsai ^{f,*}

^a School of Medicine, College of Medicine, National Cheng Kung University, Tainan, Taiwan

^b Department of Rehabilitation Sciences, Faculty of Health and Social Sciences, The Hong Kong Polytechnic University, Kowloon, Hong Kong

^c Department of Public Health, National Cheng Kung University Hospital, College of Medicine, National Cheng Kung University, Tainan, Taiwan

^d Department of Social Work, College of Nursing and Professional Disciplines, University of North Dakota, Grand Forks, ND, USA

^e Department of Early Childhood and Family Education, College of Education, National Taipei University of Education, Taipei, Taiwan

^f Department of Pediatrics, National Cheng Kung University Hospital, College of Medicine, National Cheng Kung University, Tainan, Taiwan

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Key Words

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Background: The Three-Factor Eating Questionnaire (TFEQ) is a self-assessment scale used widely in the studies of eating behavior, but its short form TFEQ-R21 has not been validated in the Taiwanese population. This study aimed to assess the factor structure and reliability of TFEQ-R21 and to identify the correlates of eating behavior in obese and non-obese Taiwanese adolescents.

Methods: A total of 445 individuals aged 13–15 years were analyzed. They self-reported their eating disorder behavior, body shape preoccupation, weight-related self-stigma, anxiety, and depression. We applied a confirmatory factor analysis to test the model fit of TFEQ-R21 for the

* Corresponding author. Department of Pediatrics, National Cheng Kung University Hospital, College of Medicine, National Cheng Kung University, 1 University Road, Tainan 70101, Taiwan. Fax: +886 6 2753083.

E-mail address: ache93@yahoo.com.tw (M.-C. Tsai).

three pre-conceptualized domains in the data. Further univariate and multivariate linear regression analyses were applied to identify the correlates of different TFEQ-R21 subdomains. *Results:* The Comparative Fit Index for the TFEQ-R21 was 0.908, which confirmed the three-factor structure (i.e., cognitive restraint [CR], uncontrolled eating [UE], and emotional eating [EE]) in the Taiwan version of TFEQ-R21. Only CR correlated with disordered eating ($r = 0.351$, $p < 0.001$). Body shape discrepancy, rather than weight status, was associated with CR in both males ($\beta = 0.15$, 95% odds ratio [CI] 0.05–0.25) and females ($\beta = 0.21$, 95% CI 0.10–0.32). Gender differences were noted in the correlates of UE and EE, where ideal body shape in males and self-perceived stigma in females were the main associative factors.

Conclusion: The Taiwan version of the TFEQ-R21 is a robust, reliable tool by which to measure adolescent eating behavior. Gender differences in the eating behavior correlates require clinical and public health attention when implementing weight management programs.

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1. Introduction

The prevalence of obesity in childhood and adolescence has risen dramatically in the past few decades and has become a global health burden, including in Taiwan.^{1,2} A recent nationwide survey reported that approximately one third of Taiwanese boys and one quarter of Taiwanese girls aged 6–13 years were overweight or obese.³ Substantial research has been dedicated to investigating impacts of childhood obesity on a wide variety of adverse cardiometabolic outcomes, including hypertension, insulin resistance, hyperuricemia, and dyslipidemia.⁴ In light of preventing subsequent health burdens, it is important to understand the determinants of obesity developed in early life.

Eating is important for human survival because promoting a positive energy balance (taking in more energy than is expended) is necessary. Satiety, the feeling of postprandial fullness, and satiation, the process of stopping eating because of fullness are principal parts of the body's appetite control system that determine intake.⁵ Unhealthy eating behavior, including overeating because of non-resistance to palatable sugared and energy-dense foods and eating quickly until experiencing a feeling of fullness, may likely contribute to the occurrence of obesity.⁶ Many factors may influence eating behavior among obese individuals, such as weight stigma, body image, emotional stress, and psychological well-being.⁷ For example, a prior study showed that weight misperception in young adults who were overweight or obese was likely associated with disordered eating behavior.⁸ Also, adolescents who have a great deal of attention paid to their weight tend to be overconcerned about others' judgments of their appearance.⁹ Consequently, these individuals are at risk for eating disorders because of negative psychological effects and dissatisfaction with their body image.¹⁰ Given that the association between eating behavior and obesity may be contextually sensitive, it is therefore essential to dissect the mechanism in different social contexts when addressing the issue of juvenile obesity in order to better design weight management programs for this specific age group.

The Three-Factor Eating Questionnaire (TFEQ) is a self-assessment scale used widely in studies of eating behavior

in overweight and normal-weight individuals.¹¹ It assesses three cognitive and behavioral domains (or factors) related to eating, i.e., cognitive restraint (CR, a conscious restriction of food intake to control body weight or promote weight loss), uncontrolled eating (UE, an insuppressible desire to eat more than usual because of loss of intake control), and emotional eating (EE, an overeating behavior resulting from dysphoric mood status). The original version contains 51 items, and a shortened 21-item version (TFEQ-R21) with a revised three-factor structure has been developed using data for obese and non-obese participants recruited in the United States and Canada.¹² The shortened form is also more suitable for epidemiological studies or clinical trials, in which the study participants may have multiple questionnaires to complete in a limited time span. The original TFEQ has been translated into Chinese and validated on a sample of Taiwanese adolescents.¹³ However, no other short forms of the Chinese TFEQ have, as of yet, been evaluated for its validity using a stringent psychometric factor analysis.

The aim of this study is firstly to validate the Taiwan version of TFEQ-R21 questionnaire on eating behavior and secondly to examine the psychological correlates of eating behavior among Taiwanese adolescents.

2. Methods

2.1. Subjects

Recruitment took place in a junior high school, where the school authorities were informed of the study but were independent from it, in Changhua County, Taiwan. All of the students were invited to participate voluntarily. The participants and their parents were required to give informed consent to fill out anonymous questionnaires linked to the records of heights and weights that were annually taken by school nurses. The detailed process of recruitment can be found elsewhere¹⁴ and it was approved by the Institutional Review Board of the National Cheng Kung University Hospital (A-BR-106-009).

2.2. Measures

2.2.1. Weight status

Weight status was represented by body mass index (BMI) calculated as body weight divided by height squared. For analytical purposes, we categorized BMI measurements into two groups, i.e., normal weight (BMI between 5th and 85th percentile of the same-age-and-gender population) and overweight/obesity (OW/OB, BMI \geq 85th percentile of the same-age-and-gender population), after excluding those who were underweight (BMI $<$ 5th percentile of the same-age-and-gender population).¹⁵

2.2.2. Taiwan version of TEFQ-R21

The TFEQ-R21 consisted of 21 items rated on a four-point Likert scale. The Taiwan version of TFEQ-R21 was abbreviated from the original full version of Chinese TFEQ containing 51 items validated in the Taiwanese population (Table S1).¹³ As suggested in the literature,¹² we averaged the scores (ranging from 1 to 4) for the overall items as well as the items within the subdomain of each item, i.e., EE, UE, and CR, where a higher score indicated a more dysfunctional eating behavior.

2.2.3. SCOFF questionnaire

The SCOFF questionnaire contains five dichotomous items, namely purging, binge eating, weight loss, body dissatisfaction, and a feeling of being controlled by food, and it was initially designed to identify eating disorders in clinical populations (Table S2).¹⁶ The scoring of the questionnaire assigns one point for every “yes,” and total scores of 2 and 3 on the five items are suggested as the optimal cutoff values for determining disordered eating behavior among males and females, respectively. The Cronbach’s alpha was 0.519. We used the Mandarin version of the SCOFF questionnaire (M-SCOFF), which is understandable and colloquial in the Taiwanese social context.¹⁷

2.2.4. Body image

Ideal and perceived body image were assessed using a sex-specific figure rating scale with seven body sketches of adolescent boys and girls ranging from underweight (1) to overweight (7).¹⁸ The participants selected the figures that most closely represented their actual and ideal body shape (IBS). Body shape discrepancy (BSD) was defined by the difference between the perceived and ideal body shape.¹⁹ A positive BSD value indicated a bigger (heavier) perceived body shape than the IBS.

2.2.5. Weight stigma

We used the Weight Self-Stigma Questionnaire (WSSQ) to measure self-stigma related to weight.²⁰ Briefly, the WSSQ applies a 5-point Likert scale and contains 12 items, which can be subdivided into two domains, i.e., self-devaluation and fear of enactment, with six items assigned within each domain. The Cronbach’s alpha values were 0.801 and 0.892, respectively. A higher score on the WSSQ indicates a higher level of weight-related self-stigma.²¹

2.2.6. Depression and anxiety

We used the Hospital Anxiety and Depression Scale (HADS) to measure participants’ psychological well-being.¹⁴ The HADS contains two domains, i.e., anxiety and depression, and each domain has seven items rated on a four-point Likert-type scale. The Cronbach’s alpha was 0.813 for anxiety and 0.692 for depression. After reverse coding the negatively worded items and adding up all the item scores, higher scores on the HADS indicated a greater level of anxiety or depression.

2.2.7. Covariates

We included age, gender, and parental education levels as covariates in our analysis.

2.3. Statistical analysis

We applied a confirmatory factor analysis to test the fit of the three pre-conceptualized domains. The final model was required to have a Bentler’s comparative fit index (CFI) $>$ 0.9, root mean square error of approximation (RMSEA) $<$ 0.08, and Tucker–Lewis index (TLI) $>$ 0.9 to indicate the model fit.²² If warranted, this algorithm allows accommodation of the existing TFEQ-R21, structured as a three-factor measurement model, to the community sample data.¹¹ The distribution of responses was evaluated at the item level to identify any significant floor effects ($>$ 50% of responses at the lowest end of the scale) and ceiling effects ($>$ 50% of responses at the highest end of the scale). The Cronbach’s coefficient α ($>$ 0.7 as recommended)²³ was used to estimate the internal consistency of each domain in the refined model. In order to examine the external validity in terms of determining the clinical symptomatology of eating disorders, we correlated the TFEQ-R21 scores and the subdomains with those of the SCOFF applying a Pearson’s correlation analysis.

We summarized the demographic characteristics and compared the differences between subgroups stratified by weight status (i.e., non-overweight vs. overweight/obesity) using a Student’s *t* test and a Chi-square test as appropriate. The distribution normality of the questionnaire scores were examined according to the values of skewness and kurtosis. Further, we used linear regression models to explore the correlates of adolescent eating behavior. In the first step, analyzing one independent variable at a time, we included actual weight status, ideal body shape, body shape discrepancy, weight-related self-stigma, anxiety, and depression, respectively, as the independent variable in the univariate linear regression model defining TFEQ-R21 scores as outcomes. Secondly, we captured the overall correlates of eating behavior as the independent variables in the multivariate linear regression model allowing for multiple adjustments. All the analyses were adjusted for age and stratified by gender, and they were conducted using AMOS 22.0 and SPSS 17.0 (SPSS Inc., Chicago, IL, USA).

3. Results

The demographic information of the participants is presented in Table 1. A total of 699 students were approached and 478 among them returned valid questionnaires. After excluding 33 participants due to underweight, the final

Table 1 Demographic information of participants.

N(%) or Mean(SD)	Overall N = 445	Normal weight N = 270	OW/OB N = 175
Age	13.90 (0.83)	13.92 (0.83)	13.87 (0.83)
Gender			
Male	219 (49.2%)	121 (45%)	98 (56%)
Female	226 (50.8%)	149 (55%)	77 (44%)
Male sample			
TFEQ-R21			
Overall	2.00 (0.41)	1.96 (0.40)	2.05 (0.41)
EE	1.78 (0.70)	1.77 (0.65)	1.80 (0.77)
UE	2.12 (0.56)	2.15 (0.53)	2.08 (0.59)
CR	2.11 (0.53)	1.95 (0.54) ***	2.30 (0.46)
SCOFF	0.83 (1.10)	0.57 (0.94) ***	1.14 (1.11)
Ideal body shape	3.95 (0.71)	3.82 (0.62) **	4.11 (0.78)
Body shape discrepancy	0.33 (2.04)	-0.28 (1.67) ***	1.08 (2.21)
Weight-related self-stigma	2.21 (0.71)	2.02 (0.74) ***	2.44 (0.59)
Anxiety	4.50 (3.63)	4.45 (3.50)	4.56 (3.82)
Depression	4.83 (3.72)	4.85 (3.53)	4.81 (3.96)
Female sample			
TFEQ-R21			
Overall	2.13(0.40)	2.11(0.38)	2.16(0.44)
EE	1.89(0.68)	1.88(0.69)	1.90(0.67)
UE	2.21(0.57)	2.23(0.56)	2.15(0.59)
CR	2.28(0.59)	2.20(0.61) **	2.43(0.50)
SCOFF	1.42(1.20)	1.31(1.19)*	1.61(1.21)
Ideal body shape	3.52(0.82)	3.35(0.77) ***	3.85(0.82)
Body shape discrepancy	0.97(1.46)	0.61(1.19) ***	1.67(1.65)
Weight-related self-stigma	2.10(0.66)	1.94(0.63) ***	2.43(0.61)
Anxiety	4.86(3.85)	4.89(3.86)	4.81(3.85)
Depression	4.23(3.30)	4.38(3.28)	3.93(3.35)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ in the comparisons between community non-OW/OB and OW/OB groups.

OW/OB indicates overweight/obesity; SD, standard deviation; TFEQ-R21, Three-Factor Eating Questionnaire 21-item Revision; EE, emotional eating; UE, uncontrolled eating; CR, cognitive restraint.

sample comprised 445 individuals with a mean age of 13.90 (± 0.83) years, of whom 219 (49.2%) were male. Among them, 270 participants (45% male) were classified as normal weight with a BMI of 15.5–21.9 kg/m², and 175 participants (56% male) were classified as OW/OB with a BMI of 22.0–40.3 kg/m². Between-group comparisons between the OW/OB and normal-weight groups in the community sample indicated that the OW/OB individuals reported significantly higher scores in the CR domain of the TFEQ-R21, SCOFF questionnaire, BSD, and WSSQ.

3.1. Psychometric analysis of the Taiwan version of the TFEQ-R21

The CFA confirmed the three-factor structure of the Taiwan version of the TFEQ-R21 (Fig. 1). The Bentler's CFI and

RMSEA for the TFEQ-R21 in the community sample examined in this study were 0.908 and 0.063, respectively, which indicated an acceptable model fit despite the fact that the TLI = 0.886 was suboptimal. No evidence of floor or ceiling effects was observed, as the percentages at the lowest or highest ends were less than 50% for all items. The Cronbach's coefficient α was 0.84 for the UE domain, 0.91 for the EE domain, and 0.79 for the CR. The correlation between the scores on the SCOFF and TFEQ was generally low. The correlation coefficients were 0.351 ($p < 0.001$) for CR, 0.099 ($p = 0.032$) for UE, 0.102 ($p = 0.027$) for EE, and 0.269 ($p < 0.001$) for the overall scores. The psychometric properties were comparable within male and female subsamples (Fig. S1).

3.2. Correlates of the eating behavior

The results of the linear regression analyses stratified by gender are summarized in Table 2. In males, the ideal body shape was consistently associated with the UE ($\beta = 0.20$, 95% confidence interval [CI] 0.07–0.33), and EE ($\beta = 0.17$, 95% CI 0.00–0.33) domain scores in the multivariate adjustment models. In terms of the association with the CR domain scores, body shape discrepancy was the only salient correlate ($\beta = 0.15$, 95% CI 0.05–0.25) while weight status was not significant in the multivariate adjustment models. In females, body shape discrepancy ($\beta = 0.21$, 95% CI 0.10–0.32) and anxiety ($\beta = 0.03$, 95% CI 0.01–0.06) were associated with the CR domain scores. The WSSQ ($\beta = 0.22$, 95% CI 0.07–0.37) and anxiety ($\beta = 0.04$, 95% CI 0.01–0.07) scores were associated with EE, respectively.

4. Discussion

The results of the current study demonstrated that the Taiwan TFEQ-R21 performed with adequate internal consistency as well as good convergent and optimal psychometric properties. The CR was the only domain that correlated with the SCOFF scores. We also found gender differences in the determinants of eating behavior in the Taiwanese adolescent cohort under consideration in this study.

The analysis in the present study showed that the three domains of the TFEQ-R21 were robust and stable. In prior research conducted in Canada and the US, the original six-item CR domain did not show stability because items 17 ('How likely are you to make an effort to eat less than you want?'), 18 ('How often do you avoid "stocking up" on tempting foods?'), and 21 ('On a scale from 1 to 8, where 1 means no restraint in eating, and 8 means total restraint, what number would you give yourself?') failed in the convergent and discriminant validity tests, thus suggesting some underlying weakness in use in the clinical population.¹² However, along with an earlier Taiwanese study,¹³ we demonstrated the appropriateness of its use in the Taiwan adolescent population. Since cultural factors may account for the differences in the psychometric properties of TFEQ-R21, we did not find any weak items loaded within the three domains of the TFEQ-R21, and our data indicated its psychometric appropriateness for use in the Taiwanese population. In the external validation analysis of the TFEQ-

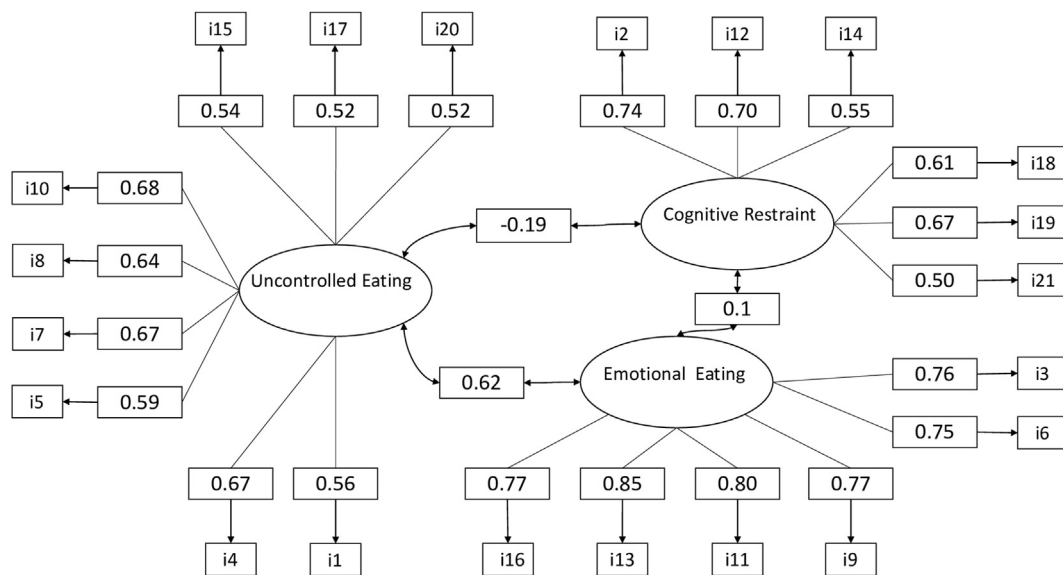


Figure 1 Confirmatory factor analysis: factor loading and domain correlation for 21-item Three-Factor Eating Questionnaire.

R21, we found that only the CR domain correlated with the SCOFF scores. The SCOFF principally measures externalizing disordered eating behavior,²⁴ which may not be captured in adolescents when using the items in the EE and UE. Another possibility for this outcome was that our sample was mainly recruited from a community setting. Externalized disordered eating behavior was not prevalent in this cohort, where only 28 (5.9%) individuals fulfilled the criteria for an eating disorder based on the SCOFF questionnaire and where the cut-off values were 2 for males and 3 for females.¹⁷ Future studies on clinical subjects may further clarify the correlation between the TFEQ and SCOFF questionnaires. Because the SCOFF questionnaire has been widely used in screening clinical presentations of eating disorders, we still argue that the TFEQ-R21 may complement its use by providing more internalized disordered eating concerns. The clinical utility of the TFEQ-R21 in this regard requires more supporting research.

In the gender differential correlates of the TFEQ-R21 subdomains, we found that body shape discrepancy was positively associated with the CR domain for both male and female adolescents. This finding supports a previous notion suggesting a desire for thinness in body shape, which drives cognitive restraints on eating behavior.²⁵ Thus, for male adolescents, the ideal body shape and body shape discrepancy were the most salient correlates in the EE domain. This finding was consistent with some recent research showing that the pursuit of muscularity under peer comparative situations or contextual pressure was significantly associated with emotional and disordered eating.^{8,12,26} In contrast, for female adolescents, weight-related self-stigma and anxiety were found to be most likely associated with the EE domain in the present study as well as in prior research.^{27,28} This finding supports previous research showing that teasing by friends and family, as well as internalized weight stigma, especially that related to weight- and body-related shame and guilt, are correlated with eating disorders.²⁷ We tentatively concluded the presence of gender differences in the correlates of

adolescent eating behavior. In response to emotional status related to weight-related self-stigma and anxiety for female adolescents and the ideal body shape and body shape discrepancy for male adolescents, males eat because of their concerns about their self-perceived body image while females were found to be more likely to be influenced by their psychological status. Accordingly, we propose the use of different strategies for the management of disordered eating found in overweight/obese individuals. For example, building up a positive attitude toward one's body image may strengthen self-acceptance and promote healthy eating habits among males.²⁹ In addition, one prior study also indicated that interventions with a focus on enhancing the acceptance of self-image can potentiate refeeding management in patients with eating disorders.³⁰ On the other hand, attention should be paid to bullying/teasing experiences and psychological status when consulting overweight/obese females. For example, intervention that centers on resolving interpersonal problems and psychological adaptation has been proven to be efficacious in reducing uncontrolled eating in overweight youths.³¹

There are some limitations to this study. First, the participants were recruited from a convenience community sample, which makes the results less representative for the entire Taiwanese adolescent population. However, the confirmatory factor analysis was consistent with previous research¹³ in defining the three factorial structure of the TFEQ. Our study should be able to validate the use of the TFEQ-R21 in the Taiwanese adolescent population. Further research may also be required to examine the clinical utility of the TFEQ-R21 in pediatric obese patients. Second, same-source bias may have been present when investigating the psychosocial correlates of eating behavior. For example, we did not obtain reports from the participants' parents or related adults. Thus, the participants may have underreported their disordered eating behavior or negative feelings if they have been presented with their unhealthy eating habits by others. Also, parental practices may have an essential role in eating behaviors and obesity among

Table 2 Psychological correlates of adolescent eating behavior in the TFEQ-R21 subdomains.

	CR		UE		EE	
	Univariate β (95% CI)	Multivariate β (95% CI)	Univariate β (95% CI)	Multivariate β (95% CI)	Univariate β (95% CI)	Multivariate β (95% CI)
Male sample						
Actual weight status						
OW/OB	0.41* (0.03–0.80)	−0.01 (−0.24–0.22)	−0.07 (−0.22–0.07)	0.13 (−0.12–0.38)	−0.49 (−1.01–0.03)	0.10 (−0.21–0.41)
Normal-weight	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Ideal body shape	−0.05 (−0.16–0.05)	−0.02 (−0.14–0.10)	0.16** (0.06–0.27)	0.20** (0.07–0.33)	0.14* (0.01–0.28)	0.17* (0.00–0.33)
Body shape discrepancy	0.18*** (0.11–0.24)	0.15** (0.05–0.25)	−0.09* (−0.16 to −0.02)	−0.04 (−0.15–0.07)	−0.03 (−0.11– 0.06)	0.00 (−0.14–0.13)
Weight-related self-stigma	0.17** (0.07–0.28)	0.09 (−0.02–0.21)	0.04 (−0.07–0.15)	0.08 (−0.04–0.21)	0.14* (0.01–0.28)	0.15 (−0.01–0.30)
Anxiety	0.00 (−0.02–0.02)	−0.01 (−0.04–0.02)	0.00 (−0.02–0.02)	0.00 (−0.03–0.03)	0.02 (−0.01–0.04)	0.00 (−0.03–0.04)
Depression	0.01 (−0.01–0.03)	0.01 (−0.02–0.04)	0.00 (−0.02–0.02)	−0.01 (−0.04–0.02)	0.02 (−0.01–0.04)	0.02 (−0.02–0.05)
Female sample						
Actual weight status						
Overweight/obesity	0.09 (−0.45–0.62)	−0.07 (−0.29–0.15)	−0.11 (−0.53–0.50)	0.06 (−0.17–0.29)	0.55 (−0.06–1.17)	−0.14 (−0.13–0.4)
Normal-weight	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Ideal body shape	−0.06 (−0.16–0.04)	−0.01 (−0.13–0.11)	−0.04 (−0.13–0.06)	−0.02 (−0.14–0.11)	0.07 (−0.04–0.19)	0.14 (−0.01–0.29)
Body shape discrepancy	0.22*** (0.15–0.30)	0.21*** (0.10–0.32)	−0.02 (−0.10–0.06)	−0.07 (−0.18–0.04)	0.00 (−0.09–0.10)	−0.01 (−0.14–0.12)
Weight-related self-stigma	0.17** (0.06–0.29)	0.04 (−0.09–0.16)	0.06 (−0.06–0.17)	0.12 (−0.01–0.25)	0.17* (0.03–0.30)	0.22** (0.07–0.37)
Anxiety	0.02* (0.00–0.04)	0.03** (0.01–0.06)	0.01 (−0.02–0.03)	0.01 (−0.01–0.04)	0.03* (0.00–0.05)	0.04** (0.01–0.07)
Depression	0.00 (−0.03–0.02)	−0.03 (−0.06–0.00)	−0.01 (−0.03–0.01)	−0.02 (−0.06–0.01)	0.00 (−0.02–0.03)	−0.04 (−0.07–0.00)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

OW/OB indicates overweight/obesity; SD, standard deviation; TFEQ-R21, Three-Factor Eating Questionnaire 21-item Revision; EE, emotional eating; UE, uncontrolled eating; CR, cognitive restraint; CI, confidence interval.

adolescents. Children's attitudes toward eating can be learned from or modified by their related adults. Having the main caretakers participate in the survey may ameliorate this sort of bias and could be insightful in future research. Third, nearly one third of students approached in the high school were not able to either return questionnaires or provide consent to participate in the study. Selection bias may exist if the reason was because these students were from a complicated family situation, where their parents were unreachable.³² As such, we might underestimate the proportion of adolescents with aberrant eating habits. Interpretation should be cautious in light of how this selection bias would lead to the association between eating behaviors and body image remaining unclear. Lastly, the self-reported eating behaviors were screened merely based on the results of questionnaire. Hence, a questionnaire-based approach was not sufficient to specify the type of eating disorders. Although prior research has indicated that a score above a critical cutoff of the SCOFF questionnaire may be suggestive of clinical eating disorders,¹⁶ a comprehensive diagnostic interview may be needed to clarify diagnosis.

In conclusion, we validated the psychometric properties of the TFEQ-R21 in the Taiwanese adolescent population. Using this questionnaire may help identify eating behavior and related concerns in adolescents. In this cohort, we identified gender differential correlates of the TFEQ-R21 subdomains. Specifically, body image is most likely to be associated with eating behavior in adolescent males, while psychological indicators such as perceived weight-related stigma and anxiety are potential correlates of eating behavior in adolescent females. The future research question of interest may be whether the link between psychological distress or body image issues and disordered eating behaviors further places these adolescents at risk for a higher weight. That is, if body image issues and anxiety have an adverse impact on weight gain among adolescents, the association could be via the mediation effect of eating behaviors.³³ Understanding these risk factors for disordered eating behavior in an obesogenic context is imperative in the weight management context.

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Declaration of competing interest

The authors have no conflict of interest to declare.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pedneo.2020.08.006>.